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in Hit Factory Criteria Studio A, Miami

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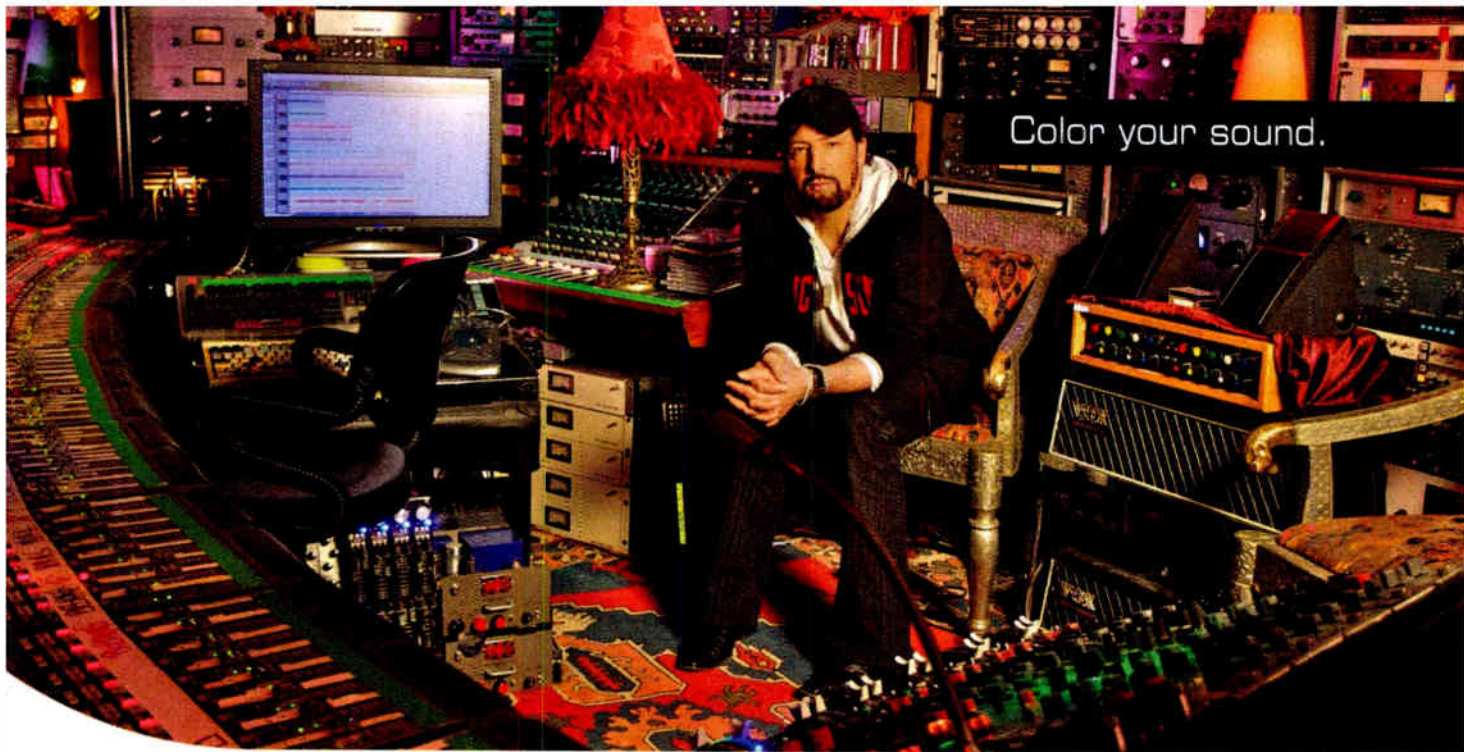
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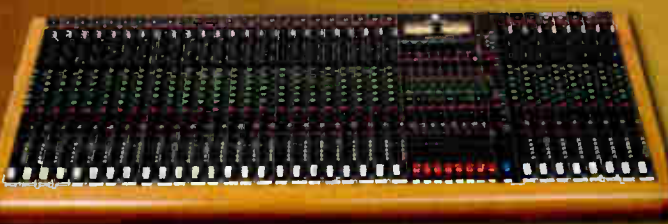
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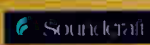


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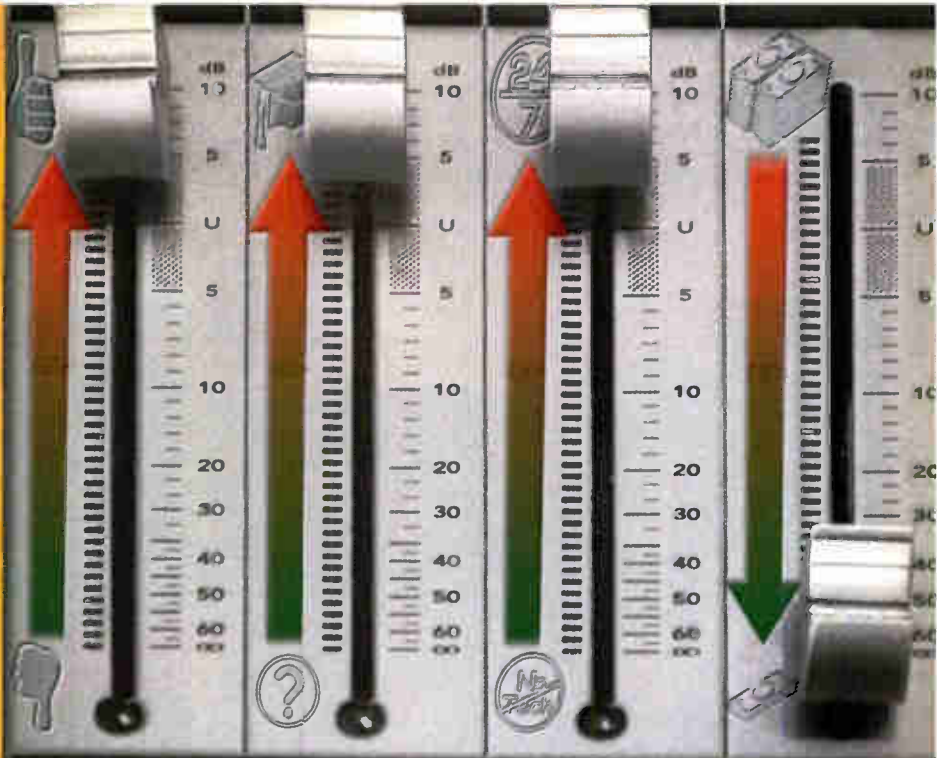
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MIX DECEMBER 2008, VOLUME 32, NUMBER 13



ON THE COVER

Hit Factory Criteria studios (Miami) celebrated its 50th anniversary this year—a rare achievement in any business. *Mix* recalls the history of this legendary multi-room facility, where recent upgrades are only part of the reason for its continued success. See page 16. Photo: David Vance.

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Mastering

Mix's annual mastering issue focuses on the specialized tools and techniques that are needed at that all-important final stage of music production.

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BY GEORGE PETERSEN

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(Volume 32, Number 13) 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 (12 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; Canadian Post Publications Mail agreement No. 40612608. Canada return address: BleuChip International, P.O. Box 25542, London, ON N6C 6B2.

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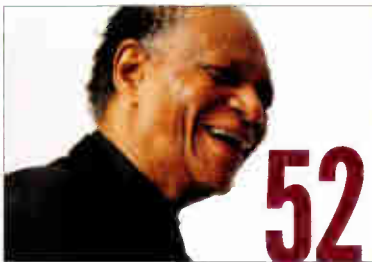
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World Radio History

The Forest and the Trees

I recently went to a rock show with a mastering engineer who had worked on that artist's latest album project. After a great set showcasing the new material, the house lights came up and I turned to the engineer, and asked, "How do you think it sounded?" He laughed, and answered that it sounded "like music."

What he meant was that after spending endless hours in the studio dissecting and massaging spectral components, tonal balance, imaging and dynamic nuances, he could finally sit back, listen and just hear the *song*. (And in this case, even enjoy it.)

Mastering is often regarded as a black art, a mysterious process requiring highly specialized listening skills and dedicated tools. But mastering is also a paradox in perspective, requiring a holistic approach to surgically fine-tune minute details.

One might liken it to a tailor eyeing a swath of fabric, yet at the same time scrutinizing stray threads and snags; or a digital illustrator applying overall color and texture enhancements, yet zooming down to make adjustments at the pixel level.

It may seem counterintuitive to a musician (and most mastering engineers *are* musicians) that mastering requires a certain amount of detachment from the material. (That same engineer told me that whenever clients ask whether he likes their music, he has to explain that it doesn't matter whether he does or not.) But this is certainly not to say that the craft is devoid of passion or creativity; mastering engineers bring a unique point of view to the creative production process—instead of focusing on the lyrics or the hook, they take the right-brain approach right down to the granular level.

All music tells a story, and that message is conveyed not just through words and melody, but through sonic context, and everyone in the recording process—from tracking to mixing to mastering—contributes something to that message. We all serve the song.

Mastering, of course, is about so much more than golden ears. In "From LP to MP3" (page 32), we examine the mastering engineer's expanding role in preparing music for multiple release formats.

We take a closer look at specialty mastering tools with our "Mastering in the Box" feature on available plug-in bundles for the task on page 42. For a look at the business side, in "Sessions" our roving reporters check in on the regional mastering scene in major cities across the U.S. And check out our Website (www.mixonline.com) for exclusive Web-only tutorials on the mastering art.

We've all agreed that enough is enough, yet these days a discussion of mastering just wouldn't seem complete without mentioning the ongoing "loudness wars." In "Setting Limits on Compression" (page 40), we bring you one mastering engineer's inspiring perspective on this all-too-familiar topic.

How do you tell the musical story? Let us know at mixeditorial@mixonline.com.



Sarah Jones
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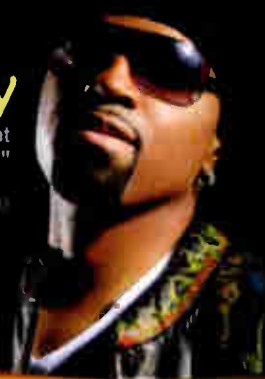
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Setting a Standard



I wanted to comment on the October 2008 issue. *Mix* always manages to bring a balanced and larger perspective on the recording industry than any other publication I read. The interview with T Bone Burnett piqued my interest, partly because this is the third article I have read in as many weeks, but chiefly because of his promotion of his new "CODE" innovation. While I appreciate Burnett's desire to return (or introduce) fidelity to the average consumer's listening experience, I am somewhat mystified by his expectations for this development. I agree that there is no real delivery standard for audio, and it seems unlikely that the industry will adopt a new standard that was not the result of an industry-wide consortium, despite the credentials of its developer.

THX is an example of a process that would not have been adopted if it had not been for the combined muscle of the developers and distributors behind it. I also have doubts about the validity of any process meant to standardize something that is so inherently subjective. There are so many variables in any audio process that uniform delivery will always be compromised by factors that cannot be controlled. One can understand the desire to ensure that what you create is delivered in the closest approximation possible, but it seems more likely that the best case for uniform delivery is at the lowest possible standard rather than the highest. THX is (to me) a fine example of this: It is a standard; it is fairly uniform and sounds completely unnatural.

Burnett is talented; he makes amazing recordings, and maybe he can pull this off. But given the history of the industry and consumers gravitating to the lowest standard rather than the highest, I wish him luck.

Todd Zimmerman
Studio 139

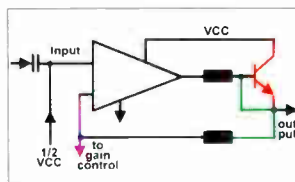
Old Gear, New Tricks

I like reading Eddie Ciletti's "Tech's Files" and picking up little insights. In his July 2008 column ["Eureka Moments: Unlocking a Vintage Console's Long-Hidden Secret," about restoring a 1970s-era Raindirk portable recording desk], he discussed removing a buffer transistor from one of the channel op amps when upgrading the amp and replacing it with a "piece of copper wire." Did Eddie consider putting a low-value resistor (about 22 ohms) there instead? I'm assuming the buffer transistor was inside the op amp's feedback loop. Putting an output resistor inside the feedback loop is an old trick: for increasing op amp stability when driving large capacitive loads, and it might help with his oscillation problem.

Even having the resistor outside the loop will help if the trade-offs are acceptable. (As the newer op amp has better output drive, taking a little away due to the resistor may be a good trade-off.) On its Website, Analog Devices offers a great explanation of this and other techniques, along with an interactive spreadsheet.

Marc Lindahl
Bowery Engineering

Eddie Ciletti replies: Marc, thanks for writing. I think I got lucky in that there was—and still is—a 100-ohm resistor between the op amp and the (former) base of the transistor. In the figure (upper-right), red represents the removed transistor; the green jumper around the transistor was added with the 100-ohm resistor



still within the loop. There is also a load resistor (not shown).

I don't recall which part of the circuit is interrupted by wiring to/from the insert points, but no outboard gear was connected and no one schematic accurately represents this model. The "upgrade" from the original op amp to a 5532



Mix's January issue will focus on live sound. We'd like to hear from live engineers—tell us about your wildest gig. E-mail us at mixeditorial@mixonline.com.

obviously revealed some shortcomings—whether in power/ground distribution or circuit board layout. My acid test was to boost treble and preamp gain to lure the beast into a trap, and the tweaks I made seemed to tame it.

Breaking In

Mix readers tell us how they got into the business:

I did some recording in Nashville in the late '70s and early '80s, and wrote a tune that made it to the radio in 1978. That's when I got the bug to be on the other side of the glass.

I was born with an eye condition called progressive degenerative retinitis. My retinas are falling apart—therefore, I am slowly losing my eyesight. When the condition took a radical turn for the worse in 2002, Missouri's Rehabilitation Services for the Blind enrolled me in Berklee's Master Certificate in Music Production and Technology program. I am almost finished with the program and have learned more than I ever thought I could retain.

In a few short years, I've moved from a two-room, 440-square-foot studio into a purpose-built 1,600-square-foot Pro Tools HD3 studio here in St. Louis. Four people work with me now. We also started a publishing company and a record label. I've been able to create a business that I love and never want to leave—even if it means 60 to 80-hour weeks and some 36-straight-hour sessions. It makes me feel alive!

Larry E. Cowser
12 Bar Productions

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World Radio History

Hit Factory Criteria: 50 Years of Musical Milestones

In the studio business, Hit Factory Criteria stands apart. Fifty years is a lifetime for any business, especially one that combines art and technology. In that time, the studio has helped shape the music industry's leading lights across six decades and countless idioms: Eric Clapton, the Bee Gees, The Eagles, Bobby Vinton, Bob Marley, Duke Ellington, Coldplay, Plácido Domingo, Fleetwood Mac, Sam & Dave, Mariah Carey, Jay Z, The Hives, Missy Elliott, Michael Jackson and Madonna. They have made records with the cream of the industry's producers and engineers, including Phil Ramone, Ed Cherney, Al Schmitt, Eric Schilling, Ron and Howard Albert, Jerry Wexler and Tom Dowd.

"If I could tell you the formula we had for becoming this successful, I'd put it in a bottle and sell it," quips Trevor Fletcher, who started in 1983 and became general manager in 2000 and VP in 2005. "But I do know some of the things that contributed. We're in Miami, not New York, Los Angeles or Nashville—the cities everyone traditionally associates with music recording in the U.S. Miami is a place you come to escape to. But it's also the crossroads of many musical cultures, as easy to get to from São Paulo and Buenos Aires or London and Paris as L.A. or New York."

But they came for more than that. They came for the legacy, and the mix of cutting-edge technology and top technical talent. Fletcher points out that keeping the facility at the top of the tech pyramid has been a key philosophy ever since jazz recording enthusiast Mack Emerman decided in 1958 to stop trundling his tape recorders and microphones from club to club in Miami in the back of his station wagon and put together a place that would attract those players and others to the charms of South Florida.

While Emerman was a jazz buff, the establishment of a state-of-the-art recording studio with custom-built consoles and a 3-track multi-track created its own kind of gravity, drawing talent across a range of styles and genres.

Emerman loved technology, and he encour-



PHOTO: DAVID KING



Above: the control room in Studio A, Hit Factory Criteria's largest of five rooms. Left: Longtime Criteria mainstays the Bee Gees pose under the studio sign in the late 1970s.

aged local electronics genius Jeep Harned to continue to refine the breakthroughs he was making after Emerman enlisted him to tweak Criteria's recording systems. (By 1965, Harned's work at Criteria led him to found MCI, the console and tape deck maker that laid the foundation for the 24-track world of the 1970s and '80s, as well as auto-location and split-console concepts.)

The studio has always been all about top-of-the-line technology, investing in battleship consoles, from the ageless Neve 8078 to an SSL Duality. "They always kept it up as a technology

showcase," recalls Grammy-winning engineer/mixer/producer Eric Schilling, who has used Criteria numerous times over four decades. "Really, the whole recording scene in South Florida stems from this one facility."

The hits started pouring out of the studio in 1965, starting with James Brown's "I Feel Good"—Criteria's first Gold record. Local artists quickly made Criteria their home base, including Steve Alaimo and Betty Wright. And after Tom Dowd and producer Jerry Wexler discovered the studio, much of the Atlantic Records roster would travel to Miami to record, including music royalty such as Aretha Franklin and Wilson Pickett.

Producer Bill Szymczyk was also lured to Criteria's investment in technology. "I told them that if they would upgrade Studio C from 16 tracks to 24, I'd move there," he says. They did, he did, and over the next 17 years Szymczyk did records there with The Eagles, Elvin Bishop, Wishbone Ash, The Outlaws and many others.

The studio grew from Emerman's original single studio to a total of five studios by 1983, with a sixth added in 2000. Technology was part of the attraction at Criteria, and as Fletcher points



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Bobby Rydell (facing forward), Diana Ross and the production team in an early session at Criteria.



1965: James Brown's "I Feel Good" is the first Criteria recording to go Gold; a slew of other hits would come from the famed studio.

out, the studio's location away from pricier beach real estate helped make the expansions possible. "It was rare then, and even more so now, to have the luxury to build rooms that had 22- and 27-foot ceilings," he says. "Each studio has its own unique acoustic character, giving you access to sounds that you can't easily re-create digitally. When you combine that with a wide range of technology, what you're giving the client are many levels of options to find a sound, to find a feel."

The sheer number of studio rooms and the tropical atmosphere encouraged artists to linger over recording projects. It was not unusual to have Eric Clapton (who recorded both Derek & The Dominos' *Layla* and his own *461 Ocean Blvd.* there), The Eagles (much of *Hotel California* was done there) and the Bee Gees essentially setting up residence there. In its heyday, managing Criteria was as much a concierge proposition as it was a technical one. With a 30-member staff, "It was like a five-star hotel that just happened to also make records," says Fletcher. And as in any fine establishment, the Criteria staff happily accept their clients' eccentricities, as Fletcher explains by recounting a moment during

the recording of Iggy Pop's *Skull Ring* LP: "I'm sitting in my office and I hear all sorts of noise going on outside. I go downstairs and Iggy is sitting in his vintage convertible Caddy. There are cables hanging out of the hood, and he is leaning on the horn repeatedly. I walked over, and said 'What's up, Iggy?' He turns around with a big smile on his face, and says, 'I'm doin' horn overdubs, man!' I just went back to my office. What can you say?"

In 1999, renowned multiroom Manhattan recording facility Hit Factory acquired Criteria, infusing the studio with a jolt of fresh capital to fund further renovations and technology updates. "There were obviously some differences in the cultures of the two facilities, but much of those complemented each other, such as Hit Factory's emphasis on the business side of studio operations and Criteria's understanding of so many different musical cultures," says Bob Lanier, COO of Hit Factory Entertainment, the studio's holding company. "And what they shared was just as important: Both studios put a premium on service to the client." With the closure of Hit Factory's facilities in New

York in 2005, Hit Factory Criteria Miami took on the mantle of carrying both studios' remarkable legacies into the future.

In all of its incarnations, Hit Factory Criteria's location at the nexus of Caribbean and Latin American cultures has kept the studio at the forefront of several generations of Latin artists, including Plácido Domingo, Gloria Estefan, José Feliciano, Ricky Martin, Juanes and Maná. It would find itself in that same position as urban music genres became more mainstream, as well, in the 1990s and into the next century. Timbaland, Jay-Z, Usher, Lil' Wayne, Mary J. Blige, Nelly Furtado and other hip-hop hitmakers are regular clients at Hit Factory Criteria, despite most of them having their own very well-equipped personal recording studios. "I think that speaks for itself," Fletcher says. "In this day and age, when people can have pretty

sophisticated recording systems in their homes or personal studios, they will still come to a commercial facility like this where the service is the key."

The same forces that have drastically changed the fortunes of the music recording industry have buffeted Hit Factory Criteria, but coping strategies and tactics have also emerged. "We have adapted to the fact that instead of one artist and producer spending three months here working on a single project, we now have two or three producers working on one or two tracks for a few days or a week, or producers working with several artists simultaneously," Fletcher explains. "Music trends are



Mack Emerman and Ted Nugent take a session break.



If these walls could talk: the tracking space in Studio A

PHOTO: DAVID KING

more cyclical now and we'll go from hip-hop to pop to Latin to rock in the span of a few weeks. The business moves faster and we've had to change accordingly. We always have." III

Dan Daley is a freelance writer based in New York and Nashville.

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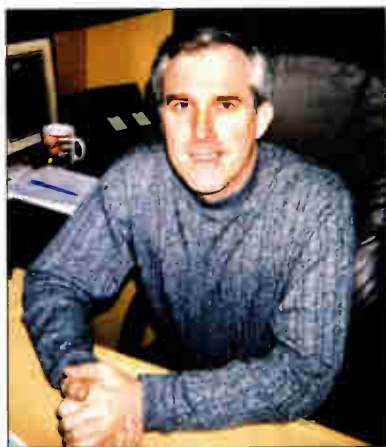


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compiled by Sarah Benzuly

Jim Cowan, 1956-2008

Neutrik president Jim Cowan passed away peacefully on November 5, 2008, after a bout with cancer. Well-known and loved throughout the audio industry, 52-year-old Cowan was a 20-year veteran of Neutrik USA, starting out as general manager and then moving on to VP and becoming president of the company in 2000.



"Jim was a wonderful leader with just the right combination of business skills and personal qualities," said Neutrik AG's CEO Werner Bachman, Cowan's associate and friend for more than two decades. "But more than that, he was an industry icon and a genuinely caring person who touched everyone with his kindness. He was sincere, yet never

took himself too seriously. No matter how busy Jim was, he always made the time to talk to you, especially at trade shows. I know he will be sorely missed by an industry he so significantly impacted."

The first employee of Neutrik USA, Cowan loved the pro audio industry. In a *Mix* interview, he talked about the satisfaction he felt from "meeting and having one-on-one conversations over the years with industry leaders and pioneers such as Hartley and Melia Peavey, Greg Mackie, Phil Hart, Charlie Wicks and Michael Laiacona—to name just a few. I have been fortunate to have met some of the most talented artists, engineers, installers and designers in the industry." Cowan recalled that one of his most rewarding accomplishments was getting Neutrik's Speakon connector accepted by manufacturers and users. "It was a big challenge for Neutrik to create something totally new and to get the industry to like it, believe in it and support it," he said. But Cowan's persistence and hard work paid off, with Speakon now accepted as a worldwide industry standard.

Cowan is survived by his wife, Catherine "Kate" Cowan; sons, Daniel and Gregory; and his mother, Adele. In lieu of flowers, donations can be made to Ocean of Love (www.ocean-of-love.org), a non-profit organization dedicated to helping children with cancer and their families.

—George Petersen

Monster Cable Rocks With TOP

Looking to its own 30th anniversary in 2009, on October 18, Monster Cable sponsored Tower of Power's official 40th anniversary concert. The group played to a sold-out house at San Francisco's The Fillmore and featured the



Left: Tower of Power's Larry Braggs performs. Above: TOP bandmembers and Monster Cable's Noel Lee (foreground, second from right).

PHOTOS: TIMOTHY HAMPSON

current lineup augmented by former bandmembers. "There's a synergy—we're both Bay

Area entities, still Number One at our games," says Monster Cable founder and owner Noel Lee. The company also captured the concert in HD video for a 2009 DVD release on its Monster Music (www.monstermusic.com) imprint as a High-Definition Surround (HDS) SuperDisc. The DVD will offer listeners a choice between an audience mix and an onstage mix.

Get in on the Mix

The members of Third Eye Blind are asking their fans to help shape the final sound of the songs for their upcoming album *URSA MAJOR*. With "Studio Access" (via Indaba Music), fans can download the audio stems, mix the song and post the finished track on the site (www.indabamusic.com/studio_access/3eb). Indaba members will vote for their top three mixes; the band will pick their fave, which will be featured on the band's Website. Also, a grand-prize winner will be chosen and will perform live onstage with the band during one of their tour stops early next year.



Third Eye Blind's Tony Fredianelli (left) and Stephen Jenkins are waiting for your mix.

PHOTO: MONA BROOKS

CAS to Honor Maitland

Production sound mixer Dennis Maitland will receive the Cinema Audio Society's Career Achievement Award, to be presented at the 45th CAS Awards on February 14, 2009, at the Millennium-Biltmore Hotel in L.A. Maitland has worked on more than 80 feature films, including *As Good as It Gets*, *The Prince of Tides*, *Moonstruck*, *Prizzi's Honor*, *The Pawnbroker*, *Three Days of the Condor*, *Searching for Bobby Fischer* and many others. The awards show will also see director/writer/producer/actor Paul Mazursky receiving the CAS Filmmaker Award.



seen & heard



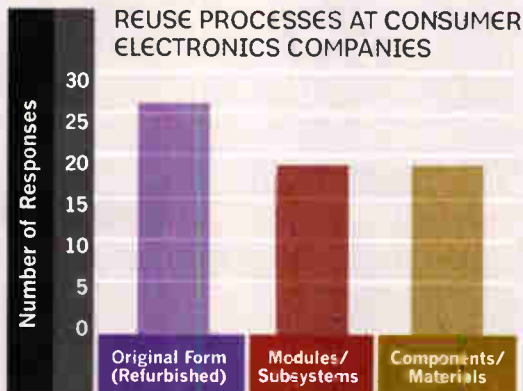
PHOTO: TOM JOYNT/COURTESY B.B. KING MUSEUM

"It's his commitment to excellence that provides the inspiration for the message and the story we want to tell."

—Connie S. Gibbons, B.B. King Museum and Delta Interpretive Center executive director, on King

'Tis the Season

The Consumer Electronics Association expects a 3.5-percent growth in sales of consumer electronics in Q4 2008 as compared to Q4 2007, as most American adults have CE devices in four of the Top 10 slots on their holiday wish list. And for those who receive a new gadget, it's becoming increasingly easy to dispose of the old ones properly: A recent CEA survey of 64 electronics companies conducted with Sims Recycling Solutions showed that 69 percent have recycling programs, 14 percent are setting up programs and 38 percent are reusing some form of the electronics products they make or use.



on the move

Adam Muñoz,
Fantasy Studios
engineer (Berkeley,
Calif.)



Main Responsibilities:
To make sure that artists who come to Fantasy have a one-of-a-kind experience and want to come back.

Previous Lives:

- 2004-2008, independent engineer
- 1992-2004, Different Fur Recording staff engineer
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The last great album I listened to was...
probably mastered really loud!

The coolest moment during a session is...
that moment of silence after the first playback of a great take, then seeing a smile.

When I'm not in the office, you can find me...
stalking the halls of eBay looking for rare effects and reverbs.

Bookshelf

The first in Focal Press' new "Mastering Music" Series, *From Demo to Delivery: The Process of Production*, provides start-to-finish guides to the production process—from composition all the way to distribution. Contributors include Bob Katz, Robert E. Runstein, David Miles Huber, Bruce Bartlett, Jenny Bartlett, Danny Cope, Craig Golding, William Moylan, Roey Izhaki, Tom Hutchison, Paul Allen and Amy Macy. \$31.95, demo2delivery.com.



Giving Back To Stax

Ardent Studios' founder John Fry has donated the studio's Audio-ronics-designed 20-input/8-output console—which is identical to the one formerly housed at the Stax label and recording studios—to the Stax Museum of American Soul Music, known as Soulsville. The museum was erected on the corner where the Stax label once operated, and visitors can stand in a re-created Stax Studio A, on the exact spot where so many legendary soul recordings by the likes of Otis Redding, Isaac Hayes, Aretha Franklin, the Bar Kays and Booker T. & the MGs were made. For more about Soulsville and the Stax Museum, visit www.soulsvilleusa.com.



Stax Museum curator Carol Drake and Fry



Audio at LDI!

Mix hosted a series of "Sound Track" panels—Using Plug-Ins Live, Last Call for White Spaces! and Recording the Show—at the October 2008 LDI show in Las Vegas. Panelists included live sound engineers Buford Jones (Meyer Sound), Robert Scovill (FOH engineer) and Nick Simonds (Hard Rock Hotel), and a host of other audio industry pros. *Mix*'s technical editor, Kevin Becka, moderated each panel. Pictured after the plug-ins panel are, from left: Scott Ray (Waves), Matt Bishop (Alford Media Services), Nick Simonds, Robert Scovill, Kevin Becka.

3.8 Million songs per month Microsoft sells through Xbox Live, mostly from *Rock Band* and *Guitar Hero*
—Microsoft

9.1¢ Mechanical royalty per track, either physical product (CD) or digitally distributed song
—U.S. Copyright Royalty Board decision in early October 2008

19.4% Album sales down from September 29 – November 1, 2007
— SoundScan

Industry News

Bradford Benn has been promoted to director of application engineering at Crown Audio (Elkhart, IN). In other promotion news, Harman Professional's (Northridge, CA) Scott Robbins is the new group-wide VP of sales...Cathy Kelly joins Mojave Audio (Burbank, CA) in the newly created position of VP of sales and marketing...Los Angeles-based 615 Music announced that its Randy Wachtler has been named chairman of The Production Music Association...New Western regional sales director for JBL (Northridge, CA) is Richard Ruse...Joel Schwartz was named business development manager for North America, Stardraw.com (NYC)...New hires at Prism Sound (Cambridge, UK): Steve Penn, product support; Mark Overall, SADiE production; Ed Tottenham, SADiE software team; Mark Evans, sales admin/product support; David Cousins, processing SADiE orders; Matt Mason, accounts; and Pete Nash, sales consultant...Distribution deals: India-based Reynold's Sound & Lighting takes on national distributor roles for Meyer Sound (Berkeley, CA); Quest Marketing joined DiGiCo's (Surrey, UK) rep team; and Aviom (West Chester, PA) named ALGAM as its French distributor.



Cathy Kelly



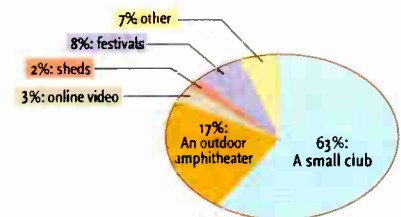
Richard Ruse



Scott Robbins

Mix Asks...

I prefer to see a band at...



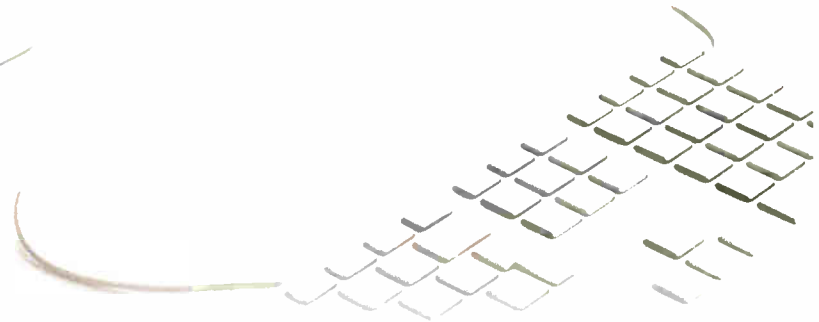
Go to mixonline.com and put in your two cents:

The thing I'm most looking forward to seeing at Winter NAMM is...

1. Microphones, can ya hear me?!
2. Guitars, baby, yeah!
3. New plug-ins—can't have enough
4. The hopping Hilton Bar scene
5. The, uh, interesting music fans roaming the aisles



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SESSIONS

Chicago Mastering Service—Digital Meets Analog



Jason Ward works on the Neumann VMS-70 vinyl-cutting lathe.

The Midwest now has its own top-flight, multiformat mastering studio. Chicago Mastering Service, co-owned by Bob Weston (also of the independent band Shellac) and Jason Ward, opened in 2007 to provide analog and digital mastering for CD, as well as lacquer cutting for vinyl.

The control room was de-

signed by Bob Alach's Alacronics firm. According to Weston, "The most important things to us in the design of the studio were the room acoustics and monitoring. We can always buy new gear and software, but the listening environment needs to be extremely detailed and accurate from the start."

The monitoring setup situates the speakers behind a sheer fabric wall in the front of the room. The computer's display is projected onto an acoustically transparent textile screen from Screen Research. This setup circum-

vents acoustical reflection problems that would arise from physical units on the console itself, near each other and the listening position.

The analog mastering transfer console was custom-built by Shea Ako. "One of the elements we requested is a button that flips the source between either the ATR-102 tape recorder or the com-

puter. When the computer is the selected source, the tape machine is routed to the inserts [to be used as an effect] without repatching anything," he says. "The console also has a built-in M/S encoder and decoder with a width control that we can patch into any two inserts for M/S processing."

All projects are mastered primarily in the analog realm. "Even when the source material is digital, we send the audio out from the workstation through our transfer console, inserting analog EQ and compression/limiting, and then maybe have a couple plug-ins on the way out from or on the way back into the workstation."

Rega and Technics turntables are available for checking lacquers. According to Weston, "We'll look for sections in the music that will pose the greatest difficulties during cutting or playback, like sibilance or loud, exposed vocals. Then we'll cut those bits onto a lacquer, bring it to the turntable and play it back next to the source audio while A/B'ing

to see if it we need to make adjustments. We first master and assemble any project in our mastering software. Then we either generate the 16-bit CD master or play back through the D/A converters at 24-bit to feed the lathe."

The studio has two complete mastering workstations: Ward's PC-based Sequoia system and Weston's Mac running soundBlade. "We direct the audio using a digital router, and the keyboards and monitors in both the control room and machine room can be assigned to either or both computers," Weston says.

Chicago Mastering boasts the only Neumann VMS-70 cutting lathe in the region, along with a Zuma variable pitch and depth computer. "When we were first talking about the studio, we both really wanted to have a lathe. And, of course, there is still a healthy market for vinyl," jokes Weston. "We also thought it would lend us a sense of legitimacy."

—Rich Wells

project studio

Forest Hill Studios



Rebeca Mauleón's personal studio doubles as a home office. She also shares the space with her husband and sons.

For 20 years, San Francisco-based musician/composer/educator Rebeca Mauleón (www.rebecamauleon.com) has relied on a modestly equipped and "cozy" but highly versatile home studio for composing, arranging and teaching private piano students. Dubbed Forest Hill Studios, it also accommodates live tracking and overdubbing for Mauleón's increasingly diverse projects, which now encompass scoring, composing and recording for TV, film, videogames and music software.

An established artist, bandleader, author and independent contractor, Mauleón divides her time between numerous jobs and family. "The music business is characteristically unstable—feast or famine, for the most part," she observes. "I tend to relish multitasking. My compositional work is special because it keeps me home, and I know my kids like it that way."

Mauleón first emerged in the late 1970s as a pianist working mainly in Latin, jazz and world music

❖ Airshow at 25 — Cause for Celebration



L-R: Mastering engineers Dominick Maita, Charlie Pilzer, David Glasser and Jim Wilson in Wilson's Studio A in Boulder, Colo.

They're toasting in Virginia and Colorado, as Airshow Mastering (www.airshowmastering.com) celebrates 25 years. The Grammy-winning studios serve scores of clients from String Cheese Incident to Smithsonian Folkways in two locations: Springfield, Va.—the original facility, run by Charlie Pilzer—and Boulder, Colo., where partner David Glasser moved 11 years ago.

Glasser's facility includes four studios: Jim Wilson and Dominick Maita's A and B mastering rooms, and James Tuttle's Home Away From Home recording/mixing studio, in addition to Glasser's Sam Berkow-designed, surround-capable Studio C. Since moving to Boulder, Glasser has enjoyed not only a lifestyle change, but also the give and take of

working closely with the other engineers.

"There are people coming and going all the time, and there are different engineers to bounce ideas off of—it's a real community," he says.

That communal spirit was lacking in Pilzer's one-room operation, so he's creating a similar environment

in his hometown of Takoma Park, Md. Berkow has designed a multiroom space with acoustics and surround capabilities that resemble Glasser's studio.

Sharing the new studio will be Mike Monseur, who specializes in audio restoration, and recording/mixing engineer Frank Marchand. Pilzer and Monseur's new room will include similar gear: Sonic Studio soundBlade and Maselec mastering consoles and Dunlavy monitors. Those rooms go online this winter. Meanwhile, Pilzer says the foundation of Airshow's 25 years of success remains "customer service—helping artists, producers and engineers fulfill their artistic vision."

Find more about Airshow at <http://mixonline.com>. III

Track Sheet ❖

Blues guitar legend Buddy Guy visited Gravity Studios in his hometown of Chicago to record for an upcoming Jive Records release. Studio owner/engineer Doug McBride

recorded the session in Gravity Studio A. Guy was the first to be tracked on the facility's new Neve 5088 console...Stephen Marsh announced the opening of his new Stephen Marsh Mastering suite (Hollywood). Marsh's previous studio was in the RCA/Radio Recorders, which building owners plan to demolish. Marsh and engineer Stephanie Villa are pleased to have found "...an existing acoustic space we could simply treat for sound as opposed to needing a full build-out," Marsh says...Producer/engineer/mixer Dave Fortman and artist-development executive Gene Joanen have opened a new Balance Studios in the New Orleans suburb of Mandeville. The original Balance, which is situated in NOIA, is still



Buddy Guy shakes hands with Doug McBride.

in business, as it has been since only one month after Katrina, but the partners had long felt they needed more space. The new studio was designed by Walters Storyk Design Group and is built into a 4,000-square-foot warehouse. It is equipped with an SSL 4000 GF+ board, Pro Tools HD and Dynaudio mains—all provided by Professional Audio Design.

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



John B displays the CD he completed at Stephen Marsh's new Hollywood studio.

by Matt Gallagher

styles. At the same time, she was studying composition at Mills College (Oakland, Calif.), where she was introduced to music technology. "I was interested in using sequencing software to flesh out my ideas, and I wanted to learn notation software so I could create charts that looked more polished," she recalls.

Mauleón continued to refine her arranging and production skills, working with artists and producers, including Mickey Hart, Tito Puente, Steve Winwood and Narada Michael Walden. In '97, she self-produced the first of three solo albums, *Round Trip*, singing, arranging and playing keyboards and percussion. Drawing on her session experiences, she expanded the scope of her project work at home.

"I'm in a downstairs office space with little more than 100 square feet," she says. "The only acoustical treatment we did was to add some insulation and ceiling tiles, as well as a dual-paned window. Fortu-

nately, the studio faces toward the yard and there is almost no noise on our street. Only occasionally do I need to stop for an airplane or truck, so it's quite idyllic so-and-wise.

"My setup is based around the production desk with built-in racks and my Roland RD-600 MIDI keyboard—which I also use for gigs, so it moves in and out," she says. Mauleón works on a Pro Tools LE system (Version 7.4) using a dual 1.8GHz Mac G5 PowerPC and a Digi 002 Rack, along with a MOTU MIDI Express XT. Outboard gear includes a TC Electronic M2000, Lexicon MX200, Avalon 737 mic pre and dbx 231 dual-channel 31-band graphic EQ. Other instruments include Roland JV-1010 and JV-1080 synth modules: soft synths from Native Instruments, IK Multimedia and Yellow Tools; and sample libraries and loop collections.

Mauleón's mic collection comprises pairs of

Shure SM57s and SM58s; a pair of AKC C-414s; a Sennheiser 421; and a RØDE NT1-A. "When I need to mike something for live tracking—such as percussion, horns or vocals—we tend to move things around in the room as needed," she notes. She uses Event Electronics Project Studio 8 speakers and on different systems, including her car stereo.

Mauleón has composed for Electronic Arts' *Sims 2* and *3* games, and produced and recorded Santana percussionist Karl Perazzo for PG Music's *Real Drums* software. She also scored the MSNBC documentary *Crossing the Line*. "With documentary and film composition, the task lies in being able to support the visual image without being too noticeable," she says. "It forces my music to remain invisible while enhancing the emotive quality of the scene. I tell my composition students, the music is doing its job when you don't notice it!" III

If things seem hectic for New York City's major recording studios, imagine what it's like to be in the mastering sector that depends on them. The past year has been a maelstrom of rearranging, with a fleet of facilities closing down, others changing hands, some opening, engineers being bounced around the boroughs like beach balls.

First the bad news: The official out-of-action list includes

who are cooperative, but so far it's working well."

Time-sharing probably won't be on the docket anytime soon for Joe Lambert (www.joelambertmastering.com), who is now on his own in Brooklyn and loving it after stints at TruTone and Classic Sound. "Even when the studios were busy, it was always stressful," he recalls. "I thought that I didn't see a future in the mastering factories—the real estate in Manhattan is way too expensive. If Sony can't afford to stay open, I don't know how anyone can."

After TruTone went into limbo—and his suite along with it—Lambert felt confident that his following would support his very own room in Brooklyn, where he saw a still-expanding client base and a palpable energy. Building a room in Brooklyn's DUMBO (Down Under Manhattan Bridge Overpass) section with the help of Francis Manzella and Kay Hought of Taytrix, Lambert feels like he's finally at home. "The bulk of the people that I work with are already in Brooklyn," he says. "Rent here is one-third of Manhattan, and it's the first stop on the F train—if you're downtown, it takes less time to get here than to Midtown. So I've gone on my own where I could have a smaller boutique mastering studio, have the same room and experience and value for the clients, and do it in a place that isn't costing so much."

However, one of the longtime big kids on the block, Sterling Sound (www.sterlingsound.com), believes that its move to large Manhattan quarters 10 years ago was a sound decision that continues to pay off today. "I'd put luck into the way that things have unfolded, but having a big staff and a big facility has been incredibly valuable to us," says Murat Aktar, president of Sterling Sound. "It allows us to make investments in developing equipment, and over the last two years we've done a lot of development on software, internal project management, recording systems and file-transfer systems."

Even as the cityscape continues to roil, Aktar points out that it's the people who drive mastering in New York City and beyond.

Murat Aktar of Sterling Sound

Classic Sound, Frankford Wayne, Jigsaw Mastering and Sony Mastering. In the gray zone is TruTone, which has moved to New Jersey while its former Manhattan headquarters is currently being renovated and is expected to be the new home for some Sony survivors. Openings include Tangerine Mastering, Meyer Media Mastering, James Cruz's Zeitgeist Sound Studios and Drew Lavayne's room within Germano Studios. The vaunted Masterdisk has changed

hands following Scott Hull's acquisition of its equipment and lease. Meanwhile, some mastering engineers are also going it alone and putting Manhattan in their rear-view mirrors.

As mastering is the last stop in the signal path, it makes sense that New York City's facilities are in a spin following the well-documented woes of the recording studios that feed them. "New York City rent is just astronomical—it seems to be tripling at a quicker rate than it was ever even doubling before," says Hull. "But this is where the work is. This is where people want to come to sessions, and for me staying in Manhattan was the only option.

"So the challenge is to find enough clients to go beyond expenses. What I've been trying to do is be more efficient, be more productive with the time and down time I have, continually network and find new revenue streams. It's a combination of all those things that make it work."

In addition to taking over Masterdisk's (www.masterdisk.com) longtime West 45th Street location from longtime CEO Doug Levine, Hull retained the Times Square site of Scott Hull Mastering and asked New York City cornerstone Howie Weinberg to helm it as Masterdisk 321 (for 321 W. 44th St.). "I felt that Masterdisk was a flagship mastering studio that could be rejuvenated to be as profound as it once had been," says Hull, who began his career as an assistant at Masterdisk in 1983. "We're working toward a multiple-engineer-per-room model, which is a major change. It's more about time-sharing than it is after-hours, and it requires selecting certain types of people

Scott Hull: new owner of Masterdisk

"The businesses that are successful will rely on the creative draw and reputation of their mastering engineers, so that hasn't changed. They'll continue to do well because when you look at the transaction cost for a mastering session compared to the kind of comfort you get from someone experienced working on your project, it's not that much of a stretch."



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NASHVILLE Skyline

by Peter Cooper

Nashville is quieter than New York or Los Angeles. That's part of its appeal. Nashville mixes, though? Suffice to say that the Loudness War has spread to bucolic Middle Tennessee.

"Country music that's distorted? That's just wrong," says Jim DeMain, who runs Yes Master in Nashville. "Every mastering engineer would breathe a sigh of relief if we could just dial it back. There's not one mastering engineer here thinking, 'I can't wait to trounce this

"I call it 'collapsing,'" says Joe Palmaccio, the engineer at The Place...For Mastering, located in the Berry Hill section of town. "The music comes out of the speakers and feels like it's folding back in. And people who are listening, think, 'I don't like this record.' It's not that they know exactly why they don't like it. But they don't."

Andrew Mendelson heads Georgetown Mastering on Music Row. "People don't listen, and say, 'That record is distorted and

fatiguing.' They're just like, 'I don't like listening to that.' It is subconsciously impacting the music industry. We have a nice room for listening here at Georgetown, and some of these things coming out now are just really hard to listen to. We've been mastering the Neil Young Archives series lately, and

I can listen down to those, and when I'm done with an album I can press Play again or move on to the next one, and enjoy it either way. But with too many modern records, you're like, 'I need a break.' You should never need a break from music."

Engineers talk about a mix's "sweet spot," where the limiter holds things in place but still allows a pulse and a dynamic punch.

"Lately, I've been into the Sony Oxford limiter," DeMain says. "Of all the ones I've tried, that one does something where it keeps the low-mid transients intact. Some limiters smear that away, but with the Sony you can hear deeper into the mix. You can find that sweet spot. But, unfortunately, that spot is usually several dB quieter than what it needs to be to be 'competitive.'"

Palmaccio's business ranges from working on archival projects such as the recent box set *Hank Williams: The Unreleased Recordings* (Time Life) to new-world work with Melinda Doolittle, Jewel, Lori McKenna and Dion. When confronted with an artist or label that wants something at a volume that causes fatigue and distortion, he likes to try to illustrate the situation.

"I was doing a record with a band out of New York recently and they were on the fence about how much to push the record," Palmaccio says. "I said, 'Here's the thing with digital limiters: We can move the mouse and turn it up and turn it up some more.' And I kept shoving it up until they realized, 'Wow, it sounds worse and worse.' It was an interesting exercise to show it to them and they understood what was going on."

DeMain, Palmaccio and Mendelson took note and found solace in the fact that the Metallica mastering was a story in the mainstream media: If music-buyers are beginning to notice the impact of limiting in the name of loudness, then perhaps the industry will allow a scaling back.

"Has a consumer ever complained that a record was too quiet?" Mendelson asks. Survey says...doubtful.

For another mastering engineer's perspective on the "loudness wars," read Gavin Lurssen's essay on page 40.

Send Nashville news to skyninemix@live.com.



Engineer Joe Palmaccio in his studio The Place...For Mastering. Palmaccio recently restored a box set of previously unreleased Hank Williams recordings.

record into oblivion."

That's not to say that every Nashville record is being trounced, or that Emmylou Harris is suddenly trying to out-volume the Metallica album that has been getting so much attention of late for supposedly hitting the loudness guardrail. But Music City mastering houses are facing the same issue that is causing hands to wring and brows to furrow across the country. Artists and producers come in holding a favorite album, proudly hand it to the engineer, and say, "I want it this loud." And every year, "this loud" goes up. A few years ago, "this loud" became "too loud" in the minds of many, yet the war goes on.

"I don't know who came up with the term 'The Volume Wars,'" DeMain says, "but I started thinking about that term. In any war, no one really wants to be there, on either side. So why are we putting up with this? We're the guys doing it. Maybe we could have a summit meeting, and say, 'These are the new standards of volume.'"

DeMain's suggestion is something like unilateral disarmament. It's a wonderful idea, in the "Imagine all the people/Living life in peace" kind of way. The trouble is that mastering is about pleasing the customer, and the customer is big into loud these days. The other trouble is that "loud" isn't just "loud"; it's also sometimes squashed and lifted until it resembles a bad plastic surgery. The microdynamics that make people tap their feet, dance and feel a physical response are smashed. The macrodynamics—the things that make the listener shake a fist and scream, "Yes" when the verse cedes to a sing-along chorus—are pounded. And the complexities of a mix get whitewashed like Aunt Polly's fence in *The Adventures of Tom Sawyer*.

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L.A. Grapevine

by Bud Scoppa

In recent weeks, longtime clients of Hollywood's Ocean Way Recording have been startled when they poke their heads into Studio A. Jack Joseph Puig, the room's occupant for nearly 13 years, has vacated, taking with him a massive amount of gear and myriad accoutrements, which combined to make it one of L.A.'s most distinctive recording and mixing spaces.

"Jack went in originally for a month booking, then two months,

ceiling along the room's back wall has also been carted off.

Essentially, Sides has restored Studio A to its original purpose: tracking big dates. Situated in what was formerly the United Hall of Bill Putnam's Western complex, Studio A gained a reputation as a great-sounding room soon after its construction in 1952. Sinatra and Basie recorded their classic 1962 album there; Phil Ramone can vouch for it—as a fresh-faced kid, he seconded Putnam on the sessions. So its history runs parallel to that of Capitol A. "Next to the big scoring stages, there isn't much like those two rooms left," he says.

The move made sense in that Puig has done few projects from

start to finish in the past few years, in large part because he's been doubling as an A&R executive for Interscope. Thus, the hallowed tracking room had been reduced to "a very elaborate

lounge," as Sides puts it—way-cool, but underutilized.

However, JJP has *not* left the building. He's mixing (and decorating) next door in Studio D, a space formerly occupied by Bernie Grundman Mastering and repurposed as a mixing suite two years ago. Studio D's centerpiece is a Neve 88R, which is even bigger than the Focusrite, as is the control room itself; it's sizable enough to accommodate Puig's estimated 500 pieces plus his clients, which had become an issue in A. "Jack was out and working in the new room within two weeks," says Sides.

Since the switch in late summer, there have been only three days when Studio A hasn't been filled with musicians. The first client was Rob Cavallo producing *American Idol* winner David Cook, followed by a 65-piece string date for DreamWorks. Soon after, Sides got the chance to re-acquaint himself

then a year, then two years," Ocean Way owner Allen Sides recalls. "Finally, I asked him, 'Jack, when are you gonna leave?' He said, 'I'm not.' It was basically booked on a daily basis, but he had enough projects to keep it rolling 50 weeks a year for 13 years. So as a studio owner, I couldn't ask for more."

Talking in 2004 about his motives for transforming A into a sort of rock 'n' roll Disneyland, Puig told me, "Most studios are boring, stale environments. I wanted to create an environment that was inspiring to people, so when they came in, they felt like, 'Wow, this is cool. We've arrived.' There's a lot of eye candy wherever you look."

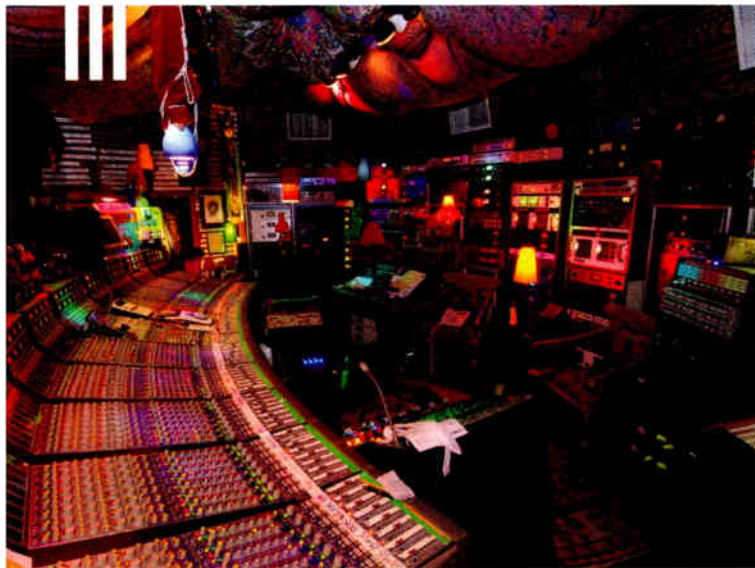
Now gone from the walls of the tracking room are the tapestries; posters of The Beatles, Stones and Brian Wilson; and mementos of Puig's past projects, like the tiki bar given to him by the Goo Goo Dolls. Gone, too, are the plush furniture, the Oriental chandelier, the hookah and the collection of effects pedals that had been carefully placed, along with lighted votive candles, atop a road case with "SUZI QUATRO" stenciled on it. Absent is the mood lighting, which gave the space the ambience of a romantic restaurant...or a brothel. Instead, you're greeted with clean lines, functional lighting and a surprising amount of space, replacing the womb-like feel Puig had fashioned.

Transformed as well is the control room; all that remains from JJP is the one-off Focusrite board that had been one of A's chief draws when he took over the room in 1996. The producer/mixer's personal collection of gear, from vintage to modern—a veritable history of pro sound—that had been stacked solidly from floor to

with the room hands-on, recording the Pussycat Dolls and mixing Chris Botti.

"I'd say we're as busy as we were 10 years ago," says Sides. "In the '90s, the hallways were always very entertaining, with the various clients and all the big rooms going. That's back. As you can see, this smile is still intact."

Sides now has yet another reason to smile. This month, he's opening Ocean Way St. Barts, located in an 18,000-square-foot villa on the beach at the Eden Roc resort, complete with a discrete custom Neve console and Ocean Way's own monitoring. As the late, great Robert Palmer once sang, some guys have all the luck.



Before: Jack Joseph Puig's inspired decor and gear, as they appeared in Studio A



Allen Sides in the Studio A control room. It's almost unrecognizable since Puig moved to Studio D.

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World Radio History

From LP

BY JANICE BROWN

To MP3

MASTERING FOR MULTIPLE RELEASE FORMATS

THESE DAYS, MASTERING ISN'T JUST ABOUT GOLDEN EARS:

The role of the mastering engineer has become more consultative as artists pursue multiple release formats for their albums. Enthusiasm for vinyl has spread anew among artists who are frustrated with the sonic shortcomings of MP3. At the same time, a burgeoning interest in optimizing material for all available, and even future, formats is beginning to emerge.

San Francisco-based mastering engineer Paul Stubblebine describes the ways he has expanded his services: "I realized recently that I have to say we're mastering for four formats: CD, downloads, vinyl and high-resolution digital. And that's not including tape, which we're also doing for our in-house label, The Tape Project."

It's not just the existence of these multiple release formats that's expanding mastering engineers' roles, however, it's also the changing profile of their clients. "There are more people with less experience in the music business today," says Sterling Sound engineer/partner Greg Calbi. "I see more people than ever coming in here who've never been in a real recording studio. At the same time, many of these independent artists are more interested in their brand, I think, than artists have been in the past. And they feel there's a learning curve when it comes to mastering. It's like we're filling a kind of void. By coming to us, artists feel they're getting an important, professional take on what they do."

Calbi—who owns Sterling with fellow mastering engineers Ted Jensen and Tom Coyne, along with president Murat Aktar—notes, "September '08 was our highest billing month in the 10 years since we've owned the company," citing a significant growth in Sterling's international business. Additionally,



he points out that, “2008 has also been the best year for vinyl, by far, in those 10 years.”

Revisiting Vinyl

By all accounts, customer interest in the vinyl format has skyrocketed in recent years, most notably among rock bands and artists who hadn't traditionally released on vinyl for club DJs. Calbi estimates that the number of lacquers cut at Sterling this year is double that of previous years. “Almost everybody who comes to Sterling at least inquires about vinyl; the business just keeps growing exponentially,” he says. “We even picked up a second Neumann lathe from Sony Studios when it closed.”

Ray Janos handles the vinyl cutting at Sterling. “Generally, he cuts from digital copies,” says Calbi. “But we do use 96kHz files when they're available and when the client is so inclined; we will create a 96k master that won't have any of that digital compression that the CD would have. Your best bet is to use the highest-resolution file that can be played back through the best D-to-A converter that you have. We use Prism converters that take 96kHz files.”

These days, most records are not so much mastered specifically for vinyl as they are re-purposed for vinyl. “There's really no difference between how I EQ material for CD or vinyl,” says New York City-based mastering engineer David Kutch, owner of The Mastering Palace. “For me, the most important element in vinyl creation is the person who is going to physically cut the master lacquer. Two different cutting engineers will yield two totally different sonic results. There are engineers who know how to ‘operate’ a lathe and engineers who play it like a musical instrument. The latter is the one who will most faithfully reproduce the essence of the original recording.” Kutch names Rob LoVerde of Mobile Fidelity Sound Lab in Sebastopol, Calif., as his choice cutter.

Doug Sax, owner of The Mastering Lab in Ojai, Calif., and veteran mastering engineer recommends, “You don't want to cut vinyl from a CD master—that's just the way to make the worst-sounding vinyl. When the client wants a vinyl cutting master, we re-transfer the album—after everyone's approved the changes we're making—at 96kHz/24-bit, with no digital limiting and without pushing the A-to-D

ILLUSTRATION BY GAY MARSHALL

converters in any way. We put tones on it and a sidebreak, and send it to someone, preferably Bernie Grundman, who's set up to do a flat transfer to vinyl, going through a minimum amount of equipment."

When mastering for CD and vinyl, San Francisco-based engineer Mike Wells sends a dual stream out through his Lavry converters, with "one going into a final stage of limiting for CD and one that doesn't for vinyl." Wells then typically sends material to be cut on vinyl to Paul Gold of Salt Mastering in Brooklyn, N.Y.

Gold says he prefers to receive a 24-bit un-peak-limited file but will work with whatever comes in the door. "My job is to get the cleanest possible transfer of the source material so that it will play back relatively distortion-free," says Gold. "I'll typically use some high-frequency limiting, de-essing, maybe a lowpass or highpass filter, and an elliptical EQ. But basically what I try to do is figure out a way to do the transfer so that as little of that happens as possible."

As far as mastering to both CD and vinyl, Gold echoes the practices of Kutch, Sax and Wells, noting, "If I'm mastering the record [for CD], I always cut off a 24-bit un-peak-limited file, but

otherwise the master I make for the CD is the same as the master I cut." Special circumstances do come up, says Gold, where the dual-format mastering is not so seamless. "I've mastered records of experimental music, and sometimes there will be elements like superwide stereo bass, which is very difficult to cut onto a record," he notes. "So I may do two versions of that, but that's the really odd case."

When planning for a vinyl release, artists need to count on significant manufacturing time, adds Calbi. "The jacket manufacturers and pressing plants are so overwhelmed now that there's a huge turnaround time. There's just more demand than there is supply, especially for high-quality pressing, but even just the raw materials."

Realities of MP3

As the lowest-quality release format, the lossy-compressed MP3 or AAC audio version of the record will not be the focus of any mastering session. Clients may ask about optimizing for MP3, custom encoding options and the digital



During sessions for a Hugh Masekela record, from left: Bernie Grundman, Masekela and producer Stewart Levine

distributors who support them, but by and large, the mastering process does not deepen, technically, to prepare the material for its inevitable digitization.

"There is a conversation, sometimes, about how to optimize for MP3, but it's really not part of the mastering process for me," says Calbi, "because I don't want to master for a dumbed-down file. I master for 16-bit/44.1."

Stubblebine shares, "We don't really do a separate mastering for MP3s, but assuming the CD is going to be used as a source for the MP3 or AAC file, my main consideration is that what makes it sound good for the CD makes it sound good for the download, as well."

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"The biggest thing we can do to make sure the download sounds as good as possible is to resist the temptation to squeeze it too hard," Stubblebine continues. "Once everything gets squeezed into the top 2 dB of the dynamic range, when you turn that into an MP3 or an AAC, what comes out pretty much sounds like noise. But if you can leave a little bit of dynamics in it, then even the lossy-compressed version sounds more musical."

While artists, producers and certainly mastering engineers may be interested in some higher-quality digital format, the distribution channels for a higher-resolution digital download are just not there yet for the mainstream music market. Wells has been "kicking the tire of digital distribution and fidelity of digital assets" for the past five years, even researching and writing on the topic. Finally, this year, he's seeing clients take an active interest in their digital assets and how they can optimize sound quality and find distributors who at least accept custom-encoded audio files, a process he promotes on his Website (www.mikewellsmastering.com) as "codec mastering."

"Awareness seems to be coming around, where clients will ask me if I can provide them with a high-quality digital asset that's compatible in the marketplace," says Wells. "I use the LAME encoder to create assets that are extremely compatible with players in the marketplace. There is also the free AAC codec, which is also very good for doing an AAC packet format. I use MP3 tag as my tagger application and then you're covering both bases so you have a nice digital asset format, fully tagged."

Many digital distributors do not allow artists to submit encoded assets directly, and instead follow a batch-encoding process using submitted CDs. "iTunes used to allow you to submit your assets directly, but they stopped because it required too much QA," Wells informs. "Apparently, they're making exceptions for the larger artists and charging a fee. But this is what I see as the independent artist's biggest bottleneck at the moment. They can come to me to get better-sounding digital assets, but then they run into problems getting it out into the marketplace."

Wells notes that the M/S monitoring feature of his Dangerous Music transfer console has been particularly useful in mastering digital files. "I do a lot of work on the CD-mastering side in M/S, and I wondered whether I could deliver better results in the digital asset realm in M/S and I'm finding that I can," Wells reports. "You do the encoding separately and then stitch the file back together, and it actually seems to sound much



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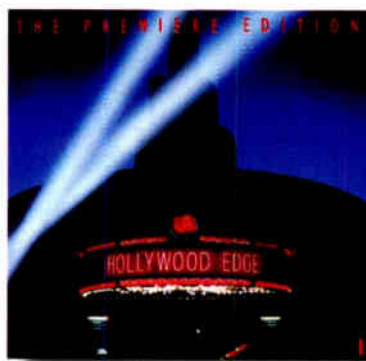
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Formats of the Future

In the post-SACD and DVD-A world, mastering engineers and audio enthusiasts wonder what will emerge as the most viable high-resolution digital release format. “There is a really weird blip in the business right now,” says Calbi. “People are coming up here all the time with 96kHz and 88.2 files, and we could process them and deliver them that way if anyone wanted them, if there was any way they could be distributed.”

Stubblebine works for a number of audiophile labels, including Reference Recordings, which recently started selling DVD-R releases containing music as 176kHz/24-bit WAV files. “At the end of the mastering session, we come out with a CD master and, starting about a year ago, file sets for high-res release for the clients who want it,” Stubblebine describes. “In addition to the 176kHz/24-bit WAV files for reference, we also



At Sterling Sound, from left: saxophonist Joe Lovano, engineer James Farber and mastering engineer Greg Calbi

made a 96kHz/24-bit version of the tracks for a new download site the Cheskys launched called HD Tracks (www.hdtracks.com). So it's a project mastered for 176 kHz, 96 kHz and CD release. We'll make whatever it is they need, and what they need depends on where it's going.”

Assuming the mainstream music market develops some high-res digital-distribution channels, mastering engineers may soon be delivering multiple digital release formats. Stubblebine assures, however, “It doesn't add too much more work or cost much more for the client to ask for two more formats because you've done most of the work getting up to the point where you have a finished, edited, EQ'd and mastered 176kHz file, and then it's just incremental work to repurpose to the CD master, the 176 master, the 96 master.”

The high-res releases from major labels that would really spark consumer interest could be years away, however, as Calbi speculates. “Because we all work in 16-bit/44.1 in terms of delivery, the engineers here don't have copies of material mastered over the past several years in high resolution,” he explains. “So if they wanted to re-release an album by a legacy artist, the labels would have to go back and remaster, which would take a real commitment and investment. Because they don't have the money, we're stuck in that in-between period, where the technology can do it but the business plan doesn't make any sense.”

Instead of coming from the larger recording industry, that commitment is being demonstrated by the efforts of individuals. Doug Sax and Bill Schnee introduced a new 2-track digital recording format at AES. “We recorded a jazz group and a small rock group direct to 2-track at 192kHz/24-bit using these new A/D and D/A converters made by JCF Audio,” says Sax, who along with Schnee, originally pioneered direct-to-disc recording with releases on his Sheffield Lab audiophile label. “We wanted to see if there was any interest and if people heard any of the merits that we heard in making it. We feel this is our purpose now—to try and explore what can be done. It was very well-received.”

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Producer T Bone Burnett is another emerging figure in the movement to improve digital audio. His new CODE technology, which he described in *Mix's* October issue as "a quality-control system," will provide a set of standards for digital audio that would work to optimize sound for every file format.

Controlling the Process

Eager to deliver elevated music experiences but frustrated by the mandate to compensate for inferior production quality while meeting commercial demands, Paul Stubblebine Mastering, Sterling Sound and Bernie Grundman Mastering have all started in-house record labels. Stubblebine held a forum on this trend at AES '08. "I wondered, what is it that's making us want



Dave Kutch in his The Mastering Palace facility

to start labels that are all so different from what the mainstream music business looks like," says Stubblebine. "I think we all feel, without dwelling on the negative, that the whole idea of making smaller and smaller files for file sharing hasn't really moved us in the right direction so we've looked for other ways of working."

Stubblebine's Tape Project produces reel-to-reel releases, Sterling's Experience Vinyl deals in vinyl and Grundman's Straight Ahead Records takes a natural approach—live recording and mixing using proprietary electronics for optimizing quality (a system that reportedly uses less overall electronics than any other).

"We're all operating off the same impulse—to allow the home listener to hear music at the kind of quality level we hear it at in the studio," says Stubblebine, "without the distractions of what comes from compressing the stuff down to MP3 and AAC—that lack of resolution that, for many of us, is just not enough."


The in-house labels give these mastering engineers the opportunity to focus wholly on

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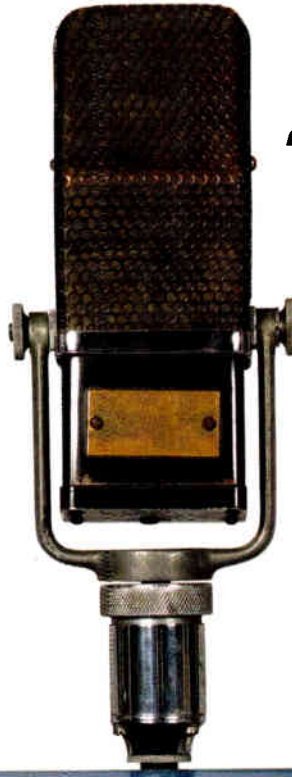
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sound quality without pressure to push the levels at the expense of dynamics. The Straight Ahead releases, explains Grundman, "are live-to-2-track and mixed right on the spot, using all custom-built equipment in the signal path. We use a special equalizer that has almost no electronics in it. We've carefully selected each piece of equipment in the chain according to what has the most natural, cleanest sound." Neil Larsen's group, Orbit, featuring Robben Ford, recently released a Straight Ahead record as a double-vinyl LP and an Emerald Audiophile



Mike Wells in his San Francisco studio

Series CD. The sound quality of this CD, made with a dark-green polycarbonate that enables a more accurate reading of the digital data from the disc, reportedly "rivals the vinyl."

Mastering a Tape Project release follows the flow of any other mastering session, says Stubblebine. "We'll get the master tape up, run it through our chain, and once we've got it optimized we'll run that twice to the 1-inch, 2-track. We'll edit those together and we'll have reel A and reel B running masters. In some cases, it requires quite a bit of EQ, and in others, none whatsoever, and we'll just do a straight connection. The major difference is in our approach because we know we're mastering for people that have decent or great stereo systems, so there's no question of compromising the sound quality."

Of Experience Vinyl, Calbi says, "We wanted to do something that would promote the studio in terms of our commitment to good sound. It's so rare to have a tape that you can put on a machine and transfer to a piece of acetate and send it to a plant, but we found one that we're releasing by an artist named Kim Taylor. It was a beautiful tape and we did a beautiful transfer onto vinyl. It sounds really tactile and rich-sounding. That's our second release; we also did a blues album by Michael Powers, and we plan on doing more." III

Janice Brown is a freelance writer based in New York City.

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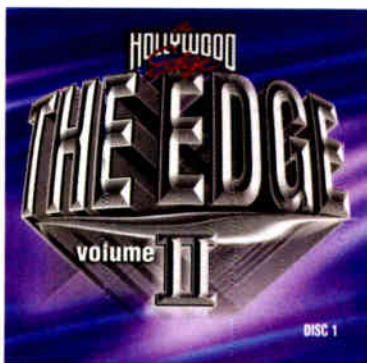
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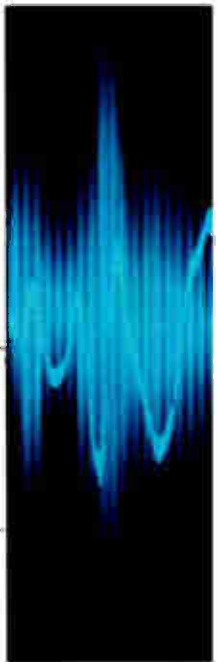
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The Limits of Compression



A MASTERING ENGINEER'S TAKE ON MAKING THE MOST OF DYNAMIC RANGE

BY GAVIN LURSEN

I recently traveled to San Francisco to attend the AES Convention and 2008 TEC Awards. If you were there, you know that T Bone Burnett delivered an inspired speech accepting his Hall of Fame award. Among other things, he challenged all of us in this industry to produce albums that re-think the ways we use the tools available to us. And he challenged us to embrace new ways of presenting music to consumers who, over recent years, have become used to a vast array of options when it comes to experiencing audio at home and on the move.

While in the Bay Area I also ducked out for a few hours to see my brother and his young family. Witnessing his two small children make their way through the world, something obvious occurred to me. I realized that, from the earliest stages of life, we are taught limits by our parents—also by relatives, teachers, friends. Over a lifetime, the lessons of our limits (and how to push them) are always with us.

This is not especially profound, just something that occurred to me when a subject important to all of us—compression and its place in our work—was on my mind.

The funny thing about limits: We also spend a lot of time testing them. Whenever my brother tells his 5-year-old daughter not to do something, she immediately does it. She pushes to see if it really is the edge—and what happens when she crosses it.

But here's the interesting thing. I asked my brother how he deals with this. He said that he doesn't sweat the small stuff and, at times that really matter, he holds the limit. He sees his job as providing his daughter what she needs to succeed, and that includes setting limits.

What in the world does this have to do with

compression? A lot, I think.

Recorded music has boundaries, too. This is why we find ourselves again and again talking about compression and the "loud" CD, download or MP3—the pushing of limits that seems to define production and consumption of music in the Digital Age.

But I think an important lesson lies in my brother's approach as a parent. As he steers his daughter through her world, he sets limits because he knows he must. But what he really does is this: He responds to the entire range of her experience. He focuses on his daughter as a whole person. And in this way, he brings out the best in her.

Call it the parenting equivalent of working with dynamic range. The limits are meaningless by themselves. What matters is the range and depth between the limits. True of parenting, true of mastering music, true of most things, probably. If you're with me, this is how I think we should approach mastering for these new times.

Mastering is not just about pushing the limits, although that is what it has become. Even at its most conservative, mastering today requires a certain amount of pushing the limits to provide sound that fits the mainstream, visceral expectations of most average consumers of music. The "whole" of the sound requires a push to complete the picture—and, frankly, all too often this means the loss of any real dynamic range. In my mastering projects, I find myself using more equipment in my chain and just applying a little of each, working very hard to sound like I was never there. The more I push a device, the more it presents a veil between the fan and the artist on a recording.



Last year, I had the honor of being included on Bob Ludwig's Platinum Mastering panel at AES. I mentioned in front of hundreds of people—all there to learn about the current trends in mastering—that I often get a request to make sure that the album I am working on is “not the loudest thing in the world.” I went on to say that I always interpret that request as the opposite of what it seems: By asking me not to over-cook the audio, what they are really saying is that they *do* want me to over-cook it, but that they want it to also sound good. Everybody laughed; nobody questioned the remark.

What the clients are asking for is to have the audio fit into today's standards but to also have it breathe and feel good. This was easier to do by previous standards: Records from 10 years ago and earlier have far lower average levels, meaning far more dynamic range and room for the recording to breathe. However, if you print audio out of the realm of the visceral expectation in today's world, it often has to come along with an explanation. Sometimes I work with producers and artists who don't buy into the levels but rather the depth of field of a recording. Established artists and producers find it easier to take this risk because they have an established fan base, but I get others who want to copy the sound.

To borrow again from the parenting analogy, I think at its worst the current loudness trend is akin to infusing a diet with too much sugar. Might taste good up front, but is that really what you have in mind? Is that best?

If my brother fed his daughter a steady diet of cereal with copious amounts of sugar, she would eat her breakfast. Job well done. But she would also develop a taste for sugar at the ex-

panse of so many other flavors (to say nothing of her nutrition). That would be her baseline, the norm. All other tastes would have to be as “loud” as sugar just to compete.

Sugar has its place the same way pushing the limits on sound has its important place, but I think we are at a time when we fear that if we remove the sugar, no one will eat the cereal.

I am not a gear head. I've always focused on “vibe” rather than the purely technical side of things; the music, the sound, is the primary focus. I only use whatever tools are necessary to get the job done, and that changes with each assignment. Less is more. Less electronics, less processing, less push on what is in the chain.

But I do have strong feelings about tools like compression—especially from a conceptual point of view. I like to think of myself as growing with the new school and participating in it on every level. Any experience I share, or mentoring, is offered in the service of creating an environment of responsible audio transfers, no matter what medium. My close work with T Bone Burnett and his CODE sound quality-control initiative is an additional testament to this.

This idea of humans always pushing against limits brings to mind the early history of CDs, starting back in the 1980s when digital storage arrived for consumers. CD manufacturers would not accept any masters with samples over digital zero. The engineer would have to record or capture the music way below the threshold to maintain a legal master.

In the late '80s and early '90s, equipment manufacturers started building tools to clip audio right before the digital zero point. That, in turn, allowed the use of compression to essentially turn up the average volume of the

music and reduce the peak volume while avoiding sample overs.

Compression and limiting became popular ways to push the limits—no longer simply part of a set of tools to be used to enhance the musical vision of an artist, producer or mixer. The trend gained popularity as more and more noise infiltrated our lives and our listening environments. When the Digital Age went portable, to compete with ambient noise meant to push and push the limits of our recordings.

In other words, we sugarcoated everything to make sure it still got eaten.

“Compression” is an often misunderstood and misused term. It is nothing more than dynamic range control. It does not reduce highs or add lows, as some people think. (I am referring to compression of the stereo master. Compression of individual tracks within a recording before it is mixed would be the subject of a different article.)

The responsibility of all engineering is to learn from and maintain standards set by the greats, to embrace and enhance them. It is about working with the whole of a sound, operating within the entire dynamic range.

When we limit the range of audio, we are in fact simply limiting ourselves. We are limiting the size of the canvas upon which we are asked to work, and we are, in the end, limiting what we can contribute to the production of music in this Digital Age. III

Mastering engineer Gavin Lursen is a two-time Grammy winner for the O Brother, Where Art Thou? soundtrack and PBS' Martin Scorsese Presents the Blues. He won two 2008 TEC awards for Robert Plant and Alison Krauss' Raising Sand.

MASTERING

IN THE BOX

By George Petersen

Digital audio workstations have a long history in the mastering/premastering process, dating back to well before the days when multitracking on a PC or Mac was standard practice in the studio. In fact, early on some of the most successful DAWs—such as Sonic Solutions' Sonic System and Digidesign's Sound Tools—were designed specifically for mastering/premastering tasks. Technology has advanced to the point where nearly every aspect of music production can be handled with the right software, and the mastering process is no exception.

Today, most DAW programs include a good selection of compressors, limiters, equalizers and other DSPs for general audio work, but mastering often requires more specialized tools. With that in mind, an increasing number of software suppliers are offering bundled collections of plug-ins that are designed for mastering applications. With a lot of new products in this genre coming to market, we decided to survey what's available.

Designed as an add-on to its Peak Series of editing DAWs (and included free with Peak Pro XT), but compatible with other Mac or PC hosts supporting RTAS/AudioSuite, VST or Audio Units, the Master Perfection Suite from BIAS (www.bias-inc.com) is a \$599 collection of six plugs, including Reveal (seven-tool analysis suite), Sqweez-3 and -5 (linear-phase multiband dynamics), Repli-Q (linear-phase spectral matching), PitchCraft (pitch correction/transposition), SuperFreq (4/6/8/10-band paragraphic equalization) and GateEx (gate with downward expander).

While the functions of applications such as Sqweez,

PLUG-IN PACKAGES TAKE YOUR MIX TO THE FINAL STEP

SuperFreq, PitchCraft and GateEx are more straightforward, some require more explanation. Repli-Q uses a linear-phase equalization algorithm to provide high-quality spectral matching (to add consistency to tracks recorded in different environments) and mastering for different delivery targets, such as repurposing a compressed MP3 track for CD release. Reveal has precision tools for looking at your project, like peak/RMS meters, phase displays and correlation meters, spectrum analyzer and spectrogram displays, oscilloscope and more.

Offered in native (RTAS, VST and Audio Units) and TDM versions, Brainworx Music & Media's (www.brainworx-music.de) bx_digital provides a 5-band equalizer—7-band in the TDM version—de-esser, Mono-Maker, and intelligent bass and presence shifters. This expanded software version of the bx1 hardware processor can operate in three modes: left/right and both mid-side (M/S) modes for recording and mastering applications. Features include extensive metering and stereo-width tweaking in M/S modes, solo buttons for mastering de-essing, and the ability to transform all LF content with a stereo track into mono for 100-percent compatibility in radio/broadcast play situa-

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MASTERING IN THE BOX

tions. Pricing ranges from about \$400 to \$780, depending on the version and exchange rates.

Cube-Tec (dist. by Sascom, www.sascom.com) has long offered a variety of plug-ins—the company refers to these as VPIs (Virtual Precision Instruments)—for its AudioCube hardware system. Rather than purchase a set bundle, users can choose from among various VPIs with discount quantity pricing based on the number purchased. Recently, Cube-Tec has begun offering its Mastering Suite VPIs, which can be used with any DAW (PC or Intel Mac) by those who simply purchase the Cube-Tec dongle. Available VPIs include Loudness Maximizer, a psychoacoustic process; Analog EQ, a 7-band equalizer that emulates the sound of analog filters; Multi-Comp, a 5-band compressor; Attack Designer, a 5-band transient shaper; Vitalizer, CubeTec's version of SPL's analog processor; and Analog Comp, a classic compressor interface with analog-style transfer functions.

Priced at \$499, the new T-RackS 3 Deluxe mastering suite from IK Multimedia (www.ikmultimedia.com) offers nine digital- and analog-modeled dynamics and EQ processors. Among these are three new analog and vintage emulations (including models based on the Fairchild 670 and the Pultec EQP-1A) and two new digital processors (intelligent, multi-algorithm brick-wall limiter and high-precision, high-definition linear phase equalizer), as well the four classic



IK Multimedia T-RackS 3 Deluxe mastering suite

T-RackS processors (compressor, multiband limiter, clipper and equalizer).

Beyond the DSP power itself, the bundle adds features such as a configurable mastering/mixing chain for running up to 12 processes in parallel or series and a metering section with peak/phase/RMS/perceived-loudness meters, as well as a spectrum analyzer with peak, RMS and averaging indicators. Other touches that simplify operations include style-based presets, full chain visualization, an A/B compare function, multiple audio processing in stand-alone mode and single-click bypass of an entire chain or individual modules. T-RackS 3 Deluxe runs in Audio Units, RTAS and VST on Intel or Power PC Macs (OS 10.4 or higher) and RTAS or VST on PCs running Windows XP or Vista. Another version, the T-RackS 3 Standard, offers the four classic TrackS processors within the new application framework for \$199.99.

Some Non-Plug-In Essentials

Plug-ins can expand the capability of your DAW, but sometimes a few basic, bundled, stand-alone apps can also smooth the mastering process.

The AudioTools™ AWE Master Bundle from Minnetonka Audio (www.minnetonkaaudio.com) is a set of integrated, iZotope-powered tools designed to address each step of the mastering process: equalization, multiband compression, loudness maximization and ambience reverb. Time-stretch and pitch-shift, with a extremely wide 12.5 to 800-percent range, are also included. Processing chains can be auditioned and saved as templates. This Mac OS X collection runs with any I/O supporting Core Audio.

Going beyond CD? The Dolby Media Producer suite from Dolby Labs (www.dolby.com) supports multichannel, non-real-time encoding and real-time file decoding of Dolby Digital, Dolby Digital Plug, Dolby TrueHD and MLP Lossless for DVD-Video, DVD-Audio and Blu-ray disc formats. Also available separately, the \$11,000 bundle includes four separate products: Dolby Media Encoder, Dolby Media Encoder SE, Dolby Media Decoder and Dolby Media Tools. All are Mac Universal apps for native operation on Intel-based and PowerPC Macs.

—George Petersen



Distributed worldwide by M-Audio, iZotope (www.izotope.com) announced Ozone 4 at the recent AES convention, with this new version of its popular mastering suite shipping next month. Offered for Pro Tools 7 (RTAS/AudioSuite), VST, MAS, Audio Units and DirectX for Mac universal binary OS X and Win XP/Vista, Ozone 4 optimizes the Ozone algorithms for low-latency DAW production. The bundle offers a new Intelligent Loudness Maximizer, Perfect Reconstruction crossovers, mid/side processing for versatile soundstage control and a True Envelope dynamics processing mode, which introduces an alternative to traditional peak and RMS-based dynamics processing that's said to provide exceptionally transparent compression, expansion and limiting. The upgrade includes numerous interface and ease-of-use additions,



iZotope Ozone 4 offers optimized Ozone algorithms.

including an improved preset system for achieving quick results from just a few parameter adjustments. Ozone 4 is priced at \$249; users who purchased Ozone 3 after October 1, 2008, are offered a free upgrade. Other existing Ozone 3 users can upgrade for \$79.

The Comprehensive Mastering Suite from Sonalksis (www.sonalksis.com) is an RTAS/VST/Audio Units plug-in bundle for Win XP/Vista or Mac DAWs. Software tools within the set include MultiLimit, a mastering limiter with five independent bands of control; the MaxLimit stereo program maximizing limiter; StereoTools stereo-imaging control; and Ultimate-D, an advanced dithering processor. Among the features within the Comprehensive Mastering Suite are 64-bit floating-point precision internal processing, up to 24-bit/192kHz resolution, and various display and monitoring choices, such as phase metering (polar and Lissajous scope graphs), spectral analysis and K-System metering options.

Looking for loud? Sonnox (www.sonnoxplugins.com) offers the Sonnox Enhance bundle, with three easy-to-use plug-ins for stereo mix enhancement. The set contains the Oxford Inflator (to increase the apparent loudness without audibly reducing dynamic range with the musi-

quality of tubes), Oxford Transient Modulator (to accentuate or flatten attacks and transients) and the Oxford Limiter. Sonnox Enhance is available for Pro Tools HD TDM (\$1,245), TC PowerCore (\$1,024) and \$627 native VST/RTAS/Audio Units versions. Sonnox also offers a variety of Flexible Oxford bundles that allow buyers to create their own combinations of individual plugs at discounted rates.

From a price standpoint, the clear winner in the mastering bundles race has to be Sony Creative Software's (www.sonycreativesoftware.com) \$34.95 XFX 2 collection, which runs seamlessly

with any DAW program that supports DirectX plug-ins. The second in the company's XFX Series, the set includes six discrete plugs: graphic dynamics, graphic EQ, multiband dynamics, noise gate, paragraphic EQ and parametric EQ.

Designed for PowerCore and the Pro Tools HD platforms, the MD3 Stereo Mastering package from TC Electronic (www.tcelectronic.com) includes the MD3 multiband dynamics and brickwall limiter, two algorithms ported from the company's flagship hardware System 6000 processor. The multiband plug allows stereo dynamics processing in three frequency bands,

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with true split-sidechain structure on dual-mono signals, and other tweaks such as M/S processing and Spectral Stereo Enhancer. The limiter eliminates digital "overs" that generate distortion in consumer CD players, radio processors and data-reduction codecs.

Available for Universal Audio's (www.uaudio.com) UAD-1 hardware/software platform—and soon for the new UAD-2 cards—is UA's Precision Mastering bundle. The \$500 set comprises three plug-ins intended specifically for stereo program material. Precision Multiband provides compression/expansion/gating for each of five bands, offering complex dynamics control or basic de-essing processing. Modeled after high-end mastering filters, Precision Equalizer is a stereo/dual-mono 4-band EQ (and highpass filter) with 192kHz clarity and stepped 0.5dB controls. Precision Limiter is a single-band, brickwall limiter with a 1.5ms look-ahead window for zero overshoot performance and comprehensive metering that conforms to Bob Katz's "K-system" metering specs. The limiter plug can also be bypassed, allowing use of the high-resolution metering function by itself.

WaveArts (www.wavearts.com) offers its



WaveArts FinalPlug 5 peak limiter/volume maximizer

Mac/PC plug-ins individually and in large inclusive bundles, as well as a \$299 Custom Duo for selecting any two, where a combination of FinalPlug 5 and TrackPlug 5 makes for a master-quality tool kit. FinalPlug 5 is a peak limiter/volume maximizer with bit-depth truncation and dither options, 24-bit/192kHz resolution, and presets for CD and DVD-Audio mastering and track compression. While intended mainly as a channel strip, TrackPlug 5's stereo capability opens up its 10-band EQ (64-bit), brickwall filters, dual compressors, gate, sidechain EQs, clean/vintage compression modes, peak limiter, de-essing and spectrum analysis functions to mastering applications, especially when combined with FinalPlug 5. Both plug-ins support hosts using the Au-

dio Units, MAS, VST, RTAS and DirectX platforms.

Waves (www.waves.com) offers more than a dozen bundles, both general-purpose and specialized, with its Masters collection intended specifically for mastering applications. Available for PC or Mac in \$900 Native (RTAS/Audio Units/VST/AudioSuite) and \$1,800 TDM versions, this bundle includes three key plug-ins. The Linear Phase Equalizer is designed for zero phase-shift operation with nine selectable filter types and five paragraphic bands (with a massive ± 30 dB gain change per band) and a dedicated LF filter. Linear Phase Multiband provides five bands of distortion-free compression, based on linear-phase crossovers and technologies such as adaptive thresholds, automatic gain makeup and finite response filters. Also included is the L2 Ultramaximizer, offering look-ahead brickwall peak limiting and level maximization with three dither types and up to 192kHz resolution. III

George Petersen is Mix's executive editor and runs a small record label at www.jenpet.com.

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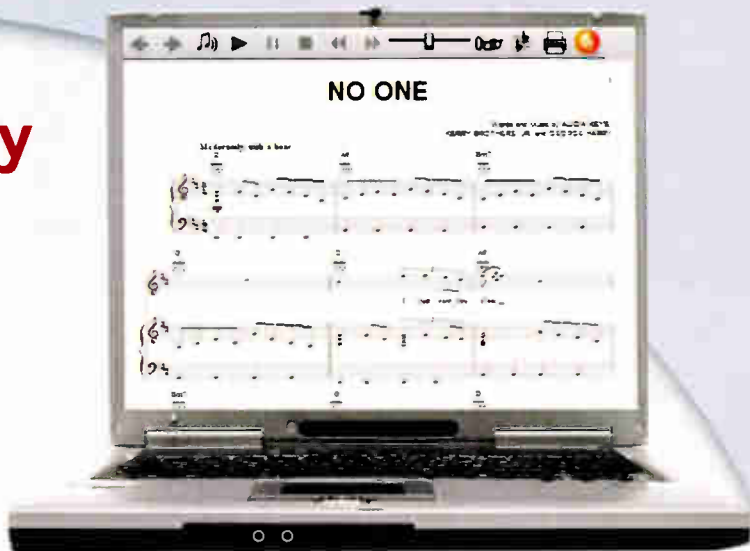
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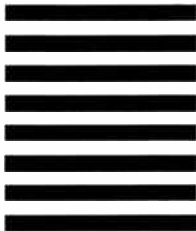


PHOTO TOREY MUNDKOWSKY



L-R: Mark Stoermer, Dave Keuning, Brandon Flowers and Ronnie Vannucci

By Heather Johnson

The Killers

"DAY & AGE" IS NEW ROCK WITH A REMIXER'S TOUCH

During one of the worst times ever in U.S. economic history, the reports of stock market nosedives, high unemployment and other gloomy events seem endless. But there is at least one positive outcome of all this mess. If it weren't for our slowing recording industry and the real estate downturn, there wouldn't have been a certain

recording studio for sale in Las Vegas. And the celebrated rock foursome The Killers wouldn't have bought said studio, nor would they have remodeled the place, bought a few pieces of equipment and turned it into Battle Born (www.myspace.com/studiofio7), the recording home for their third studio album, *Day & Age*, released

November 25 on Island Records.

The Vegas-based quartet—vocalist Brandon Flowers, guitarist Dave Keuning, bassist Mark Stoermer and drummer Ronnie Vannucci—had outgrown their barren rehearsal space and wanted a more comfortable place to prepare for their busy tour schedule, work through song ideas and, ideally,

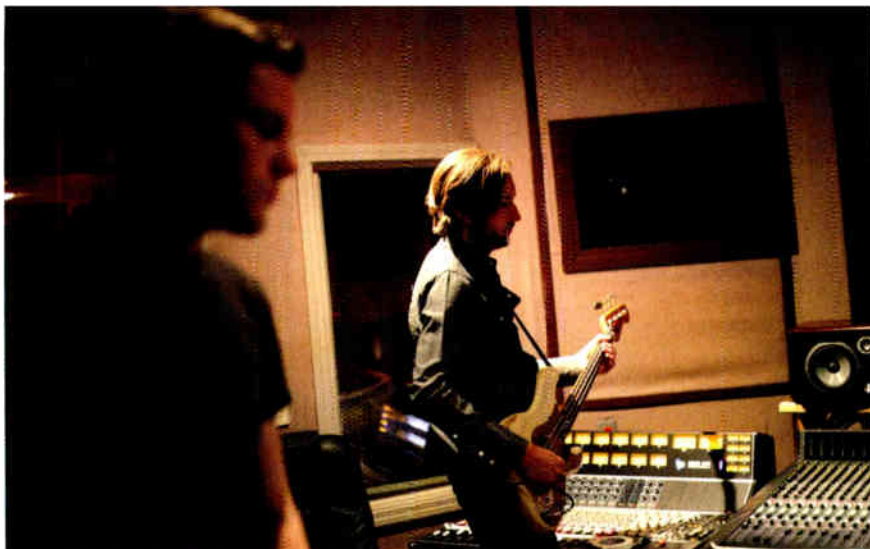
record them. “We were hoping to look into some of these foreclosures that were happening in some areas of Vegas,” says drummer Vannucci. “We wanted to find a home or a nice lot where we could make noise, but that didn’t really materialize. Then, on the very last day, the realtor says, ‘I know a guy that wants to sell his studio in central Vegas. It’s not listed yet, but I’m sure you can take a look.’” Ten minutes later, Vannucci was at the doorstep of Studio V (aka Studio Vegas), a mid-sized facility with two control rooms, a live room with two iso booths, a drum room and a decent stock of equipment, most of which could stay with its potential new owners. “I made an offer right then and there,” says Vannucci, “hoping the other guys would like it and I wouldn’t have to pay for it myself!”

With the paint dry and a newly purchased API 1608 console with 16-channel Expander installed, as well as pairs of Westlake BBSM-105 and Focal Twin 6s, The Killers could record their new album at their own studio without the tick of the clock counting down the billable hours. They had the freedom to experiment and re-record liberally; however, most of the time, they found that the first or second take was the best one.

Similarly, they followed their instincts when choosing Stuart Price to produce *Day & Age*. Price, an electronic musician/remixer/producer whose background includes remixes for No Doubt and Coldplay, as well as producing Madonna’s *Confessions on a Dance Floor*, had produced The Killers’ Grammy-nominated remix to “Mr. Brightside” and their 2007 Christmas single, “Don’t Shoot Me, Santa.” Although the band had only worked with Price as a remixer, they trusted the creative and personal chemistry at play.

“The Killers have a history of changing direction radically on each record,” says Price. “They recorded their first album very quickly—they were recording and mixing a song a day. They spent a lot more time and got a lot more in-depth in making the second record. So for this third record, I suppose they were equally interested in making it in a slightly more chaotic way, which would give rise to it being a little more of-the-moment. So it became an odd but interesting choice to have a remixer produce the record. They took a big risk, but that’s really the only way you can generate excitement.”

At the same time, Price, with his primarily electronic and dance-music background, took a risk when signing on to work with a rock band. “I always thought it would be great to make a rock record with remixer’s ideas,” says Price. “After doing The [Killers] remix, I was secretly hoping that they would be interested in working



Flowers and Stoermer at work in the band’s new Battle Born studio in Las Vegas

on an album. So the two ideas just married up really nicely. And I really think that’s what this album is—a rock record made with remixer’s ideas. That, for me, makes it new and groundbreaking.”

Trans-Atlantic Demo Recording

The Killers’ spontaneous approach to *Day & Age* came after months of preparation. Beginning in early ’08 after wrapping up their winter tour, each bandmember began coming up with song ideas, and then uploaded those ideas via e-mail and Apple iDisk accounts so that the rest of the band could build off of them. “We could add, change and shoot things back and forth this way,” says Vannucci. “We ended up with something like 50 ideas for songs, so when we did get into the rehearsal room, it was like, ‘Okay, let’s go down the list.’ Every idea saw the light of day.”

By late summer, they were ready to take the best of those ideas and turn them into songs. With Vannucci manning an Apple MacBook Pro equipped with Logic Pro 8, the band recorded rough versions of the songs and sent them to Price, who edited, rearranged and otherwise manipulated the tracks from his London studio. “Sometimes these demos would be re-arranged three or four times until we felt like we got it right,” says Vannucci.

“There are four prolific writers in the band, and sometimes all the song needed was someone to say, ‘What you’ve got in that verse is really exciting; maybe we can expand on that with this chorus idea,’” adds Price. “And from my studio I could be very objective because there was no one over my shoulder. I could work very honestly. And when I sent songs back to Ronnie or Brandon, they could be really objective, as well, about what was coming back. Somewhere in that international Internet language we found a way for the songs to evolve.”

The demo recordings evolved so well that

about half of what you hear on *Day & Age* came from those sessions. By high-end recording standards, the tracks shouldn’t have worked. The band recorded in either their rehearsal space or their unfinished studio using only a Logic system and “budget” mics. Oftentimes Flowers would intend to record scratch vocals in the Battle Born control room with a Shure SM58, but they sounded too good to replace. The quality of the music transcended any perceived limitations of recording equipment and technique.

“Stu really liked the sounds that we were coming up with,” says Vannucci. “A lot of it couldn’t be duplicated—but we tried! There was no pressure, and sometimes it ended up sounding better than something more thought out or contrived. The tracks had this breath to them that was very easy, free and effortless.”

One- or two-take moments happened frequently, including on “Losing Touch,” where Keuning nailed a guitar solo. “Dave plugged in about eight bars before the solo came in,” says Vannucci. “I miked his cabinet with an SM57 and recorded a separate line out just from his guitar. I also had a dry signal where I would mess around with plug-ins. Dave had a pitch-shifting pedal that had kind of a ’70s harmony, and I was also getting that harmony on the dry signal. I ran the dry signal through an amp send and it sounded perfect for that song. So we ended up using it.”

The epic “Good Night Travel Well” features an on-the-spot drum pattern from Vannucci. “I caught a particular drum pattern and I wasn’t thinking about it; I was just letting it come out,” he says. “I listened back, and thought ‘Wow, this isn’t half bad, and it sounds good, too!’ I forwarded it to Stuart, and he loved the drum sound. When we got into the studio, we tried to go back and re-do those ideas, and it just didn’t work out the same.”

From his well-appointed London studio,

Price fleshed out the arrangements and added parts of his own, including keyboards and other embellishments. His Apogee Symphony system with Logic Pro 8 includes an assortment of Universal Audio and VST plug-ins, which he uses with a vintage Neve Melbourne console, GML and Pultec EQs, UREI 1176 compressors, and Avalon and Neve mic pre's, among other items.

For music creation, Price turned to his extensive analog synth collection, which he used liberally on the album's lead single, "Human." "The pads on that song came from an ARP Chroma [analog synth]," says Price. "We also used the Korg MS-20 and Nord Lead 3 quite a lot. A lot of the drums were processed through the external filter of the Korg MS20 because the old transistor distortion of that filter unit is very characteristic."

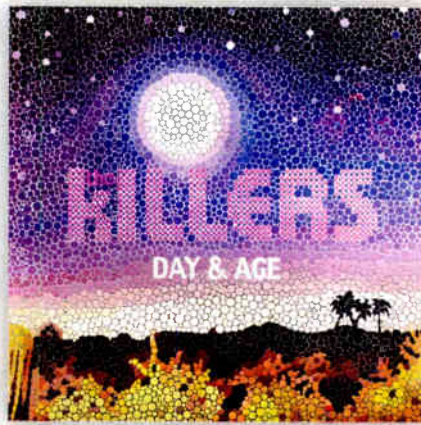
Price also used the Korg SQ-10 analog sequencer—triggered by Vannucci's kick drum—which would activate certain sounds from the MS-20. "On 'Human,' the rhythm is very rigid," says Price. "I wanted Ronnie's drums to sound like a machine, but I didn't want to replace him with a machine because that would defeat the purpose of working with a band."

Charging Ahead at Battle Born

By the time the band got into the studio—their studio—to track the album with Price and engineer Robert Root, they had a solid foundation. "When we first started rolling, we'd say, 'Okay, what do we want to build off first?'" says Root. "Then we would get the next piece of the puzzle laid down. We decided on a song-by-song basis who was going to play and in what order. So it was similar to overdubbing rather than straight tracking, mostly because the demos had already been heard and manipulated in some way by Stuart before he came to town."

For the parts that they did record, the band took a "less-is-more" approach, choosing a more sparse miking technique, especially on the drums, which Root spread out to only nine tracks. He miked Vannucci's extensive Craviotto drum collection with an AKG D-112 or Audix D6 for the kick, Earthworks SR25 drum mic for overheads and a Royer R-122 for the center overhead in certain cases. Snare top was miked with a Josephson e22S, while snare bottom took a Shure SM57. Root used a Brauner VM1 with a UREI 1176 compressor for additional room sound. For a different type of response, he put the drum kit in the vocal booth.

Lacking a sub-kick microphone, Price created one using a technique borrowed from other recordists. "We found an old speaker cone in the



studio, but it was a little too small so we took the two wires out of it and ran it into a mic channel so it was working backward," says Price. "That's what we used to create a lot of the low end coming from the kick drum. Since the speaker cone is so much bigger than the normal diaphragm on a microphone, it creates a really huge 'subby' sound."

Despite its rickety design, the speaker cone mod worked well enough to also capture room ambience. "We'd use it in reverse and fire audio out of it back into the room and capture that sound from the other side of the room with a distant room mic," says Price. Flowers' vocals got a similar treatment. "If we thought that the vocal sound needed more body, we would take a speaker with a bass port and send the vocal through that, but with an SM58 right inside the bass port so it was really just picking up this sick bottom end. When you hear it back, you hear this muffled sound, but when you mix it in with his direct vocal, it added a lot of body."

Experiments aside, most of the tracking sessions were pretty straightforward and efficient. Root recorded into Logic using the band's new API 1608 with 16-channel extension—a lucky find. "We were going to try to get away with the Studer board that was already there, but it blew up two days into recording," says Vannucci, "which is kind of good because I had my eye on the 1608. We threw in a couple of API 500 Series and Purple Audio compressors and bought a bunch of plug-ins to work inside the box."

While the band recorded new parts to merge with the demo tracks, Price worked at a brisk pace embellishing tracks, re-arranging, editing and mixing, all pretty much simultaneously. "Sometimes when people aren't sure if a song is there or not, they'll say, 'Well, it's going to be good when it's mixed.' When you say that, sometimes you're avoiding the real issue, which is, 'Is the song good enough or not?' I thought it would be nice to do these two things together. That involved me and Robert Root working very

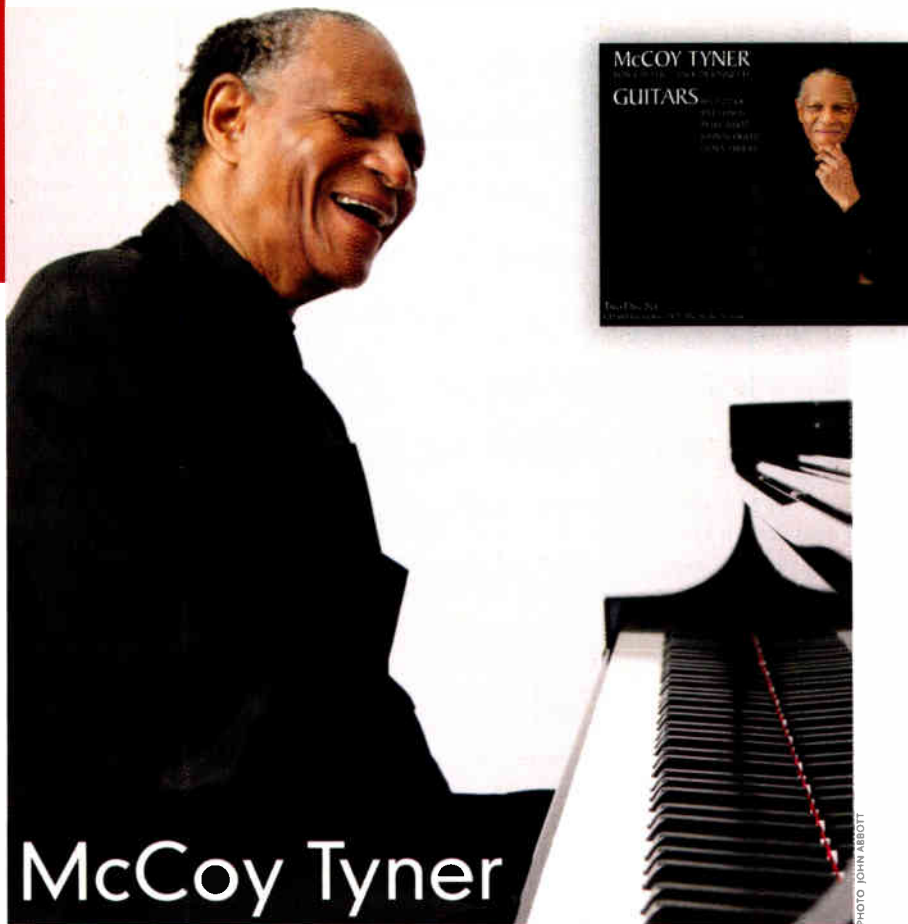
quickly and trying to mix as we went along. That way, if Dave was recording guitar and came back into the room to listen, we could have it already sitting in a track. So Robert and I would work in a very restricted way where we squeezed drum lines, bass, guitars, keys and vocals onto 16 channels on the API. Instead of separating the two processes, we brought the two together."

Because Price had edited and partly mixed the album during the tracking sessions, the actual mixing sessions, which took place at London's Olympic Studios, incorporated guitar, bass and a healthy amount of vocal overdubs. (Flowers originally sang many of the choruses before he had finished the rest of the lyrics.) Price mixed on the facility's SSL 9000 K console, and as with the rest of the process they maintained a collaborative environment.

"The Killers are very active in every area of their career: their promotion, their music, their image," says Price. "For that reason, it was good to not have any separation and for us to make the record as a unit. There is a certain amount of smoke and mirrors involved when you're producing a record. Sometimes it's advisable not to let people see [what's behind] the smoke and mirrors, but I thought from day one that if everyone is there and sees what's going on, no questions will be raised in the end. And I felt better that we were making an honest record that everyone had been a part of."

Final mixes complete, Price delivered the album to esteemed mastering engineer Tim Young at London's Metropolis Studios. "Tim is equally good at his job as he is unimpressed by anything," Price says with a laugh. "So when he gives you the nod, you really know that it's good. He thought about what was best for this album and decided to master it using all analog equipment."

Excitement began to build well before *Day & Age* dropped on November 25, propelled by its lead single, "Human," which debuted at Number 13 on *Billboard's* Modern Rock Tracks chart, a well-viewed appearance on *Saturday Night Live* and just the all-around anticipation from fans that have waited two years for some new Killers songs. And considering the attention the band, both as a unit and individually, has put into their songcraft this time around, it's worth the wait. "They're all very creative and have their own ideas and opinions, but when you get them all together, it's like they know what each other is thinking before they say it," says Root. "They're very tight-knit. They act as one and think as one, but individually they're all creative. They're the quintessential rock band." III



McCoy Tyner

JAZZ PIANO GREAT JOINED BY TOP GUITARISTS

By Blair Jackson

Over the course of a career spanning five decades, jazz piano giant McCoy Tyner has played with scores of great musicians on literally hundreds of albums, both as leader and bandmember. Of course, he'll forever be most associated with John Coltrane's famous early '60s quartet, but through the years this fearless and utterly distinctive stylist has been remarkably adaptable, whether with Eric Dolphy, Milt Jackson, Wayne Shorter, Pharoah Sanders or even swing violinist Stephane Grappelli. On scant few occasions, he has plied his craft with electric guitarists—Grant Green being the most notable—but it's safe to say he's never made an album quite like his recent Half Note Records release, *Guitars*.

For these quartet recordings, Tyner was joined by the formidable rhythm section of bassist Ron Carter and drummer Jack DeJohnette—legends themselves—and a handful of highly creative axemen: John Scofield, Marc Ribot, Derek Trucks (of the current Allman Bros.; a young phenom), Bill Frisell and banjo sensation Béla Fleck. The result is a fresh and exciting collection of tunes that range from free-form improvisations (with Ribot), to Coltrane

classics ("Mr. P.C." with Scofield, "My Favorite Things" with Fleck), to originals by Tyner and the various soloists, and unusual choices like the folk anthem "500 Miles" (Ribot) and a beautiful take on "Greensleeves" (Trucks).

The album was produced by John Snyder—whose decades-long CV is peppered with dozens of notable albums by top jazz, blues and even jam-band artists—and engineered and mixed by Randy Funke, who captured the quartets in two day-long sessions at New York's Clinton Studios in September 2006. Snyder says, "The record company wanted to get McCoy together with the commercial players—Larry Carlton, George Benson, people like that—but I wanted to get what I'd call the 'left-wing' guys. I wanted to get really adventuresome players with McCoy."

Funke—a Connecticut-based guitarist, engineer, computer wiz and video editor—has worked on projects with Snyder for the past five-plus years, including a series of *Master Class* DVDs with the likes of Cecil Taylor, Phil Woods, Toots Thielemans, Clark Terry and others, available through www.artistshousemusic.org, the Website of the educational Artists House

Foundation founded and run by Snyder. The Tyner *Guitars* sessions were also shot for a remarkably illuminating DVD (packaged with the CD), which allows the viewer to choose which player(s) to watch at any given moment. As Snyder notes, "If you want to go to school with Ron Carter, you can do it," or you can watch a pre-edited version or all four at once through iso split-screen.

During the sessions, Snyder was in the room with the musicians, even manning the camera trained on Tyner. "I like to be in the room when I produce," he says. "On the other side of the glass you've always got hangers-on and people talking, and you can't entirely tell what's going on. You certainly can't pick up on the subtleties of the communication among the musicians."

The sessions were tracked live to Pro Tools through Clinton's 8000 Series Neve and "as many inboard mic pre's as possible," Funke says. "I didn't really EQ or compress anything at that stage." Miking was fairly simple. On the piano he used three Neumann U87s: "I like to have the spread of left and right; the middle one I like to use as a mono to give it a larger-than-life sound." Carter's standup bass was a combo of a DI and a Neumann M150 six or seven inches away. Funke says that drummer DeJohnette is "like the undulating undercurrent of the world. It seems like he's playing every drum every second!" To capture his kit he used an Audix D6 on the kick, a Shure 57 on the snare, Shure SM81 on hi-hat, Sennheiser 421s on toms and two U87s as close overheads. "Some songs have more overhead than others," he notes. "Frankly, I tend to gravitate toward a dry, in-your-face, non-roomy sound a lot of the time. But this had a lot of natural room sound in there." For the guitarists, Funke used two mics, side by side, a couple inches from each's amp (or two, in Frisell's case)—a 57 and an AKG 414. Fleck's banjo was miked with an 87 and a 414.

Funke mixed the album "in the box" at his home studio, Zone Media, sending mixes back to Snyder, who was in New Orleans, listening on his beloved Tetra speakers. On most songs there was a minimal number of edits; then there were Fleck's tracks: "Béla likes to overdub very, very small passages of notes," Funke says. "He did 46 takes of an eight-bar phrase, and then he wanted to get a copy of the hard drive so he could edit his takes and get the things he wanted on his own. So he chopped stuff up at his studio and put the notes in he wanted. He did so many edits. Scofield overdubbed a solo but we didn't end up using it. And Mark Ribot overdubbed a few little things. But most of it is really the way it went down in the studio." III



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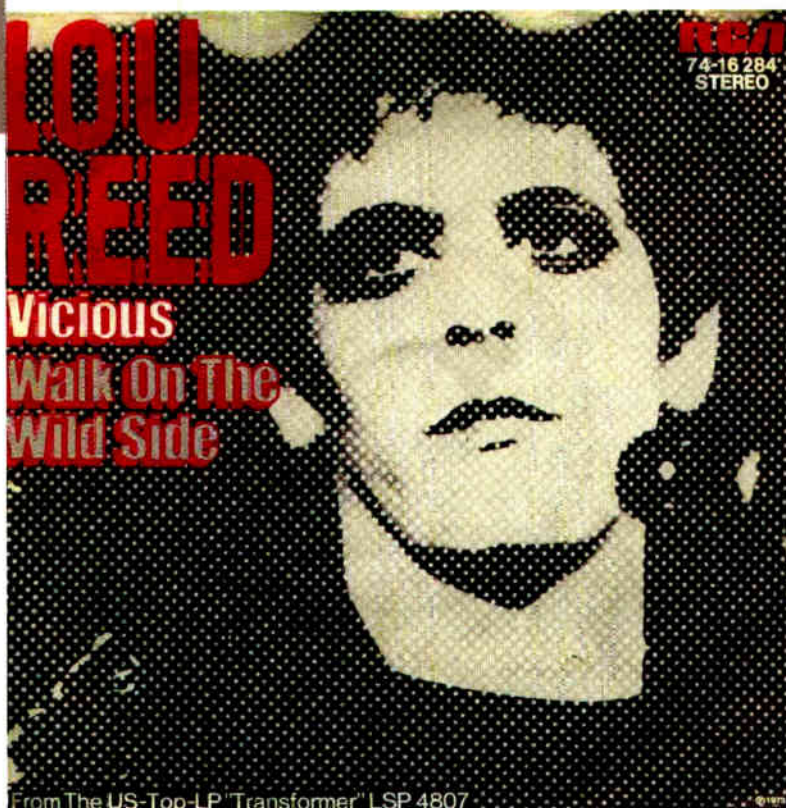


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CLASSIC TRACKS



Lou Reed

"WALK ON THE WILD SIDE"

By Dan Daley

If all Lou Reed's groundbreaking single "Walk on the Wild Side" had ever done was put oral sex explicitly onto the radio and into the pop-culture lexicon, that would have been enough. But the track, from the 1972 *Transformer* LP, was seditious in a number of other ways. It was a portal into the mysterious pharmaceutically powered and androgynous scene that swirled around Andy Warhol and the New York art world, featuring references to drag queens Holly Woodlawn ("Holly came from Miami F L A...Shaved her leg, then he was a she") and Candy Darling (the aforementioned fellatinal reference), as well as Jack Kerouac-by-way-of-William Burroughs hustlers like Joe Dallesandro ("Little Joe never once gave it away/Everybody had to pay and pay"). But it wasn't just proto-snarky cultural references that made "Wild Side" so archly fun. Bassist Herbie Flowers' haunting bass line, which is spread between an acoustic double bass and a Fender electric bass, is instantly recognizable and has been sampled hundreds of genre-crossing times; and

the nonsense refrain of "Doo, doo-doo, doo-doo, doo-doo doo." sung by "the colored girls"—actually three white English girls collectively and professionally known as Thunder Thighs—is the slouching Greek chorus of rock 'n' roll.

Engineer Ken Scott—who cut his teeth on Beatles recordings at Abbey Road in the 1960s and would go on to engineer and produce records for Jeff Beck, Elton John and Duran Duran—had already finished *The Rise and Fall of Ziggy Stardust and the Spiders From Mars* with David Bowie, who would produce this record for Reed. Scott was an adventurous but well-grounded record maker who meshed well with the innovative but calculating Bowie, an anchor of practicality as glam-rock moved from its salad days into its own business sector clad in \$1,000 snakeskin boots and make-up. Scott was comfortable at Trident Studios, in London's SoHo district, in a five-story former printing factory. The single main studio reminded him of Abbey Road's Studio Two—the Beatles' room—with its control room looking

down on the studio from a floor above. Trident's founders, brothers Norman and Barry Sheffield, were yet to develop the Trident brand into one of the classic marquee of the console business with the sublime A-Range and the workhorse Series 80. Scott says it was likely a 20-input/16-output Sound Techniques console in the control room in 1972 for *Transformer*, sideloaded into the room and underneath a pair of large Tannoy speakers in Lockwood Audio cabinets. There were two each Universal Audio LA-2As and UREI 1176 compressors in the rack next to the console. An EMT plate was the sole reverb.

The recording studio was sizable enough to hold a 45-piece orchestra, with a drum booth recessed into a cubby underneath the control room. "Wild Side" was one of 11 songs on Reed's *Transformer* album, and Scott approached the recording of it like any other project. "I make it a point to never listen to the lyrics, so I wasn't shocked by anything," he says. "I was listening to the melodies and the sound. I mean, we were doing this right in between *Ziggy* and *Aladdin Sane*, so Lou didn't seem that out-there by comparison."

On the drum kit, played on this track by Ritchie Dharma, Scott placed an AKG D-12 dynamic on the kick; a Sony C-38 on the snare, angled in at about 45 degrees; and either a Beyer M160 or an STC 4038 overhead. Scott says that by this time, he had started recording drums in stereo, and on this song likely put the kick on its own track and mixed the snare and overhead microphones in stereo to the 3M 16-track deck running at 15 ips with Dolby NR. (Trident was the first UK studio to use Dolby.)

Herbie Flowers was playing a stand-up double bass in the room, on which Scott likely experimented with a Neumann KM 56 wrapped in sponge material and stuffed into the bridge, a technique he had used successfully recording Stanley Clarke. An acoustic guitar, played by the late Mick Ronson, Bowie's collaborator and co-producer on *Transformer*, was recorded with two AKG C-12As. The microphones were placed at an angle of 45 degrees down from the front of the instrument and facing 45 degrees to its rear. A second mellow-sounding electric guitar is also on the track, with a U67 on the amplifier.

As regular readers of "Classic Tracks" are aware, basic tracks in the early multitrack era were not drawn-out affairs, and "Wild Side" was no exception; Scott figures the band nailed it within three or four passes. But a lot went on during the run-up—the band learned the song

and rehearsed it, and Scott tweaked the sounds, though neither party was restricted to one side of the glass or the other. Initially, Dharma started running the song down with drumsticks. "I heard it and it sounded like he was playing a march, so I ran down and suggested he try it with a pair of brushes," Scott recalls.

The first overdub was the trademark bass line. Flowers laid a Fender bass on top of the acoustic one, with perfectly matched glissandos on each. Then came Reed's vocals. He stood in front of a U67, and it may have been more like an actor delivering his lines than a singer doing a vocal. With Bowie and Ronson rehearsing during the evenings for a forthcoming live show at the Rainbow Theatre in London, *Transformer's* session hours were curtailed to the daytime (not exactly Reed's best milieu) and Scott was concentrating on getting the tracks done. He found it best not to intrude into Reed's odd, uncommunicative state of mind and simply let him perform. "It was a strange time," Scott recalls. "David wasn't around much, he was off with Rono rehearsing for the show, and I had no idea where Lou was. I mean, his body was there, but I'm not sure about the rest of him." (Two weeks after the project wrapped, Scott was in a Chinese restaurant in SoHo when several RCA Records executives came in with Reed in tow. "He had no idea who I was," Scott says.) Reed's vocal required a touch of one or the other of the compressors and a little EQ, and little else other than the occasional punch.

Next came the background vocals, the famous "Doo, doo-doo, doo-doo, doo-doo, doo" performed by Karen Friedman, Dari Lalou and Casey Synge—who had become sought-after backup singers in the London studio scene and would go on to chart singles as Thunder Thighs with titles such as "Central Park Arrest" and "Dracula's Daughter." "David said we need some girls on this track, and I put in a call to them," says Scott, who had used them on a previous project. He grouped them around the U67 and "Doo, doo doo" went into the history books quickly.

"Wild Side" also has a string section, the kind of contrast that Bowie thrived on and Ronson was perfect to execute. *Transformer* has strings on some of its other songs, too, but when the string session came around to this one, for some reason the violas and cellos were nowhere to be found. Thus, there are only violins doubling up on Ronson's simple, single-note lines, forlorn and almost Celtic, the antithesis of lush, into the U67s Scott had set up. It was emblematic of how Bowie and Ronson approached the production of

the record: Bowie's visionary conceptions made manifest by Ronson's visceral touch, though there was a more prosaic side to the equation, too. "Lou found it hard to understand Rono's northern English accent and David would have to translate for him," says Scott.

The last bit of the song is the saxophone solo, performed by Ronnie Ross, which plays the song out to its fade. Scott set up two U67s, one on the bell and the other facing the upper valves of the sax, both less than a foot back. "So much of the sound comes from the upper microphone," he says. "That's where the breathiness is."

Scott had developed his own unique method of mixing, born out of a lack of extra hands to make moves in the pre-automation days. He would break the song into sections, mix them individually on the Studer 2-track, splicing the 1/4-inch tape sections together as he went from one section to the next. "There wasn't even a second [engineer] with me in the studio," he recalls. "David was on the Queen Elizabeth sailing to New York. He had to leave early because he refused to fly after a near accident. So I'd break it into short sections and mix them bit by bit."

The song's mix is hardly radical—the electric and acoustic guitars are split left and right, and the rest of the track seems right down the middle—but the reverb on the background vocals is notable. The women are introduced surrounded by a dense halo of reverb, from which they emerge, the sound morphing into an intimate breath in your ear. "I had to do something—how many times can you hear 'doo, doo, doo' without getting bored?" Scott asks. He set the background vocal track echo send pre-fader (it was going to an EMT plate), so as he brought the background vocal track up progressively, the reverb return stayed at the same level. The effect is three-dimensional, adding depth and motion as a counterpoint to Reed's deadpan delivery.

All of *Transformer* took little more than three weeks to make, start to finish. Scott says that's part of what made it such a good record. "You got to the point quickly recording that way," he says. The song became the only charting single of Reed's career, making it as high as Number 16 in the winter of 1973. Big things were ahead, however. In 1974, his dynamic *Rock 'n' Roll Animal* live album (with extended versions of Velvet Underground classics written by Reed such as "Sweet Jane," "Heroin" and "Rock 'n' Roll") went Gold and brought in a new generation of fans for the idiosyncratic artist. But it's "Walk on the Wild Side" that has survived the decades and is acknowledged as one of rock's greatest tunes. III

Mojave Audio
by David Royer



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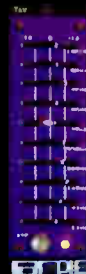
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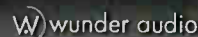
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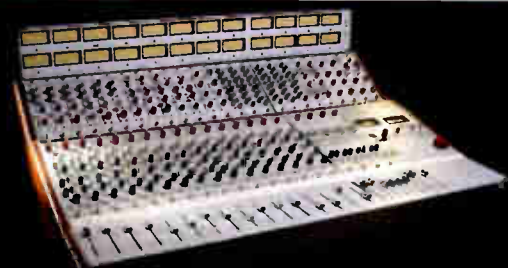
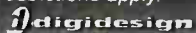
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PHOTOS: PAULE SAVIANO



By Gaby Alter

Janet Jackson

POP QUEEN ROUGHS UP ONSTAGE SOUND

Celebrating 25 years in the music business, Janet Jackson has nothing left to prove, but she continues to enhance her live performance year after year, including bringing a more rock sound to her pop sensibility. At the Madison Square Garden stop on her Rock Witchu tour, the power vocalist swept

through her catalog in a two-and-a-half-hour blitz that showcased hit songs (including those from her latest albums, *Discipline* and *20 Y.O.*), punctuated by pyrotechnics, celebrity video duets and even a little mock S&M. For each tightly choreographed dance routine, Jackson and 20 backup dancers

whipped through a dizzying number of costume changes that ranged from retro-futuristic to fantasy to maritime.

"That [brings] its own challenges in terms of Janet singing, her coming on- and offstage, changing costumes all the time," notes front-of-house engineer Jon Lemon. "We always have three

or four mics being swapped over, so the whole wardrobe department gets that together. The belt packs are in the right place to match the headsets and handhelds." In addition, Jackson's costumes have pockets sewn in for the wireless packs.

Getting the Voice Right

During the show, Jackson sings through handheld mics and her signature headset. "For the really heavy dance portions of the show, she uses a headset mic—the same one for 12 years: a Crown 311 headset," says Blake Suib, the show's monitor engineer. "Pretty standard; still sounds great."

"A lot of it is a physical thing because they attach very well," Lemon adds. "They were custom-made for her so they can actually stand up to the dancing. And she likes the sound of the Crown microphones."

For the ballads, Lemon and Suib chose a Sennheiser SKM 5200 wireless with a Neumann KMS 105 capsule. "I've used the KMS 105 a lot with different bands," Lemon remarks. "With women I find that they're really, really good because they're just such a natural-sounding microphone. They're not colored at all, so

that slick pop thing. So it's been really nice to kind of blend that together because most of her songs have so many great pop hooks in them anyway."

To work in that edgier live sound, Lemon has found much attention needs to be paid to microphone and P.A. choice, as well as tuning of the P.A. "One of the most exciting things about this tour for me is that I have the new Clair 15 P.A. system, which is a total revelation," he exudes. "It's certainly hands-down the best sound system they've ever made. I don't think I've ever had such consistent gig-to-gig audio as I've got currently."

"One of the great things about the 15 is that it's got the new Clair subs with Powersoft amps on them," he continues. "I'm convinced there isn't a better sub in the world at this time. I'm expecting tonight that should really help on that floor, give us a much better bottom end because we could actually steer the bass around the room using delays."

The new P.A. requires a new rigging system, deftly handled by Clair tech Frank Principato, who uses a J-hang for the speakers, with a stack—from top to bottom—of six 2.5-degree cabinets, six 5-degree cabinets and two 10-degree cabinets. "That enables me to get a lot of power coming straight down the room to the back," Lemon explains. "And in arenas, of course, you need a lot of high end to cut through the reverb."

The side hang sees four 5-degree cabs and four 10s, offering a bit wider dispersion as you go down the setup. "And we've been able to make that walk from down the arena going up the side

bleachers right around in the back totally seamless now," Lemon adds. "I think it's been the first tour where I've been able to make it that seamless with a line array."

Lemon mixes the show on a DiGiCo D5 with "well over 100 cues in this show, snapshots set up, and then you control that from the MIDI on the Pro Tools so there's just stuff going on all the time," he says, also praising the board's analog-like sound: "It's got that fat, British thing going on, which most of the other consoles don't."

The band comprises two keyboardists, one of whom doubles on bass, and a drummer. The remaining sounds, such as loops and backing vocals, are played through Pro Tools. All the instruments are DI except for the drum kit. "For this, again, I wanted something that would bridge the pushier, rockier thing, as well as really reflect her music," Lemon says. "The kick drum

is a Beyer TGM 88 and a Shure SM91—fairly standard. Snare top is an SM57, snare bottom is an AKG 414. And then the top of the kit is basically all Sennheiser and Neumann—the two hi-hats have KMS 184s on them, the cymbals are Neumann TLM 103s and all the toms I use Sennheiser 604s, which is kind of very interesting because they had Shures on the drum kit in rehearsals, and I sent over my own mics, and they were all amazed when they heard that the drums were miked up differently—they heard the difference in dimension immediately."

A Closer Look at Monitor World

Suib does his mixing on a Digidesign VENUE, citing the board's recall functionality as crucial: "We rehearsed for two-and-a-half months to re-create all the sounds that are on the record, but with a new twist for the live performances, which was quite a task because we started with 53 songs. So the great thing about the VENUE was the recall." Suib is also taking advantage of onboard effects, including Focusrite plug-ins for all mix EQs, Bomb Factory compressors and TC Electronic reverb.

Jackson and the band all use Ultimate Ear UE7s, with Jackson and one of the musicians using the Sennheiser 300 wireless system; the other two are on hard-wired packs. Amplification is via Lab.gruppen. Another feature of the system is Digidesign's Personal Q mixers, which give the band control over their own mixes. "It allows you to have 12 groups or channels per mixer so I can build stems," says Suib, "The band can actually mix their own ears without having to ask for a mix, and then I can devote the rest of the time to Janet's mix."

Because Suib spent eight weeks with the band and Jackson before Lemon arrived, he was able to do something he has never had the opportunity to do: "I would record all rehearsals in Pro Tools through my console," Suib says. "I would then mix each song down to a 2-track and burn a CD for Janet to approve the arrangement. I would use the same stereo outputs I was using to mix the CDs for her ear mix so when she liked what she heard, the mix was saved and that was the mix she heard for the tour. Each song had its own set of levels and EQ settings, and because they were saved to their own snapshots, she always heard the mix she approved. Most of the time, this is done from the FOH console, but for this tour, I was able to do this. The end result was that Janet had total control of what she was listening to." III

Gaby Alter is a freelance writer based in New York.



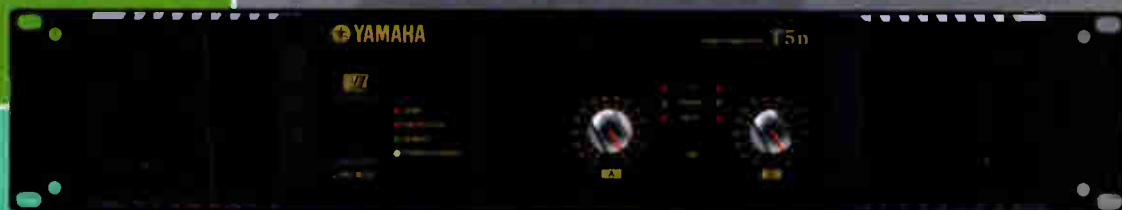
Monitor engineer Blake Suib (left), FOH engineer Jon Lemon

you get this really sexy-sounding vocal, basically, almost like a studio-quality vocal."

Lemon processes both microphones using two Manley VoxBoxes ("The de-esser is great on them, the EQ is great on them, the compression's just fantastic, so for me they're a no-brainer") and two TC Electronic 6000 systems to add chorusing and double-track effects to the vocals. The remaining two channels of the 6000s are dedicated to reverbs for the drums, such as small plates and small rooms.

P.A. Showcases Rock Quality

Lemon—known for his work with Beck, Oasis, Marilyn Manson and Nine Inch Nails—might seem an unusual choice for Jackson. "Pop has never really been a big part of my genre," he says. "But she wanted something kind of edgy: She wanted loud, rock-y-sounding, not just



true colors.

or should we say "no colors."

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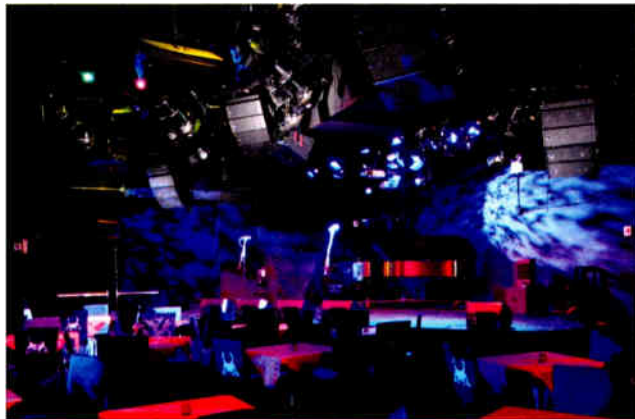


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SOUNDCHECK

Updating Le Poisson Rouge



The state-of-the-art Meyer Sound system can be shifted into five different configurations.

What becomes a legend most? If you're taking over the space that once housed one of the most beloved live music venues on the East Coast—New York City's Village Gate—you have two choices: Re-create it or reinvent it.

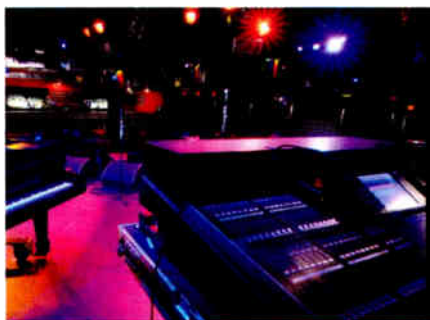
The entrepreneurial duo of David Handler and Justin Kantor chose reinvention, as they took over the 12,300-square-foot duplex space, rechristened it Le Poisson Rouge (www.lprnyc.com) and updated it for the 21st century. Today, the 800-capacity room not only offers audiences extremely clean live sound every night, it also provides crew members with a high level of versatility.

The venue redesign was guided by Walters Storyk Design Group's John Storyk (architect/acoustician) and his partner/wife, interior designer Beth Walters. Their firm helped ready the room for multichannel surround sound capable of 7.4 and the more commonly used 5.1 or stereo or mono; the club gives technical director/head sound engineer Josh Loar choices, choices, choices every night. "There's not a room this size in New York City with the equivalent degree of flexibility and sound quality," Loar says. "Part of the whole mission of this place is to create a venue that is for all music, not just rock or hip-hop, but also classical, jazz, blues, international and avant-garde. What we're striving for here is to have a standard of excellence that's missing in the New York City nightlife in a club this size."

Loar, Storyk, WSDG associate David Kotch and installer Masque Sound's audio specialist Paul Klimson examined every aspect of the challenging 3,882-square-foot performance area—bedeviled by inconveniently placed fixed columns—to make it adaptable to almost any situation. For example, the raised-balcony VIP area creates a much needed

storage space for the club's Yamaha S6B grand piano and additional chairs. Meanwhile, a multiconfiguration, portable stage can emerge from beneath the main stage to provide an in-the-round position at the center of the club. The 200-square-foot multifunction stage can also be configured with a semicircular, "dropped front extension," or in "fashion-runway" mode to accommodate various performance styles.

For Loar and visiting engineers, however, the real star is the Meyer Sound system, headed by the first Digidesign VENUE Profile Console Mix Rack (48-in x 16-out) installed in New York. The board also allows Loar to take advantage of plug-ins such as Sonnox Oxford EQ and dynamics to enhance live mixes, and the limiter for premastering CDs and downloadable performance releases. Le Poisson Rouge has a "three-clubs-in-one" versatility that can be shifted into five different speaker configurations. "Every element in the venue's design was selected to optimize the performance of the sound system," Loar explains. "We joke that this is our spaceship: It's really fast, and when you have classical musicians first, a funk band second, and DJs and party bands for late nights—all of whom demand soundcheck—we spend half as much time setting up than we would with any other type of system."



FOH features a Digidesign VENUE Profile Console Mix Rack—the first installed in New York.

For the WSDG team, Le Poisson Rouge was a chance to step outside of the studio recording world and share their skills with concertgoers. "Le Poisson Rouge would be big for a studio, but the fundamentals of acoustics are the same," Storyk points out. "It's a relatively small room where factors such as low-frequency behavior and reflection control have to be managed—skills that are required in recording studio design."

—David Weiss

tour log

Jakob Dylan and band were recently spotted performing at the 2008 Austin City Limits festival. We caught up with FOH engineer Jimmy "Ace" Acevedo. Check out the photo gallery from the festival at mixonline.com/photos/austin_city_limits_2008.

How long have you been mixing FOH for Jakob Dylan?

I've been mixing Jakob for the past year. I have, however, been his monitor



PHOTOS: DAVE VANN

engineer for the past 12 years with The Wallflowers.

How much gear are you carrying on this tour?

This year found us doing TV, festivals and supporting Eric Clapton and Willie Nelson, so we haven't been carrying production. I have been carrying a Bob Heil mic package that's made a big difference; I also advance some Summit DCL200 compressors.

What's in your vocal chain?

The Heil PR35 with the Summit DCL200 on Jakob's vocal gives off the natural warm sound of Jakob's vocal. Using a TC Electronic 4000, I'll add a touch of verb.

What is your mixing style for this band?

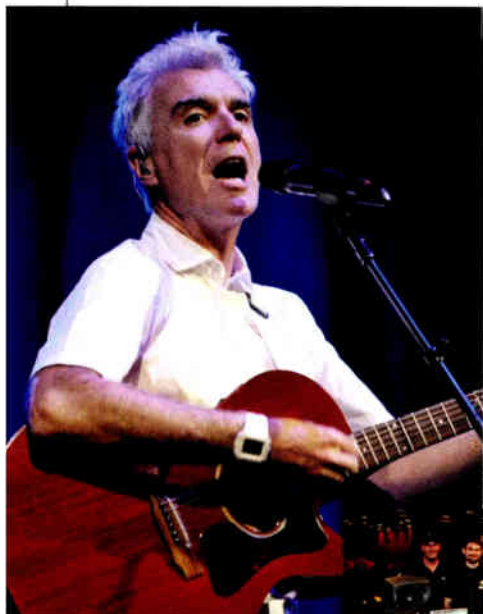
I run a heavily compressed, bass-heavy show with Jakob's vocal sitting in front of the compressed instruments (dbx 160SLs) and a slightly reverbed drum kit.

When you're not on the road, where can we find you?

In Austin, playing golf—rain or shine!

Byrne Brings 'Eno' to Shows

Rebranded Clair Global is providing SR for the current David Byrne tour, where the artist pays tribute to collaborator Brian Eno, working through a set list mostly from the duo's recent outing, *Everything That Happens Will Happen Today*. Mix caught up with the tour at the Wells Fargo Center in Santa Rosa, Calif.



From left: systems engineer Michael Conner, monitor tech Ben Rothstein, Bruce Knight, lighting designer Jon Pollack and Bob Lewis

Front-of-house engineer Brian Knight mixes on a Studer Vista 5 SR, citing the channel-strip functionality as a perk: "It's all right in front of you where you need it, when you need it, on three large touch-display screens, including mic pre's, EQ, dynamics, stereo imaging and effect sends. The setup works great and lets me focus on mixing the show." Complementing the Studer is a rack full of gear, including two Summit Audio TLA 100s and a DCI 200, Lexicon 480L and PCM81, Eventide H3000 D/SE, TC Electronic 2290 and Yamaha SPX-990.

The P.A. comprises a Clair i3 line array for mains (12 boxes per side) with Lab.gruppen PLM1000Q power, Prism subs (two per side) and eight Clair FF2 front-fill. "With the new Lab.gruppen amps with Dolby processing," Knight adds, "we are running AES digital output from the Studer right to the amps. Michael 'Coach' Conner is hitting home runs every day, adapting this system to the ever-changing environments on this tour."

Monitor engineer Bob Lewis is mixing on a Digidesign Profile, taking advantage of onboard plug-ins. "We're using Westone ES2 [in-ears]," he says. "Great earpieces. David's vocal mic is a Neumann KM 104 capsule on a Sennheiser 5000 wireless handheld."

—Steve Jennings



PHOTOS: STEVE JENNINGS

load in



From left: Gavin Harrison and Tony Levin (King Crimson); Ian Bond (front of house); and Adrian Belew, Robert Fripp and Pat Mastelotto (King Crimson) with the Midas XL8 the band is using on tour.

DiGiCo's new SD8 board is already hitting the road: Art Garfunkel and band's 12-date European tour. Monitor engineer Mikey Osman is manning nine monitor mixes (one on in-ears and the rest on wedges) on the AudioLease-supplied desk...Quebec City's Capitol theater hosted the latest run of *Les Misérables*, which saw audio company Solotech's Richard Lachance overseeing audio production. He chose Sennheiser MKE 1 lavalier mics as part of the 32 live mics onstage...Keith Urban FOH engineer Steve Law and monitor engineer Jason Spence both manned Studer Vista 5 SR consoles at the recent NFL Live Kickoff concert in New York City's Columbus Circle as part of sound company Clair's support package for the country artist. The show was broadcast nationally on NBC and the NFL Network with onsite broadcast support by Metrovision, whose OB truck featured a specially configured Vista 5 with mixing by audio engineer John Bates and truck tech Mike Christopher...The Vienna State Opera boasts a new multichannel wireless system centered on the AKG WMS 4000.

road-worthy gear

Cerwin-Vega C Series Subwoofers

The C Series folded-horn subs feature performance enhancements and a new design. Folded horns differ from traditional subs, using a complex path within the speaker enclosure to create a bass horn that is effectively larger than the cabinet. Shipping now, the AB-36C, EL-36C and JE-36C feature a custom-designed Cerwin-Vega 18-inch cast-frame driver with 6.5-foot folded-horn chamber lengths in the AB-36C/EL-36C and 5-foot in the JE-36C for more bass per square inch. Integrated wheels and a new ergonomic handle allow easier transportability.

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Community M12 Upgrade

Community has improved its 12-inch, two-way M12 low-profile stage monitor with rubber pocket-grip handles for effortless portability and a larger, easier-to-access connector base. The M12 is ideal for applications where low visibility is a key requirement. Features include a unique asymmetrical 40x90x70-degree coverage pattern, multilayer glass composite construction and switchable bi-amp/passive configurations. Max (peak) SPL is rated at 129 dB. Options include hardware for wall/ceiling mounting, custom ATA roadcases for two or four M12s, and a choice of low-luster black or white finishes.

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JBL EON500 Series

The wildly successful—nearly 1 million sold—EON speakers from JBL just got better with the EON500 Series. The new-generation, 15-inch, two-way EON515 has 450 watts (continuous) Crown Class-D bi-amping and weighs less than 33 pounds; the 10-inch, two-way EON510 has 280 total watts and weighs only 17 pounds. Features include onboard 3-channel mixers; lightweight, high-output neodymium drivers; 100x60-degree waveguide horns; integrated M10 suspension points; and multi-angle enclosures for main or monitor use. Optional is the EON518S single 18-inch sub with 500W continuous power and pole mount.

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ALL ACCESS

Photos and text by Steve Jennings



The Hives

Sweden-based The Hives captivated alt-rock fans when they signed up for a slew of touring gigs with The Strokes and White Stripes in 2001. Since then, they've cultivated their own following, attracting legions to their sold-out club dates while touring behind the 2004 *Tyrannosaurus Hives* album. Last year saw the release of the much-anticipated *The Black and White Album*. *Mix* caught up with the blistering foursome when they played at San Francisco's recently renovated Warfield Theater.



Vocalist Howlin' Pelle Almqvist



Front-of-house engineer Dave Lamb

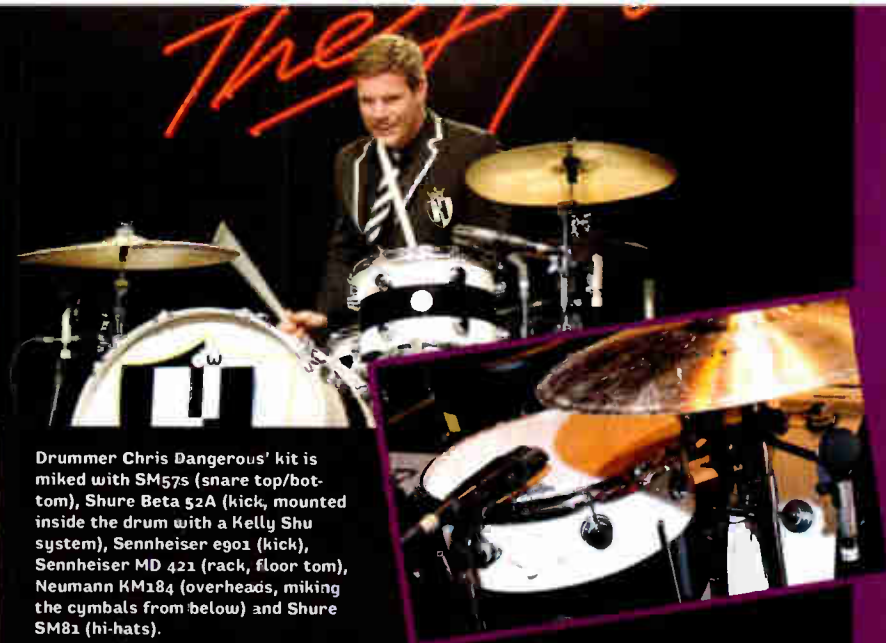
Front-of-house engineer Dave Lamb is mixing on a Midas H3000 console, supplementing that with a few choice pieces of outboard: a few Yamaha SPX990s and delay, dbx 160s on everything and a stereo valve comp over the mix. "I put everything through API preamps and then compress the hell out of it," Lamb adds. "We are not carrying P.A. with us, so for rental we have enough for 110 dBA clean at FOH—always nice to have headroom.

"For mics, Sennheiser looks after us. We have white-capped 935s that look cool and 421s on everything else except inside the kick [Shure Beta 52, Sennheiser 901] and underheads [Neumanns]. Working with The Hives, they're one of the best bands and crew I've ever worked with."

The 11



Bassist Dr. Matt Destruction uses a HiWatt 1x15/4x10 SE1510 cabinet. "For heads, we are using Mesa Boogie 400+, HiWatt Custom 200 and Ampeg SVT Classic," says guitar/drum tech Fredrik Normak.

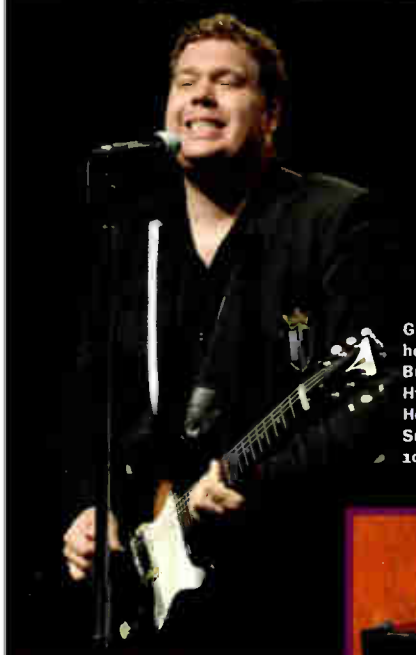


Drummer Chris Dangerous' kit is miked with SM57s (snare top/bottom), Shure Beta 52A (kick, mounted inside the drum with a Kelly Shu system), Sennheiser e901 (kick), Sennheiser MD 421 (rack, floor tom), Neumann KM184 (overheads, miking the cymbals from below) and Shure SM81 (hi-hats).



Guitarist Vigilante Carlstroem's licks are heard through two different amps: Divided By 13 LDW39 head that runs through a HiWatt 4x12 cabinet stack with Celestion Heritage G12M speakers; and a Marshall Super Lead 1959HW with the HiWatt custom 100 DR103 stack.

According to Normak (pictured at left), guitarist Nicholaus Arson (below) has a blackface Fender Bandmaster from the late '60s that runs through HiWatt cabinets equipped with four 12-inch Celestion Heritage G12M speakers.



Monitor engineer Zoran "Zok" Malceski



Zoran "Zok" Malceski is pulling double-duty: monitor engineer and tour manager. He's mixing on a Yamaha PM5D with API preamps in line with the rig, acting as the bridge between the P.A. and the stage. "All inputs from stage run through the preamps into the production stage box and from the multicores of both FOH and monitors," Malceski explains. "That is, we use all

our own mics, cables, snakes and sub-snakes. This gives us, essentially, uniformity for each show. As we don't carry our own production, we are often at the mercy of in-house rigs, which vary greatly venue-to-venue in both equipment and condition. Lately, as our shows are getting larger and production is better, these can be considered a little overkill, but they do continue to provide that signal uniformity and thereby make the FOH and monitor positions a little easier to control."



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MIXBOOKS

World Radio History



By Blair Jackson

'Quantum of Solace'

SOUND TEAM TREATS JAMES BOND IN NEW WAYS

The new James Bond film, *Quantum of Solace*, picks up just a couple of minutes after the last one—the wildly successful *Casino Royale*—left off. “This one opens with quite a bang, which is an Aston Martin being chased by two Alfa Romeos through the Italian hills,” says effects re-recording mixer Mark

Taylor, who, along with virtually the entire British sound team, worked on both films. “And it literally does kick in about 30 seconds into the movie—we’re immediately thrown into full-on action, which was tough in terms of finding a benchmark for [sound] levels and where we were going to go from

there. So we just kind of hit a blow to the head and hope they like it,” he adds with a chuckle.

Bond audiences *want* to be grabbed by the throat and taken for a ride, and the opening pre-credits sequences are justifiably legendary, arguably the most anticipated part of every 007

film. So what better way to get the audience's blood flowing than a hair-raising chase, with Bond spectacularly ruling the road in an Aston Martin DBS, the supercharged descendant of Bond's *Goldfinger* car from 35 years earlier?

Fortunately, Taylor had lots of great raw sound material at his disposal, thanks to the work, months earlier, of supervising sound editor Eddy Joseph and his team of effects recordist/editors: sound designers Martin Cantwell and James Boyle, field recordists Dave Mackie and Russell Edwards, and production sound mixer Chris Munro. Much of the engine material was captured up in England's Midlands at Aston Martin's headquarters, putting the cars on a "rolling road" (actually, a chassis dynamometer, which allows the car to remain in a fixed position while the engine revs and the tires spin as if they were on an actual highway) and then recording from multiple angles.

In that particular case, Cantwell had a Sound Devices 744T hooked up to a Schoeps M/S mic setup in the interior and two Soundlux cardioid condensers, one above the engine and one two meters from the exhaust; Mackie also ran a 744T, with two piezo mics under the engine and under the differential, and two Sanken CSM 7s, one at the front and one at the rear; Boyle had a Nagra ARES-BB with Sanken CMS 7 and a Sony PCM D-50 with built-in X/Y four meters from the rear of the car, on the ground; while Edwards had a 744T, two DPA 6042s inside the car and an SM58 at the back near the exhaust. There was also an unmanned Fostex FR2 with a Neumann RSM 191 pointing at the middle of the right side of the car, about four meters up. Also at the Aston Martin facility, the team went out on a "brake strip"—an eight-lane, two-mile straightaway—to record speed passes, swerving passes, accelerations, gear change passes, and starts and stops, with rigs both in the car and outside along the roadway.

Once the needed FX had been recorded, "James Boyle laid up the sound effects for that section," Taylor says, "and then we kind of remastered the engines down at Real World—where we premixed—through vintage valve gear. We used Tube-Tech and Crane Song compressors and some Pultec EQs, just to give it some *grunge*, but so it still had a presence and it maintained that presence through the sequence. We did the same thing with some of the explosions in the hotel collapse sequence in reel six, just to get the energy. Then we re-recorded them back through a 2-inch [tape machine], as well, just for the extra analog feel."

Well, reading that sort of description might

make one think this is a typical James Bond film—and in a way it is: There are several big action pieces, including brutally realistic fist-fights, a big boat chase, a dogfight between a DC-3 dual-prop plane and a little Marchetti stunt plane, a couple of shoot-outs (of course) and the aforementioned hotel collapse.

But this is also a James Bond film with a somewhat different vibe, as Eddy Joseph learned when he, Boyle and Cantwell first met with director Marc Forster to look at an early cut. It was clear that the German/Swiss director, who had never made an action film before (but was Oscar-nominated for the genteel *Finding Neverland*), wanted to take a somewhat different approach from his *Casino* predecessor, Martin Campbell.

"When I first met Marc," Joseph says, "he said, 'What I want is I don't want to do this as a Bond film. I want to do this as an independent movie.' And I said, 'Forgive me, but I can't do it like that. I have to do it *first* as a Bond film and then we'll try to do what you want—if you can help us a little more with what you really mean by "independent movie." And then he said, 'In a car chase I get bored,' and then he explained that what he meant was that it doesn't have to be all noise, that there are other ways of portraying these action sequences. So we went away from that a little confused, but it made us think, and that's probably what the whole meeting was about from his perspective. I believe the expression these days is he wanted us to look at the film from 'outside the box.' And we did."

Dialog and music re-recording mixer Mike Prestwood Smith, who has worked with Taylor on seven films, including *Casino Royale*, comments of Forster's approach: "What's interesting is that to date, the Bond movies—and action movies in general—tend to be quite literal. You usually hear what you see, and you want to excite the audience and give them exciting sounds and music to give it the pace and feel. What Marc wanted was to get away from that literalness and take it into a slightly more subjective point of view. I think the feeling of the Bond movie this year is very much based on Bond himself, feeling what he's feeling to an extent. And I think Marc wanted to have the score, particularly, do a lot of that work and tell us what Bond was going

through. It works really well and it moves the film into a slightly different place."

For instance, there is a major action scene that takes place during a performance of the opera *Tosca* at the amphitheater in the Alpine town of Bregenz, Austria, "and the opera drives the sequence," Taylor says. Adds Joseph, "Every shot is a different perspective of the opera—which is really well-done—and to show what the place is like, where people are and so on; there's a different perspective and slightly different angles all the way through it, and all the music has been mixed that way and all the sound effects with it so everything has its own space. It's a really interesting mix and a good achievement. Then we go into almost like a dream sequence, which is a shoot-out, and it's quite unusual the way it's mixed. At one point during this stand-off, it goes



Preparing the Aston Martin DBS for the "rolling road"

quiet—almost no sound—and then it goes into like a slow-motion sound sequence where the music is kind of drifting off. And it's very selective in what you're hearing: Which of the gun shots should we play? Should we reverb that or play the reverb off the rear speakers only? There were all sorts of different things we could have done. I think *that's* the sort of thing Marc was keen on doing. It's not the sort of thing you would have done in a previous Bond film. You'd have gone for the big sounds—the big gunshots, the big explosions."

By contrast, there is a particularly graphic fistfight scene early in the film that is, as Prestwood Smith says, "gritty, brutal and hard, and it's the *lack* of atmosphere and ambience and music that makes it feel different. We avoided all temptation to—forgive me for using the word—'Hollywood' it. We ended up pretty much using the sync track with some carefully placed Foley for a nearly mono section. It feels nasty and real, like you came into a room and it's two people having a fight. The lack of effects and music support is part of what makes it work as well as it does."

Still, the sound team had ample opportunities to play FX in big ways at different points in the film. The airplane dogfight, for instance, involved bringing five recordists to Dunsfold Airfield south of London and “miking inside, outside, from a distance, in the air, on the ground, absolutely everywhere,” Joseph says, “over-covering because if you’re going to have a couple airplanes [to capture], you’re going to have the pilots and health and safety and nurses and catering and marshalls and all the rest of it, so you might as well have three or four sound recordists because it really doesn’t add very much to the budget! So we over-cranked, but we made sure we got the best possible sound so we could then play around with it. We had the luxury of a little bit of time because we got going early. But we also knew that the score was going to be big there—it had this pulsating score and a lot of it was in the same register as the airplane sounds, and we couldn’t re-pitch the airplane so we had to find [sounds] that worked with the score.

“There’s also a boat chase and we went onto a lake and recorded that the same way—with a team. We recorded *everything*. We even went to Germany to record a unique electric car at a research institute. It’s a hydrogen-fuel-cell car and it’s very weird—it sounds almost like a dentist drill. But it makes the scene work because it’s different and also a real thing.”

David Arnold, who has scored the past five Bond films (beginning with *Tomorrow Never Dies* in 1997), worked closely with the post team, providing music for the temp mix from past scores that was similar in feeling to what he would be writing for *Quantum*, or actual demos from his score-in-progress. “He came onboard very early because Marc was keen to get something slightly different out of David this time or push him a step further,” Prestwood Smith says. “Marc and Matt [Chesse, co-film editor with Rick Pearson] kept directing him to get what they wanted from a very early stage. So that mood was established early on and we almost inherited it in a way, and it helped define how we shaped the sound.”

Mark Taylor describes the score as “more eclectic” than *Casino*’s, “with a more ethnic feel in places,” reflecting some of the exotic locales such as Haiti and Bolivia (actually shot in Panama and Chile, respectively). Still, there is a big traditional score recorded at AIR Studios in London.

When it came time for Arnold to complete his score, “David stuck to the feeling of the temp quite tightly,” comments Prestwood Smith. “And Jeff Foster, the music mixer, actually had our temp tracks on his mix stage when he was

mixing the music. We decided last time out [on *Casino*] that it was really useful because he could hear what he was up against. It meant we were sort of singing from the same sheet fairly early on, which made life a lot easier and is one reason [the final mix] went so smoothly. It helped, too, that it was the same bunch of people again, so in a sense we already knew what kinds of things worked and what didn’t.”

As noted earlier, the extensive pre-dubbing took place at Real World studios in Bath, Somerset, about 100 miles west of London, over the course of about a month. Taylor says that editor Chesse “liked the idea of being away from London so we could concentrate. It worked really well being residential. It meant you just focused on what you’ve got to do, and if you want to run on a bit into the evenings or whatever, you can without any financial penalties.”

Prestwood Smith, who has a place in the countryside not far from Real World, says he did pre-dubs for *Casino* at his house “and [the most recent] *Harry Potter*, and all sorts of other things, but it was getting a bit unwieldy at home having editors around the kitchen table with the Pro Tools. A mutual friend put Peter [Gabriel, owner of Real World] and me in touch with each other, and I went over and decided to put my little room there. They built me a little pre-mix room there with a [Digidesign] ICON. Then we developed the big room together into a mix stage, which has been very successful for us.” That big room already contained an SSL desk (Gabriel is part-owner of the company), but it was augmented with a 24-fader Neve DFC and a couple of ICONs. “I like the DFC’s summing matched with the versatility of the ICON,” he comments. “It’s a great combination. It means you can get right into the tracks on one board and then sum everything really tightly and use all the great-sounding processing on the DFC.” That particular DFC is a smaller version of what he and Taylor did their temp and final mixes on at DeLane Lea’s Studio 1 in London, “but in terms of processing, it’s not far from what we can do there.” These days, Prestwood Smith makes liberal use both of plug-ins—including Waves and the TC Electronic VSS3 reverb—and outboard models like the dependable Lexicon 960L.

The sound team did a temp dub for the



Supervising sound editor Eddy Joseph in the Aston Martin DBS

film over the course of five days at DeLane Lea, and Forster seemed quite pleased with what he heard, to the point that he requested very few changes between the temp and the final. And, Taylor says, “He constantly referred back to that: ‘That’s not the way we had it in the temp.’ ‘Okay, we’ll tweak these up or down or whatever.’ He’d made up his mind about what he wanted and that was pretty much it, which was great for us. He had his reference point, which was the temp, and any question marks we had when he wasn’t there we’d refer back to that.”

When it came to the final, Taylor adds, “Marc was very much hands-off during the mix. He would much prefer for us to put a reel together, have him come and see it, and then give us his notes. I think I’m right in saying every action sequence we played him, he didn’t change anything—he was happy with what we’d done, which is unusual, but quite pleasing. [Laughs] I think he realized we’d done it before and that’s what we do, so he let us go.

“We’d done our experimenting and tried out a lot of things [in the temp] and he was seemingly happy with them, so we knew we were on the right track,” says Joseph. “Hopefully [in the final] we’ve improved it that final 20 percent, as you’d expect. The main difference, of course, is we had the final music for the final, and we’d also seen all the [visual] effects, though that didn’t really change much. We had pre-mixed this film really carefully, so the final ended up being fairly easy as these things go. We had longer hours on *Casino Royale*. I really can’t complain about this one.”

Taylor agrees: “It was mostly a lot of fun and *not that stressful*.” For everyone except for James Bond! III

Blair Jackson is the senior editor of Mix.

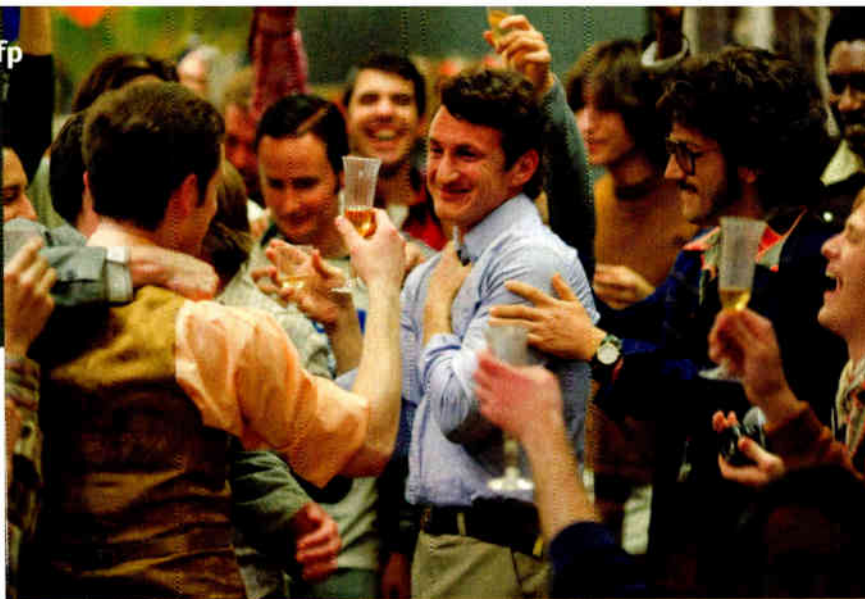


PHOTO: PHIL BRAY

Gus Van Sant's 'Milk'

FILMMAKER THRIVES ON THE UNCONVENTIONAL

By Blair Jackson

Gus Van Sant has long been one of America's most daring and creative directors, deft at depicting the complexities of the human psyche. A critical darling since his moody 1989 breakthrough film, *Drugstore Cowboy*, Van Sant has occasionally flirted with the mainstream, too, though always on his own terms: *Goodwill Hunting* (1997) was a huge hit that earned nine Oscar nominations; *Finding Forrester* (2000) was also successful. His films since then have been less commercial, including *Gerry*, *Elephant* (inspired by the Columbine killings), *Last Days* and *Paranoid Park*—little films that pack a big emotional punch. Van Sant's latest is a return to "bigger" films, but is no less brave: *Milk* tells the saga of Harvey Milk, an openly gay member of San Francisco's Board of Supervisors who was assassinated along with mayor George Moscone by a political rival in 1978. Sean Penn stars in the title role of this film, which was partly shot on location around San Francisco, including City Hall where the murders took place.

Dating back to *Even Cowgirls Get the Blues* in 1993, Van Sant's primary collaborator on sound has been Leslie Shatz (whose career goes back to *Apocalypse Now*), and the two have gone down some interesting sonic roads. Shatz says, "Gus wants to do things in the most unconventional way possible. He loves to experiment and he is full of ideas—about sound and everything else."

Shatz acknowledges that the overall approach to *Milk* was more conventional than on some of Van Sant's other films, but it was not without risks, even when it came to the all-important production dialog tracks. Spearheading that end, as

he has for Van Sant's movies since *Gerry* in 2002, was New York-based Felix Andrew, who has made a fine career working on indie features and documentaries—mostly as a production mixer, but also editing, working the camera, even directing.

"The great thing about Gus' films is they are all incredibly collaborative," Andrew says. "On the sound side, Leslie Shatz is always very involved and totally responsible for the post-production elements [he is both sound supervisor and a re-recording mixer working out of Wildfire Post in L.A.]. But Gus and [cinematographer] Harris Savides also contribute to what we do, and I also have a very close collaborator on the production side, Neil Riha. Often, we'll both be running separate rigs, and he and I both boom scenes, as well; sometimes we run two booms. We also had a third on this film—Mike Primmer—who did some booming and various tasks. It was very fluid, always changing depending on where we were shooting."

Though Andrew says that *Milk* was more of a "studio film" than Van Sant's lower-budget efforts, he still likes to bring techniques he learned in the documentary world to every shoot. "Documentaries teach you to work with what you have and to work with less, and Gus' filming environments are conducive to that aesthetic,"

Sean Penn (center) stars in Van Sant's portrayal of the late Harvey Milk.

Andrew relates. "We always try to be open to what might happen and we try not to have a lot of gear and people around. I like to be very mobile,

so a lot of the time I don't even work with a sound cart. We recorded *Milk* on two Sound Devices 744s, literally over the shoulder for most of it." For mixers, Andrew and Riha carried Sound Devices 442s. The RF mics were Lectrosonics Digital Hybrids.

One unusual production sound choice was to have the primary boom be stereo—Andrew suggested a Shoeps M/S mic. "The M/S technique has more of an ambient feeling than a left/right feeling," Shatz says, "and it worked well for *Elephant* because they were shooting in high schools and I thought it would preserve the acoustic feeling of the hallways. Gus really liked it because it produces this spacey, almost psychedelic feeling." In *Milk*, he notes, the M/S approach added dimensionality to the crowd scenes.

"It's a hassle for Felix," Shatz continues. "He has to boom and lav everything, and it's a hassle for me [on the mix stage] because we're using the lavalier in the center and the M/S on the sides, but you have to carefully calibrate how much M/S-to-mono you use, and what the spread of the M/S is.

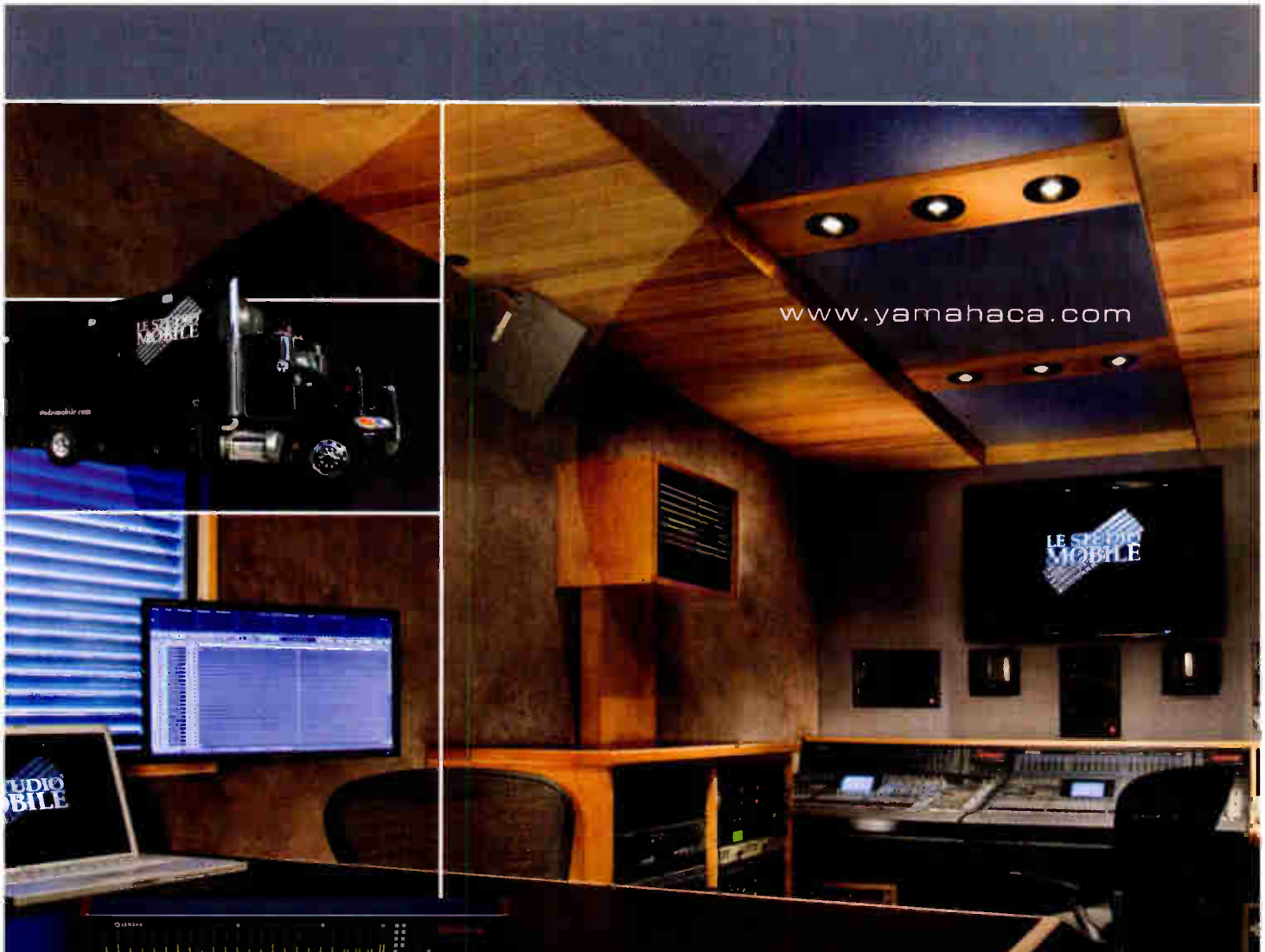
"Also, with M/S mics there's a lot of low end and noise we have to get rid of, and for ADR it's insanely difficult to match. If you're putting an ADR line in an M/S scene, you have to have M/S ADR, too—you can't suddenly have it collapse in mono. But ADR stages have no acoustic color, so we were faking it in using a [Digidesign] TL Space reverb. Next time we'll ADR in a more acoustic location."

"A lot of directors want a straight, clean mix and that's fine," Andrew adds. "But Gus is always looking for other kinds of experimental tracks that have a different sort of feel. That's why his movies sound different than other people's." III



PHOTO: PHIL BRAY

Production sound mixer Felix Andrew on the set of *Milk*




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The Elliptical Advantage

Bock Audio 5-ZERO-7 Tube Microphone

Designers David Bock and George Cardas have patented a new elliptical mic capsule design, and the new Bock Audio 5-ZERO-7 mic (\$6,995) is the first to bring it to market. Distributed in the U.S. by TransAudio Group (www.transaudiogroup.com), the mic has a large body with fully discrete tube electronics, audio transformers and a custom power supply modeled after those found in 1947-era microphones. The elliptical-capsule design strives to resolve chronic in-band resonance issues of both large- and small-diaphragm microphones. Round capsules have a relatively low frequency in band resonance—typically around 1 kHz—while small-diaphragm mics usually have much higher in-band resonances, typically about 15 kHz or higher. The el-

lptical capsule offers the best of both, avoiding the constant "edge-to-center" distance of round capsules, dramatically reducing in-band resonances and expanding the application possibilities.

The mic also features a hand-built, 6-micron, gold-sputtered diaphragm used in the Bock 251 and edge-termination design, and a three-layer head grille to prevent moisture and dirt from reaching the capsule. The power supply has an inductor-based design and promises a combination of long-term power, low noise floor and high-end sonic performance. The fixed-cardioid pattern targets this



mic for vocal applications where proximity effect can be used to add a variety of color at various

distances. The capsule can also be custom-tuned for orchestral or other uses.

Compact Digital Dynamo

Lawo Crystal Console



Lawo (www.lawo.de), the German console company, has released a new generation of digital audio consoles designed for radio on-air and edit suite applications. The unit comes as

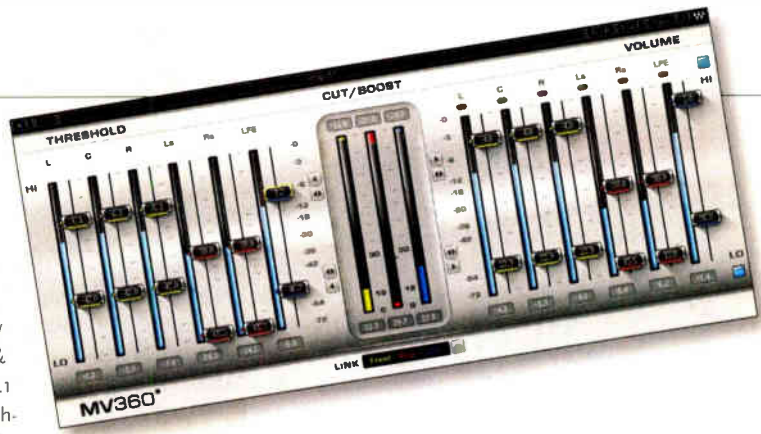
two pieces: The first is an easy-to-use desktop surface promising a short learning curve for frequently alternating users; the second piece, connected via CAN bus (Cat-5 cable), is a 19-inch chassis housing I/Os,

signal processing and the control system. Crystal (price TBA) is delivered with a choice of ready-to-use configurations for standard application, but adds the possibility of unique configurations adapted to user workflows. Available with four to 16 faders, Crystal also features an integrated matrix of up to 288 I/Os and intelligent networking with other consoles and matrices.

Dynamically Yours

Waves MV Bundles

Waves (www.waves.com) unveils the MV2 and MV360°, two new dynamics processors for stereo and surround applications. The MV2's dual-fader interface lets users dial up optimal volume levels and is now included in Waves Mercury, Diamond, Platinum, Gold, and Broadcast & Production bundles. A dual-function dynamics processor for 5.0 and 5.1 surround applications, MV360° features six channels of low-level and high-level compression, with five versatile Link modes, making it a simple, flexible way to control volume levels in surround production environments. The MV360° is being added to the 360° Surround Tools and Mercury bundles. Both plug-ins are available at no charge to existing users covered by the Waves Update Plan.



Vintage Revival

Pearlman Church Microphone

A faithful remake of the Stanley Church/MGM microphone from the 1950s, the Church Microphone from Pearlman (www.pearlmanmicrophones.com) was built using the original schematics, and features a refurbished vintage Neumann K47 or M7 capsule, hand-selected 6072 dual triode (12AY7) vacuum tube and the original Triad transformer—made specifically for Pearlman, after 50 years of not being available. This two-pattern (cardioid/omni) condenser mic is built in the same housing as the company's popular TM-1. The mic is offered as a \$4,500 limited edition and ships with power supply, shockmount, hand-built Mogami cable and aluminum carrying case.

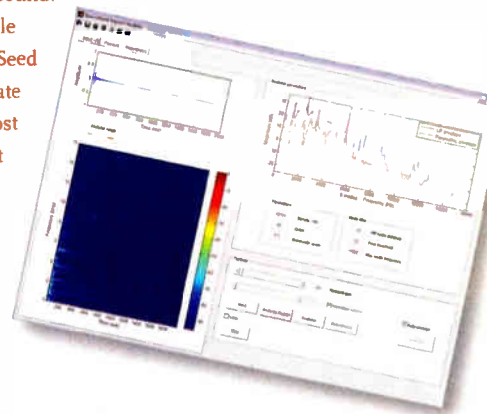


Sowing Interactive Sound

Audiokinetic SoundSeed

SoundSeed (price TBA) from Audiokinetic (www.audiokinetic.com) is a family of interactive sound generators for game audio. SoundSeed lets sound designers create an unlimited quantity of variations from a single "footprint" sound, enabling them to create varied—hence, highly immersive—audio environments while keeping run-time memory usage and recording and production costs at a minimum. SoundSeed will gather a series of modules, all aiming at generating sound variations, with each using a specific technology adapted to a specific type of sound.

The first available module, SoundSeed Impact, can create variations of most resonant impact sounds, such as sword clings, footsteps, bells and more.



New Portastudio Gets Flagship Status

Tascam 2488neo

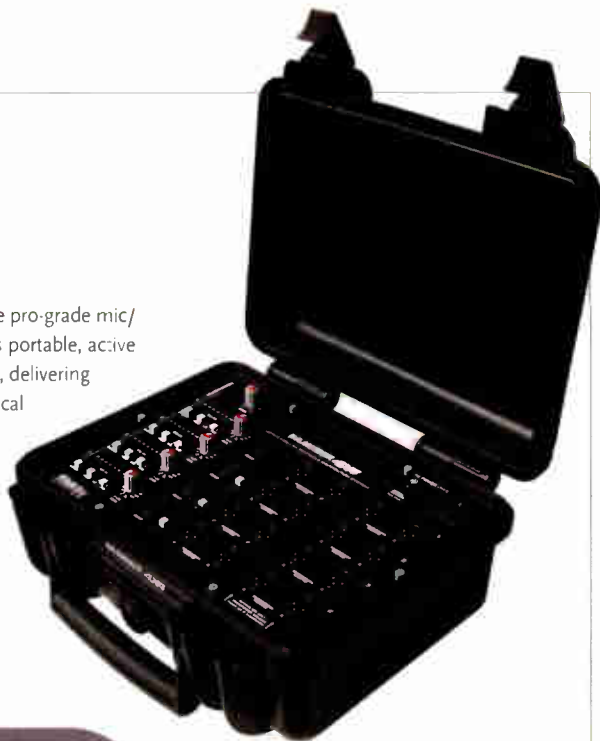
Tascam's (www.tascam.com) 24-track/24-bit workstation has been upgraded to the 2488neo (\$1,199). The neo sports a bold new look, new mastering effects and an 80GB hard drive, enough for hours of 44.1kHz/24-bit recording. Like its predecessor, the 2488neo has eight phantom-powered mic inputs, seven effects processors and the same user interface common to all Tascam Portastudios. Other effects include a reverb, multi-effect with guitar amp simulation and up to nine compressors. Mixes can be burned to CD or transferred to computer via the USB 2 jack.



Let's Split!

Drawmer Kickbox 4x4

The Kickbox 4x4 (\$1,495) from Drawmer (www.drawmer.com) is designed to provide pro-grade mic/line inputs with multiple outs for live sound, location recording and broadcast. This portable, active splitter is housed in a rugged carry case and accepts up to four XLR mic/line inputs, delivering them to up to 16 line-level XLR outputs. The Kickbox 4x4 configures to four practical routing schemes: one input to 16 outs; two ins each to eight outs; four ins each to four outs; and one input to 12 outs, while handling another single input to four outs. The 4x4 comes standard in a road-proof case with a removable lid for unhindered access to all controls and connections. An onboard, selectable-source headphone amp allows quick setup and monitoring.



Get in Control

Sound Devices CL-8

A new addition to the 788T digital recorder, the CL-8 (\$995) controller from Sound Devices (www.sounddevices.com) adds capabilities without significantly increasing weight, making the 788T adaptable to a variety of field productions. It features eight large rotary faders to control the 788T's eight inputs, plus command over input settings such as highpass filter, limiter, polarity and mute. To ensure accurate, clear track marking, the CL-8 can manage the 788T's built-in slate mic. For rapid setups in the field, the CL-8 lets users quickly assign inputs to the main left and right record tracks. With a push of the input knob, users can also solo an input in headphones for concentrating on a specific track within a recording.



Adding to the Lineup

Lauten Audio Oceanus, Clarion and Torch Mics



Lauten Audio (www.lautenaudio.com) expands its mic offerings. The Oceanus LT-381 (\$1,599) has a large dual-diaphragm capsule, NOS military-grade pentode input, transformerless triode output, and omni, cardioid and figure-8 (and six intermediate) polar patterns. The \$1,499 Torch ST-221 is a pair of small-diaphragm tube mics featuring interchangeable cardioid and omni capsules, NOS mil-

spec tubes and premium high-resolution electronics. The \$799 Clarion FC-357 is a solid-state, multipattern, large-diaphragm condenser mic offering Class-A electronics and a dual-diaphragm capsule capable of omni, cardioid and figure-8 patterns.

Simple Problem Solver

Little Labs Redcloud 8810U8ERS

The Redcloud 8810U8ERS (\$400) from Little Labs (www.littlelabs.com) is a compact, 8-channel balanced attenuator pack with I/O on a DB-25 connector. The unit can be configured as eight balanced mono attenuators or up to four balanced stereo attenuators, or even externally wired as eight stereo unbalanced attenuators. The special attenuators used are a 5k-ohm im-

pedance, allowing devices to drive the attenuator easily but also drive relatively long cables without high-frequency loss. The Redcloud 8810U8ERS can be rackmounted, making it possible to have up to 32 channels of attenuation in a 1U rackspace. III



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Euphonix Artist Series MC Mix and MC Control

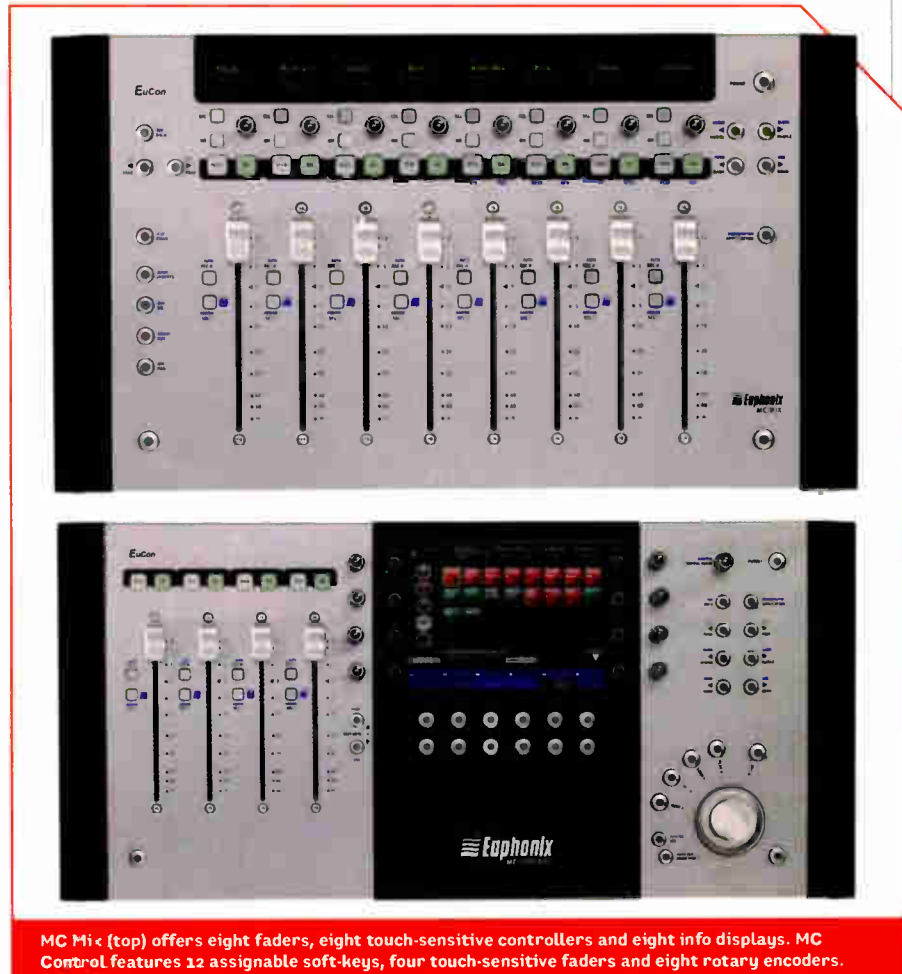
Sleek, Customizable Desktop Operation for Mac DAWs

Long known as a manufacturer of high-end products, Euphonix has recently ventured down-market, targeting Mac-based DAW users with two affordable products under a new brand. Euphonix' Artist Series comprises the MC Mix, an 8-channel system with touch-sensitive faders, rotary encoders and high-contrast OLED displays; and the companion (or stand-alone) MC Control, which offers four faders, dedicated transport controls, 12 programmable buttons and a 6x3.5-inch, touch-sensitive color LCD.

These new units use technologies from the company's MC Pro, including extensive customization of controls, the ability to switch control instantly between multiple applications and even the capacity to transfer control to a second computer workstation. Both products work under Euphonix' EuCon control protocol, which is integrated into DAWs from Apple, Steinberg and MOTU.

Setup and EuControl

While unpacking these units, I noticed handy fold-down feet on the bottom of the controllers. These raise the angle of the worksurface but don't lock in place, so sliding the MCs forward or back made the feet fold up, which became tiresome. Fortunately, included risers attach to the bottom, so a full-sized Apple keyboard can sit comfortably in front—problem solved. Removable side panels let you physically connect multiple MCs together for an integrated console look. The MCs communicate via an Ethernet



MC Mix (top) offers eight faders, eight touch-sensitive controllers and eight info displays. MC Control features 12 assignable soft-keys, four touch-sensitive faders and eight rotary encoders.

connection, after wiring them to my network switch and plugging in the AC adapters, I was ready to rock.

The brains behind the Artist Series is the EuControl application, which appears as an "E" icon in the menu bar. A green "E" confirmed that my Mac recognized the MC units. EuControl is "application-aware," allowing it to instantly switch control between multiple programs. As I use Logic Pro as my main music tool and Soundtrack Pro as my audio editor, I had the perfect scenario for testing this system. Logic Pro has built-in EuCon support—there's no need to configure anything. Both MCs imme-

diately reflected Logic's mixer as soon as my project opened. Soundtrack Pro doesn't support EuCon, so I set the Euphonix MC control panel to tell the MCs to use Mackie Control Universal Emulation mode whenever Soundtrack Pro was active. Once configured, switching between the two apps automatically remapped all of the controls instantly. The MCs even have a button for switching programs from the surface.

Delving Into the MC Control

The MC Control has some important features that don't appear on the MC Mix, such as dedicated transport controls including a jog/shuttle wheel. The small button size and the way the keys are oriented around the jog wheel didn't

PRODUCT SUMMARY

COMPANY: EUPHONIX

WEB: www.euphonix.com

PRODUCT: Artist Series MC Mix and MC Control

PRICE: MC Mix, \$1,399.99; MC Control, \$1,999.99

SYSTEM REQUIREMENTS: Mac G4 with a 1.25GHz or faster PowerPC G4 processor (PowerPC G5, Intel Core Duo or Intel Xeon processor highly recommended); Mac OS 10.4 or later; 10/100 Base-T Ethernet port; 1GB system RAM

PROS: Buttons can be completely user-customized. Easy setup and switching between applications.

CONS: Small button size and key orientation around the jog wheel make operation difficult. Buttons and soft-keys may be sluggish or inconsistent.

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However, the MC Control really shines with its touchscreen and 12 programmable buttons, each of whose current function is indicated in the bottom of the screen. With its pre-mapped settings for popular apps, I instantly realized this system's power. For example, in Logic Pro, the first button is used for tool selection; in Soundtrack Pro, it toggles the Cycle mode; and for Safari, the same button opens a new Web browser. And pressing the soft-key setting on the touchscreen reveals 24 more virtual buttons, providing instant access to 36 software functions at one time. For me, the best part of the MC Control was the ability to customize every button for the functions that I wanted using EuControl's Soft-Key editor, which even let me color-code the displays on the touchscreen.

The MC Control has four faders, but unlike the MC Mix it has no dedicated display above them. Information (such as channel track names) is displayed to the right of the faders at the top of the touchscreen. I prefer having channel information visually connected to the fader, but was able to adapt quickly. Four rotary encoders flanking each side of the touchscreen provide control over many parameters. For instance, after selecting a track in Logic, I used these to configure the channel strip settings, such as I/O, aux sends, inserts and panning. Each encoder's function is displayed in the adjacent area in the touchscreen.

The encoders also have a push-button. The upper-right encoder that says "pan" didn't control panning, which seemed strange. You must first press the Pan encoder like a button and then turn the only pan parameter, which is now on the encoder on the upper-left side. This happens because MC Control uses a layer system for the encoders, and the first layer is simply used to select the category of controls you want to look at. As there's only one pan parameter for most tracks, it seems silly to have to navigate to a second layer just to move the shaker track to the left speaker. For all other channel strip parameters, the layered approach works well.

Pressing the Inserts encoder displays the names of the plug-ins in the first eight insert slots next to each encoder. Editing a plug-in was easy: I pressed its encoder and the first eight parameters of that plug were mapped to the eight encoders for adjusting parameter values.

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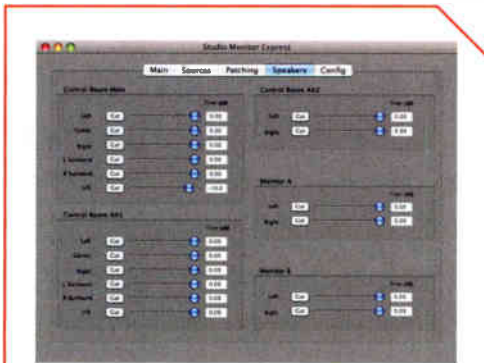
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If more than eight parameters are offered, the Page buttons can move to the next set of parameters. One flaw with this system is that some plug-ins have so many parameters that your favorites may be spread across multiple pages. The MC doesn't provide a way to map the most

data. It was during the automation tests that I came across my biggest disappointment with these surfaces. Quick taps of buttons didn't always register, which was particularly annoying when I was trying to perform mute automation. Although this is less critical, I also noticed a sluggish response with soft-keys. I was able to work around this by being a bit more deliberate when pressing buttons. Fortunately, the fader control and touch response on the encoders felt great.

You can mute and solo tracks from either surface, but the MC Control offers an innovative way to perform these basic functions. Click the Track soft-key on the touchscreen and it displays a 32-block grid of the channels in the project. By tapping the blocks you can solo, mute, record-enable or select tracks. Unfortunately, you can't slide a finger across a range of tracks to solo or mute on either unit, but this display seems to offer the fastest way of finding tracks in large projects.



Studio Monitor Express lets users control many operations from the Artist Series controllers, including 5.1 and stereo monitors.

important parameters to a single page. In Logic, this is possible using a \$200 MIDI fader box that outputs generic Continuous Control numbers. It would be nice if the MCs provided a MIDI CC mode to get around this problem.

Next up: MC Mix

The MC Mix lacks MC Control's flashy screen and programmable buttons, but I like its dedicated rotary encoders and displays above each channel. Selecting and editing channel strip parameters is similar to that of the MC Control, but MC Mix gives you an additional set of Select and On buttons next to each encoder. One notable advantage of the MC Mix over the MC Control is that the former can flip parameters from the encoders onto the faders—a real plus when doing automation moves or building headphone mixes. I also like EuControl's option to bank the faders of the MC Mix and MC Control independently so you can view two parts of your mix at the same time.

Automation and Mute/Solo

I automate more than just fader moves and I enjoy working with touch-sensitive encoders. Most control surfaces lack touch-sensitive knobs, making work in touch-automation mode less than intuitive as the DAW can't recognize an intent to update a parameter until the knob moves. With the MC units, as soon as I place my finger on the encoder, Logic started to write

Studio Monitor Express

A feature not to be overlooked is an application called Studio Monitor Express (SME). SME let me use the MC Control and my MOTU 896HD for conventional control room monitoring functions by intercepting the audio signal between the application's output and the audio interface. Once configured, the MC Control's dedicated Control Room speaker-level knob and the touchscreen offered options like sum-to-mono and even talkback capability without having to modify anything in my Logic project. I really like this approach, which is a feature that is absent on most other controller systems.

End of the Test Drive

If you're a Mac-based DAW owner, MC Control and MC Mix will change how you work. Their controls have deep feature sets and let you quickly switch between applications, as well as completely customize the units' look and operation for your own needs. Despite minor complaints I have about the ergonomics and the inability to map favored plug-in parameters on the surface, the positives are overwhelming, making MC Control and MC Mix a solid, small-footprint control choice for command and control of your audio applications. III

Robert Brock is an audio consultant, musician and engineer.



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BIAS Peak Pro XT 6.0.3

Stereo Editor for Mac Adds CD Authoring Enhancements and Bundled Apps

The market for multitrack DAW software is crowded. But if you're looking for a high-end stereo audio editor on the Mac, BIAS Peak Pro is the only game in town. The Version 6 release is not a breakthrough, but it provides some welcome enhancements: multisegment volume envelopes for the regions in a playlist; a broad variety of dithering, including precise clones of the most popular algorithms available; support for FLAC and MPEG-2 files; user interface enhancements, including improved crossfade modes; richer support for CD subcode data; and much more.

Peak Pro XT ships with plenty of extras, such as Peak Pro 6, SoundSoap Pro, SoundSoap, Master Perfection Suite and DDP Export. Features include a Metering window with seven displays called Reveal, a widget from Cycling '74 that can capture the output of other audio apps as new Peak files; a starter sound library with some loops and special effects; and more. For full details on the differences between Peak LE, Peak Pro and Peak Pro XT, check the BIAS Website.

Peak Experience

During the past few years, I've accumulated a variety of original music on my hard drive, so my first big project in Peak was importing the finished stereo mixes and creating a CD master. First, I copied the files from my PC to my new MacBook Pro (which was able to access the Shared folder on the Windows computer without trouble). I then opened all of the files and added Region markers at the beginning and end of each. Alternately, users can simply drag the files directly to the playlist and region markers are automatically created.

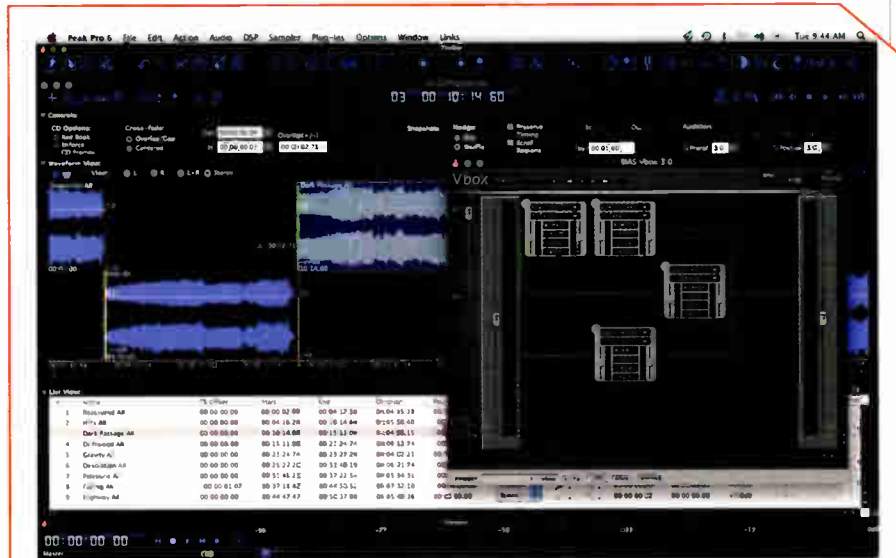


Figure 1: Peak's Playlist editing window (background) and Vbox effects matrix (foreground, right)

Importing the Regions into the Playlist was a snap, but after that the process got interesting. The Playlist (Fig. 1) is displayed graphically and as a database-style text list. I wanted to change the order of the tunes so I tried grabbing a waveform with the mouse and dragging it to the left as I would in a DAW. That didn't work. Next I tried editing the start-time field in the text list, but the Mac issued its "error" noise and rejected the new data input. [Editor's note: BIAS claims entering an illegal Red Book value would cause an error.] Eventually, I discovered I could change the order of the tunes by dragging one up or down in the list. Why the drag operation should be implemented in one interface but not the other is a mystery.

Adjusting the amount of time between CD tracks was a no-brainer. The intro of one track was too quiet compared to the end of the previous track, so I added a volume envelope to the intro and nailed the transition. Burning a test disc was easy, but when I listened to the CD on my stereo, it was clear that a couple of the tracks needed EQ. Rather than alter the original mixes, I decided to make the adjustments in the Playlist.

Peak allows effects, including EQ, to be added to single Regions in the Playlist using Vbox 3, a wonderful tool for complex series/parallel plug-in routing. When trying to set it up, I noticed the List View was off my screen to the right and required a scroll move to access. This would not be the case with a wider monitor.

Once I scrolled over, adding EQ to Regions with Peak's SuperFreq-10 10-band parametric was a point-and-click process. I could have added multiband compression just as easily with the highly flexible Sqweez-5 compressor included in Peak. It's advisable to choose silent spots for the boundaries between regions, as sudden changes in the effects plug-ins can cause pops. At the end of the day, Peak gave me a CD master that had well-matched frequency spectra for the tracks and just the right spacing between them.

The Playlist can also be used for constructing podcasts or assembling bits and pieces of multiple takes—for instance, a studio classical piano recording—into a composite. However, it can only overlap, at most, two stereo files at any given point. If you're working on a film soundtrack and need separate channels for dialog, Foley and underscore, all of them running at once, then you'll need to use a different audio

PRODUCT SUMMARY

COMPANY: BIAS
WEB: www.bias-inc.com
PRODUCT: Peak 6
PRICE: Peak LE, \$129; Peak Pro, \$599; Peak Pro XT, \$1,199

PROS: Powerful DSP, batch processing, CD burning, hosts Audio Units and VST plug-ins.
CONS: Sketchy manual, no plug-in parameter automation. Playlist overlaps only two files at a time.

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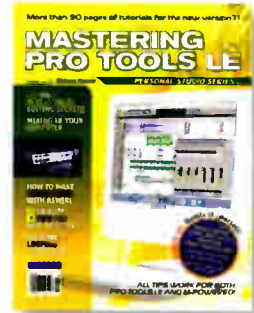
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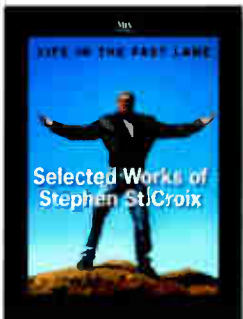
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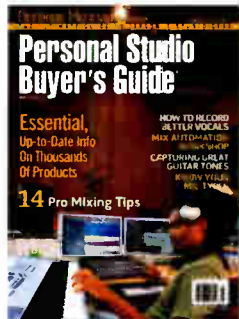
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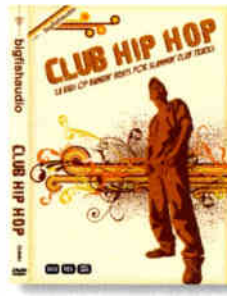
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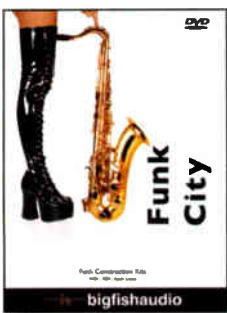
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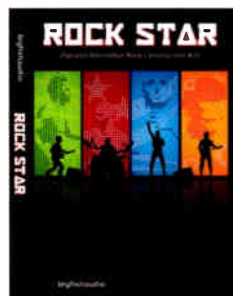
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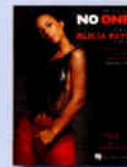


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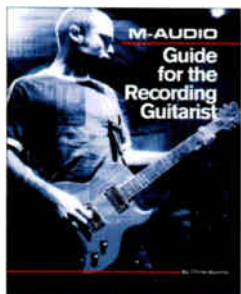
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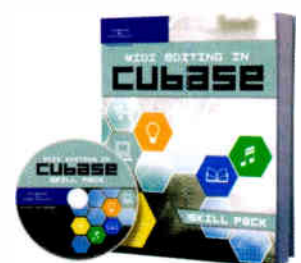
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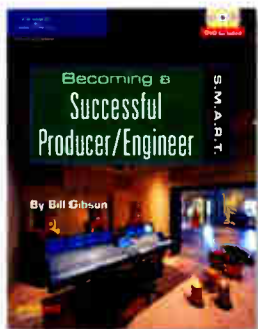
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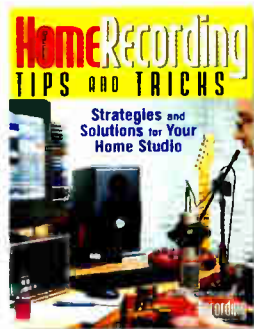
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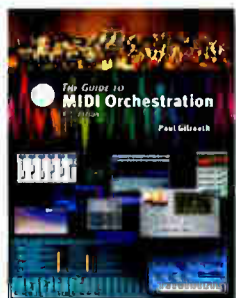
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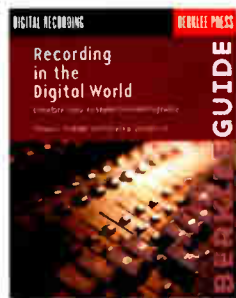
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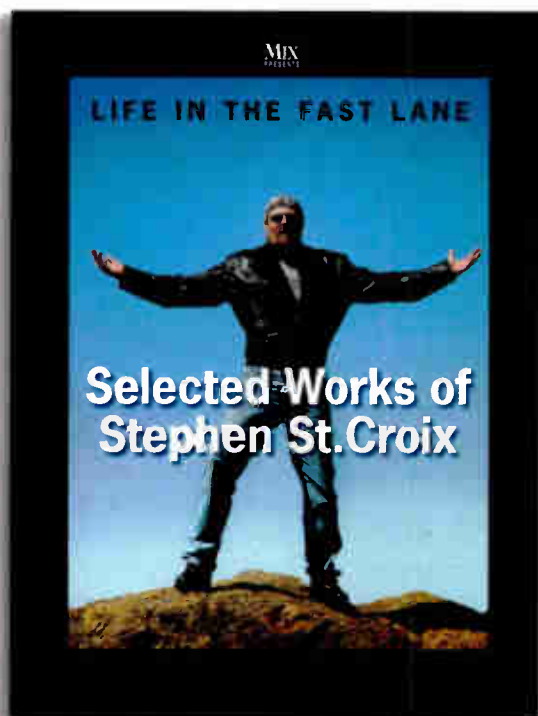
World Radio History

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Selected Works of Stephen St.Croix

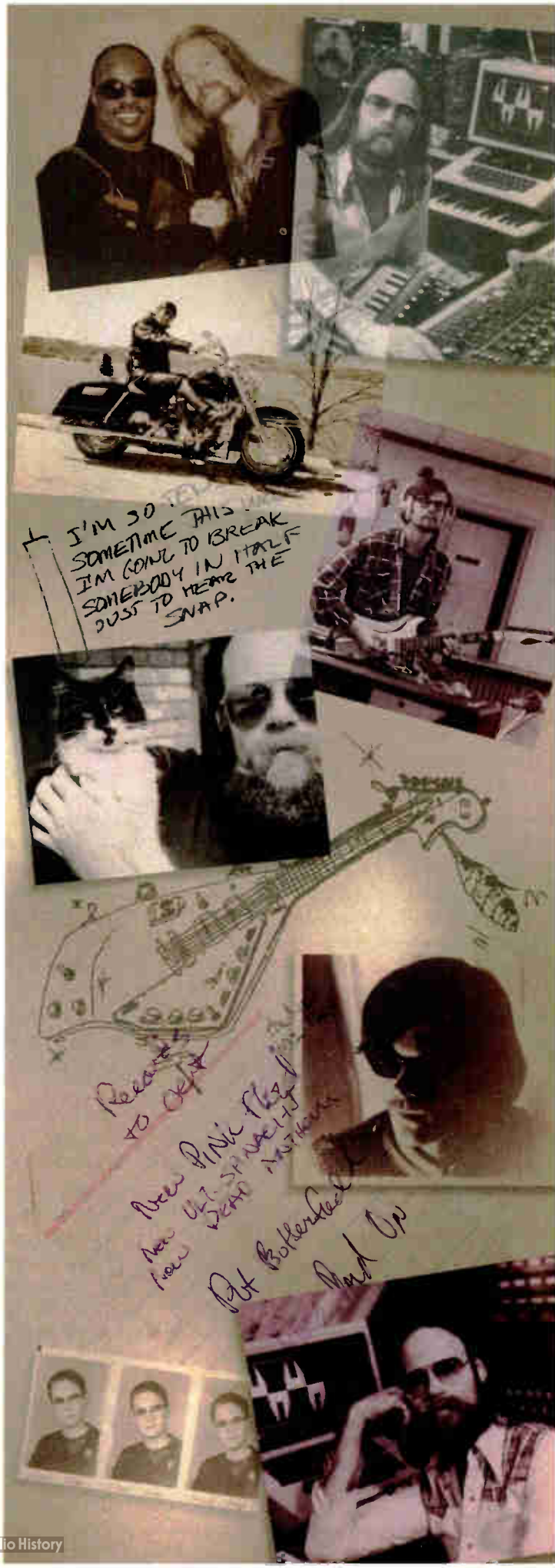
Stephen St.Croix inspired, provoked and educated *Mix* magazine's readers for 18 years in his one-of-a-kind column, "The Fast Lane." As an inventor, musician and engineer, St.Croix offered his audience a wealth of



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MIXBOOKS



application. Peak will play QuickTime movies in a window, but it's not surround-capable.

automate effect parameters, but a multisegment wet/dry envelope can be used with an effect.



Figure 2: SoundSoap Pro combines hum, rumble, click, crackle and broadband noise-reduction tools.

I was able to create a smooth loop for a rich harmonic texture very quickly using the Crossfade Loop command. A classic loop end/start edit window is also available. Sound library developers may appreciate Peak's support for both batch file processing and Apple Events. Peak's support for hardware samplers hasn't changed in years, primarily because the newer sampling instruments don't support anything like SMDI for sample dumps via USB. The program can still communicate with a variety of obsolete hardware samplers using SMDI (you'll need to use a USB adapter to attach a SCSI cable to a modern Macintosh), but to offload audio files to any of

you to A/B/C/D the sound.

The manual gives instructions on how to zero in on hum, but SoundSoap couldn't find any in my file. By listening very closely, I could hear the rumble filter cleaning up the empty space at the start and end of the track. The click remover found and eliminated a couple of low-level, high-frequency clicks, but a loud LP needle pop defeated it. This pop happened to be in a gap between two phrases in a very sparse drum intro, so I could eliminate it using conventional editing, but it was just too loud for SoundSoap to squash.

The broadband noise filter has a Learn button, which is supposed to set its bank of 12 threshold and reduction sliders for optimum noise elimination. I selected a "silent" section at the start of the track and clicked the Learn button, but the sliders didn't move, so evidently there wasn't enough noise to worry about. The noise gate is a conventional type and a "tool of last resort." The stock settings produced silent spaces between the phrases in the sparse drum intro, but I was able to adjust the release to get better results in the places where the reverb tails of the drums faded into the noise floor.

The improvements in the Weather Report mix were very modest, but this track was already in decent shape sonically, although the original engineering was pretty bad. Zawinul's electric piano was horribly distorted (possibly on purpose), and at one point someone audibly pulled back a fader because the synthesizer was much too loud. SoundSoap will produce more startling improvements when processing more problematic material, such as old cassette recordings and on-the-street interviews with wind noise. If I were transferring my LP collection to digital (not a bad idea, actually), I would definitely run everything through SoundSoap, and podcasters may find it a first-call plug-in for cleaning up source material.

Creative DSP

Most of Peak's file-altering DSP functions have been around for a while. Rappify (whatever that is) dates back to V. 1, as do the convolution and phase vocoder. If you intend to use Peak for creative sound design, plan on spending a few hours exploring these functions. My first attempts weren't instantly inspiring, but as I dug deeper, I started to discover some exotic tones. (Check out my audio example of a drum loop treated with some of these effects at mixonline.com.) The usual utilities (normalize, swap stereo channels, etc.) are provided and work as expected.

The ImpulseVerb convolution reverb comes with dozens of impulse-response files, and it sounds terrific. It lacks separate control of pre-delay and early reflections, which are found not only on filter-based reverbs, but on some convolution reverbs. On the plus side, it can use the contents of the clipboard as an impulse, which opens up more sound design possibilities.

EQ and compression are handled as insert effects—a flexible design that lets you create insert chains, audition them in real time and then render the result when you're satisfied. In addition to BIAS' own effects, which sound exceptionally good, Peak can host both Audio Units and VST plug-ins. Unlike a multitrack DAW, Peak can't

the modern multisampling synthesizers from Yamaha, Roland or Korg, you'll need either portable memory or an instrument that can see the computer's hard drive.

Among Peak's strengths is the choice of more than a dozen types of noise for dithering. These include DCAT (Dither Cloning Audio Technology), which offers access to a wide array of popular dithering options, as well as control of the frequency and attenuation skew, including POW-r dithering.

A Change in the Weather

To test SoundSoap (Fig. 2), I hauled out an old Weather Report LP. After a few nervous moments, my 25-year-old turntable got itself spinning and I transferred a track into my Mac.

SoundSoap operates as a plug-in within Peak. (SoundSoap Pro, which is included with Peak Pro XT, can also operate stand-alone.) It comprises four tools: a hum and rumble filter, a click and crackle remover, a broadband noise filter and a noise gate, each of which can be switched on or off as needed. Because SoundSoap operates as a real-time plug-in, A/B'ing the sound with and without each tool is a snap. In fact, "A/B'ing" is too simple a term: Peak provides four memory buffers for its plug-ins, allowing

Summit Up

Peak is a feature-rich stereo editor and seems very stable. While working on this review, I had only one nonrepeatable crash and noticed one trivial bug. I'm sure I'll put Peak to good use in other projects. Aside from a few minor UI tweaks, the main thing I feel is missing is support for multiple audio channels in the Playlist—and that's probably not a deal-breaker. If you're an audio professional and use a Mac, there's really no reason not to buy or upgrade. III

Jim Aikin writes about music technology, teaches cello, and composes and records in his home studio.

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World Radio History

KSdigital C5 Tiny Studio Monitor

Ultracompact, Coaxial, Powered Near-Field System

Sure, you may have the big guns in the soffit to impress the client who simply must monitor at ridiculous levels (as you step out of the room), but most of our mixing is done at much lower levels, with much smaller speakers. The ability to transfer your mix to just about any other speaker system is key, and that is executed through careful monitoring levels, with accurate speakers that tell you how the elements relate to each other, particularly at lower volumes. The KSdigital C5 Tiny is the type of speaker you can go to against your primary near-fields to get a reference to the relational balance on a smaller speaker—all without taking up much space and having enough power to have the headroom necessary to kick up the volume without distortion.

Neutral Design

Even though the C5 is diminutive in size, (7.9x7.9x9 inches. HxWxD), KSdigital's primary design goal was neutrality. The speaker's coaxial components provide point-source accuracy within the time domain, with a wide soundstage and solid imaging. Linear phase response is optimized, thereby creating a flatter frequency response. We're not talking about DC to light here; published response is 79 to 28k Hz, and I can attest to the extended top end on these little boxes. You'll hear the upper-end "air" that could be missing on a lesser system.

The speaker has a 6.5-inch woven-carbon cone driver with neodymium magnets; it's a light, fast-moving material that's still highly rigid in nature, avoiding any material-based induced distortion. The center tweeter is a woven-cap design, with the visual similarities

of a simple dust cover. This design, in association with the high-output magnets, suppresses resonance within the membrane, producing its extended, upper-end response, allowing the mixer to make confident decisions when applying EQ in these areas.

A real wood front baffle should compliment any environment; the rest of the cabinet housing is of a flat-black metallic origin. The metal mesh grilles did not fit well, with one side refusing to stay put. The grilles are mounted on two sides of the speaker via a routed slot. The tension of the metal holds the grille in place, so a bit of bending could create a more "spring-like" effect to hold them in place, but I thought the design to be rather inadequate. I see these grilles immediately coming off under any and all circumstances.

Big Power

KSdigital provides substantial power for such small transducers—100 watts for the highs and 170W for the lows. Plus, both MOSFET amps have extended response to 100 kHz.

This amount of power provides an abundance of clean headroom before clipping, while a peak output stage limiter affords assurance against clipping and possible driver damage.

The crossover is a third-order Bessel filter at 2.5 kHz, with an additional Chebyshev filter at 60 Hz to protect against "bottoming out."

The C5 is a rear-ported design and has a rear



The C5 Tiny features an active, dual-driver coaxial design.



The rear of the C5 offers dual ports and adjustments for gain, high frequency and bass levels.

PRODUCT SUMMARY

COMPANY: KSDIGITAL
WEB: www.ksdigital.de
PRODUCT: C5 Tiny
PRICE: \$2,900/pair (MSRP)

PROS: Small, extended top end, plenty of power in a small package.

CONS: Could seem too bright compared to other speakers, port turbulence noticeable in certain environments and volumes.

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panel balanced XLR input, sensitivity control and separate high/low EQ. A removable plastic plug provides access to the recessed pots for the three parameters. After adjustments, the plugs must be replaced—leaving them out increases the port turbulence exponentially. Input sensitivity is +6/-10 dB, giving enough range to interface with -10- or +4dB sources. The bass and treble controls are shelving-type with a ± 6 dB range. KSdigital does not state the knee points for the frequency controls; feeding pink noise through the C5s and a quick RTA analysis revealed that the low EQ shelves around 160 to 200 Hz and the high EQ around 3.15 kHz, going gently out to their maximum range.

Powered Up

On first listen, the C5s seemed a bit bright. After listening to these against other speakers, they do appear brighter than your average 6.5-inch full-range system. The extended top end is quite noticeable. This could make engineers believe they are hearing too much top end and turn down high-frequency elements in the mix, or apply

EQ to lessen the upper-harmonic structure. You definitely have to learn these speakers.

Imaging was superb on mastered commercial releases and raw, self-tracked Pro Tools files at both 16/44.1 kHz and 24/88.2 kHz. Even with a limited low-end response, plenty of onboard power provided a nice punch on kick drums and bass guitars. There is no doubt that a subwoofer would complement these speakers nicely for music mixing, yet isn't the point of a small, limited-response monitor to provide a "typical" speaker experience—with compromised bandwidth?

Evident from the front of the speaker, I noticed some port turbulence, which I initially thought was cone distortion. Listening to the back of the speaker, the distortion was definitely emulating from the rear ports. Without the little rubber plugs covering the gain and EQ controls (for access to the controls), the turbulence was amplified to the point of annoyance. After replacing the plugs, the distortion was greatly reduced but never entirely disappeared.

The top end is a different story, with cymbals and distorted heavy-metal guitars coming

forward in the mix on the C5s as compared to my reference JBLs. Guitars particularly had a boost in the 1.25- and 6.3kHz ranges. Voice-over work is an application where these speakers excelled. Sibilance is immediately noticeable, as were smacking lip noises and unwanted page turns. These speakers really bring out what is happening in the top end, while tape, fan or any ambient noises cannot hide from the C5s.

Final Thoughts

As a secondary speaker system, the C5 Tiny is a winner. It gives mixing or tracking engineers another reference to use with their primary transducers. Broadcasters will like these for voice-over and radio work. Music mixers will have plenty of SPLs, and the speakers' small size could make them highly useful in a remote truck or mobile rig. The extended top end really gives you an idea of what you may be missing up in the attic. III

Bobby Frasier is an audio consultant, engineer and inventor of the Frasierita. His Beatle band, Marmalade Skies, is learning Side 2 of Abbey Road.

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Focusrite ISA One Mic Preamp

High-Quality Unit With DI, Cue and Optional ADC

The desktop ISA One mic/instrument preamp with stereo cue facilities and optional A/D converter uses the same amplifier section found in Focusrite's acclaimed ISA 110, and the channel strips in the million-dollar Forte studio console. However, with the ISA One, Focusrite improves upon those designs with a slightly different range of mic gain settings and variable input impedance circuitry.

The unit measures 11.25x9x4.5 inches (DxWxH) and includes a flight case. Sloped for easy access, its front panel is dominated by bright backlit push-buttons and a large, lighted Nissei VU meter. A microprocessor-based logic board controls Sunhold relays with silver contacts for dead-quiet audio switching and a safety Lock Out feature that disables the High Gain mode whenever the Main input source is changed.

Dual Input

The ISA One has two input sections. The Main input section has XLR and TRS connectors for mic and line level inputs. The Instrument (DI) input has a second 1/4-inch jack for throughput out to an amp, as well as EXT I/P—a rear panel, external 1/4-inch input. Both the Main and Instrument inputs can be used at the same time with separate analog outputs, such as recording a direct guitar and vocal or a bass guitar—both DI and amp.

The Main input has a four-position switch that changes mic and line gain in coarse 10dB steps. Mic gain range can be switched between low (0 to 30dB) or high (30 to 60dB) ranges. The line input has a -20/-10/0/+10dB gain positions. Both mic and line inputs have up



The ISA One offers a zero-latency cue system and mic preamp impedance controls.

to 20 dB of additional gain available from a smooth-working pot for up to 80 dB of mic gain. The Main input features switchable mic impedance (600/1.4k/2.4k/6.8k ohm); 48-volt phantom power; phase (polarity) flip; switchable 75 Hz, 18 dB/octave highpass filter; and an insert in/out jack for connecting an outboard processor.

The Instrument input has 470k/2.4M ohm input impedance settings and a +10 to +40dB gain-control knob. By selecting the Instrument input on the Main input section, its signal is routed to both line outputs.

My review unit had the optional stereo 24-bit/192kHz A/D converter using AKM's highly touted AK5394A chip. An optional DB9 fanout cable (\$69.99) supplies AES/EBU in either single- or double-wire formats. Optical Toslink and ADAT ports output S/PDIF, while BNC connectors handle external clock in/out.

Versatile Metering, Cue

The VU meter measures the Main section output, defaulting to 0 VU = +4 dBu. An alternate calibration knob can "re-range" it from +11 dBu to +26 dBu. The adjacent LED peak meter also reads Main output as the

level going to the A/D. It has a default calibration of 0 dBFS = +22 dBu but is variable from +18 to +26 dBu. The second LED meter reads the Instrument input or the level of the signal coming into the EXT I/P jack. The meters can also be switched pre/post the insert path.

The ISA One's cue system is switchable between a stereo feed connected to the rear 1/4-inch jacks, and a local, "fixed mix" of audio from the Main input and Instrument section. For zero latency, feeding a mono mix into the EXT I/P jack replaces the Instrument section in the fixed mix scenario. Unfortunately the fixed mix can't be played with the stereo mix at the same time.

In the Studio

I recorded a Martin D-28 acoustic guitar using a Violet Wedge condenser mic without EQ or compression, using the ISA One's High Gain position, and added +10 dB of additional gain. I compared that sound to the same mic and guitar/player with my RTZ 9762 mic preamp (a high-quality unit based on a Neve 1272) running into my Benchmark ADC-1 A/D converter. I externally clocked the ISA One from the ADC-1 to neutralize any sonic differences from clocking. With the highpass filter on, the sound was virtually the same and (with the

PRODUCT SUMMARY

COMPANY: FOCUSRITE
WEB: www.focusrite.com
PRODUCT: ISA One
PRICE: \$799; Optional A/D \$399

PROS: Great sounding pre-amp and A/D converter. DI and Mic/Line inputs can both be recorded simultaneously.

CONS: No individual channel mutes. Zero-latency headphone monitor mode is not stereo.

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Wedge) I found no sonic difference using any of the impedance choices.

The ISA One is exactly like using the original ISA 110, except that it's easier to ride gain on-the-fly with the ISA One's 20 dB of fine gain control and larger knob. Like the 110, I found that the ISA One is less likely to overload while producing a smoother, cleaner sound as compared to a vintage Neve 1272 preamp. The ISA One is also quieter and has more dynamic range. The meter recalibration keeps the VU from slamming the pin with the hot analog levels required for full 24-bit resolution into Pro Tools HD's I/O calibrated at -18 dB.

I used both channels to record bass and guitar—direct and miked amp. The Instrument input's low-Z setting "loaded" the P-90s on my guitar, dulling the sound. If you don't want this, use the High Impedance position; otherwise the direct guitar and bass sounds were crystal clear.

For the amp, I placed a Royer R-121 ribbon mic directly on the center of the speaker. There was no sonic difference between any of the different input impedance choices except the 600-ohm position. Rated at 1,500 ohms, the Royer was mismatched, producing less output and a sound without much life, although I liked this for heavier, thicker guitar parts—making them more sludge-like. At the 1.4k-ohm position, the mic was more or less matched to the preamp, so the sound was spot on—exactly what I expect to hear. My only wish was for mute buttons—one for each section so I could audition each of the ISA One's inputs individually.

I monitored much of my testing through the unit's headphone system. The sound that it produced was clean—super quiet, and could drive my 55-ohm AKG K271 headphones as loud as I could stand.

All Business

The ISA One is a first-class piece of studio gear, whether you use it in a high-end studio with a large console or with a laptop-based portable rig. Its Main and Instrument channels, headphone system, flexible metering and built-in A/D converter offer a unique combination of great-sounding tools that perform and work together flawlessly. III

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

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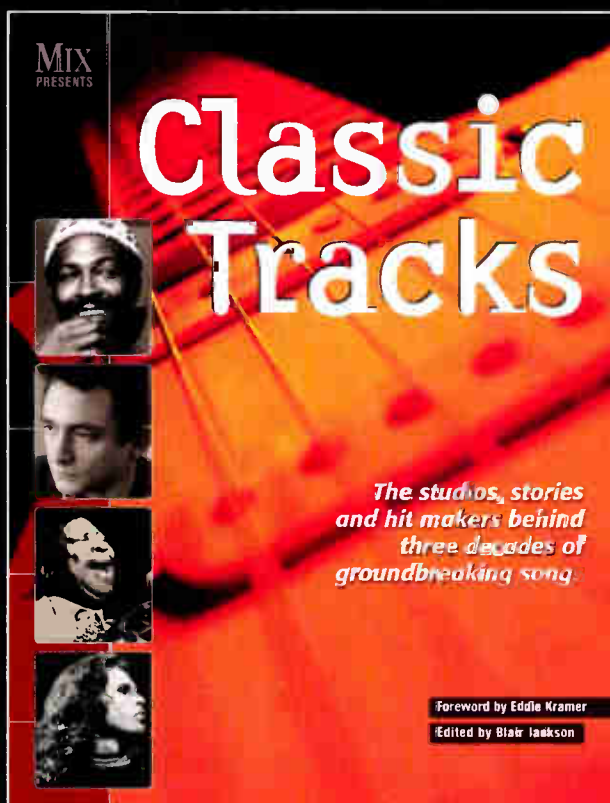
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Old Becomes Retro

For years, I had a tube-based stereo system, selected because it was affordable rather than fashionable. My aging systems always needed a little TLC, which was a trade-off (you might even say an investment). Working on "broken stuff" that is typically "old stuff" put many of the technically inclined ahead of the curve when that stuff became "cool stuff."

As I've said many times before, digital audio re-invigorated retro audio, making it inevitable that many maintenance gurus, expat scientists and technically gifted musicians would get into the boutique audio biz. There are even cottage industries based on modifying inexpensive Chinese and Russian goods that need an old-school DNA infusion.

Economic Scale

How does the stuff we buy get priced? Let's consider what's involved. Mass-produced items like cell phones and computer circuit boards can be "stuffed" by a pick-and-place machine in minutes.

By contrast, many boutique audio products are still assembled by humans, and even when their circuit boards take advantage of modern production techniques, big, bulky retro audio components—like transformers—must be hand-mounted and soldered (skilled labor). Beyond parts and labor, the bigger chunks of the end-user price tag include other spendy items like the chassis, marketing and retailer mark-up. One way to make high-performance retro-style gear affordable is by building kits, where the most important component is your time commitment.



ILLUSTRATION: EDDIE CILETTI

By supplying build-ready printed circuit boards, audio kits offer a way to save money and learn a little in the process.

Tools and Techniques

Success in building any kit requires a good soldering iron and a handful of decent tools. (For some suggestions, see my June 2008 column, http://mixonline.com/studios/business/audio_tools_olde_friends.) You might want to consult the manufacturer as to solder preference, and while we should all be moving away from lead-based solders, they are the easiest to use. Start with a clean, well-lit work area. Follow the instructions as to the order in which the parts are placed on the circuit board. At this point, you may be instructed to bend the "legs"—also known as leads—enough to secure the parts and trim the excess before soldering anything.

For geek newbies, fine motor skills will be the first challenge. For example, the three-step wire-prepping process starts with stripping (removing insulation), twisting (if the wires are stranded) and tinning (applying solder to keep the strands together). Practice on expendable wires before moving on to the kit. In the first step, the goal of the wire-stripper tool is to break the insulation but not nick the wire. It is better to be cautious, so if you don't cut all the way through the insulation, just bending it should complete the job. Twisting the insulation while removing it will also twist the wire strands underneath, saving a step.

During the tinning process, you'll notice that the insulation shrinks, so keep this in mind. You will always start with—and want—a little more bare wire than necessary. When it's time to attach a wire (to a circuit board, connector or switch), it's important to butt the insulation all the way up to the connection—you don't want exposed, un-insulated bare wires that might come in contact with other connections.

To avoid internal component damage, use long/needle-nosed pliers to grip the leg near the part's body before bending. Most electronic components come in two configurations: axial and radial. When placing

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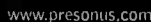
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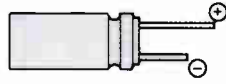
AUDIO SCIENCE

ALL ABOUT SOLDER

Solder is an alloy of metals used to bond electronic components together. Tin/lead solders are being phased out in favor of tin/copper/silver to meet RoHS environmental compliance. Flux is a chemical blend that's either mixed in with the solder or applied to the work to simultaneously remove oxide, thus improving the bond/connection.

Good soldering begins with a high-quality iron, like the temperature-controlled Hakko 936 (about \$80 online). The key to quality solder connections is getting "the work" hot enough to melt the solder—approximately 800 degrees F. Keeping the soldering iron tip clean by wiping on a damp cellulose sponge—followed by applying a thin coat of solder to the tip—helps improve heat transfer while extending the tip's life.

—Eddie Ciletti



Radial Lead Type



Axial Lead Type

Radial leads (pronounced "leeds") exit from the same end of the body; axial leads exit at opposite ends.

small-signal transistors (these have a case style known as TO-92), don't shove them all the way down on the circuit board as this will stress the internal connection. Once placed on the board, bend the leads on the opposite side enough to secure the part while the board is upside down.

Parts with polarity and orientation issues are capacitors, diodes, transistors, ICs and LEDs. Transistors (and voltage regulators) are three-legged devices. While all transistors have a base, emitter and collector, the "leg" order is not always the same. The square TO-220 case style is used for transistors, voltage regulators, diodes and resistors, so be sure to read the part number. Here, a jeweler's loupe or magnifying glass can

make this task easier. LEDs have a long leg (anode = "+") and a short leg (cathode = "-"). The same convention applies to polarized capacitors. Round LEDs also have a flat spot on the cathode side.

Home Stretch

Scheduling time for your first kit might be challenging, but you'll be rewarded with improved fine motor skills and a greater awareness of electronic components. You may even find the process mentally therapeutic. So you'll feel better, save money and learn something in the process—not a bad deal. III

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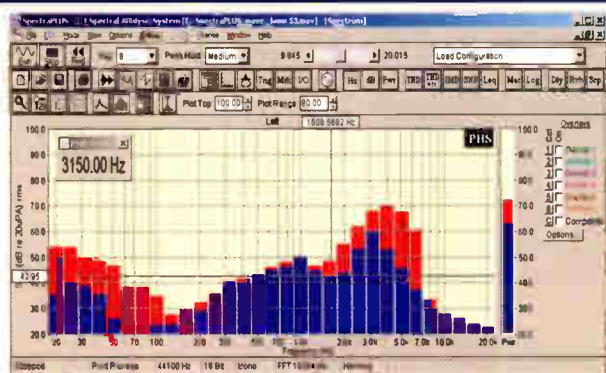


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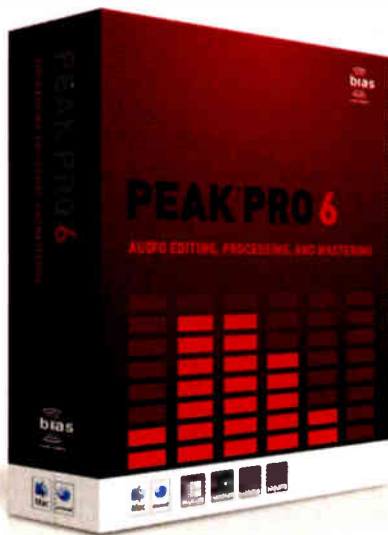
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World Radio History

Bob Ludwig

The mastering master reflects on changing technologies, the loudness wars and more than four decades of musical inspiration.

What's driving this resurgence in vinyl?

I think part of it is, the kids who have grown up in this generation have never experienced having a vinyl record in their hands, with that big artwork; it's so tactile, so physical. It's really such a different kind of a being than a cold MP3 file—you know, if it's coming over an Internet connection and it goes in your ears, there's nothing to feel.

A lot of it might be that, and hopefully this whole loudness war thing that we've been through with the CD, there's no more room to go. These things are just stupidly loud and annoying to listen to. There's quite a big backlash.

Do you think the loudness wars have reached critical mass?

I'm having that feeling, yeah. I'm thinking people are realizing that it's one thing to have your iPod on "shuffle" and have your song be the loudest thing; to put out something that in an iPod shuffle won't sound as loud as what comes before and after it does take a certain amount of guts as a producer.

As a mastering engineer, people sometimes blame us for things we have no control over. Mixers themselves have found that certain A&R departments and record company executives wouldn't approve their mixes unless they were already that loud. So the mixers, in self-defense, started premastering stuff before they sent it to me, and pre-squishing it and compressing it. And then we get it, and everybody in the band is used to this by now, and if you don't give them something back that's at least that loud, they think that you're not very good. It's a very deadly situation.

So what do you do?

Well, you try to educate. There's a couple of

bands I work with, like Tool—I remember Danny Carey, the drummer from the band, walked into the studio session, and said, "We don't care if our record's the loudest record on the radio, we just want to have the quality of what we've achieved in the mix," and I just have to admire that.

Lately, there seems to be a growing consumer awareness.

Well, I hope so. There's nobody out there educating people to think that the "normal" thing, their MP3s, aren't as good as they could be. I think a lot of people falsely think that they don't have the ears to tell the difference. And I think the average person would be surprised to find out how good their hearing is.

How does more widespread access to studio technology affect the projects you get?

The average record comes in to us probably sounding worse than it ever has, as far as quality goes. Believe me, the good guys are still doing great work. But a lot of the indie stuff we get, some of it sounds pretty bad. So a good mastering engineer can turn something that sounds like dog meat into something that sounds at least normal. So by spending a few thousand dollars on good mastering, it will sound like your budget went up \$100,000.

What are some albums that you consider benchmarks of great projects?

When I was really young, I mastered *Led Zeppelin II* to vinyl and *Houses of the Holy*; I never dreamed that all these years later, that band would still be keeping new bands off the air. [Laughs] If you look at 1969, when that record [*Led Zeppelin II*] came out, and look at the 39 years it is to here, 39 years before Zeppelin, you're talking about Louis Armstrong, Gershwin or Cole Porter. It's just amazing that after the '60s, so much of that music has stuck for so long. It's never been that way in the history of music before, that I know of.

I did the early Band records; that's one of my favorite groups ever. I remember when I first heard that music, I was knocked out by it, and all these years later it still knocks me out. And then I got to work with Jimi Hendrix for a day; I cut some reference discs for him on *Electric Ladyland*. Some of the artists whose whole catalog I've done, or most of it, like Bruce Springsteen—he's a superstar in so many ways; besides being the consummate poet, he's a great songwriter,



and obviously great musician and performer, and he's a great person. It's always a privilege to be able to have contact with someone like that, even for a short while. I've done most of John Mellencamp's catalog, all of Bryan Adams. Or Nirvana. And the Foo Fighters. And Beck's one of my favorite artists, too. Lots of favorites!

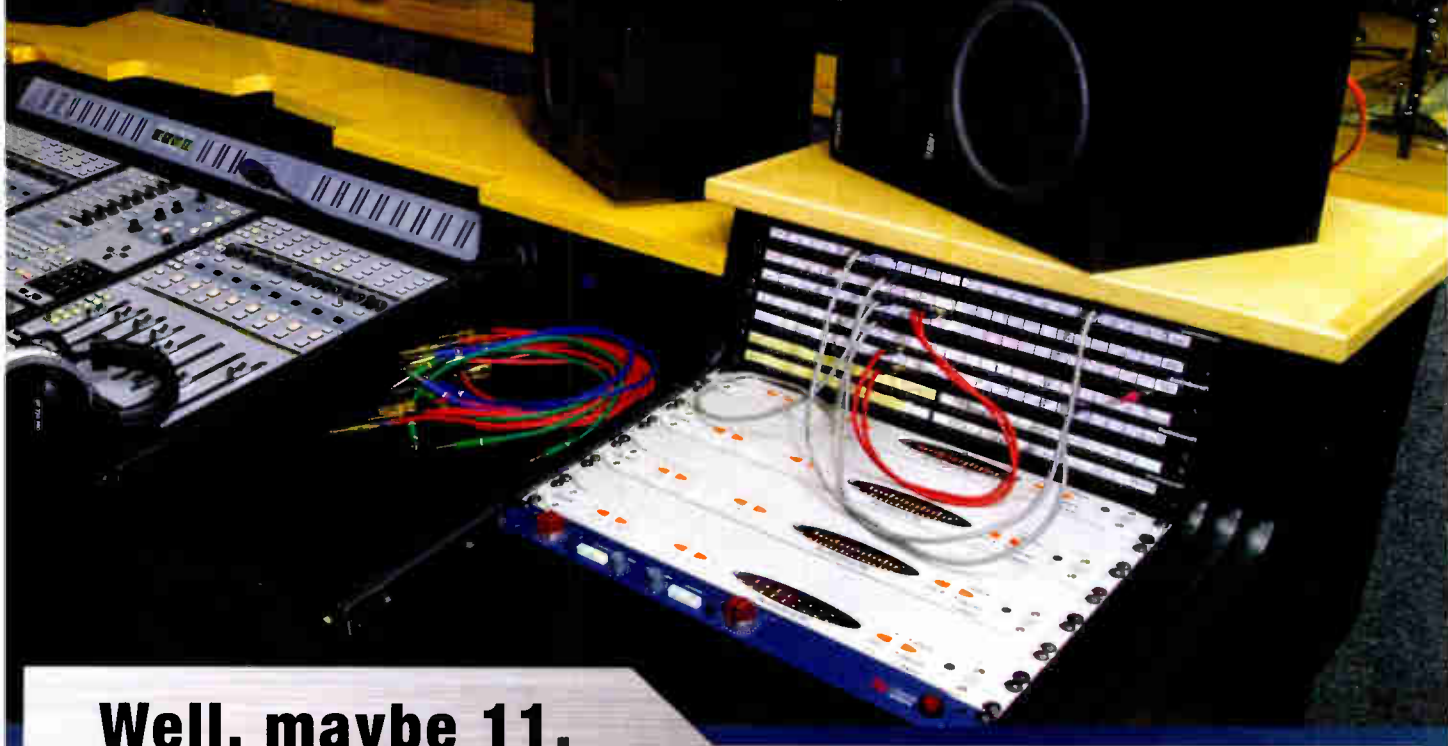
How important is it to bring a musical perspective to mastering?

It's inconceivable to me to be in the music industry without being a musician. Everybody at Gateway Mastering [Ludwig's Portland, Maine, facility] is a musician. There are some guys who have good reputations who aren't, and through the years they have learned how to relate to musicians. But for me, all the technical part, you just have to know that 110 percent. All of the gear, it's just got to be so under your fingers that it doesn't show up as an issue as much as the creative part of it, trying to see what aesthetic is going to make this record be as good as it possibly can.

We're the last shot that an artist and producer have to make the music that they worked so long and hard on sound better. It's a responsibility I take very seriously. I think when you're mastering, if you're any good at it, you try to stay in your right brain, the creative part of your brain, and the more gear you have that takes you away from that, the less creative you can be. ■■

Sarah Jones is the editor of Mix.

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