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MIX

PROFESSIONAL AUDIO AND MUSIC PRODUCTION

SPECIAL ISSUE MAY 2004

THE NEW MEANS OF PRODUCTION

Mixing Inside the Box | Commercial Studios—the Producers' Take

Meredith Brooks on Her Own | The Console-Workstation Interface

How To: Audio Prep for DVD | Matthew Sweet Happy at Home

Monitor Controllers, A to Z | Beyoncé on DVD | Microsoft WMA9

HD 5.1 Broadcast for the Academy Awards | Same-Night Concert CDs

Masterdisk Masters WiFi | globalSAN From SNS | Virtual Vocals

Codecs for Internet Delivery | Cookie Marenco Makes ESE Surround

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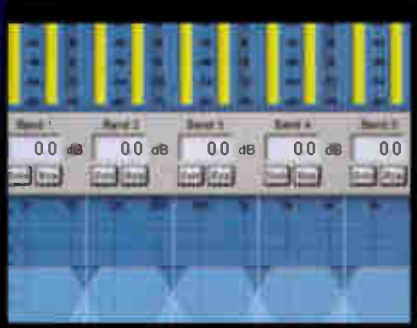

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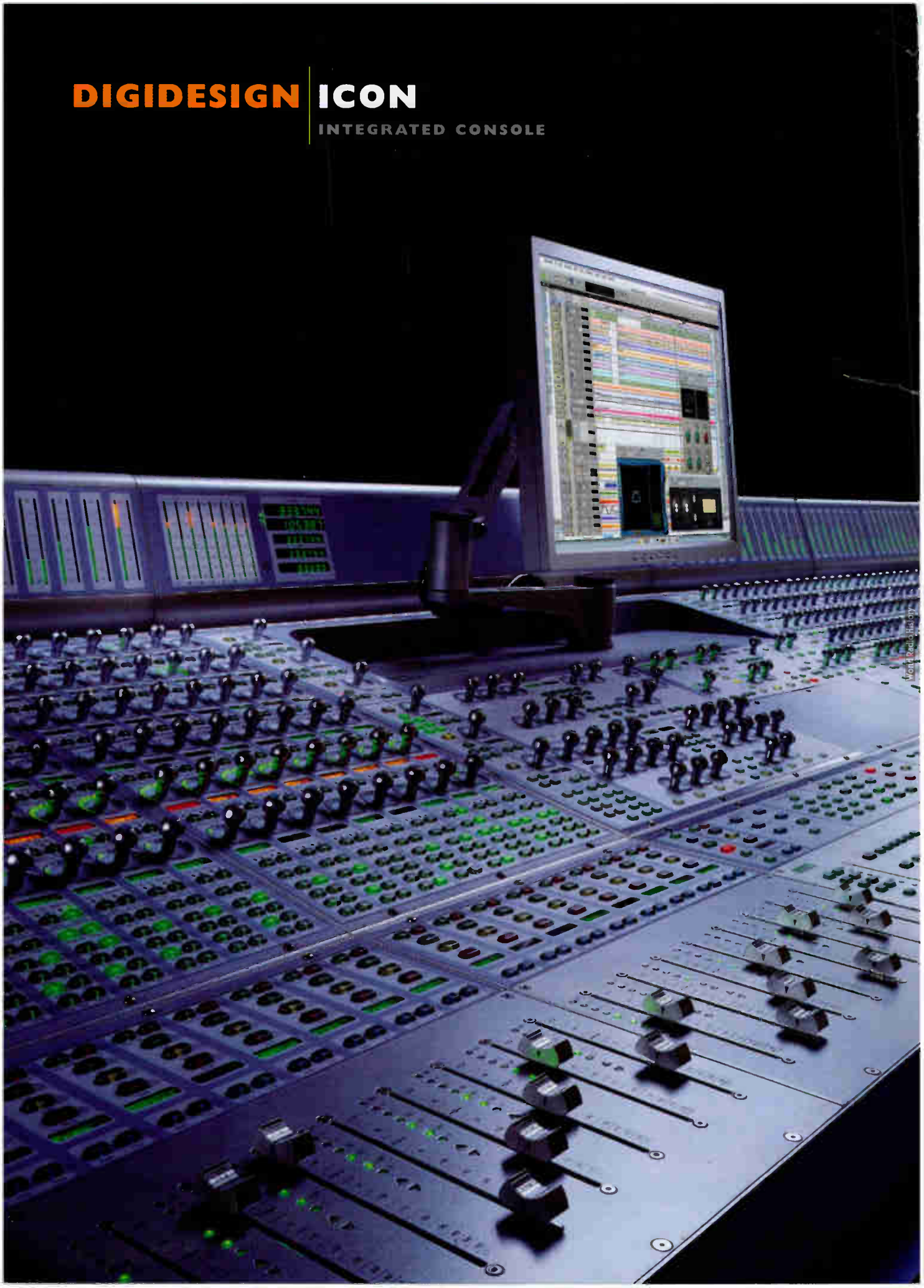

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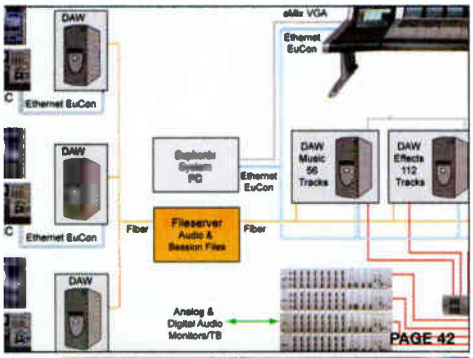
PROFESSIONAL AUDIO AND MUSIC PRODUCTION
May 2004, VOLUME 28, NUMBER 6



the new means of production

New Production Pioneers

On the Cover: Console-workstation interfaces, mixing "inside the box," remote collaboration—there is no "right" way to produce audio today. This special issue, "The New Means of Production," looks at new technologies and ways of working as they converge to a common goal: creating great music.

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

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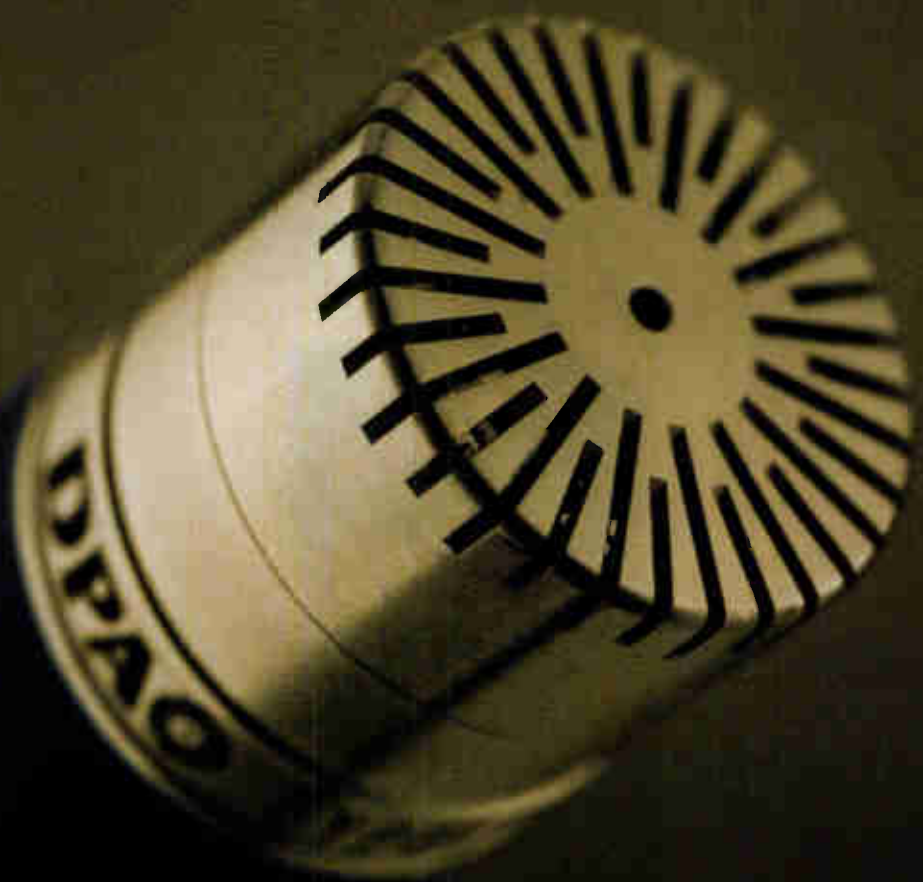
Is there any piece of equipment in your studio that is more than 20 years old and still the best?



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"The New Means of Production"

Last May, *Mix* presented "What Can Save the Music Industry," a highly read and talked-about themed issue that rocked the audio community. A year later, we're doing it again, but rather than re-examine the changing label/distribution model, this time we're focusing on "The New Means of Production." Change is a constant in any technology-driven industry, whether you're talking about cellular communication, the Internet, GPS navigation, medical scanners, electronic cinema, digital photography or DAWs, and these days, digital is definitely the force behind the revolution.

Audio pros are no different than other techno-artisans, who after years of creating with Linhofs and Leicas—or Panaflexes and Arriflexes—are a little reticent to give up their analog tools for a box of chips, RAM modules and an endless smattering of storage formats du jour. But the lure of digital is great: DSP file manipulations can transform the usable into the acceptable, whether Photoshopping a tattered photo back to life, *Shrek*-king the image of a lovable ogre into the hearts of children or auto-tuning a single warbled note out of an otherwise flawless performance.

Audio capabilities were once defined by track capacities—24-track, 16-track, 8-track—yet such terms are of little relevance in a world of virtual tracking, virtual consoles, virtual instruments and plug-in equivalents of racks of hardware outboard gear, where the limits on system capabilities may be simply a matter of CPU power/speed and RAM.

Should we plunge headfirst into the console-less/outboard-less world of total desktop production? There are many factors at play here and no one-size-fits-all solution for everybody. Mouse mixing may work for some, but grabbing faders on a DAW controller or traditional console remains most engineers' preference, especially on more complex projects. Many digital console manufacturers have responded with products having fader banks/mutes/solos/sends that either tweak audio directly or send controller information to a DAW. But in production, there are no set rules—one project is best served staying entirely within the workstation; the next date may be mixed using the console alone or as a hybrid session combining the advantages of both conventional console/outboard mixing fed from stems premixed on the DAW.

New technologies are changing the ways that we create, reproduce and distribute music, and examining this topic required a multifaceted approach. Kevin Becka explores production in "DAWs and Hybrid Mixing." Mel Lambert looks at the evolving console/DAW interface, asking whether the all-in-one workspace has finally arrived. Maureen Droney chats with top producers about how commercial studios fit in with the "Changing Face of Record Production." Sarah Benzuly investigates the growing trend of bands selling CDs of live shows—minutes after the last encore. And because PCs aren't typically equipped with volume controls or talkback facilities, David Ogilvy checks out the latest in outboard monitor controllers for stereo and surround DAW production.

Anyone who produces or engineers audio today is faced with some tough questions. However, the revolution is an ongoing, evolving process, and hybrid, virtual or traditional, what's most important is to create a production style that works best for you.

George Petersen
Editorial Director

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BACK ISSUES: Back issues are available for $10 each by calling 800/532-8190 or 815/734-1216.

POSTMASTER: Send address changes to *Mix* magazine, P.O. Box 1939, Marion, OH 43306.

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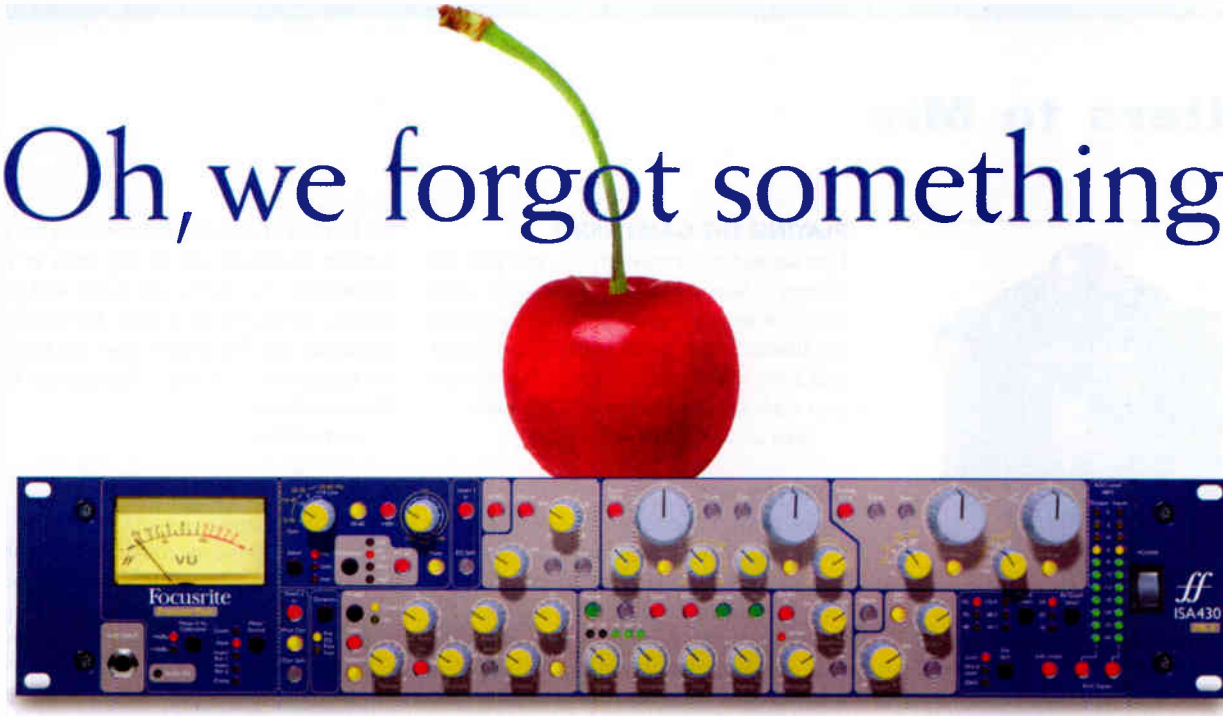
Oh, we forgot something.



The New ISA 430MkII Producer Pack

When we designed the original ISA 430 Producer Pack we wanted to include all the best features and circuits from the Focusrite ISA product family since 1985. And so we did! However, in the past three years we have had a few more great ideas. So the ISA 430 MkII is born. Have we forgotten anything? All we can think to add is a cherry on top!

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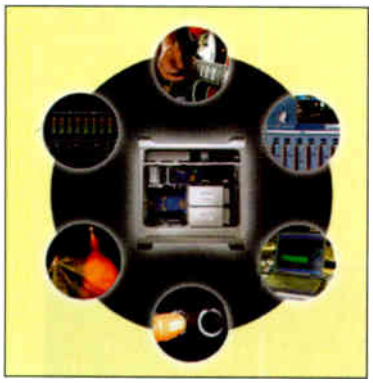


AN APPLE WITHOUT BUGS

In the article "Taking the G5 Live!" by Kevin Becka (February 2004), I think the author [may have] encountered a bug with the G5's front FireWire port under the "Video, Too" section. Becka says, "What didn't work was when we tried to take the QuickTime video out of the second FireWire port to a DV cam, then out to a second projector and screen onstage. When doing so, we could get the video out to the DV camera, but once we played the song and all was in sync, it resulted in some serious dropouts."

If Becka was actually referring to the "second FireWire port" as the front FireWire port on the G5, then he should be aware that Apple has an internally documented issue with the front FireWire port on Power Mac G5s. The symptoms of the issue are that when a DV video device is connected to the front FireWire port, the video and audio playback/capture suffers from severe dropouts and occassional device disconnections. When the same device is connected to the rear FireWire 400 port, there are no problems at all. Apple support says that this is a hot issue and has been escalated to top-level engineers.

I experienced the same problem with a new dual 2.0GHz G5 system when I connected a Canon GL2 video camcorder to the front FireWire port. The problem can be seen when trying to capture video from the camcorder into iMovie or Final Cut Pro 4.1.1. I took my camcorder into an Apple Store to try capturing on a single 1.6GHz G5. Strangely enough, I did not experience any problems with the front FireWire port.

Some other G5 users have reported similar problems on the Apple Discussion forums. [To visit Apple's Discussion forum, go to http://discussions.info.apple.com and choose a topic.—*Eds.*]

Tony Tang

PLAYING THE GAME RIGHT

I just wanted to congratulate you and your colleagues at *Mix* magazine on a terrific job covering game audio in this month's issue. Please pass our thanks to the entire team. Fantastic work and some great research on your part—you guys really did your homework! Thank you.

Greg O'Connor-Read

MYSTERY MIC

In the January 2004 issue of *Mix*, the article "Let It Be...Naked" states that The Beatles' last concert used the Neumann KM84i for vocal mics. They wouldn't have [had] a KM84i, as the "i" stands for a U.S. export version of the mic with an XLR connector instead of Tuchel. Those are AKG C28s, which also offered a capsule extension rod. The available Neumann extension rod was not nearly as long as some of the available AKG C28 extensions. You see the AKG C28 in quite a few Beatles sessions from this era. If you look at pictures from the rooftop concert, the mic body is about twice as long as a Neumann KM84.

Chad Shapiro

INTEGRATION FOR WHO?

I am sure that Mr. Jobs appreciates Mr. St.Croix's shrine in the corner of his living room. But before he nominates Mr. Jobs for some sort of Nobel Prize, I have to wonder how many times Mr. St.Croix has labored for untold hours over a product on a PC, only to have it rejected by the operating system when trying to import it? All simply because the OS prefers its own *proprietary* format? As a person that regularly moves between the two platforms, more than one tastefully designed little plastic box has been spared a horrible fate simply by the fact that a sledgehammer wasn't handy at the moment. Maybe some more consideration should go into Jobs' King of Integration title?

As one local Apple sales representative told me, "You just have to learn the little tricks to get around it." Tricks?! When I purchase a tool, I shouldn't have to learn any "tricks" to make it do what it claims it can do. I think we can all thank our lucky stars that auto manufacturers don't design their vehicles to run on only certain brands of gasoline. (Although, I am sure they have considered it.) Or how about a saw that only cuts pine? An oven that only cooks certain types of food? It's a marketing dead-end, no matter how "tactilely beautiful" they may be.

Computer manufacturers remind me not of Mercedes and Maseratis, but of adolescent-minded 4x4 truck owners with the all-too-visible Bad Boy stickers on the rear windows performing unsanitary acts on the logos of their competitors. Computers are a tool and not a lifestyle, no matter how clever the marketing campaign, and they should serve the needs of the people who use them. *That* will get them the market share.

Curtis Enlow

A SCHEMATIC FROM THE PAST

Imagine my surprise when I opened to the "Tech's Files" (February 2004) and saw part of my 1973 Omnipressor™ schematic (including original handwriting) and my trick of limiting op amp output with pin 8 discussed in detail—30 years later. The final touch: seeing Eventide's ad for the Legendary Legacy plug-ins of the same 1970s classics. A real blast from the past!

Eventide Clockworks started in the basement of Sound Exchange, a small studio at 54th Street and 8th Avenue. We worked with Richard Factor and Tony Agnello on the early digital delay lines, a bucket brigade Flanger and the Instant Phaser. Ah, yes, discrete analog design, incandescent pilot lights, handmade wiring harnesses and TTL logic! What a time. It was the beginning of a revolution in sound processing and the transition to digital audio. How far we have all traveled in the three decades since!

Jon Paul

AMP TO FIT

Paul Lehrman's article "In a Silent Way" (March 2004) reminded me of Tony Bennett's performance with pianist Ralph Sharon in Auckland a few years ago. Due to traffic problems, my wife and I arrived at the venue—a large acoustically challenged hall—slightly late.

We entered the auditorium a couple of minutes into Mr. Bennett's opening number and my immediate thought was that part of the P.A. system had failed. After a few minutes, however, our ears adjusted to the low volume and we were treated to a superb concert where the P.A. system was—in the most literal sense— merely "reinforcing" the true sounds of the performers. The minimal amount of amplification brought a wonderful, emotional honesty and immediacy to the performance.

Ian G. Morris
Tonewright, New Zealand

Send Feedback to *Mix*
mixeditorial@primediabusiness.com

STREISAND DEDICATES RENOVATED SONY SCORING STAGE


PHOTO: WIREIMAGE

Sony Pictures Entertainment (Culver City, Calif.) threw an elegant afternoon soiree on February 9, 2004, to celebrate the renaming of its recently renovated scoring stage: the "Barbra Streisand Scoring Stage." The historic and unchanged recording space, the site of scores for *Gone With the Wind*, *The Wizard of Oz*, *Lowrence of Arobio* and many others, and the remodeled control room (newly installed Neve 88R console) were bedecked with arrays of Streisand's favorite white gardenias as Sony execs, staffers and a few invited guests nibbled shrimp and pastries, drank cocktails and mingled.

Standing on the stage where she recorded some of her most celebrated music, Streisand said, "It really is a great honor to have this legendary scoring stage named after me, especially when you consider all of the amazing artists who have recorded their music here. I'm grateful to Sony."

The Scoring Stage's new 96-input Neve 88R console features a stem matrix option and the first 88R Scoring Panel, designed by Neve with Sony Pictures.

—*Moureen Droney*

CRAS GRADS TAKE HOME GRAMMYS

Conservatory of Recording Arts and Sciences (Tempe, Ariz.) graduates Moka Nagatani and Darrell Thorp have taken home 2004 Grammy Awards: Thorp for Best Engineered Album, Non-Classical with co-winner Nigel Godrich for Radiohead's *Hoil to the Thief*, and Nagatani and Thorp for their work on OutKast's Album of the Year, *Speokerboxxx/The Love Below*.

After graduating from the school in 1997, Thorp interned at Track Record Studios in North Hollywood and then moved to Ocean Way Studios (Hollywood). Nagatani graduated in 2002, after which she interned and was subsequently hired at OutKast's Stankonia Studios in Atlanta. She currently splits her time between the U.S. and Japan.

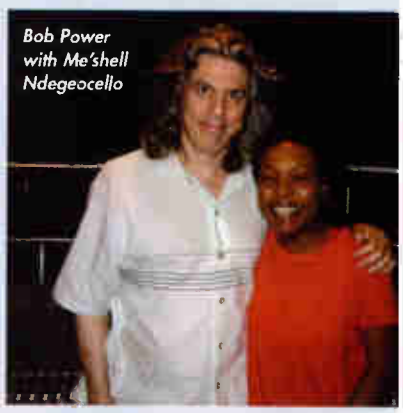
According to Kirt Hamm, administrator of the Conservatory, "Having Darrell and Moka honored with the industry's top award is a testament to their talent, work ethic and their strong education."


PHOTO: KIR BONZA

Darrell Thorp in front of the Neve 88R console in Studio D at Ocean Way Hollywood

Moka Nagatani at the Pro Control in Stankonia Studios' (Atlanta) Studio B

POWERED UP IN NYC


Bob Power with Me'shell Ndegeocello

Bob Power has been busy in New York City mixing Me'shell Ndegeocello's new Maverick CD, *Comfort Womon*, at Chung King Studios' Gold Room. Power also mixed tracks for Jon B. (Dreamworks) at Sony Music Studios; both sessions utilized an SSL 9000 J console, Pro Tools|HD and TDM, lots of Power's vintage Neve 1073 and API 550 gear, and newer Pendulum tube compressors.

NINTH ANNUAL L.A. OPEN

The Ninth Annual Mix L.A. Open charity golf tournament, Monday, June 14, 2004, at the Malibu Country Club, is filling up. The event, presented by the Mix Foundation for Excellence in Audio, is a "best-ball" tournament that attracts golfers of all levels. Registration and a continental breakfast begin at 8 a.m., with the shotgun start at 10 a.m. The awards dinner and silent auction are scheduled for 3:30 p.m.

For more information about sponsorships and entry fees for individuals or companies, visit www.mixfoundation.org or contact Karen Dunn at 925/939-6149 or Karen@tecawards.org.

COMPILED BY SARAH BENZULY

GEAR LUST SATED AT THE VILLAGE

PHOTO: BARRY RUDOLPH

L-R: Simon Blackwood (Focusrite), Dino Virella (Focusrite), Benny Sanches (Digidesign), Chandra Lynn (Digidesign), Chris Gooddie (Focusrite), Jerry Antonelli (Digidesign) and Jeff Greenberg (The Village)

Village Recorders (West L.A.), Digidesign and Focusrite hosted the U.S. premiere of Focusrite's Liquid Channel channel strip to a "who's who" of L.A. engineers and producers on March 4 in Studio D's control room. Focusrite's Chris Gooddie put Liquid Channel through its passes under actual recording conditions in front of small groups of attendees and took questions from David Reitzas, Dave Pensado, Mike C. Ross, Dexter Simons, Rafa Sardina, Dave Rideau and Roy Thomas Baker.

—Barry Rudolph

TASCAM CELEBRATES 25 YEARS OF PORTASTUDIO

In 1979, Tascam's cassette-based 144 Portastudio helped launch the home recording boom, as musicians could use TEAC 4-track reel-to-reel recorders to do their own multitrack recording, including record, overdub, EQ, bounce and mixdown multiple tracks in one portable box that weighed just 20 pounds. This year, Tascam introduced the 2488 Portastudio (pictured), which expands on the original 144 by adding 24-bit/44.1kHz, a built-in 36-input mixer, a 64-voice MIDI sound module, digital effects, a 40GB hard disk and USB 2.0 connectivity. For the final mix, the built-in CD-RW drive can record the 2-track master mixdown, as well as back up the hard drive and import/export .WAV files. www.tascam.com

MASTERING "REVOLUTION"

Lorenz Vauck (pictured) is the man behind the computer at XARC Mastering (Dresden, Germany), where he provides low-cost, fast-turnaround mastering services to an international clientele. He founded XARC in 1999 after years of working in sound for television broadcast.

Vauck runs XARC out of a home studio, where he uses a proprietary system and listens on KRK Expose monitors, but XARC's real home is the Internet. Vauck receives and conveys projects online and uses online chat to interact with clients. One of XARC's most high-profile successes has been with the BAFTA-nominated score for the game *Republic: The Revolution*. Vauck worked with veteran music composer James Hannigan, who says that video game projects usually do not allow time or money for music mastering. However, the music for *Republic* was recorded in disparate locations, so Hannigan needed a mastering engineer who could step in quickly and help bring cohesion without sacrificing dynamics.

"I started receiving the first tracks around 5 p.m. and the last one at around 9 p.m.," Vauck says. "While James was mixing at Pinewood Studio in London, he sent me the tracks. After a long night with James assisting me in real time via ICQ, the master was finished for him to download at around 7 in the morning!"

For more on XARC, visit www.xarcmastering.com.

—Barbara Schultz

MELTING CRAYONS TO MAKE RECORDS

Shawn Borri (left) works on a 1901 Edison Triumph Phonograph (using a 1898 Edison recording head custom-modified by Borri), while .moe guitarist Chuck Garvey plays.

Since the age of 10, Shawn Borri has tried to duplicate the wax recording techniques used by the North American Phonograph Co. founded by Thomas Alva Edison in 1888, beginning with melting crayons around a roll of toilet paper. Fast-forward 15 years: Sound engineer Borri has reopened the North American Phonograph Co. (Freehold, N.Y.; http://members.tripod.com/~Edison_1/) as a wax cylinder recording studio.

Using 1880s technology (recording horns and spring motors; no microphones or electricity), tracks are recorded on wax and digitally transferred using an Archeophone, a state-of-the-art digital cylinder player designed by Henri Chamioux. The company also re-issues classic cylinders, some recorded a century or more ago, in their original cylinder form for $25 each.

Borri's recordings also appear under his Borri Records label, which includes .moe's *Wormwood* and Al Duvall's *Hey Rube*. Album proceeds are donated to the Save our Sounds Project, which preserves original wax cylinder recordings in the Library of Congress, The Smithsonian Institute and others.

"Acoustic sound recording on the phonograph gives a presence to the recording that no other method can duplicate," says Borri. "We invite any recording artist to our studio for a free trial of this method to discover the possibilities and potential."

PORCUPINE STUDIOS BRINGS IN GEORGE BENSON

Porcupine Studios (Chandler, Ariz., www.porcupinestudios.com) recently hosted George Benson, who worked with producer Paul Brown on guitars and vocals on his upcoming CD; Brown manned an Otari Status 80-input console and raided the studio's 80-plus mic closet. Co-owner John Wroble has been busy working on the third season of Comedy Central's hit series *Crank Yankers*, various audio and video projects with Johnny Depp, Esteban's live DVD recording, and various projects for GIA Publications and Metal Blade Records.

The studio's birth was, ironically, caused by an economic downturn. Wroble's field engineer day job at AT&T ended when he was laid off in 1994, allowing him to invest his time and energy—and money—to expand his project studio into a 1,400-square-foot recording space. Soon after, Wroble met future co-owner Jeff Harris while both were doing a remote recording for the Arizona Music Awards; soon after, Harris was also laid off. The two began doing session work and with numerous projects coming in, Wroble and Harris moved to a larger location that now houses three studios and a video edit bay.

PHOTO: CAROL CEFALU

Jeff Harris, right, and John Wroble

Harris' past gigs include engineering at The Village Recorder (Los Angeles) for 15 years, where he worked on Supertramp's *Breakfast in America* and Fleetwood Mac's *Tusk*.

PREAMPS IN PARADISE —A MEETING OF THE MINDS

Pictured from left: John Hall, Doug Fearn, Hutch Hutchinson, Oliver Archut, Dan Kennedy, Lynn Fuston, George Massenburg, Dave Hill, Greg Gualtieri, Geoff Daking and Grant Carpenter

What do you get when you bring together 10 leading preamp manufacturers, sit them down at a table and let them loose? You get 3D Audio's panel discussion, held January 31, 2004, in Murfreesboro, Tenn. 3D Audio's Lynn Fuston brought together Geoff Daking, Doug Fearn (DW Fearn), Greg Gualtieri (Pendulum Audio), Dan Kennedy (Great River), Dave Hill (Crane Song), Grant Carpenter (Gordon Instruments), Hutch Hutchinson (Manley Labs), Oliver Archut (AMI), George Massenburg (GML) and John Hall-Langevin (Electrodyne, Quad 8) to discuss mic pre topics such as transformers, solid-state vs. tube, ICs vs. op amps, parts availability and its impact on designs, manufacturing in the Pacific Rim (cost vs. quality) and many others.

According to Fuston, it was exciting to witness the amount of camaraderie shown between these otherwise competing manufacturers. "These guys are competitors, but there was an overriding sense of brotherhood with the common goal of making better-sounding records."

The result of this preamp gathering will be a two-part "time capsule" video documenting the roundtable and a bonus "preamp comparison blowout" that will be available at AES in San Francisco.

INDUSTRY NEWS

Domenic Buonincontri

Dr. James Andy Moorer, inventor of NoNoise restoration system and co-founder of Sonic Solutions, has joined **Sonic Studio**'s (Plymouth, MN) advisory staff...Former director of engineering **Domenic Buonincontri** has been promoted to general manager for **Cerwin-Vega** (Simi Valley, CA) and **KRK**; in other company news, Cerwin-Vega announced these appointments: **Bill Bush**, director of engineering; **John Devins**, director of sales for pro audio; **Richard Kwasneski**, director of sales for mobile audio; **Derek Covin**, sales administration manager; and **Jesse Walsh**, director of marketing, while KRK promoted **Richard Ruse** to director of worldwide sales...**Shure** (Niles, IL) has promoted **Christine Schyvinck** to executive VP of operations, where she will be responsible for global manufacturing, corporate quality, materials, and process and tool engineering...**Event Electronics'** (Santa Barbara, CA) **David Hetrick** was promoted to VP of sales...Filling in the newly created position of **Sennheiser Electronic Corporation's** (Old Lyme, CT) business manager for the guidePORT and Tourguide product lines is **Dennis Zembower**; in **Sennheiser Communications** news, industry vet **Dean Gonzalez** was appointed to Western regional sales manager, covering the U.S. territory from North Dakota to all parts west, excluding Texas...**BSS Audio U.S.** (Northridge, CA) brought on **Will Fraser** as an applications engineer and product specialist...**Boston Skyline Studios** (Boston) filled the senior staff engineer seat with **Rob Pemberton** (former chief engineer at Sound Station Seven Studios). Custom scoring company and production music library **MusicBox** (Los Angeles) named **Caitlin Hill** director of client services...In addition to opening a New York office (162 W. 21st St., 4th Floor, New York, NY 10011, 212/242-1155), **Non-Stop** (Salt Lake City) has added **Ben Porter** as East Coast regional manager.

Christine Schyvinck

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NOTES FROM THE NET

Download Me a River

iRiver's iHP-120 is a 20-gig (10- and 40-gig models available) portable MP3 player that allows users to record MP3s or uncompressed .WAV files through either an analog line-in or a digital optical line-in, as well as a built-in mic and FM tuner. The iHP-120 can be used for mobile recording; as a portable hard drive to carry sessions, samples, etc.; listening to the radio; or as a portable dictaphone. The 120's battery lasts 16 hours and comes with a wired remote, which has a four-line LCD, a leather carrying case and more. www.iRiveramerica.com

Latte and a Song, Please

In mid-March, Starbucks launched its first retail digital music service in Santa Monica, Calif., that allows coffee-drinkers to access its Hear Music brand to burn full-length CDs and personalized compilations from more than 20,000 albums and hundreds of thousands of tracks. The company said that it will begin to deploy this service to select stores. Acquired by Starbucks in 1999, Hear Music (www.hearmusic.com) creates music programming and CDs for the company's stores worldwide and operates four retail stores in California and Seattle.

Download to Cell to PC and Back Again

Vodafone Germany's Vodafone Live! Music download service uses Musicwave's MODS (Music On-Demand Service) to securely download full-length music direct to mobile handsets. Users can browse and purchase songs via the handset through one-click billing systems: Thirty seconds post-download, the song automatically plays. Once playback is finished, the track is saved in the phone's memory. Consumers can retrieve the tracks on their PCs via a secured music storage vault. The user can also track downloaded songs via the company's site, www.vodafone.com (www.musicwave.com coming soon), download new songs and send directly from PC to handset.

SAE HOSTS DEBUTANTE BALL

SAE Institute recently held a coming-out party for its new and expanded New York City campus in the heart of Manhattan's bustling Herald Square. The open house revealed an attractive comprehensive facility designed to address the fast-evolving needs of today's audio engineering students. A tour led by Udo Hoppenworth, director of SAE N.Y., and Rudi Grieme, senior VP of SAE USA, highlighted the school's emphasis on advanced systems. In addition to the two main studios that feature an SSL 4000G+ and Neve 88R, and a Control 24 Surround Suite, the main floor offers Mac G5–equipped Pro Tools suites, isolated and color-coordinated MIDI production suites and more—for a total of 33 studios/technology labs/personal workstations. The flowing layout and design lends itself to interaction between rooms for studies ranging from surround sound to DVD authoring, recording, mixing and beyond. —*David Weiss*

PHOTO: DAVID WEISS

Rudi Grieme, senior VP of SAE USA (left), and Udo Hoppenworth, director of SAE N.Y.

CORRECTIONS

In the April 2004 "Table of Contents," we mistakenly said that Widget Post in L.A. took delivery of the first Digidesign ICON; Widget was slated to get the first one in Los Angeles.

In "All Access: Barenaked Ladies" (February 2004), the keyboardist's name is Kevin Hearn, not Kevin Heam. Also, the band's latest effort is *Everything to Everyone*; the name of the tour was Peepshow.

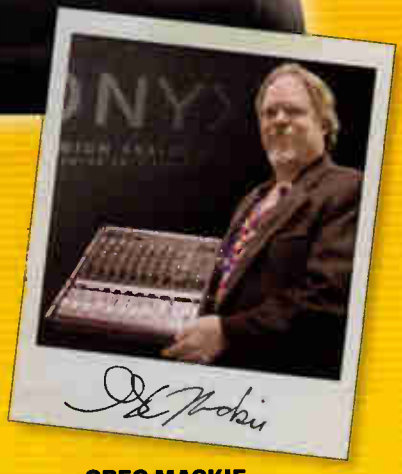
The "Hearing Conversation Gets Financial Boost" news piece in March 2004 "Current" incorrectly stated the amount of the check; it was for $25,000, not $23,000.

In the Ryan Adams recording piece ("Recording Notes," March 2004), other studios that Adams recorded at included Globe Studios (New York City) and Cello Studios (L.A.).

Mix regrets these errors.

Send Your "Current" News to Sarah Benzuly at sbenzuly@primediabusiness.com.

While the other guys were busy adding switches and knobs, we reinvented the whole thing.



GREG MACKIE,
our founding father, shows off a killer shirt... And the Onyx 1220.

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BY STEPHEN ST.CROIX

Toy Time

For Bleeding-Edge Geeks (Us)

I don't have a lot of extra time. My guess is that you don't either. And that's the very reason why we all need new toys—new mo' better, mo' powerful toys—so we can play faster. Any toy that lets you get in two hours of playtime for every hour of actual time is worth twice as much as your current 1:1 toy, right? Yeah, we need new toys.

When I think of all that time I spent playing as a kid—maybe 10 years or so—I realize that I could have grown up five years sooner if these newer, more powerful toys had existed then...

But they *do* exist now. And they even make us more powerful and creative as well.

This newest burst of audio tech is actually the result of several converging advancements—some physical, and some in the way people think and design.

While one rule of technology has always been guaranteed, it is now a *literal* statement. Whatever *you* have, the place that made it already has a newer, much better one. Most manufacturers have already built a working prototype of the next generation of the toy you are going to pick up this week. They know that the only sure way to keep a competitor from rendering their product obsolete is to do it themselves.

No doubt you've pretty much figured that out by now. What's new is that the difference between what you have and what they have can be profound, if not shocking these days.

So. Let's take a look at how we got here, and then look at what a bunch of distorted people have accomplished in their quest to eliminate, well...people (by replacing them with distorted, ah, well...people).

By their very nature, developers clamber all over themselves to outperform their own existing offerings. But recently the rules have changed and made all of this much more intense. As the world gets smaller, and the providers of technologies for developing technology make better and faster development tools, higher-level development (the kind that radical little audio companies do) becomes considerably less time-consuming and expensive.

Let's take logic. I don't mean you should steal Logic, I mean let's look at digital logic in general and the chips that provide it. In the Stone Age, when a higher percentage of engineers were stoned than are now, life seemed easy but was hard. We just didn't know it, because, well...

Everybody had the same chips to work with. If you wanted to make a delay line, you looked through all the Motorola, National Semiconductor, Texas Instrument, Crystal and AMD catalogs, found the parts that best fit your plans and tried them out. You designed only what you could with exactly the same parts that everybody else was using. Sort of like NASCAR racing where all the cars are choked back to the same power and all the ground effect trims provide identical down-force. This keeps competition more equal, and thereby more interesting, not to mention keeping 2,000 horsepower cars from flying off the tracks into the witness stands at 400 mph when their skirts fall off.

Anyway, the interesting audio companies found clever ways to use these available parts to get specific jobs done. They knew how to pick parts that could work together the way they needed, and glued them together so that they sounded okay and didn't catch on fire in three months. Of course, their basic concept had to be attractive, as well. A box that changes female vocals into the sounds of a forklift backing up might have a somewhat limited market, no matter how low its distortion and noise.

Whatever you have, the place that made it already has a newer, much better one. Most manufacturers have already built a working prototype of the next generation of the toy you are going to pick up this week.

It was pretty easy to do relatively simple stuff like delay lines, pitch changers, compressors and even reverbs, but that was it. You did not dare to even think of more radical lower-level engineering, as it might require *silicon design*, and that was not for mere mortals. No, that was only done at the top of Mount Olympus by the Digital Deities themselves.

Well, folks, them days is *long* gone. Two significant advancements have changed the way audio technologies are developed.

First, new families of programmable silicon chips

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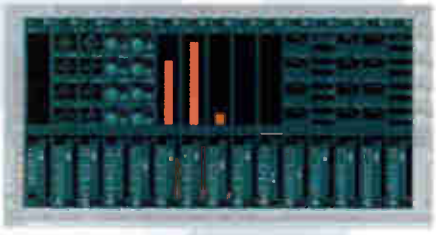

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rained down upon us awhile ago, allowing anybody to actually program a tiny black spider to do exactly what he wants. This changed everything. Designers could suddenly make just about anything happen the way they needed. The result? They began to think differently. They started going for what they wanted from the beginning instead of adhering to the standard paradigm of figuring out what could be done with commercially available components. This is a fundamental advancement: free creative thinking replacing thinking outside the box.

Now of course this boxless thinking produced a mountain of stupid, ill-conceived failures and left thousands of unresolved experiments littering previously nonexistent conceptual paths. But it also gave us hundreds of profound improvements on existing technologies and, finally, handfuls of new, radical and sometimes scary technologies. New toys that do more interesting things for dramatically less money.

And I will be showcasing several of these devices over the next few months.

The second advancement is merely evolutionary, but impressive nonetheless. Personal computers have become *insanely* fast and powerful.

Within the virtual domain of software, you can do anything you can think up—you just have to think right and have enough horsepower to pull it off. Software guys have always been adept at creative thinking from the ground up. They just needed more freakin' power. More speed lets them execute more lines of code in the little slice of time between each audio sample. There is only one real question: How much work at any given word length can be done in 1/44,100 or 1/96,000 of a second?

Today, anybody can get their hands on a computer powerful enough to do things that they wouldn't have even pretended to do a few years ago on *Star Trek*. Monster PCs and floating-point math allow software designers to push out in new freaky directions—extreme code for the extremely bold. They will immediately use every bit of power that the hardware guys come up with, and they'll still scream for more.

TC-Helicon's Lola and Leon are great examples of this.

Within the virtual domain of software, you can do anything you can think up—you just have to think right and have enough horsepower to pull it off.

At this point, you should probably read Paul Lehrman's "Insider" column—in this issue, following mine—for the background and details of both the technology and the commercial result. Maybe you should read it now and then return here. You can look at an ad or two on the way if you want, but only cool stuff.

I have both Lola and Leon, and yes, they are basically impractical in the real world with real-world deadlines. But they are a fascinating glimpse into the future, and if you have the patience, they offer an

—CONTINUED ON PAGE 150

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BY PAUL D. LEHRMAN

Ghosts in the Machine

Are Singers About to be Obsolete?

ILLUSTRATION: MIKE CRUZ

How many Elvis clones does it take to change a lightbulb? None. We have machines for that now. Remember when drummers were the butt of that joke? It was after the first programmable drum machines came out. But they weren't alone for long. Soon, bass players, horn players string ensembles and even keyboard players were being rendered obsolete by advances in synthesis, sampling, control, DSP and AI technology. Studio musicians adjusted and learned to use the new tools, or else they stuck to playing weddings or got out of the business entirely. But a few groups of traditional music-makers managed to keep themselves working in their old ways, hovering a safe distance above where inanimate surrogates could threaten them. Among them were virtuoso horn and string players and, of course, singers.

This is not to say that singers have been totally exempt from electronic competition. I used my first choral sample on a session in 1977. It came from an optical disk-reading device called a Vako Orchestron (if you want to hear what it sounded like, check out www.hollowsun.com/vintage/orchestron), and it was pretty startling in its realism, at least if I made sure to keep it in the back of the mix. A few years ago, a cappella group Take 6 did a marvelous disc of scat-syllable samples for Kurzweil, and when these samples are used carefully, they're good enough to be right up front. But real singers singing real words have avoided being replaced by electronics. So far.

Now, the end of vocalists' immunity may be in sight. Thanks to developments in several areas of audio technology, good singers may find themselves supplanted by not-so-good ones, and all of them by some very clever software. Interestingly, none of this stuff emerged from the think tanks and labs that usually supply us with wondrous new toys, like MIT, Stanford and IRCAM. It's resulted from collaborations between companies and institutions in England, Japan, Denmark, Western Canada and Spain. And a lot of it came about not from the demands of high-end studios and post houses, but from that bastard stepchild of the pro audio industry—karaoke. And it's all pretty cool, if not downright scary.

One of the consortia at the forefront of this is TC-Helicon, a relatively new company combining the re-

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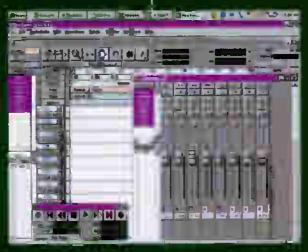

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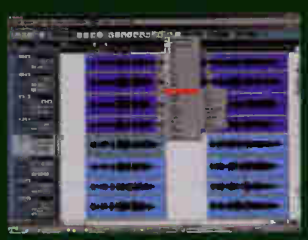

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PERSONAL CREATIVITY

sources of the Danish TC Electronic and Victoria, B.C.'s, own IVL Technologies. The Danish partner started corporate life in 1976 with guitar stomp boxes, eventually working its way up the audio food chain to its current high-end lines, which include the System 6000 reverb, Finalizer 96k mastering processor and the PowerCore PC-hosted audio system. The Canadian company dates from the early 1980s. From its beginning, IVL Technologies led the field in pitch-recognition technology, providing the guts for products like the Ovation/Takamine MIDI guitar systems. Though the company has produced a few products under its own name, most notably the IVL Pitchrider, most of the output has found its way into other companies' products, like Digitech (whose harmony generators are based on IVL's technology), Mackie, Korg, dbx, TC Electronic and even Yamaha. And they're big in Japan: Many high-end karaoke rooms, in which the owners have invested upward of $15,000 into their sound systems, use IVL-based voice processing to make the paying customers sound far better than they are.

While TC-Helicon is not creating synthetic singers, the company is quite intent on improving the singers whom you happen to have or turning them into other people—or other creatures entirely, if that's what you want. The company was born in 2000 when the two firms decided to merge their parallel paths in computer modeling: TC was working on acoustic spaces while IVL was working on the human voice. The results include voice-modifying software that runs on TC's hardware, and hardware dynamics and reverb processors that also do pitch correction, timbral modification and harmonization. And they're getting a lot of notice.

Kevin Alexander, an IVL veteran and now managing director of the new company, sees two approaches to voice processing. "One is to manipulate the voice to enhance it and make it better, keeping it natural-sounding so the listener doesn't know processing is happening," he explains. "Most people who sing or speak like their voice and their sound and don't want someone to change it, like a guitar player doesn't want to change into a tuba. The other is to treat the voice as an instrument and work toward creating new voices and effects.

"It's totally accepted that the voice can be manipulated in ways other than EQ, compression and slapping on some reverb," he continues. "Pitch correction is now a fact in most pop music, and it's there whether the singer really needs it or not." In fact, pitch correction is nothing new: New England Digital's synclaviers were fixing famous divas' mistakes in the late '80s, and by the mid-'90s, Opcode Systems' StudioVision had a slick pitch-to-MIDI-to-pitch function that let you literally draw new pitch contours onto a vocal line. But TC-Helicon is putting a lot of effort into making the process more transparent, both to the engineer and to the listener.

> Most people who sing or speak like their voice and their sound and don't want someone to change it.
>
> —*Kevin Alexander, IVL Technologies*

"Two years ago, you couldn't do this much voice processing without it being audible," says Alexander. "Now there are artists known for their 'pure' voice work, who are actually getting pitch correction and modeling. Maybe they had a cold that day or they don't sound as good in the upper range. To make it transparent takes some manual control using graphical edit. If you know what key the tune is in, you can set the key and scale, the attack time, correction window and amount. They work 80 percent of the time, but that means they don't work 20 percent of the time. We want to get them better so they work almost 100 percent of the time so the amount of input necessary goes to zero."

The key to effective correction and modeling, Alexander says, is in the analysis of the voice: "How do you break down the voice into its elements? Pitch, formant structure, voiced versus unvoiced consonants. With all of these, you can always go into more detail. We separate the voice into those components and process them all separately and recombine them. The more you can break it down, the better the modeling sounds. And with better analysis, you have more flexibility. So you are asking, what else can you use pitch detection for to drive dynamics processing and EQ? What else can you use detecting voiced and unvoiced sounds for? What's important?

—*CONTINUED ON PAGE 151*

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The Changing Face of Record Production

NEW PRODUCTION

By definition, a music producer is responsible for getting the job done. Ensuring that happens is a process that can encompass anything from creating a proper vibe to complete track construction and everything in between: managing the budget, choosing songs and musicians, creating musical arrangements, providing psychotherapy and general hand-holding—you name it. Every project is different, and every producer has a different set of skills. But for many years, for any project, at least one thing was pretty much taken for granted: The record was going to be made in a commercial recording studio. For a whole generation of producers and engineers who grew up nurtured by the old-school recording studio culture, that was a simple fact of life.

These days, of course, things are different. Driven by technology and changes in the business climate, the recording landscape has been cracked wide open. The excesses of the '80s and '90s are long gone, and studios can no longer afford the endless cycle of "bigger, better and more." Home studios compete with the big boys and all kinds of people are looking for new careers. Meanwhile, producers determined to stay in the game are adapting and getting creative about how and where they record.

Producers are redefining how the job gets done and carving out a living doing what they love and are good at. Here, *Mix* checks in with a few stalwarts for some insights into the challenges of making records now.

Where Does The Commercial Studio Fit In?

PRIVATE AND SELF-CONTAINED

A number of people recording today avow that a commercial studio is completely unnecessary. Producer/mixer Scott Humphrey, known for his work with Rob Zombie, Monster Magnet and Ozzy Osbourne, among others, is one of them.

"The business is definitely changing," he says, speaking on the phone from the elaborate studio that he's constructed in a house in the Hollywood Hills, "but I changed my style of working long ago. I moved into my own space permanently about eight years ago, because I wanted the convenience of always having things set up the way I want them."

Humphrey's studio takes up the whole 7,200-square-foot house. The control room, equipped with a 64-input SSL G Plus, is larger than you'll find in many commercial studios. Nearby, dedicated drum and guitar recording spaces are outfitted with everything a rocker needs to sound huge.

Humphrey owns the building that houses the studio, but he chooses to live 45 minutes away. "It's too hard to unwind at the end of the day if you're living in the same place you're working," he comments. "Sometimes, though, it can be an advantage to stay there. I've gone through periods where I slept at the studio and mixed in the middle of the night. That can work out great, because 90 percent of the time, when you're mixing, you don't really need anyone else around."

After starting out as a musician, Humphrey progressed to production and then added engineering to his skill set. He notes that, these days, the line between who's doing what technical job tends to blur depending on the session: The producer is, at any given moment, the engineer and perhaps the Pro Tools operator. "I don't necessarily want to do all of the jobs, but I'm usually doing two of the three. Engineering came with producing. You can't really know how to do one without the other. But there's more expected of you now. You have to be able to wear as many hats as possible. Pro Tools used to be a specialized area. Now, it's just a requisite skill to get to the next level. Sometimes you can't afford to have a guitar tech, a drum tech, an assistant engineer and an engineer. You may have to take on some of those roles yourself. Even if you don't, you have to know how to do them."

Staying in one place for a whole project works well for Humphrey, because, stylistically, he tends to dispense with separate pre-production. Instead, he prefers that bands learn the songs to be recorded while in the studio, moving immediately to recording while everything is fresh.

The social aspects often touted as a plus to recording at a commercial studio complex also find

no favor with Humphrey, who cites the benefits of a private facility where he doesn't have to deal with "people constantly coming in to visit." He admits, however, that building and maintaining the kind of high-end studio he owns isn't easy, noting, "It's a long-term commitment to add to your collection of equipment as you can afford to, until you reach the point where you're really happy and you have everything you need."

THE INCREDIBLE SHRINKING STUDIO

Composer/producer Pete Scaturro also says that he has no need to use a commercial studio. Currently, he's even downsizing the physical space of his own Venice, Calif., live/work studio compound. Scaturro began his career as a musician and producer of alternative rock bands in the San Francisco Bay Area. Although he long ago transitioned into sound-for-picture—that's his theme music you hear on ABC's *The Practice*—until recently, he kept his hand in producing records for the likes of virtuoso guitarist Buckethead. Lately, he's making changes in direction.

"Big-album budgets, except for really major artists, have gone away," he states. "And the mid-level record has all but vanished. Since my experiences with labels in the past were often negative, I don't think it's all that much of a loss. I really believe that with the importance of visuals growing, it doesn't make much sense to work on anything that doesn't include them."

As far as working style, Scaturro continues, " My studio has definitely shrunk and my job description has changed. In the past, I didn't have to do so much engineering; I'd leave that job to someone else. Now, I do everything from making backups to labeling tapes—it's become a one-man show. With budgets reduced, it's much more profitable if I don't have to hire other people."

Scaturro's studio used to include a big live room and client amenities, but, because he's using fewer musicians and taking advantage of FTP uploading for project review and approval, those things are no longer necessary. "I have fewer and fewer people coming down to the studio," he asserts. "I used to have a big live room and a pretty big control room. Now, I'm going to basically just occupy half of the building. In constructing my new studio, I'm not really thinking about the clients, who were my first concern in the past!"

Another change Scaturro sees is in people's expectations of how projects can change. "In the past, when you cut tracks in a more traditional studio, there was the big recording date," he says. "Producers would come down to the session, and there was a sense of that day being important and that you weren't going to change things too much after the fact. Psychologically, it was a different way of looking at things. Now, everything is—supposedly—easy to change."

LOCATION, LOCATION, LOCATION

Of course, plenty of people are still recording bands in studios. In musician/producer Dave Fridmann's case, the bands often make the trek to Tarbox Road, the residential upstate New York facility he co-owns with his wife Mary and experimental pop rockers the Flaming Lips.

Fridmann, in addition to his production work with bands such as Café Tacuba, The Delgados and Sparklehorse, has been a longtime collaborator

Matt Wallace

Chuck Ainlay (left) with Mark Knopfler

Dave Fridmann

with both the Lips and the legendary Mercury Rev. Tarbox came about, back in 1997, when he wearied of leaving home and family to go to work. "By the early '90s, it had become pretty much up to me to decide where to record most of the projects," he recalls. "There was no place within 150 miles of here with facilities that were adequate for what I needed, so I'd just find the best, cheapest studio I could and go there. It became obvious that I was bringing those places 'x' amount of business per year, and that I could build and make payments on a studio for less. Ultimately, it was a matter of convenience and quality of life. We don't really make money with the studio, but it is self-sufficient."

Fridmann made a conscious decision to separate home and studio—by 10 miles. "I used to work at a studio where the owner lived across the street," he says with a laugh. "I'd call him at 3 a.m. when I couldn't find a mic, and he'd come over and help me out. Now I realize how inappropriate that was, but I also know people would do to that to me if I lived across the street!"

Those who use residential studios often tout the camaraderie created during the recording process. Fridmann agrees that the "cloistered environment" can foster creativity. "In a place that doesn't have a 9-to-5 mentality," he observes, "musicians can be really relaxed. At the same time, they can really concentrate."

No 9-to-5 can mean 24/7. Fridmann tries to keep to a 12-hour day, and encourages bandmembers to work on their own if they want to go longer. "Most musicians know Pro Tools now. Since it's nondestructive, I'll save what I have, make a backup, set up the mics and let them go ahead. It can be good for them to feel no distance between themselves and the music and to spend all night if they want. A lot of musicians do their best work between 2 and 4 a.m.!"

On the occasions Fridmann leaves his hometown to work, he looks for studios with a lot of gear options and a lot of space. "I want it to be an experience where everybody can spread out and be comfortable, and where the room sounds good. A lot of the great rooms got eliminated. But to me, it's really the only point of going to a big studio anymore."

When he's not at Tarbox, which is equipped with an Otari Concept desk, Fridmann tends to choose 80 Series Neve consoles for mixing. But, due to the ubiquitousness of quality outboard preamps, he asserts that the actual recording console, at least for tracking, isn't of huge consequence anymore. "You end up bringing in your own modules and creating a hybrid recording setup that couldn't possibly exist. The console itself is just the playback conduit. With Pro Tools, if you have a decent mic and a Neve module, you can record a lot of your material anywhere.

"What I see for the future," he predicts, "is the artist continuing to gain control of the recording process. With a Pro Tools Mbox or Digi 002, you can do a very good product in your home. You can track drums and mix in a big studio, and overdub at home until you're blue in the face with a good mic and preamp. As a producer, there's a trust issue to having clients do that, but we'll talk about it at length. A lot of times, I'll literally set up the recording chain at my studio, write down all the parameters and send them home with it.

"I guess, to some degree I saw the writing on the wall with the movement toward residential and other alternative studios. Bands typically seem to like coming out here and being away from distractions. At first, the labels had some concern that we were so far away from them, but over time, I've built up enough trust with them; we've quelled their fears."

MAKING IT WORK

Matt Wallace is another musician/producer who's made quality-of-life changes in his working style. Well-respected for a Platinum

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track record that includes Faith No More, The Replacements, Blues Traveler and Train, among many others, Wallace is currently riding high with Maroon 5's *Songs About Jane*, which, on the week we spoke, was Number 7 on the *Billboard* Hot 200.

Although some years ago he foreswore studio ownership, Wallace has come around again; currently, he maintains a personal studio at the Sound City complex in Van Nuys, Calif.

Wallace has worked with budgets both large and small. A couple of years ago, the decision to sign on for a spate of indie records gave him a leg up on dealing with the challenges that are now prevalent in getting records made. "The saving grace has been putting together my own studio," he says. "Six years ago, I had one in the Ocean Way complex. I loved the vibe and the creative aspects of having a place set up and ready to go, but I didn't like having to run a facility. Ultimately, I sold off most of the gear and went back to working in commercial studios."

Wallace's manager, Frank McDonough, persuaded him to try again by emphasizing the benefits: Money spent at outside studios could be reapportioned to the project as a whole, helping to alleviate the time pressure demanded by today's lower budgets. "When I had the studio before, we opened it up to outside clients, leading to a lot more complication," Wallace explains. "The only time my current studio works is if I'm there or if I let friends use it. I've set up my gear in what was a rehearsal space, so it's sort of like a giant living room. The lack of pressure is the best thing: If a band is having a bad day, they can go home and try again tomorrow. Also, I can try to go home for a couple of hours every night for the kids' bath and bedtime. It means more driving, but too many people in this business only see their kids on Sundays. That doesn't work for me."

For recent projects, Wallace tracked at other studios, including Sound City and Burbank, Calif.'s Third Stone, citing large live rooms with vintage consoles, iso booths and good headphone systems as the draw.

A recording tactic Wallace now employs, for reasons of both creativity and efficiency, is making sure that at least two people at any given time are working. "I did a project a while back where we always had three Pro Tools rigs set up, so we could be doing vocals, guitars and cleanups all at once," he comments. "It was great for the budget, and it was also much more exciting. I hate it when the singer's singing and the rest of the band is twiddling their thumbs, watching the producer or engineer in front of the Pro Tools screen. This way, there's a lot more excitement and enthusiasm.

"I rely on Pro Tools, like any other producer," he continues. "But a lot of the fun has been missing since it took over. These days, I always try to get the vibe of a bunch of musicians in a room doing their thing, playing off of each other and having moments of brilliance. That's what I'm looking for."

THE BEST OF ALL WORLDS

Nashville-based producer/engineer Chuck Ainlay has, for many years, collaborated with singer/songwriter/guitarist Mark Knopfler on Knopfler's recording projects. For the latest, they recorded at a number of different places, including the residential Shangri La Studios in Malibu, Calif., BackStage Studios in Nashville (in which Ainlay is a partner) and Knopfler's home setup in England. Final mixing was also scheduled to be done in England, the debut project at Knopfler's elaborate new multiroom facility in London, which, when we spoke, was nearing completion.

With a budget that allows for a wide range of choices, how do you decide where

to work? "The sound of the room is always very important to me," says Ainlay. "For this project in particular, we didn't want to overdub lots of instruments to make it sound full and complete. We wanted the room sound to help fill in the spaces in the music. One of the reasons we chose Shangri La was its sonic space; the sound of the recording room was perfect for what we were doing. We put most of the musicians in the same room and went for leakage, trying to get the ambience recorded on everybody as much as possible.

"Also," he continues, "although I do carry a lot of equipment with me, the microphones and outboard available at a studio matter a lot to me. Some of the songs we're doing had a '60s and '70s-ish vibe. Shangri La is a vintage kind of place with an old API console, lots of great old outboard and an immaculate collection of classic ribbon and tube mics. I used Shangri La's console for certain things, but in general, rather than relying on a big board, I like to create a signal path for each mic that gives me the particular sound I want. The console is mostly a monitor playback desk."

Ainlay suggests that the relaxed ambience of the Malibu studio affected the music; the on-site living accommodations were also a plus. "We wanted a place where everybody could have their own space, but also hang out and feel like we were a group," he comments. "It definitely helped with the energy of the record to be in such a beautiful place. There were a lot of remarks about how it didn't feel like we were working, and I think that's part of the reason we ended up getting so many first takes. The ambience drew out some wonderful performances."

With basic tracks complete, a stop was made in Nashville to add parts by local musicians. Then it was off to work at Knopfler's London home workspace, which he and Ainlay both admit isn't really a studio, just "a living room and bedroom where we do guitar and vocal overdubs and comps."

Knopfler's new facility, on the other hand, is indeed state-of-the-art for both new and vintage equipment. The Neve 88R studio, with iso rooms, variable acoustics and a tracking space large enough to house a large orchestra, is also equipped with Beatles-era EMI consoles. "I always wanted a space where a band could play in the room together. All of my favorite recordings are done like that," says Knopfler.

The B room features an API desk. Both rooms, built with full-range 5.1 monitoring, also have dual Studer A800 analog 16/24-track recorders, and Pro Tools and Nuendo systems. Wait a minute—isn't building a studio like this flying in the face of all the other trends we've been discussing here? "I'm always miles behind everybody else," Knopfler says with a laugh. "Anybody with any sense is closing their studio, and I'm just building one."

Well, so much for trend analysis. What's it all mean? These days, one size fits all doesn't. Projects are being tailored to suit the budget, the desired sound for the music and the band's personality. Whatever the budget level, producers want the best they can afford from both old and new technology. Custom setups have, in large part, taken over, with the individual signal path most important in recording. There's a desire for recording environments that feel relaxed, but are, in reality, highly productive.

It's not about the latest and the greatest anymore, it's about what really works and what will deliver the best results for the money. Each project takes more thought to work out what its individual requirements are and where the budget is best spent. There's still a strong need for good-sounding live recording spaces and proper control rooms for mixing, albeit at the right price. And contrary to how it may sometimes seem, there's still a need, perhaps more than ever, for skilled and experienced engineers and producers who know how to maximize a budget and get the job done. ■

Maureen Droney is Mix's Los Angeles editor.

DAWs and Hybrid Mixing

NEW PRODUCTION

Alert: The following may alter or validate your views on audio production—or even make you mad.

Let's start with a basic fact: Like any product-maker, DAW manufacturers want your dollars. Emagic, Digidesign, Steinberg, MOTU, Cakewalk, BIAS and others regularly duke it out, raising the bar for each other in the process. The hope is to entice new users and keep old ones. Philosophies vary from product to product, but apart from the basic approach, they all offer—some insist—that you can stay "inside the box" throughout your mixing project.

For many users, this makes perfect sense. The dizzying pace of software and operating system upgrades, the ever-increasing speed of processors, the variety of plug-ins and application's ease of use make all-in-computer–based mixing a more valid way to work than ever before. Professional projects ranging from band demos to Hollywood feature films are all being produced entirely in the box. Although many do choose this route, there are also a lot of engineers who opt to take a more cross-bred approach to mixing and production. The people we spoke to for this article have adopted this hybrid approach.

In our discussions about hybrid styles, a common thread encountered echoes the sentiments heard from other engineers and *Mix* readers and on audio Web forums—not everyone agrees with manufacturer's claims. Despite what a white paper, spec sheet or an ad may say, a user's experience in reference to track counts, the sound of the mix bus, the ability to easily get around the interface, latency and other DSP issues differs—sometimes greatly—from the company line.

Those interviewed here have a variety of high-end production tools, both analog and digital, at their disposal and have based their gear choices on listening tests, personal preferences and work styles developed over long careers. Of course, they all take advantage of the DAW's strong suits: editing, processing and accurate level manipulation of audio. But *where* the DAW fits in the chain varies from person to person and for differing reasons, ranging from "I think it sounds better this way" to objecting to a company's basic design philosophy. No matter what the opinion, it all makes for an interesting read.

Five Engineers, Five Approaches

STAYING IN THE BOX

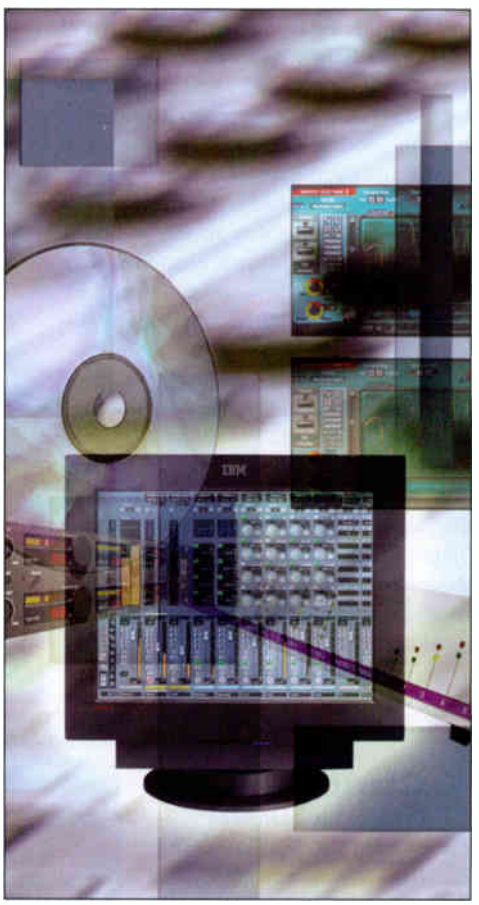
Erik Zobler has worked as George Duke's engineer since the early '80s. Most recently, he has mixed for Everette Harp, Britney Spears and the group Impromp2. On many Duke projects through the years, Zobler has worked with a combination of linear and nonlinear digital recorders with various consoles. However, when working with other clients, Zobler relies almost entirely on his own Pro Tools rig.

Zobler runs a six-card Pro Tools|HD system using a custom-made expansion chassis from Chris Papastephanou at ChrisMix. The expander has four slots for SCSI drives and seven PCI slots. For his setup, Zobler needed to jump between old and new Mac operating systems with minimal headaches. To accomplish this, he uses two internal drives running off an ATTO card: one carrying OS 9 and the other OS X. In addition to his single 192 I/O, which he prefers to clock using an Apogee Big Ben, Zobler employs Lavry Engineering 44/96 Blue converters. All of this runs off a Mac 733MHz G4 with 1 Gigabyte of RAM.

Track counts have not been a problem for Zobler, as he often goes well over 96 without a hiccup. And though he owns analog gear from Manley, GML, Neve and more, for the most part, he stays inside the box, citing convenience as the motivator.

While working with Pro Tools, Zobler has performed many listening tests, one of the most interesting occurring when mixing a record for jazz guitarist Doc Powell. He took three mixes to mastering: one printed internally to Pro Tools, the second sent out via the AES digital outs of his 192 I/O to a Masterlink and the third through the Lavry converters to an ATR-102 half-inch 2-track. After a blind playback of the mixes for three engineers, including mastering engineer Stephen Marcussen, they all chose the internally printed mixes. "They all sounded good, but my mixes sounded more like my mixes coming back over Pro Tools," Zobler says.

Although he relies heavily on "the box" when mixing, he still feels that there's room for improvement. "I just wish the summing sounded better. While I think that HD summing has improved dramatically over the previous version, it's still not good enough."



ANALOG/DIGITAL FUSION

Engineer Chuck Ainlay uses a combination of technologies in his production style, holding on to his analog past and combining it with Nuendo. We caught up with him in London, where he was working on an upcoming release for Mark Knopfler. The project was tracked to twin 16-track Studers and then transferred to Nuendo at 96k for comping and overdubs. Ainlay believes that given their druthers, most engineers who have used analog in the past would use a combined approach similar to his. "It's different for the kids who don't know any better," Ainlay says. "They will just make it sound good and will never miss the air and sweetness of analog tape processing and summing."

That said, Ainlay doesn't think "vintage" when it comes to computers. His rig comprises a hot-rodded PC built by Racksaver that uses dual AMD Opteron 64-bit processors, 4 Gigs of RAM, a built-in 800-Gig SATA raided drive and a Studio Network Solutions fiber drive. I/O is provided by 24 channels of Mytek converters, 24 channels of Steinberg converters and three Lynx AES 16 cards. A Lucid SSG 192 acts as the master clock.

Ainlay relies on Nuendo for editing, sequencing and even some mixing. "My track counts generally exceed the 48-track output capabilities of my machine, so some mixing is done internally," he says. "Also, there are times when it's more relevant to use the automation in Nuendo rather than on the console. This way, I can get more precise or use it to automate pans, especially when doing surround." Ainlay processes a lot of overall gain changes in Nuendo, keeping the console automation tasks relatively simple. He sometimes prefers this method to riding faders, which makes it hard to resist making a lot of moves. He finds that processing gain changes in the box preserves the artist's original intent.

Ainlay uses a combination of analog and digital processing, relying on plug-ins such as Wavemachine Labs' Drumagog, Antares Auto-Tune and other titles from Steinberg and Waves. He also uses a Mackie UAD-1 card to access Universal Audio's DreamVerb and Fairchild compressor plug-ins. With his rig, DSP overhead is not a problem. "I was trying to get it into trouble recently by piling on plug-ins while mixing a couple of albums at 48k," Ainlay says. "I couldn't get the VST processor meter to 30 percent."

INCORPORATING OUTSIDE GEAR

Three-time Grammy nominee David Rideau is a Pro Tools power user who has worked with the popular DAW in numerous ways, the common theme being using a variety of analog outboard gear. His system comprises an HD3 system, two 192 I/O interfaces with analog output expansion cards and twin Glyph SCSI drives, all running on an 800MHz G4 with 1.25 Gigs of RAM.

DAWs and Hybrid Mixing

For his mix signal chain, Rideau chooses not to use Pro Tools' panning and summing unless necessary. Instead, he runs 16 analog outputs of his 192 I/O directly into the Dangerous Music 2-Bus, and then stereo out of the 2-Bus into a Waves L2 hardware processor, a Tube-Tech SMC 2A and, lastly, into an Alesis MasterLink. "I'm using the SMC 2A as a compressor and to hold the tone of the song," says Rideau. "It tightens everything up overall and makes it sound more open."

On individual outputs, Rideau uses various compressors to get what he calls his "meat-and-potato" tracks (kick, snare, overheads and percussion) out of the box and into the 2-Bus. For instance, his 192 I/O output 1 always carries the kick drum sent through a dbx 165A compressor into the 2-Bus. Output 2 is the snare, traveling through another 165A, and outputs 3 and 4 carry his overheads and stereo percussion through a Studio Electronics C2s compressor on the way to the summing box. Other important mix elements, such as the lead vocal, bass and other lead instruments, ride on their own output directly to the 2-Bus.

Rideau also relies on a few outside reverbs for various duties. He uses the digital outputs of his 192 I/O to get in and out of a TC Electronic System 6000 and a Lexicon PCM70 for other time-based tasks. His battery of plug-ins includes the Waves Diamond Bundle and IR-1 reverb, Massenburg MDW EQ, various Sony plug-ins and the McDSP filter bank.

Although Rideau often works without a large-format console, he would almost always prefer to mix using one. However, he finds the large-console room vs. the engineer-owned Pro Tools suite to be a trade-off: What you gain in studio toys, you lose in time. "There's nothing like being able to ride each band of EQ all the way through a lead vocal," says Rideau. "But you simply don't have the time to do that in the studio."

DAWS IN POST

Re-recording mixer John Ross has been an early adopter and creator of many computer-based audio innovations. He's mixed both inside and outside the box and is always experimenting and improving his production workflow. Ross was first attracted to Pro Tools instead of the Synclavier and Fairlight platforms because of what he calls its comparatively "nonmonolithic" nature. Ross has been a Pro Tools user for years (working five HD rigs), using it most recently to mix the film *The Butterfly Effect*, which was mixed entirely inside the box.

Over time, however, Ross became fascinated with Nuendo, ASIO and VST because of their more open architecture. According to Ross, "In the beginning, we used Pro Tools because it let us design our own formats, use as many monitors as we liked and create networks. Today, the Nuendo system is more along the lines of the nonmonolithic system because of the use of host-based processing, which has become very powerful."

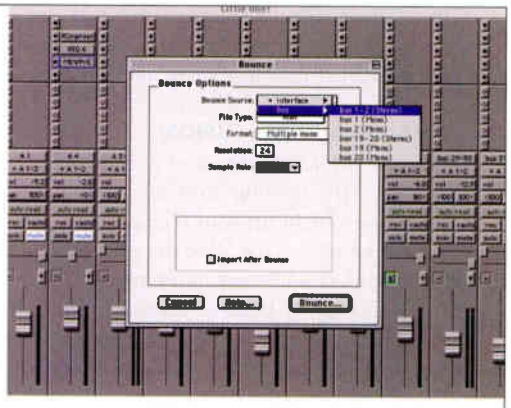
Ross just finished mixing *De-Lovely*, a Cole Porter biopic, using three Nuendo systems linked through MADI to a Euphonix System 5 console. He likes using the System 5 because it's easy to have a large physical system that is designed to interface with a lot of inputs and from which you can run automation.

The Nuendo systems used for the *De-Lovely* dub mix used three dual-processor Athlon machines: one for dialog, one for effects and the third for Foley and backgrounds. Each machine had 1 Gig of RAM, two 73-Gig SCSI 320 drives, Gigabit Ethernet hooked up to a Gigabit Ethernet router inside the rack and MADI cards for digital I/O. A separate Athlon computer was used for DV video playback and other systems on the stage for editorial—all hooked up through the same hub.

Although Ross lauded Nuendo for its mixing and processing power, to him, the networking capability was even more important. For example, editors could build elements on the fly as the session was

Erik Zobler

Better-Sounding Bounces to Disk



In listening tests, Erik Zobler has discovered that when bouncing to disk in Pro Tools, his mixes sound better when coming through buses rather than through the interface. To make this easier, he duplicates the outputs of the individual tracks in his session to two outputs of his interface that go directly to his speakers, and then to a pair of buses. To mult the outs, first choose your regular stereo pair of interface outputs from the channel's output selector. Then, holding the Control key, choose a second pair of output buses. (The Option key will force the output choices across all channels.) Both pairs are now active (denoted by the "+" sign before the name on each channel's output window). When you bounce to disk, choose the buses as the source.

Chuck Ainlay

Comping Inside Nuendo

By using Nuendo's Events Editor, Chuck Ainlay can quickly edit multiple takes and create a comp track. First, he records numerous passes on the same track and then uses the Object tool to select all of the tracks. Then, he pulls down the Audio menu and selects Events to Part to create the Events track. Double-clicking the track opens the Audio Parts Editor, placing all of the takes in different lanes, with the last take at the bottom. The tracks can then be edited in sections and listened to using the Mute tool. Once the best bits are found, he drags them down to the comp track, which always plays, ignoring the tracks above. If the comp doesn't feel right, it's easy to audition alternatives and drag them down for an update.

IR-1 Convolution Reverb

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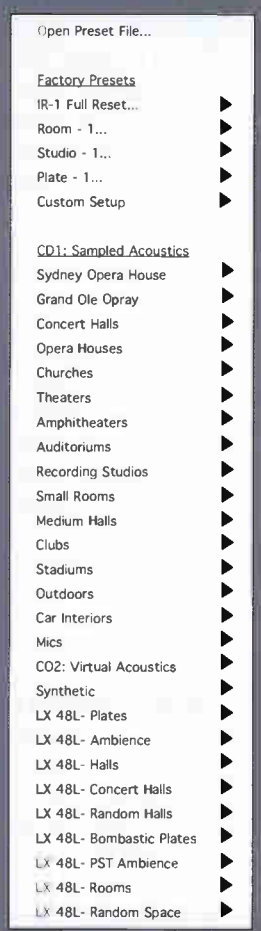

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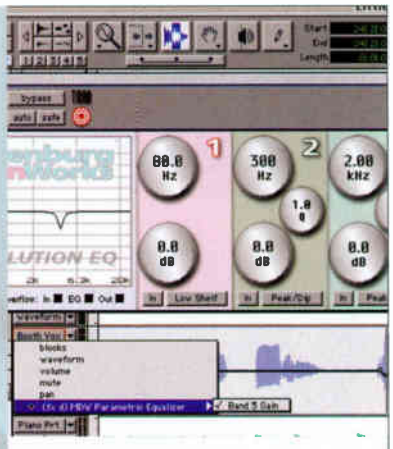
rolling, and then with Nuendo's built-in networking protocol, they could sync the stage playback and editorial systems and port the elements directly to the System 5's mix position in real time through MADI.

For offline processing, Ross used various VST and Nuendo plug-ins because he could commit them to the sounds. The System 5 was used more for global sweetening. For example, because the film was shot in the UK, there was a lot of 50Hz-based hum to deal with. Ross used Elemental Audio's Eqium plug-in to notch out the fundamental and any offending harmonics. Ross also used Firium to match ambience for ADR. (See his power tip on page 41.)

As for track counts, Ross finds Nuendo a stellar performer. (He claims that predubs and playbacks from *De-Lovely* would have choked other workstations he's used.) Of course, track count is system-dependent, but Ross' point is, with nonmonolithic systems, the user decides how big the track count needs to be and how much money and effort they want to put into making that system.



David Rideau

Offline De-Essing

Engineer David Rideau uses Pro Tools' volume editor and a Massenburg MDW EQ to do offline de-essing. First, he views the waveform on the Edit screen in Volume mode and finds an offending "ess" in the track. Next, he precisely dips the volume by inserting a "v" over the sibilant area. If this isn't enough reduction, he'll then automate the gain on a band of the MDW, choose the frequency and Q that best reduces the sibilance, and while viewing MDWs gain over the waveform, dip the frequency momentarily by creating a "v" over the sibilance.

For Ross, it's a matter of being able to keep up with the technology. Even though his systems are only seven months old, processor technology has already improved significantly. "By leaving the world of dedicated DSP, you can straddle Moore's Law more effectively," says Ross. "The performance that we're getting from the people that are building systems for other purposes is fantastic. We're just along for the ride. Their resources [for R&D] go into the hundreds of millions a year, whereas the resources for the dedicated DSP companies is nowhere near that."

MIXING LOGICALLY

Engineer/musician Robert Brock, who wrote the Apple Pro Training Series book *Logic 6: Professional Music Creation and Audio Production*, splits his time and tasks between Logic and Pro Tools. Brock's rigs vary from a G4 laptop up to a 1.25GHz G4, and he generally gives Pro Tools the nod for final mixdown duties. The reason he works this way is because of basic design philosophy. "Logic, DP and Cakewalk all grew up as musicians' tools focusing on the sequencing side," says Brock, "whereas Pro Tools was designed by and for engineers." Although

Brock will do some mixing and even tracking in Logic, he finds some basic features lacking for his needs. For instance, when you create a stereo track in Pro Tools, you get two panners: one for each channel. In Logic, you only get a single balance control when working in stereo. Another of Brock's Logic peeves is the way it addresses busing for headphones. "Pro Tools is a much more intuitive interface," he says.

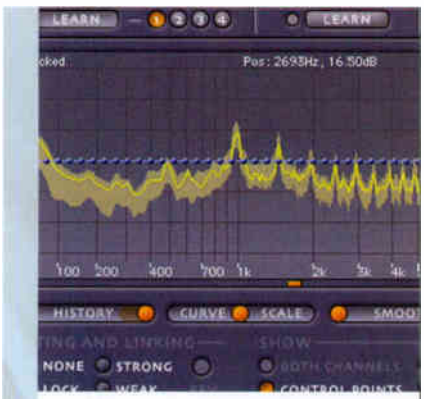
According to Brock, Logic shines in getting ideas together as a writer and/or arranger, including premixing. When mixing in Logic, he uses many of its unique features and plug-ins; for instance, Logic allows him to display numerous automation parameters on the screen for the same track. This also includes plug-in parameters. Brock also likes the included list of plug-ins that comes with the new Logic Pro package, which includes Emagic's convolution reverb, Space Designer. "Space Designer is an excellent reverb, and I think that Logic's channel EQ is the best-sounding I've heard from any DAW," he says.

Brock's work method is to first start a track in Logic and do whatever EQ'ing and processing he wants to get the basic tracks together. After that, he'll use Logic's Freeze function to port them over to Pro Tools. Freeze lets you render a track with its plug-ins as an audio file to save DSP, or to take them to another application, much like Bouncing to Disc in Pro Tools. As to how Logic handles track counts and DSP allocation, Brock has some strong feelings. "Basically, with a 64-bit optimized version of Logic and a dual-processor G5, it's simply awesome," he says. (For more on Logic and the G5, see "Taking the G5 Live" in the February 2004 issue of *Mix*.)

CONCLUSION

The "art" of audio production has never been more emphasized. Engineers choose their colors and styles in the form of recording formats, platforms, sample rates and software. The one conclusion that you can draw from these opinions, styles and mixing techniques is that there is no single solution in audio production. A computer is a tool and just because you *can* use it to do every task doesn't mean you have to. As for the varying means of production—*vive la difference.* ■

Kevin Becka is Mix*'s technical editor.*



John Ross

Matching Set Ambience for ADR

Using Nuendo's built-in sampling reverb and Elemental Audio's Firium plug-in, re-recording mixer John Ross is able to very accurately match and apply ambience and EQ curves from the movie set to ADR tracks.

First, Ross uses Nuendo's built-in sampling reverb to capture some of the ambience created from the clapper used on the set. Then, he brings in Firium's spectrum matching feature to "learn" the harmonic content of his sampled source track. Ross then saves the "learned" EQ curve as a preset and applies it to the ADR track with the sampled reverb created from the clapper. The outcome? Very believable ADR tracks.

The Console-Workstation Interface

NEW PRODUCTION

Is the All-In-One Workspace on The Horizon?

As mixers, our dream is an all-in-one system that allows complete bi-directional control of workstation and console functions in real time. And we know mixing console functions can be achieved within a workstation, but most workstations lack an assignable control surface for mixing. It's not surprising when you remember that workstations and mixers do not share a common heredity. Digital audio workstations (DAWs) evolved from tape- and then disk-based recorders, while mixers have grown in complexity and operational depth as audio production became increasingly complex. And because the underlying technologies are radically different, it's no surprise that there are few, if any, manufacturers offering both types of products.

However, there are several ways in which a DAW's Mix Engine can be controlled while adjusting channel levels, routing, pan, EQ, dynamics and other parameters. The easiest way is to route playback outputs at a fixed level to an external analog/digital mixer and then control the parameters there. Problem: We now have two sets of functions to deal with: the workstation's track assignments, built-in static processing and plug-in values, plus the conventional mix/EQ/dynamics automation data from the console.

The second technique might be to develop a MIDI-based external controller that issues commands to the workstation via standardized commands running at MIDI's relatively slow data rate. But we still need to deal with the MIDI commands and the DAW settings for full recall and reset. A good example of this approach is Yamaha's DM2000 Assignable Digital Console. As Marc Lopez, DM2000 product manager, explains, "With the strong trend in using a DAW for recording and mixing, most engineers feel they still need tactile control to improve the computer-centric workflow of a DAW. The DM2000 integrates tightly with [DAWs] to create a complete production and mixing environment." External DAW control is via multiport USB I/O, using a single MIDI port per bank of eight channel faders. (Yamaha's 02R96, DM1000 and 01V96 also support these protocols.)

"Extensive support for Digidesign's Pro Tools provides full control of mixing and processing, as well as transport/track-arming control and access to editing functions directly from the DM2000," Lopez continues. "Advanced support for Steinberg's Nuendo DAW is also under development." The Nuendo Virtual Channel Strip, available in the DM2000 Version 2 software's Advanced DAW Support feature, enables users to control Nuendo and Cubase EQ, stereo and surround panning, and aux sends from the DM2000's Virtual Channel strip. These are controllable functions that vary depending on the DAW software being used. Version 2 also offers surround panner control for Pro Tools.

And let's not overlook Loud Technologies, whose Mackie Control, HUI and Baby HUI systems provide MIDI-based control of a number of popular DAWs, including MOTU Digital Performer, Steinberg Nuendo and Cubase, Soundscape (via Mixpander), Digidesign Pro Tools and PT LE, Cakewalk Sonar, Emagic Logic, Magix Samplitude and Sequoia 7, Adobe Audition and RML Labs SAWStudio. (The firm's dXb and older d8b Digital Production Consoles also feature Control and HUI modes to control Pro Tools, Logic and many other DAWs.)

The new Tascam US-2400 Control Surface is also pre-mapped for any DAW software that supports HUI or Mackie Control protocols. The unit features 24 touch-sensitive moving faders, rotary encoders with LEDs (remappable as 4-band EQ sections, for example) and a joystick controller. Bank switching enables access to 192 DAW channels. A transport section features a jog/shuttle wheel.

DAW COMMAND PROTOCOLS

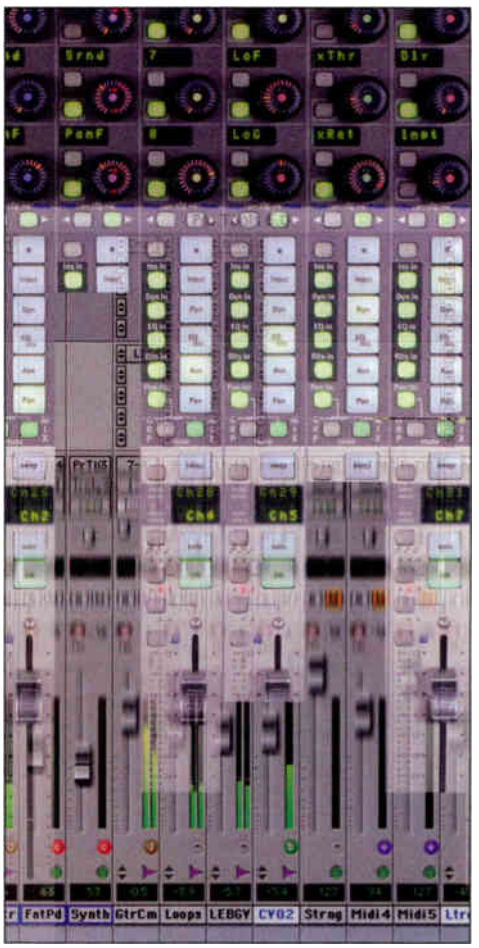
The third scenario would be to develop a dedicated set of commands that a DAW could recognize; arrange for them to be sent at a sufficiently rapid rate so that we can develop medium- and large-format console topologies; and store all of the frame-accurate settings within the DAW. Instant recall of every parameter is now possible, along with the availability of familiar designs of control surfaces. A number of manufacturers, including Euphonix and Fairlight,

are developing such capabilities and their motivation is pretty obvious: Euphonix, like other makers of large-format digital consoles, has obviously seen the writing on the wall—Big is Expensive. A great deal more functionality is now available from DAWs based on commodity processors, and the only serious drawback has been how to control all of this power.

Euphonix's EuCon object-oriented Command Protocol allows a mixing console to control third-party DAWs, special-purpose DSP hardware and software plug-ins. "Existing command-based interfaces were not up to the task," says Martin Kloiber, Euphonix executive VP of technology, "because they were either too rigidly limited in their format or put too much programming burden on the developer, or both.

"An object-oriented interface is a good choice because mixing consoles and audio processors fit neatly into the object paradigm," Kloiber continues. "Channels, buses, faders, knobs, meters and such are all easily comprehended as discrete objects. Also, consoles typically have a hierarchical design that lends itself well to object modeling. For example, a console includes many replicated channels, each channel including a fader that has a level control slider, mute switch and so on."

EuCon is currently being used to control the Euphonix System 5 DSP Engine from the S5's (and post/broadcast variants) assignable control surfaces and within the new MC Intelligent Application Controller. "The [EuCon] architecture will allow several DAWs to be controlled from a System 5 for film-dubbing applications," offers Kloiber. "The operator will be able to bring each individual track from any of the DAWs up on the System 5 control surface, as well as handle all audio patching between systems." In addition to conventional fader, knob and switch commands, EuCon includes instructions for DAW plug-ins and other functions relevant to edit functions. A prototype of the MC Controller was shown at the New York AES Convention last fall; production versions are expected to be unveiled at the upcoming San Francisco Convention in October. "The MC is a DSP-less console," Kloiber emphasizes. "All of the control takes place inside the workstation. EuCon can also act as a hub to translate different protocols between different systems."



Euphonix is closely working with Steinberg and other DAW manufacturers to enable full MC control. At recent trade shows, Euphonix demonstrated work-in-progress with Nuendo and is in discussion with other DAW makers. "Our philosophy is to enable users to utilize the best class of products in an integrated environment," Kloiber stresses. "EuCon is 'DAW-agnostic'." MC provides high-speed control of not only EuCon-aware applications, such as Nuendo, but also any PC application via keystroke commands. The unit includes a 5.1 monitor section, twin trackballs, a QWERTY keyboard, eight programmable knobs, four moving faders and 56 programmable LCD SmartSwitches.

"In March [2004], we released an SDK [Software Developers Toolkit, a set of utilities that allows programmers to include high-level routines into existing software applications]," Kloiber concludes. "The SDK will reduce the time it takes for a DAW maker to add EuCon command to six to eight weeks using the MC Controller's physical controls. Programmers can use command sets already available [within the SDK] and

translate them to the specific DAW."

With a foot in both the digital control console and DAW camps, Fairlight has an inside track on connectivity, at least between its own products. Unveiled at last fall's AES Convention, the Dream Constellation large-format digital console now offers control of external workstations via the firm's RAPID Protocol Sharing Initiative. Dream Constellation is powered by Fairlight's QDC engine and a Binnacle control surface that supports up to 144 channels, 48 buses and 32 mono multitrack buses. According to Fairlight CEO John Lancken, "RAPID—Remote Application Program Interface for Dream—was developed [as] an open operating platform that enables automation, disk recording, editing, plug-ins, SFX, video and all other elements to be stored and controlled from a single control surface." Because RAPID is already implemented across the Dream product range, external PCs can be used as clients with Fairlight products. Video editing functions are also included.

Like EuCon, RAPID SDKs are now available from Fairlight. "Being a small API, compared to something like Windows, [RAPID] is generic and easy to implement," Lancken adds. "The SDK contains a document, sample code and information on how to use the API." Fairlight has also set up a Website that supports three levels of implementation: bronze, silver and gold. "Bronze-level implementation covers transport only," Lancken says, "while silver handles transport and mix functions, including dynamics. Gold includes the silver-level functionality, plus editing and automation. The forthcoming platinum level will handle all of that, plus plug-ins and video."

Unlike EuCon, RAPID isn't a control protocol. Instead, a dedicated PC gathers all of the various data that comprises a complete music or post project and allows the stored data to reproduce the same time-dependent environment. "This data will be DAW-specific, but once the software is implemented, a 'sniffer' program detects the nature of data being passed backward and forward and stores changes," Lancken continues. "Upon playback, RAPID simply re-creates the changes it detected during the original session." In this sense, RAPID is more like AAF than EuCon, for example, in that it monitors real-time changes in a project rather that the commands it follows on a communications channel.

LARGE-FORMAT DIGITAL CONSOLES

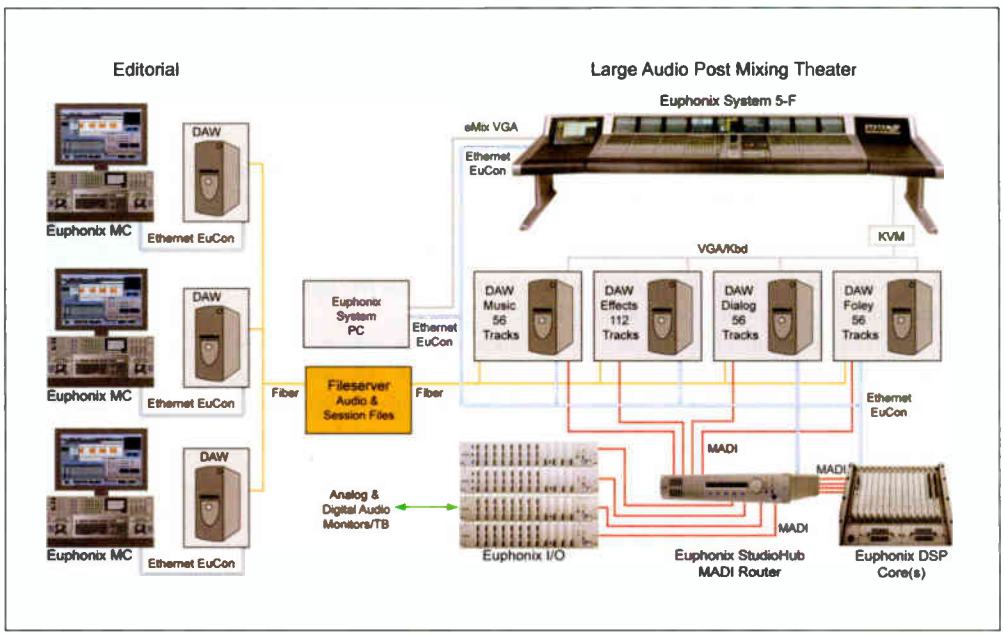
Across the Atlantic, a duo of UK-based console manufacturers has also given serious thought to workstation control from a central mix location. As Niall Feldman, Solid State Logic's director of product management, offers, "SSL has some history with developing integrated workstations and mixing consoles; products such as Scenaria and Omnimix pioneered this 'third generation' more than 10 years ago. Our experience in that development path was that one editing solution didn't fit all applications, and editing methods and platforms were a significant product development challenge in themselves.

"In both our XL 9000 and C200 consoles," Feldman continues, "there is control integration for DAW systems. In the C200, there is also the ability to control DAW processing/parameters from a central, assignable plasma display." A large-format digital console, Feldman reasons, "has more processing horsepower and can therefore process more complex algorithms on many channels simultaneously. The processing and performance aren't being compromised by the scale of what you're trying to do, which is sometimes the case in a complex DAW mix."

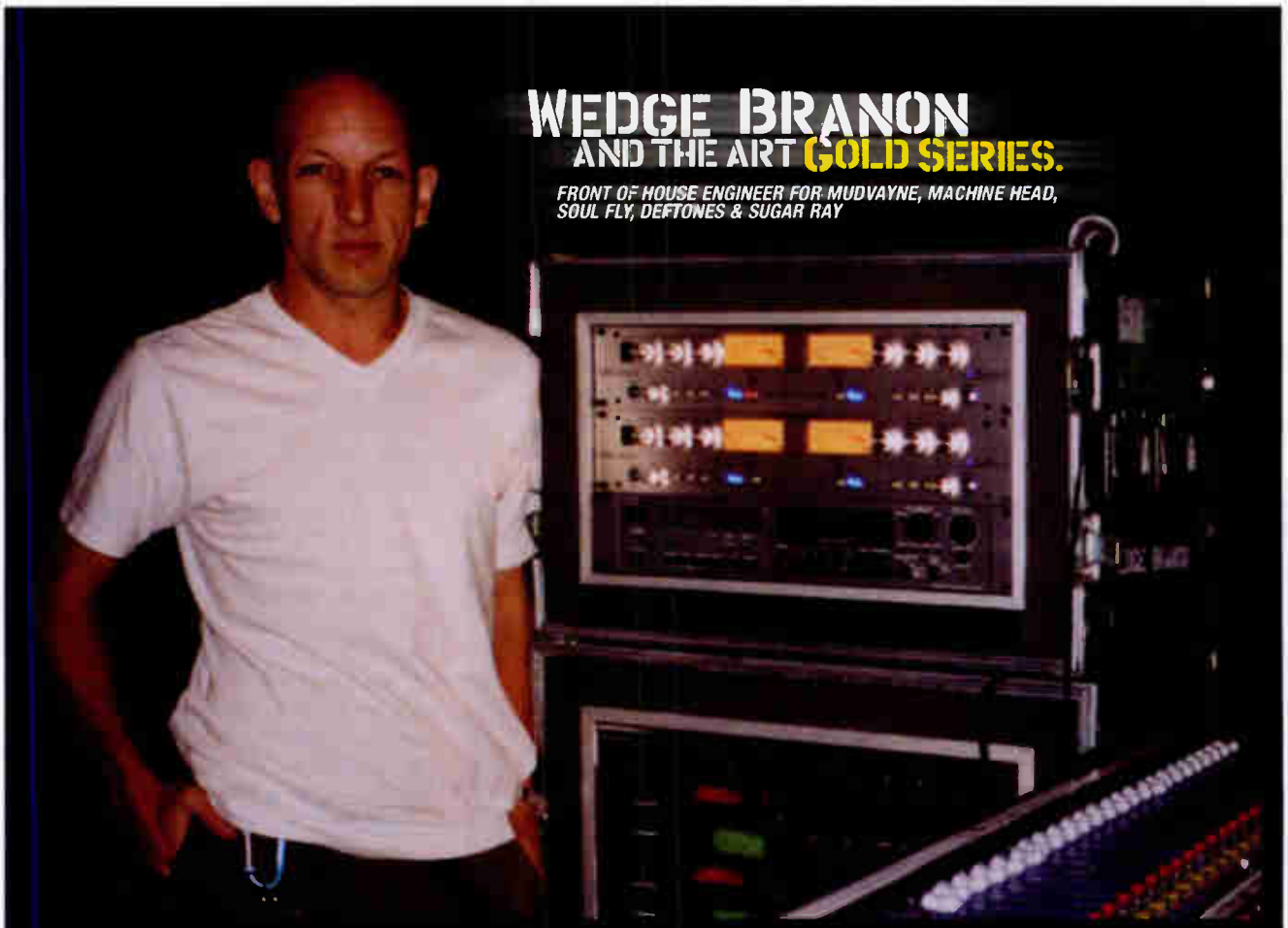
SSL currently supports MIDI, USB and RS422 serial data. "Our systems support other protocols such as Ethernet," Feldman adds, "and therefore, we have several development options. We try to use standardized protocols wherever possible, as this provides the greatest flexibility. At a professional level, Pro Tools is the predominant DAW we encounter, though we have many consoles that have integrated Fairlight control. Emagic Logic is also popular."

As Mike Reddick, AMS Neve's editorial products manager, points out, "From the early '90s, [we] recognized the importance of editor/mix integration. This was the thinking behind the Logic 1, the world's first integrated editorial workstation. Even back then, [the system featured an] integrated project format allowing audio, EDL, console configuration and automation to be stored together in one place."

At the NAB 2004 Convention, AMS Neve was scheduled to unveil the latest element in its integrated solution. Workflow is the firm's approach to post work as it flows through a facility via a StarNet network. "To this end," Reddick says, "the solution integrates editorial, mixing, DSP processes [plug-ins], control by and of third-party systems [via TCP/IP], networking, secure storage and nonlinear picture playback." Workflow and StarNet enable virtual object–oriented mixing, "allowing any element of the project to be changed at any stage, and for these changes to be visible and accessible at any other," Reddick concludes.



Euphonix's EuCon lets a console control third-party DAWs, DSP hardware and plug-ins.



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THE OTHER END OF THE TELESCOPE: DAW MANUFACTURERS

If digital console manufacturers are actively pursing the potential of controlling external workstations, then what of the DAW makers? For example, Steinberg continues to work with Euphonix to refine EuCon functionality. But, according to Martin Stahl, Steinberg's project coordinator for post-production, the firm offers MIDI- and USB-based external control of Nuendo from such devices as Yamaha DM2000 and 02R96 consoles, and has just released its own dedicated control surface. Developed with German company WK Audio, the USB-based ID Controller enables real-time control of more than 128 Nuendo playback channels. (The target is 340 channels, according to Stahl.) The ID control surface features 12 assignable faders and rotary controls, plus a separate editor section with jog wheel.

In terms of EuCon-based controllers, Steinberg senior product manager for pro audio, Lars Baumann, explains that Nuendo has basic connectivity available now, but that a public release is not planned before more functions are added. "Upcoming versions of Nuendo will offer a new feature set that we will open for control using our own protocol—and be compatible with EuCon—but will allow us to control our own destiny," he says. Currently under final development is a Hardware Controller SDK that will allow third-party vendors to develop suitable solutions. "We decided to develop our own protocol, as well as continuing to support EuCon and MIDI, simply because we don't want to [favor one manufacturer over another]," says Baumann. "We are currently adapting to many brands of hardware controllers, [but] would like to redirect this effort to the manufacturers and keep our focus on the software. With the SDK, we can develop a means of Nuendo control via Ethernet, FireWire, USB or any other I/O that maximizes Nuendo's user-friendliness."

SADiE has experience in DAW/console integration, having co-developed a system four years ago with Soundtracs. But the experience was not too thrilling, as managing director Joe Bull confesses. "Part of us won't go there again," he recalls. "Innovation can be [troublesome], because it is often difficult to get a mixer manufacturer to completely comprehend the intricacies of DAW technology. We had a great solution that responded very well, but then Soundtracs went off on its own."

Bull is quick to point out that current-generation DAWs offer powerful mixing functionality: "It's a matter of developing a means of controlling those capabilities," he rationalizes. "Mixing is a more linear function, and it takes focused design to appreciate the differences. Our R&D department is currently asking a number of pertinent questions, including 'What do users want the system to do?' 'What protocols are available?' We have looked at EuCon, but if we go down that route, what about rival manufacturers like SSL and AMS Neve? Are we painting ourselves into a corner?

"We have looked at integrating SADiE's workstations with large-scale consoles," Bull concedes, "but most customers want a choice of control surface for their chosen DAW. If we lock into one solution, we may compromise some features. And there may be situations where we sell a DAW system to a facility that is more familiar with a mixer that we don't support. Personally, I'd like to see the AES [organization] develop a standardized protocol between DAWs and assignable control surfaces.

"In reality, for smaller installations, we currently support MIDI control from Yamaha's DM2000 console or [Mackie] HUI Series. But what do customers need [in terms of mixing functions]? An SSL? A Euphonix?

Fairlight Dream console

Or maybe the [Sony] DMX-R100 or DM2000 [medium-format] console might represent a larger market? What does the 'average' facility or studio want? That is the *crucial* part of the equation. Is the market too small for bipartisan development? And music, broadcast and post are looking for different solutions."

Merging Technologies' sales and marketing manager Ken Barnsley also stresses the importance in considering current-generation DAWs as combination editor/mixers and not just editing stations. "Pyramix with Version 5.0 software has a 128-channel digital console with assignable buses, I/O aux sends, et cetera—a *real* live mixing desk, it just doesn't have any metal in front of it," he says. "We already support MIDI, UI and Yamaha protocols, but believe we must take this much further to a multifaceted and multilayered control, protocol-specific Pyramix."

The firm is currently developing an advanced protocol that will allow a digital console to control Pyramix and create additional layers of mix capability even to smaller digital console configurations. Barnsley foresees initial applications within film dubbing and is in active discussion with three major console manufacturers specifically for this application. Recently, Merging Technologies issued an SDK to the initial console makers involved in the project.

Pyramix can internally mix up to 128 channels and offers up to 128 outputs. "These can be configured as individual internal mix layers with discrete outputs to create single or multiple premix output layers," Barnsley says. "In effect, Pyramix can supply any number of discrete premix outputs from the same system or even multiple systems, which is usually the case. If the console has control over Pyramix's virtual mixer, I/O routing, processing functions and each mix layer, the premix process can be achieved from the console but without the need to destructively mix down."

The leading DAW manufacturer—in terms of installed systems—is Digidesign, which has developed a number of proprietary control surfaces for its Pro Tools Series, ranging from the entry-level LE Music Production System through Pro Control and Control|24 to the new D-Control Audio Worksurface. [See "Technology Spotlight," *Mix*, April 2004] "Control surface solutions complement rather than replace the Pro Tools software interface," says David Gibbons, Digidesign's marketing manager.

Stan Cotey, Digidesign's senior product manager for hardware, offers that over time, workstations' internal mixing capability has become an important addition. "Often, the amount of power available for mixing was in contention with the editing features, graphical user interface updates, OS overhead, et cetera," he says. "Digidesign's offering during this time used the same host computer for editing and automation, while offloading all of the intensive audio processing to a built-in, high-quality DSP hardware accelerator system. This allowed integration between audio and automation data, and the ability to save one session file that contained all of the automation data, audio edits, routing, system settings, et cetera."

Perhaps an intermediate generation can be thought of as involving data interchange between systems, Cotey considers, "allowing automation data from a console to be affected by the editing done on a DAW [and] also network interchange between two different DAWs. This led to the emergence of widely adopted interchange standards for groups of related files—like OMF and AAF—but didn't lead to a real-time control parameter standard other than MIDI." Cotey allows that new standards may emerge over time, possibly including EuCon.

"In most cases," Cotey concludes, "supporting these interactions comes at a great cost to the alternative feature development we would like to do within Pro Tools. When we choose not to support something, it's usually because the burden of maintaining the support is too great, considering the demands we are trying to meet from users for other features. It's sensible for us to wait to see if a new standard will be widely adopted before moving to support it."

Of course, Digidesign's new ICON eliminates the need for a separate analog or digital console because every Pro Tools function—including plug-ins—can be mapped

to faders, knobs or switches on the control surface via a high-speed Ethernet connection to the host Mix Engine. But there are no plans to make the connection protocol available to third-party developers. "Our protocol remains proprietary," Gibbons stresses. "It is simply a matter of available resources. Currently, we have a team of four in-house developers that support our plug-in program. If we tried to create and publish a control surface protocol, we would need an even larger team to provide technical support to OEMs. While we understand the market's needs, the amount of resources we'd need to provide would not be viable."

MIDI still provides an easy-to-implement control of Pro Tools functions from an external console or control surface, says Gibbons. "[MIDI] might not be the best solution [in terms of speed and depth of control functions], but it gets the job done. And it's an open standard that everybody understands!"

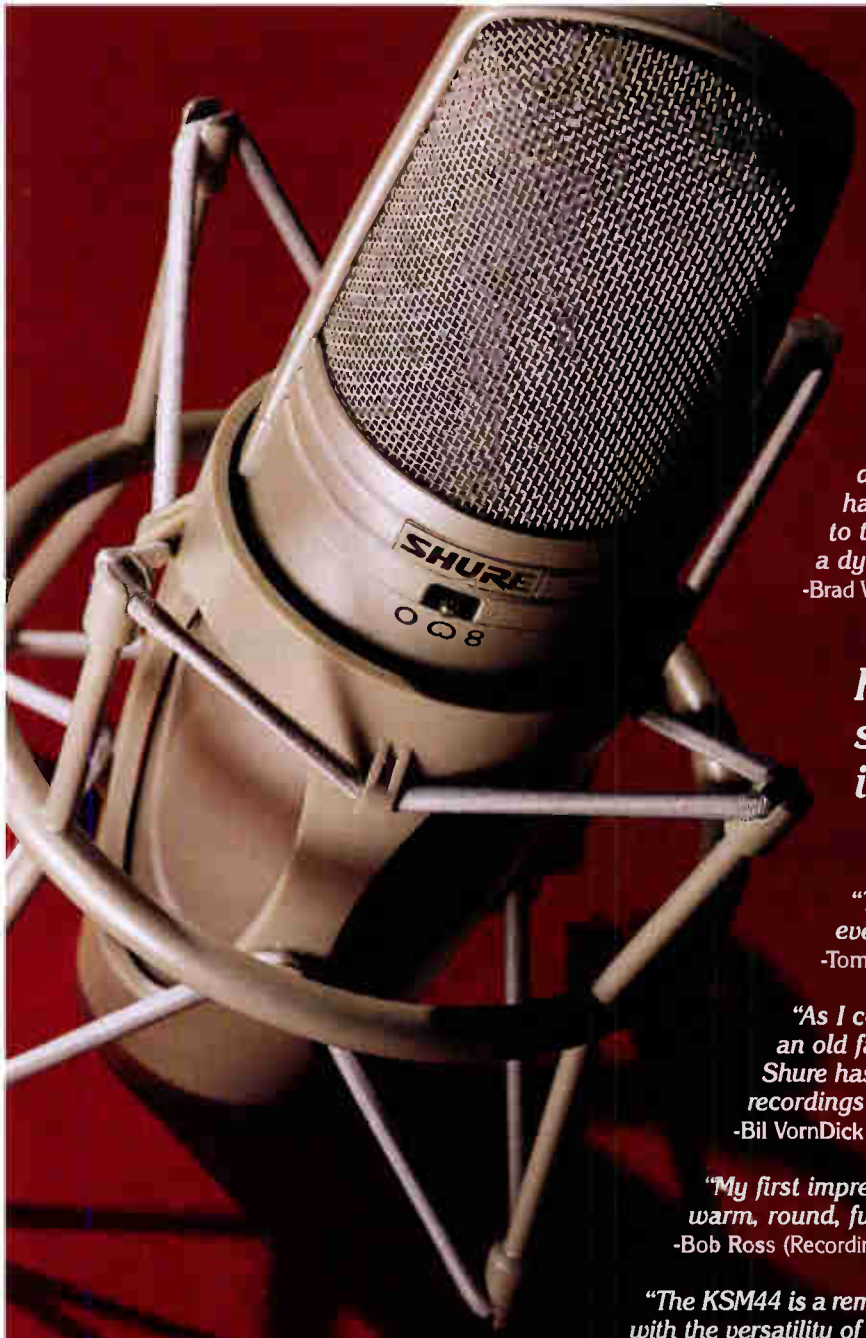
All of which makes sense. Digidesign is both burdened and blessed with its acknowledged success. A large installed user base means that control surface developers, including makers of large-format consoles, are eager to tap into an existing market. However, for Digidesign to spend the time and dollars to innovate or accommodate a new protocol that provides access to every element of its powerful mixing and processing engine makes miserable commercial sense. Great to play nice-guy, but are there better ways to make friends and influence their key customers? Yes, indeed.

Digidesign is not inattentive to the control surface paradigm—witness the new ICON and ongoing success of ProControl and Control|24. While ProControl and Control|24 may arguably lack all of the bells and whistles of offerings from SSL, AMS Neve or Euphonix, many music and post users are using them day to day. And several console manufacturers are actively considering protocol schemes like EuCon and RAPID, which can add a level of connectivity and system integration that is needed by the growing breed of audio engineers for whom the distinction between editing and mixing seems arcane and unacceptable.

A major unknown on the immediate landscape remains Apple Computer, a company that certainly possesses the resources to develop a fully integrated solution and one that will find immediate appeal to the project studio, sound editorial and musician user. Logic is a popular production tool and could benefit from an Apple-developed control interface. It remains to be seen whether Apple will consider this a viable proposition—and with sufficient ROI.

One thing is certain: While Apple remains pre-eminent at dominating its target markets, and is winning hearts and minds in the Windows community, Digidesign's business model is now based on a closed architecture that requires customers to purchase proprietary Digidesign hardware to run the firm's software. In contrast, Apple is offering standard software with an open plug-in architecture and an open hardware interface, a paradigm also supported by Steinberg and other DAW makers. All of which opens the door for other companies to develop solutions—including full-capability console control surfaces—that plug into the Apple-innovated hardware and operate within an Apple software architecture. Truly, we live in interesting times. ■

Mel Lambert heads up Media&Marketing (www.mediaandmarketing.com), a full-service consulting service for pro audio firms and facilities.



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NEW PRODUCTION

Keeping Your Sonic Vision Intact

A few months ago, I received a DVD from an engineer who was looking for a job. He worked on a prominent television show, so I assumed that the DVD would reflect his excellent work. Indeed, the video on the disc was beautiful, but when the disc began to play, I had to dive for the master fader on the monitoring console. The audio was highly compressed and showed 10 full-scale samples in less than two seconds. I set the master fader to my reference level for DVD, so I felt as if I were inside an exploding grenade for about two seconds. Fortunately, I was near the console. After that experience, I learned to never trust audio levels on DVDs. Like Forrest Gump's box of chocolates, you never know what you're going to get.

Although there are many emerging technologies that require audio preparation for publishing, such as SACD, streaming audio, interactive games and background "scenarios" for cell phone conversations, for this article, I'll concentrate on audio for DVD-Video and DVD-Audio.

COVERING YOUR ASSETS

Unfortunately for audio, most DVD authoring houses evolved from video post-production studios. This scenario presents a big problem for audio as well as for audio engineers in the DVD world because most authoring packages come with audio encoders. Fairly good video editing programs, such as Final Cut Pro, even incorporate rudimentary audio editing and mixing capability. DVD authors will say, "Just send me your multichannel tracks and I'll make them work." Then they will call the audio engineer wondering why the audio sounds distorted or (and this is 10 times worse) why the audio slips out of sync with the video.

For this reason, today's prudent, wise and savvy audio engineer must learn how to prepare the audio for a DVD release so that the authoring house has less chance of ruining it. After all, who gets the blame when the audio sounds bad on a DVD? The authoring house? Not if the audio engineer or recording studio is in the credit roll. While all of the people around you may be talking about "repurposing assets," it's best to remember that saving your own is by far the most important consideration—especially if you want to stay employed.

Audio Preparation For DVD Authoring

DVD-VIDEO, OR SAY GOODBYE TO 44.1 KHZ

No matter how you feel about sample rate conversion, if your wonderfully mastered oeuvre with its excellent soundstage and "warmth with clarity" is a 44.1kHz file or a Red Book CD, it will need to be upsampled to at least 48 kHz for the DVD-V disc's PCM audio track. Also, don't assume that authoring houses have an elegant sample rate converter with polyphase filters. They may say "no problem" and then play your CD from their sweaty Walkman after they finish jogging, right out of its grimy RCA jacks and into the analog ports of their ancient Avid. Because the Walkman only listens to its internal clock, you'll soon receive a call. "Hello? We sent you the QuickTime movie and you said your audio matched the length, but it's off by 15 frames toward the end of the clip." By now, you should know that "no problem" from an authoring house is code for "It's *your* problem if it doesn't work."

The answer to this dilemma is to learn not only the audio specifications for DVD-V, but also common authoring programs and their limitations, what the target authoring house has and how to find the person who handles the audio assets at the authoring house. Get all of the information you can and always, always, *always* label everything with as much information as you can legibly squeeze onto the label. A "read-me" doc is nice on a CD or DVD assets package, but never assume that anyone will actually read it. If you are delivering assets via disc, then get white printable discs and a CD printer and put the pertinent information on the disc. Also, forget about those paper labels—put them on a DVD-R and you may render the disc unreadable. DVD players spin at a much higher rate than CD players do, and unbalancing the disc with a paper label is asking for trouble.

SOME SIMPLE DVD-V SPECS FOR AUDIO

DVD-Video discs can have up to eight streams of Dolby Digital multichannel audio, MPEG-2 and MPEG-1 multichannel audio, or linear PCM audio.

The authoring house takes your audio and multiplexes ("muxes") it with MPEG-2–encoded video. The resulting files reside in the Video-TS folder on the finished DVD-V. You'll often note an empty Audio-TS folder on a DVD-V disc. On a DVD-A disc, this folder contains all of the disc's information. Unlike CD, which grew from an audio file format, DVD-V and DVD-A evolved from the CD-ROM format and their file structures and directories follow the Universal Disc Format, not Red Book audio.

Although MPEG-2 and MPEG-1 audio are "in the spec," they are rarely used. For NTSC, DVD-V discs must have one of the primary tracks (usually Dolby Digital or PCM) as the first audio track. The remaining seven tracks can be any of the three primary formats or one of the two optional formats: DTS (Digital Theater Systems) and SDDS (Sony Dynamic Digital Systems). SDDS, the Sony multichannel file format based on the ATRAC Mini-Disc, is seldom used for DVD-V discs. DTS, a lossy format with a high bit rate, is often used as the second audio track for DVD-V discs in which multichannel audio quality is the primary concern.

Multichannel PCM is specified for DVD-V, but decoder manufacturers have declined to implement it and we've never seen a DVD-V disc authored with multichannel PCM. People have authored DVD-V discs with stereo 96kHz/24-bit PCM, but the audio bit rate imposes severe restrictions on the video performance.

All DVD-V audio formats support Karaoke mode. This comprises stereo L and R channels, with optional melody (M) or guide (G) channels, and two optional vocal channels (V1 and V2). Karaoke mode, however, is usually only implemented for DVD-V players that offer special features for mixing and microphone output. I'll save that discussion for another article, perhaps after there has been a bit more research in the sushi bars—er, in the appropriate audio environments.

An abbreviated chart on page 52 displays audio formats you may encounter if you are preparing audio assets for DVD-V. Audio engineers who work in the DVD-V area know most of the chart by memory, because calculating bit rates and data storage is par for the course when they try to convince DVD-V authors to compress the video more so that the audio may be compressed less. Similarly, when clients want to know why their assets won't squeeze into a regular 4.7-gigabyte DVD, you can pull out the chart and a calculator to show them the reason why they have to pay for the extra baggage with a DVD-9.

The evolution of a DVD

The author preparing her DVD elements

PCM AUDIO ASSETS FOR DVD-VIDEO

As stated earlier, although DVD-Video supports up to eight channels according to the spec, I've never seen a DVD player that implements it, nor have I seen a DVD-V disc with multichannel PCM. One manufacturer referred to it as a "non-spec" in a recent phone conversation, but I've seen contributors to various Internet lists steadfastly maintain that because it is in the spec, it *must* be possible. While waiting for this event, I'll focus on the common formats for PCM on DVD-V: PCM stereo (or Dolby Surround matrixed as Lt/Rt) at 48 kHz and 96 kHz at 16, 20 and 24 bits. Other matrixed formats may also be used, such as SRS Circle Surround and Dolby Pro Logic II. The file format is still PCM; it's up to the target decoder to either recog-

nize or be set to dematrix these PCM formats.

Delivery formats include DAT with timecode, two tracks on an MDM tape (such as tracks 7 and 8 on a DA-88 tape, with discrete multichannel on the first six tracks), and files on CDs, DVDs, hard drives (FireWire and SCSI), Jaz drives and even those USB keychain drives. You may also be asked to provide an ftp area on your company's Website for clients, or you can use a Web server hardware device, such as Digidesign's Digidelivery, that sends the client an e-mail with a link to the client software for installation and then sends the encrypted data over the Internet. Authoring houses generally prefer .WAV, Broadcast .WAV or .AIFF, but some may request SDII files.

This sounds simple enough, until you start dealing with video synchronization. If you have a DAW, I've found that the easiest way to work is to request a QuickTime video file for the work print. Ensure that the video program starts exactly after two seconds of video black and leaves two seconds of digital black at the front of the audio file or tape. I've had audio files that arrived sans timecode hit lists and started "somewhere" in the video intro. On one such disc, I had to search through the video and audio to line up vocal plosives with the vocals on the audio file. I have a line item for that on the bills: "fix audio synchronization." If the audio and video match exactly (down to the audio timecode subframe), it's much more cost-effective for the client.

Another quirk I encountered was difficulty in making those "audiophile DVD-V" discs. For one project, I made 96kHz/24-bit .AIFF files and found that Sonic DVD Fusion refused to recognize them. It had been happy with the 48kHz/16-bit .AIFF files, so in desperation, I decided to use Barbabatch to convert them to Sonic Solutions format. This failed, too. After some investigation (and sleepless nights), I had to have 96kHz/24-bit files rendered in the Sonic Solutions 5.4 EDL format. You can hack the files (sorry, I won't tell you how) or open them up in a Sonic Solutions HD system and save them in that format. There is also a utility called Sonic Magic that will do this, which is available from Sonic Studio LLC and Dark Matter Digital. I downloaded it and it tried to open up Classic Mode on an OS 10.3.3 machine, but I haven't tested it yet. (I'll save that for "downtime" days). It looks like a better alternative than hacking files or pulling favors from friends with SSHD rigs.

Other problems can happen when the authoring house has a buggy software revision. I've run into this a few times: There's a version of a midlevel Mac authoring program that will import a 96kHz Broadcast .WAV file and then encode it at 48 kHz (twice as long and half as fast)! Fortunately, it worked fine with 96kHz .AIFF. There are various DVD lists on the Internet and although it can be exhausting, it's worthwhile to join them and keep track of messages—searching through file headers at 2 a.m. can sometimes mean the difference between keeping and losing a client.

DOLBY DIGITAL/AC3 ASSET DELIVERY

Dolby Digital files for DVD-Video are usually delivered to the authoring house as .AC3 files. They can be encoded via software encoders like Minnetonka Audio SurCode,

DVD-Video Audio Formats

Format	Sample Rate	Bit Depth	Channels	Bit Rates	Typical	Compression
PCM	48, 96 kHz	16, 20, 24	1 to 8	Up to 6.144 Mbps	48kHz, 16-bit stereo	None
Dolby Digital (AC-3)	48 kHz	16, 20, 24	1 to 6.1	64 to 448 kbps	192 kbps for stereo	AC3 (lossy) and 384 or 448 kbps for 5.1
DTS	48, 96 kHz	16, 20, 24	1 to 7.1	64 to 1,536 kbps	377 or 754 kbps for stereo and 754.5 or 1,509.25 kbps for 5.1	DTS Coherent Acoustics (lossy)
MPEG-2	48 kHz	16, 20	1 to 7.1	32 to 912 kbps	seldom used constant and variable bit rate	MPEG (lossy)
MPEG-1	48 kHz	16, 20	2	384 kbps	seldom used	MPEG (lossy)
SDDS	48 kHz	16	5.1 or 7.1	Up to 1,289 kbps	seldom used	ATRAC (lossy)

DVD-Audio Formats

Format	Sample Rate	Bit Depth	Channels	Bit Rates	Typical	Compression
PCM	44.1, 48, 88.2, 96, 176.4, 192 kHz	16, 20, 24	1 to 6, with up to two simultaneous streams	Up to 9.6 Mbps	5 or 5.1 channels of 96kHz/24-bit with MLP	Meridian Lossless Packing (MLP)

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www.emagic.de or www.apple.com/software/pro

Keeping Your Sonic Vision Intact

Universal Audio Smartcode Pro, Nuendo Dolby Digital Encoder or Apple A-Pack (the AC3 encoder included with DVD Studio Pro). Dolby also provides a PC utility to capture the AC3 bitstream from its hardware decoders to make AC3 files.

Not all encoders implement all of Dolby's AC3 features. Among the most notable missing features are timecode and RF overmodulation protection. AC3 files with timecode are rarely required, but I was thankful to have an AC3 file with timecode (created with Dolby's capture software) when an authoring house called up saying, "The audio loses sync slowly with the video." I was able to take timecode hit-points from the video EDL and prove that the AC3 file matched the hit-points on the video delivered to me from the video post house. Further investigation revealed that the authoring house was running a revision of a high-end authoring system that dropped video frames in preview. *My* collective assets were safe.

The most hotly debated topics regarding Dolby Digital center on audio levels. Threads abound on the Internet with audio engineers staunchly defending their right to break Dolby Digital–encoding rules and Dolby representatives countering that the encoding guidelines are there for well-tested reasons. The best way to deal with this is to get all of the information from your client (for instance, find out some DVDs that the client likes or would like to sound like) and all of the information from the authoring house about successes and failures that they've seen. After a while, you'll learn when to use which settings.

For instance, if you're encoding for a DVD that will be played on computers, make sure RF overmodulation protection is turned off. If your encoder doesn't allow for this, then you need another AC3 encoder for that project.

Also, if you go with Dolby's suggestion to set dial-norm (dialog normalization) to -27, be aware that a track encoded using DTS will sound 4 dB louder than the AC3 track. According to some, you should just tell your client to turn up the playback system for the DTS track. If your client has customers coming back who are complaining that the DVD is "broken," then you may want to change dial-norm to -31, which means "off" for dial-norm. Setting dial-norm requires an in-depth knowledge of the Dolby Digital encoder; for more information, read one of the several articles at www.dolby.com.

Music purists would often rather have compression set to none. If the end-user has a decoder set to "heavy compression," then the music may be squashed anyway because the decoder may override your setting.

Rarely will your AC3-encoded tracks be exactly the same length as the original audio tracks. They can be off by nearly a frame in total length due to the difference in video frames compared to AC3 frames. You should have a few frames of video black and audio black at the end of the program material so that audio doesn't get truncated with a click.

ENCODING WITH DTS

If you're encoding using a software DTS encoder, then don't choose the .WAV file option, which is for making DTS CDs. It will not work for DVD-V; instead, choose the .CPT option.

Also, encourage the authoring house to let you use the higher bit rate version of DTS. Especially for multichannel, the sonic improvement is clearly audible with respect to the proper imaging of transients.

LEVELS

While most audio engineers who have mixed multichannel for a while will stress the importance of a calibrated mix room, many DVD authors work in small, cramped spaces with tiny computer speakers for monitors. Even worse, talk about audio for DVD on the Internet often centers on "How high can the levels be without distortion?"

DVD-V levels seem to be climbing, too, so it's important to know what your client expects before delivering the audio.

While experienced engineers will advocate the standard -20 dBFS = 0 VU = +4 dBu = 85 (or 79) dB SPL, those new to the trade will mix with CD "compressed-to-the-max" levels in mind. Notwithstanding the modern movement to bring more dynamic range to mixing, remember that AC3 will "fix" overload caused by overly high levels. When the overload protector kicks in, it ain't pretty.

Others suggest that discrete multichannel should have peaks anywhere from -10 dBFS to -6 dBFS. Some also say that DVD-V audio levels should match those for broadcast, but broadcast specs have been changing lately, with some cable broadcasts showing much higher levels than those in recent years.

Finally, music mixes for DVD-V may, in fact, need to be encoded differently than programs with center-channel dialog. The client and the audience are the final arbiters of taste, and experience in dealing with the public will often trump other encoding factors.

DVD-AUDIO AUDIOPHILE ASSETS

Like DVD-V, DVD-A offers downmix capabilities for playback systems that cannot reproduce the max number of channels at the

highest bit rates. Downmix for DVD-A is more elegant than downmix for DVD-V, with coefficient tables to prevent overload and assist in mixdown control. Of course, hybrid discs offer the possibility of separate stereo including backward compatibility with DVD-V. Although DVD-A trails behind DVD-V in market penetration, interest in the format continues to grow. Lower-cost DVD-A authoring programs that can import Video-TS folders (such as Minnetonka Audio Chrome) are slated to be available by the second quarter of 2004.

The WG-4 (the DVD Forum's working DVD-Audio group) is also considering ratifying the DVD-A/CD "flipdisc," a format tested this spring in several U.S. cities. As I write this in late March, the WG-4 has just chosen the Advanced Audio Coding format as the low-resolution codec for DVD-A's DVD-ROM zone, satisfying the consumer need for a format that is suitable for solid-state and portable audio devices. Again, the engineer who wants to work with DVD-Audio needs to know various encoding formats and the techniques required for the best end result.

The one rule that most engineers follow for DVD-A is to deliver five full-range channels sans LFE (unless there are musical sound effects involved). Although most modern DVD-A players have bass management, some older systems do not, so if you include an LFE, then include information about its level setting in large type on the final product. Then, the end-user will have a means to a solution for fixing playback with a strange bottom end.

PREPARING FOR THE FUTURE

Although the DVD Forum has announced "provisional approval" of Microsoft's VC-9 for the video portion of the HD-DVD specification (in addition to the mandatory H.264 and MPEG-2), the audio spec remains to be sorted out. While Blu-Ray devices can now be purchased, they are targeted at the home market for recording HDTV.

Will future specifications for DVD-Audio include 384 kHz to compete with the high bit rate of DSD for SACD? Will we be including highly compressed video for portable devices?

The challenge for audio engineers will be to know as much about audio codecs as they do about mixing audio, as it is clear that the complexity of these issues cannot be relegated to the exclusive domain of those who view audio encoding as a push-button afterthought to video. ■

K. K. Proffitt is chief audio engineer of JamSync, a Nashville facility specializing in multichannel mixing and DVD authoring.

Pump Up The Volume

NEW PRODUCTION

Manage Your Levels With Stereo And Surround Monitor Controllers

In the past decade or so, the studio environment has changed radically, but one thing that's remained constant is the need for a hardware device to adjust tracking or playback levels. In the old days of stereo-only production, a studio volume pot and a couple of push buttons did the job, letting the engineer easily choose from several playback sources, perhaps with a Monitor Dim (attenuator) switch and a Sum button for checking mono (phase) compatibility.

However, with surround mixing, DAW controllers and the virtual (onscreen) mix environment, your console's monitor control section may be absent or inadequate for the needs of modern production. To address this situation, many companies now offer stand-alone monitor controllers that range from simple passive volume pots to complex systems incorporating monitor control selection, multichannel bus management and comprehensive talkback facilities.

So whether you're upgrading your "A" control room to surround or starting a home studio, let's look at what's available in monitor controllers.

The 7800 Master Module from API (www.apiaudio.com) puts summing buses, monitor control (volume/dim/mute/mono) with multisource switching (three 2-tracks, sends or the stereo bus), a stereo master fader and talkback/slate functions into a single-rackspace unit. The unit is usable stand-alone as a stereo monitor controller, or can be combined with Model 7600 input modules to form a complete console or workstation front end.

Adgil Designs (dist. by Sascom Marketing, www.sascom.com) offers a controller called The Director (MSRP: $4,950). Housed in a three-rackspace chassis, this programmable, microprocessor-controlled system can handle up to eight output channels and 300-plus inputs. The most recent development allows the unit to be configured with two separate 7.1 speaker systems and a stereo pair selectable from a remote (included). The Director can monitor several sources simultaneously, so it can be used as a line-level fixed 1:1 mixer for stems and submixes. There's an insertion point before the level control for encoding/decoding mixes, and all access is through standard DB-25 multichannel connectors.

The ASP 510 from Audient (www.audient.co.uk) supports three 5.1 and three stereo sources and has six speaker outputs, all on DB-25 connectors. Comprising a single-rackspace main unit with a remote controller, the ASP 510 ($2,885 retail) includes an internal pink-noise generator. Each speaker output has a trim control, and eight record outputs are standard. Also featured are user-definable reference and dim levels. This device communicates comfortably with Dolby Surround, DTS and others, with an insert for external encoding/decoding.

The Blue Sky (www.abluesky.com) Bass Management Controller addresses the need for 5.1 bass management and volume control. Five XLR inputs/outputs are provided for the main channels, and one XLR input for the LFE and two parallel XLR outs for single or dual subwoofers. Except for a power switch, all controls for the single-rackspace BMC are located on a 6x8-inch remote with a large volume knob (operating in 0.5dB steps) flanked by switches for muting and preset reference level. MSRP is $725.

For surround sound volume control, the SR5.1 by Coleman Audio (www.colemanaudio.com) has six inputs and six outputs—all XLR. Muting and individual level control are available for each channel. No VCAs are used in this single-rackspace unit, and the stepped attenuator tracks to 0.05dB precision throughout its range. Also available is Coleman's A/B 5.1 Surround switcher, which is handy for comparing 5.1 speaker systems. Three groups of six inputs/outputs (balanced TRS) can be connected as one input to two outputs for comparing speakers, or two inputs to one output for comparing mixes. The A/B 5.1 is a passive unit without electronics in the audio signal path. Switching is done via relays. The A/B 5.1 retails at $595; the SR5.1 is $995.

Offering a discrete, Class-A audio path, the Avocet studio controller from Crane Song (www.cranesong.com) is a stereo unit with an upsampled, jitter-reducing D/A converter, three digital inputs,

three analog inputs and a headphone system with talkback provisions. Also standard are dim, mute and mono functions, and a switch to select one of three speaker outputs.

The Dangerous Music (www.dangerousmusic.com) Monitor LT is available in stereo or surround versions. Each has four pairs of inputs (the fourth with variable gain), three sets of speaker outs and remote control. Also onboard is a 4-input cue mixer with talkback, to power a dozen pairs of headphones. All connections are balanced. Details are still forthcoming as these new units have yet to appear on the market. Slated for release this month, the stereo Monitor LT should retail around $1,700; the surround version is due in June or July. The company's popular Dangerous Monitor also has a surround version in the works. The stereo model ($4,999 retail) features three pairs of inputs, two sets of XLR speaker outs and remote control. Built-in D/A conversion, digital routing and digital inputs with active thrus allow the Dangerous Monitor to be used as a digital patchbay.

Retailing at $699, the SRM-80A from Furman Sound (www.furmansound.com) allows you to route a stereo signal to three pairs of monitors and four mixdown recorders. The single-rackspace box has an 80-segment LED meter (average/peak-switchable), trims, a headphone output with level control and buttons for dim and mono. Inputs/outputs are balanced TRS, and four additional sets of RCA ins/outs are provided for mixdown recorders. Its most unique feature is a pair of banana speaker *inputs*: One power amp can be sent to two sets of passive speakers through the SRM-80A. The optional SRM-RU remote control is $89.

Grace Design (www.gracedesign.com) celebrates its tenth anniversary with the release of the m904 (stereo) and m906 (surround) monitor controllers, two units designed to offer the same reproduction as its top-rated mic preamps. The m906 features balanced/unbalanced analog 5.1 inputs, multiple balanced stereo analog inputs and 24-bit/192kHz digital (AES3, S/PDIF, ADAT and Toslink) 5.1 and stereo inputs. All I/O and audio is handled by a two-rackspace rack; a compact remote provides control of all functions. The m904 is similar but designed for stereo-only applications, with multiple analog and digital inputs and a fixed-level 5.1 DAC output for direct digital transfers. All m904 controls are built into the front panel, but an m904b remote/blank front panel brain model is also offered. Standard are low-jitter s-Lock™ phase-lock loop word clock regeneration, a built-in high-current audiophile headphone amp, and 100dB range main and headphone level controls with 0.5dB step precision.

The LFE-4 and LFE-5 Bass Management Controllers from M&K (www.mkprofessional.com) take in five full-range XLR inputs and up to two LFE XLR inputs and allow redirection of the bass content to one or more subwoofers. Any LFE input(s) to the other channels are combined at the proper level, while providing an 80Hz highpass filter for the five main channels, an 8Hz lowpass filter for the subwoofer feed and a 125Hz lowpass filter for the LFE channel. The $999 LFE-5 has all of the features of the $800 LFE-4, plus mutes for every channel and a 6-channel volume knob. Although the standard mixing level for film is 85 dB, some film houses turn down the left and right surround outputs by 3 dB; M&K planned for this by including a -3dB switch for the left and right surround channels in the LFE-5. Mixing to 7.1

Blue Sky Bass Management Controller

Grace Design m906

SPL Surround Monitor Controller

Pump Up The Volume

formats can also be accommodated; contact the factory for details.

Mackie (www.mackie.com) just released a $385 monitor switching, source and communications box called the Big Knob. Besides its level knob, controls include three buttons that switch between three sets of studio monitors, a built-in talkback mic, input source selection of up to four different stereo sources and dual headphone outputs. Additional switches include dim, mute and mono. Besides the trio of stereo inputs, Big Knob has a dedicated DAW mix input and a phono preamp.

Retailing at $3,195, **Martinsound's** (www.martinsound.com) MultiMAX EXR is a more affordable and equally efficient combination of its MultiMAX EX controller and remote. Virtually all forms of surround sound are supported, including IMAX, DTS-ES and SDDS. The MultiMAX EX and EXR have 16 speaker outputs, allowing for switching between various combinations of surround and stereo speakers. For example, two 7.1 systems, one set of stereo speakers and one mono speaker can be compared. Four separate 8-channel inputs can be auditioned, with additional inputs available if you choose the Wide inputs as another source. Multichannel connections are DB-25. Numerous options are available, such as the $1,995 Monitor Max Stereo Monitor Controller, which adds a mic pre, talkback functions and up to 10 2-channel inputs.

NHT-Pro's (www.nhtpro.com) Passive Volume Control (PVC) is an affordable ($150) volume control for mixerless DAW and nonlinear video production environments. Stereo level adjustments can be made from 0 to -40 dB, within 1 dB, and with ±0.5dB interchannel accuracy to -60 dB. The PVC features balanced connections: Neutrik combo XLR/TRS inputs and XLR outputs.

New from **PreSonus** (www.presonus.com) is Central Station, a stereo device with a remote, plus talkback and cue circuit functions. It boasts three sets of analog stereo inputs (TRS) and two sets of digital inputs: one AES-S/PDIF, the other Toslink. These allow users to compare earlier analog or digital stereo mixes with workstation mixes in progress. Each of the three sets of stereo outs have passive trims, and all switches are passive. Also standard is a 30-segment LED L/R meter and great DAC specs. Future plans include a switch that changes the unit from stereo to surround. The Central Station retails at $699; the remote is $199.

Offering a frequency response of 10 Hz to 100 kHz, the SPL (www.spl-usa.com) Surround Monitor Controller 2380 manages two surround and two stereo sources. Inputs are via D-Sub and RCA jacks. Its ¼-inch balanced speaker outs for stereo and surround are controlled by a discrete potentiometer. A slave output allows the stereo or surround input signal to be routed directly to a recording device. The slant-face desktop enclosure is handcrafted in Germany and retails at $769. The MTC 2381 Monitor and Talkback Controller is the latest in the SPL line, and can sit comfortably under a computer screen. XLRs provide output to three pairs of speakers, deriving signal from 12 inputs. Talkback and cue functions are complemented with a headphone out and a footswitch jack for the talkback section. Monitoring functions include mono, dim and muting, and a slave output can route the input signal to the SMC 2380.

Studio Technologies' (www.studio-tech.com) StudioComm line includes the 68A and 78, both single-rackspace units for controlling multiple surround sources. The 68A allows for 16 balanced inputs, organized as two 5.1 and two stereo ins; and the 78 supports two 7.1 surround mixes, with a total of 16 balanced inputs. Each has a remote panel controller (models 69A and 79, respectively), which includes mute/solo functions, input selection, level control and dim/mute buttons. The 79 also features a 4-digit LED readout for level display. Both the 68A and 78 units present 16 trim pots on their front panels for calibration of input signals. Input and output connections are 25-pin D-Subs. The 68A ($1,799 with 69A remote) handles one stereo and one 5.1 surround set of speakers. The 78 ($2,799 with 79 remote) manages one 7.1 system, but can be reconfigured for 5.1 ins/outs. Both units are designed to integrate with recording and film electronics, allowing automatic switching of the StudioComm's input source whenever the recording system changes between play and record.

The DS-M7.1 Digital Surround Monitor Controller from **Tascam** (www.tascam.com) is designed for 5.1, 6.1 and 7.1, as well as stereo, mono or LCRS. Eight input channels, eight output channels and 44.1/48/88.2/96kHz operation make the $1,899 DS-M7.1 a versatile contender. Digital ins and outs for the console and recorders vary from TDIF to AES/EBU and ADAT optical. Also featured are surround bass management, an insert for external decoding, individual channel mute/solo and a pink-noise generator. The front panel of the 3U device detaches for wired remote control. ■

David Ogilvy engineers, produces and teaches in the San Francisco Bay Area.

NEW! US-2400

The plug-and-play DAW controller with 2.5 motorized faders per finger.

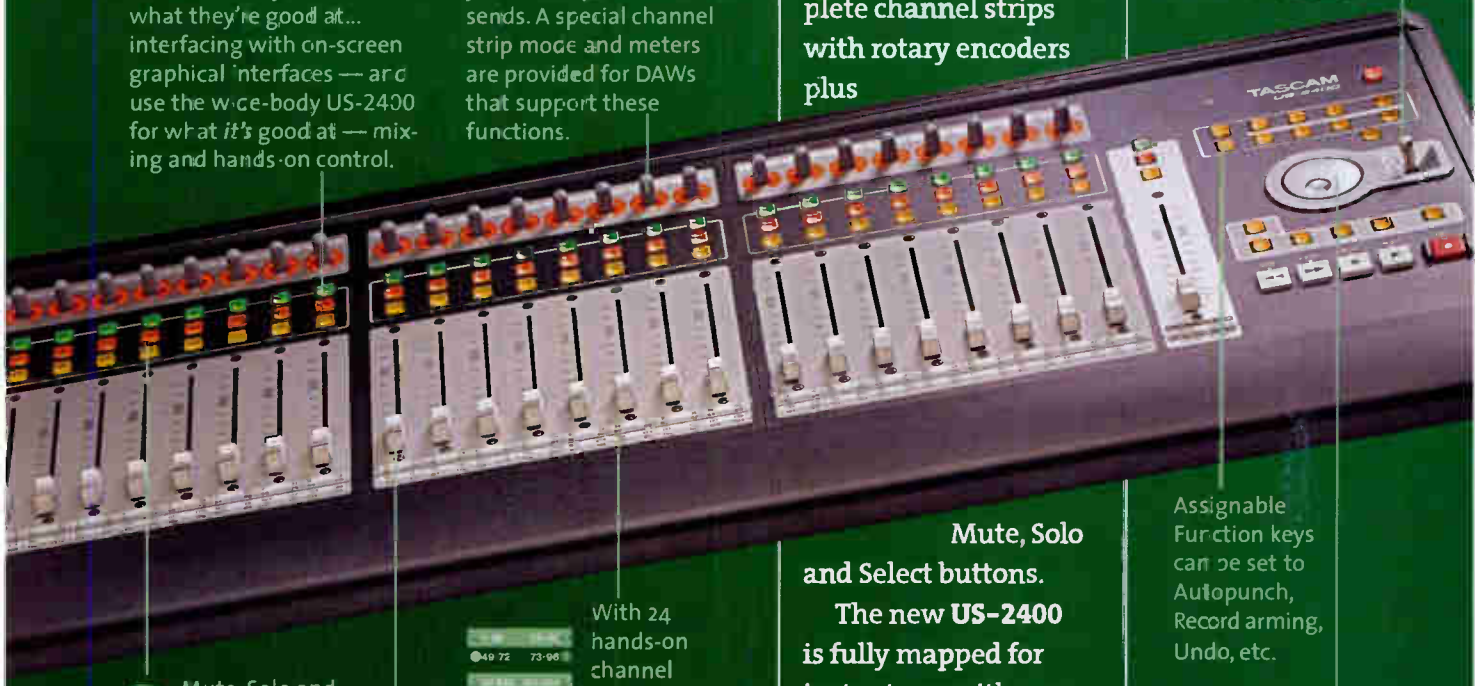
Now you can use your mouse and keyboard for what they're good at... interfacing with on-screen graphical interfaces — and use the wide-body US-2400 for what *it's* good at — mixing and hands-on control.

LED ring encoders give you hands-on "analog" of you DAW's pan and aux sends. A special channel strip mode and meters are provided for DAWs that support these functions.

Twenty-five, 100mm touch-sensitive, high-resolution motorized faders.

Twenty-four complete channel strips with rotary encoders plus

Joystick for surround sound panning.



Mute, Solo and Select buttons.

The new **US-2400** is fully mapped for instant use with any DAW that supports HUI® or Mackie® Control protocols.

For more info on the first DAW controller with enough faders to handle a typical recording session without lots of bankswitching, e-mail us for a brochure at *tascamlit@teac.com* or visit a TASCAM dealer.

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Mute, Solo and Select buttons on every channel beat the heck out of trying to mouse and click on-screen icons.

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Touch-sensitive motorized faders have 10-bit resolution — FOUR times finer than many competitors' control surfaces. You get ultra-smooth, big-console-quality fades. Hit the FLIP button and the faders can be used for writing automated pan or aux send moves while channel levels remain accessible on the LED rotary encoders.

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- In/Out point buttons
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- Adjust DAW software parameters such as 4-band EQ via the rotary encoders

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Story > The newest evolution in Yamaha digital mixers. A fusion of PM1D's core elements with the advances realized in DM2000 and PM5000. But with a unique ability to control outboard DME processors directly from the PM5D. True system integration.

One point of control.

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24 channels of I/O in DME24, 64 channels of I/O in DME64, up to 10 of Yamaha's newest 96kHz DSP processors, new software allows direct control of crossovers, EQ, and delays from the PM5D digital mixing console, control via Ethernet, CobraNet™, USB, RS232/422 or MIDI, four models of remote control panels, cascade ports, GPI, Euroblock connectors...

< Numbers

The power of Yamaha digital technology harnessed into the world of programmable black boxes. An intricate network of DSP. Robust intuitive software. True integration of audio and control with PM5D.

A processor that puts the console in command.

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BY TOM KENNY

Microsoft Windows Media Audio 9

Multichannel Codec Options for Pro Production, Mass Distribution

Two years ago at NAB, Microsoft had a relatively small booth tucked into the very last row of the newly opened South Hall, sharing space with Steinberg, M-Audio and a couple of video companies. There wasn't a lot of foot traffic, but there was considerable buzz throughout the convention center about a Microsoft codec that would deliver high-resolution 5.1 audio, code-named "Corona."

Last year, Microsoft moved up in the South Hall and filled out a much larger booth, again with partner companies, and considerably more traffic. Corona was rechristened Windows Media 9 Series, and broadcasters and audio types alike filtered through to figure out how this technology might fit into their operations.

This year, Microsoft has quite simply leaped into the forefront of technology development for new-media production and distribution.

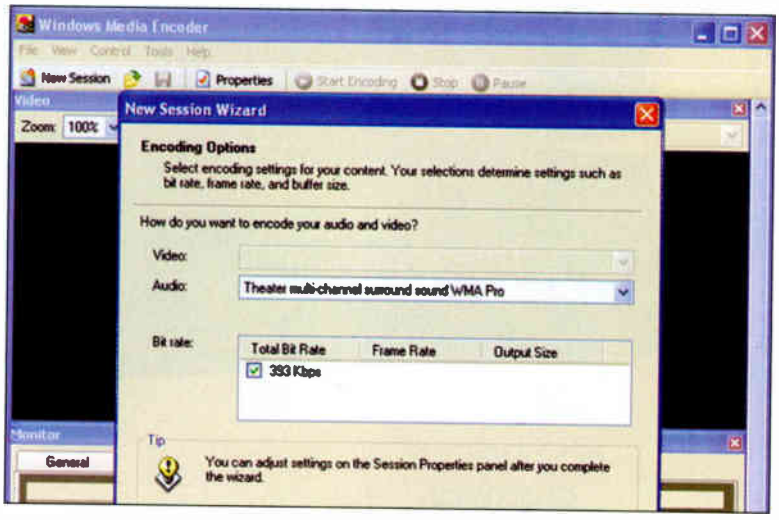
It should come as no surprise that Microsoft would enter the professional video and audio industries. The company has always focused its technologies high and low, from enterprise solutions in the server rooms of Fortune 500 companies to the giveaway players found on millions of desktops worldwide. In our world, this means providing the means for producing and encoding high-resolution audio and video content, along with mass distribution on physical media or over the Internet.

Most consumers and professionals at this point are familiar with the download and streaming capabilities of the cross-platform Windows Media Player. Far fewer, however, are familiar with the range of capabilities inherent in the Windows Media 9 Series of codecs. And it is here, in our tiny industry, that Microsoft is making its push.

Actually, the company began its push in video a couple of years ago, concentrating on digital cinema, digital dailies and high-def video production. At the recent Sundance Film Festival, five films were projected in the Windows Media Video format. And film studios, recognizing the surge in LCD and plasma displays for home theater, have piggybacked WMV HD discs, which can deliver up to six times the resolution of conventional MPEG-2-encoded DVDs, onto more than 16 dual-disc DVD titles (including *Terminator 2* and *Standing in the Shadows of Motown*).

T2: Extreme DVD *has been re-released with a second disc showcasing the WMV HD–encoded film.*

Despite the hype surrounding the brave new world of digital delivery, Microsoft still sees value in physical media. The DVD Forum recently named VC-9, the underlying video compression technology used in the WMV-9 codec, as a mandatory format on the next-generation HD-DVD devices. And at the 2003 IBC show, Microsoft made its video compression technology available as an open international standard. Last month at NAB, the company announced that SMPTE has elevated VC-9 to Committee Draft status.



The Windows Media 9 Series encoder offers both easy-to-use and advanced Wizard interfaces.

"We've found that the benefits Windows Media 9 Series brings to pro video can be even greater than for pro audio, simply because with HD video production, the demands on the PC are so much higher than they are with stereo or multichannel audio production," says Steve Sklepowich, director of pro marketing, digital media division, at Microsoft. "Clients can review HD-quality video with 5.1 audio using WMA9 Pro without having to purchase a $75k HD tape deck. Then, producers have the ability to deliver high-def secure dailies, whether over a network or via physical media, and expand their reach to DVD, Web, digital signage or digital projection. Video post-production houses and broadcasters spend millions of dollars today shuttling VHS tapes around for client review. Windows Media 9 Series can bring immediate and significant cost savings to the production process."

Cost savings, speed, efficient workflow—these are the mantras in today's production chain, whether for video or audio. Files are shared on networks, shuttled to FTP sites and reviewed in New York for drive-time delivery in L.A. FedEx is no longer fast enough. Clients don't have time to leave the office and approve the mix. And a producer is working on three projects simultaneously. This is where Microsoft sees opportunity. And as audio follows video, the same rules apply.

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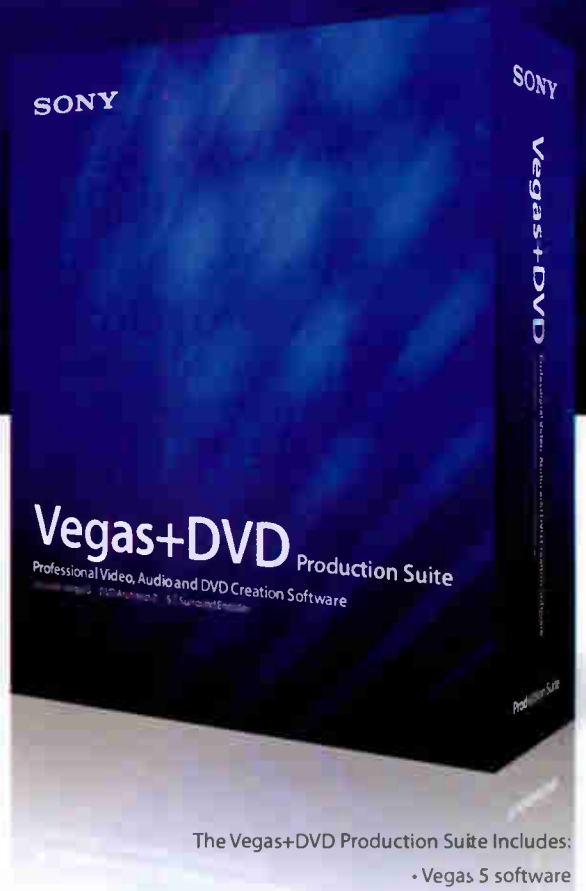
Sony's Vegas 5 software redefines workflow by providing an all-in-one real-time solution for editing, multi-track recording, compositing, titling, scoring and encoding. Its customizable interface allows users to accomplish a wider range of complex production requirements. Whether you're off-lining 24p HDCAM proxy files or finishing your project in DV, Vegas software delivers the ultimate in flexibility.

Sony's DVD Architect 2 software delivers a complete, professional set of DVD production tools that lets you develop dynamic menu-based DVDs with subtitles, alternate audio tracks, end actions and more.

Created through imagination driven by uncompromising innovation.
No other media production suite is like it.



The Vegas+DVD Production Suite raises the bar with these new features:

New in Vegas 5:
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- Keyframable bezier masking
- Control surface support
- Envelope automation recording
- Auto-input record monitoring
- Film-style 5.1 surround panning
- Real-time A/V event reverse
- Media subclip creation
- Customizable keyboard mapping
- Networked rendering
- And much more

New in DVD Architect 2:
- End actions
- Multiple audio tracks
- Subtitle support
- 24p DVD encoding
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- Project overview window
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The Windows Media 9 Series audio codecs run the range of encoding options, from WMA9 Voice for playback at 20 Kilobits per second to WMA9 Lossless for archival purposes, approaching 3:1 compression. Most audio professionals would likely be working with WMA Pro, which provides 5.1 or 7.1 capability, 24-bit/96kHz sampling, and download or streaming delivery at anywhere from 128 to 768 Kbps. It also supports one- or two-pass constant bit-rate (CBR) and variable bit-rate (VBR) encoding.

"For archival purposes, our Lossless codec makes the most sense," Sklepowich explains. "128 Kbps is intended for the most constrained network delivery; 192 Kbps is well-suited for streaming at decent quality or for proxy review; 384 Kbps becomes suitable for review or high-fidelity delivery such as home theater or D-Cinema; and 768 Kbps is for high-fidelity delivery and archival purposes. But these are generalizations, and it's going to vary according to the material and encoding parameters, such as VBR/CBR, single-pass or two-pass and sampling rates. It's really up to the audio engineer to be the judge."

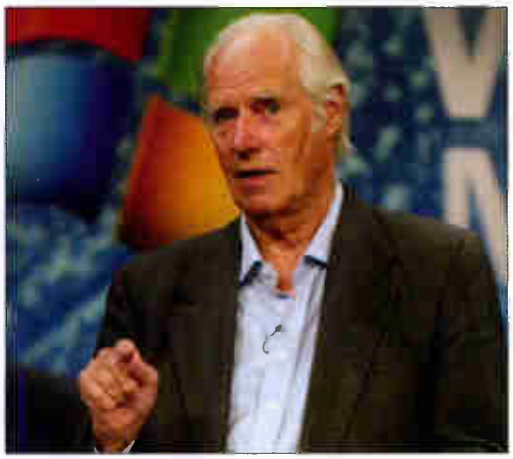
Because security is a major concern, whether for client approval or consumer delivery, the WMA Series includes extensive built-in digital rights management—royalty-free.

One of the geniuses in Microsoft's development efforts, whether for consumer or professional applications, is that they make things easy on users. The WMA encoder is already built into Steinberg Nuendo, Digidesign Pro Tools and Adobe Audition. M-Audio Delta 1010 and Echo Layla 24 cards include drivers for capturing live or sourced audio. Many more manufacturers are certain to follow.

"Hopefully, software vendors will see the value in this themselves," Sklepowich says. "There is no cost associated with licensing the Windows Media Encoder or the Windows Format SDKs [software development kits], so anyone is free to download and implement them within their product. And the Windows Media 9 Series licensing is built into the cost of Windows, so when you buy an application like Pro Tools or Nuendo based on Windows, Digidesign and Steinberg do not pay use fees. When producers deliver their Windows Media content to PCs, again there are no additional fees. And our licensing is flexible for non-Windows platforms, as well." (There have been hints of third-party development for Linux and Mac OS. Details for licensing are on the Microsoft Website.)

There have been numerous efforts in remote delivery and approval applications during the past decade. EDnet burst onto the

scene in the early '90s with dedicated, secure lines. But that proved prohibitively expensive for all but top-end studio projects. Liquid Audio and Rocket Network are two companies that surfaced with relatively short-lived efforts at remote collaboration and delivery. And, of course, countless producers have worked out their own means for mix approval and file exchange. But nobody has yet put together as comprehensive and far-reaching a scheme as Microsoft.



Sir George Martin at the Windows Media 9 Series launch

"We see great opportunity in two main areas," Sklepowich concludes. "First, for the pro audio world, in addition to the client review and collaboration applications, WMA9 has become pervasive in the music service arena. WMA9 and WMA9 Pro can be used today to market traditional new or existing CD audio releases on the Web. We see tremendous growth here.

"Secondly, we think there is a real opportunity in delivering multichannel audio using WMA Pro on DVD-ROM to complement the great HD video that we can get with WMV HD. We've done a lot to advance the HD experience today for consumers on PCs. For example, WMV HD offers up to six times the resolution of DVDs today with up to 7.1 surround sound with WMA Pro."

During the past couple of decades, for a variety of reasons, Microsoft has become the company that everyone loves to hate. But that shouldn't diminish the company's recent efforts in media production technologies.

While the company has been primarily concentrating on mass delivery for D-Cinema, broadcast and home-theater applications, it only takes a bit of imagination to see the possibilities in production. For post, sound designers in various cities can shuttle elements for approval by a supervisor in L.A. In the commercial world, the account exec can approve a finished spot from an office in Chicago or Minneapolis for national delivery that day. Broadcasters and Webcasters can move large files around a network without hogging space and then deliver worldwide. In music, it's already happening among high-end producers for mix approval, probably more than Microsoft even knows. And in the trenches, in the project studios and home-based facilities across the country, you can bet Windows Media 9 Series is being used in creative and interesting ways. ■

Tom Kenny is the editor of Mix.

PHOTO: KAREN SAS/PROPERTY OF ARTISAN ENTERTAINMENT

The Grammy-winning Standing in the Shadows of Motown *is now available as a WMV HD–encoded film.*

BY OLIVER MASCIAROTTE

Studio Network Solutions' Next-Gen Storage

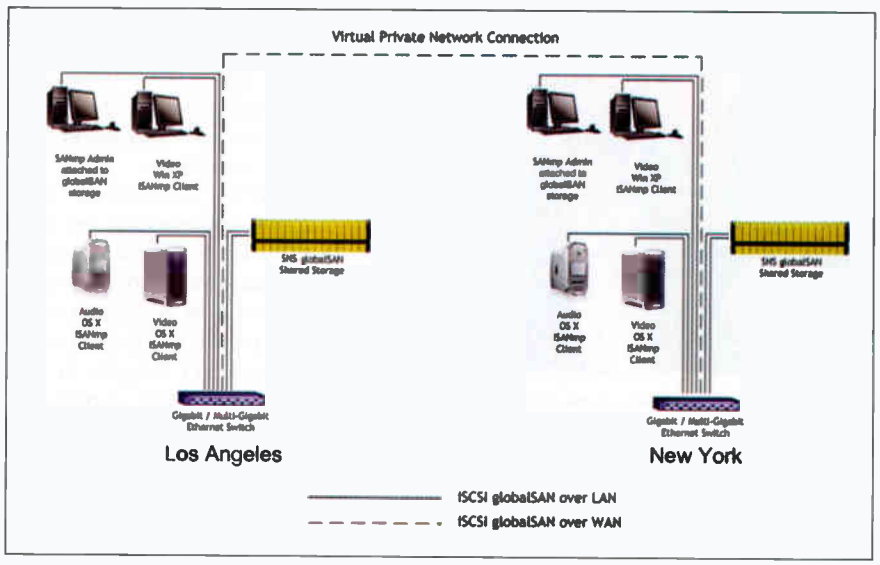
Low-Cost Multi-User Access Via iSCI-Based Systems

SANs are storage for high rollers—or are they? Storage Area Networks are specialized storage systems that allow multi-user access, as server-attached storage does, but also provide high performance, which SAS cannot. To overcome the adoption barrier that the high cost of traditional SANs impose, Studio Network Solutions has introduced a new family of storage products based on the recently adopted iSCSI protocols instead of the more complex and costly Fibre Channel standard that the company already supports. Its globalSAN™ iSCSI storage solution uses the universal Internet Protocol (IP), upon which both the Internet and Ethernet are based, to transport encapsulated SCSI commands. This encapsulation, or packaging, allows IP-based storage to use commodity infrastructure for rapid, cost-effective transport of block-level I/O data over existing high-speed networks.

Unlike NAS, or network-attached storage, which provides relatively sluggish performance of only file-level data, iSCSI allows for true block-level manipulation over LANs, MANs and WANs (local, metropolitan and wide-area networks). This means that, rather than moving entire files from storage to a local node or computer for processing and then saving the modified file in its entirety back to the NAS, iSCSI allows for reading and writing *inside* of a file while it resides on the remote storage device.

The iSCSI protocol takes into account the myriad problems typically found in a local, metropolitan or wide-area networked environment. Trouble is, although Microsoft has a Windows-native iSCSI initiator available for download, Apple does not. So, Studio Network Solutions had to build Mac OS X–native iSCSI initiator software and provide its own iSCSI Host Bus Adapter—another piece of the puzzle not available for Mac OS. The company's HBA is a multi-port PCI-X card with support for link aggregation and jumbo frames, features that considerably improve throughput.

With all of the low-level pieces in place, the Studio Network Solutions development team needed to provide a means for the end-user to control the day-to-day operations of his or her storage network. Because they already had full management and networked storage functionality in their existing SANmp™ software, they extended it to include the necessary bits to interoperate with iSCSI, as well. This means that Windows, Mac and mixed or heterogeneous network clients can all dynamically share both Fibre Channel and iSCSI storage assets without compromise.

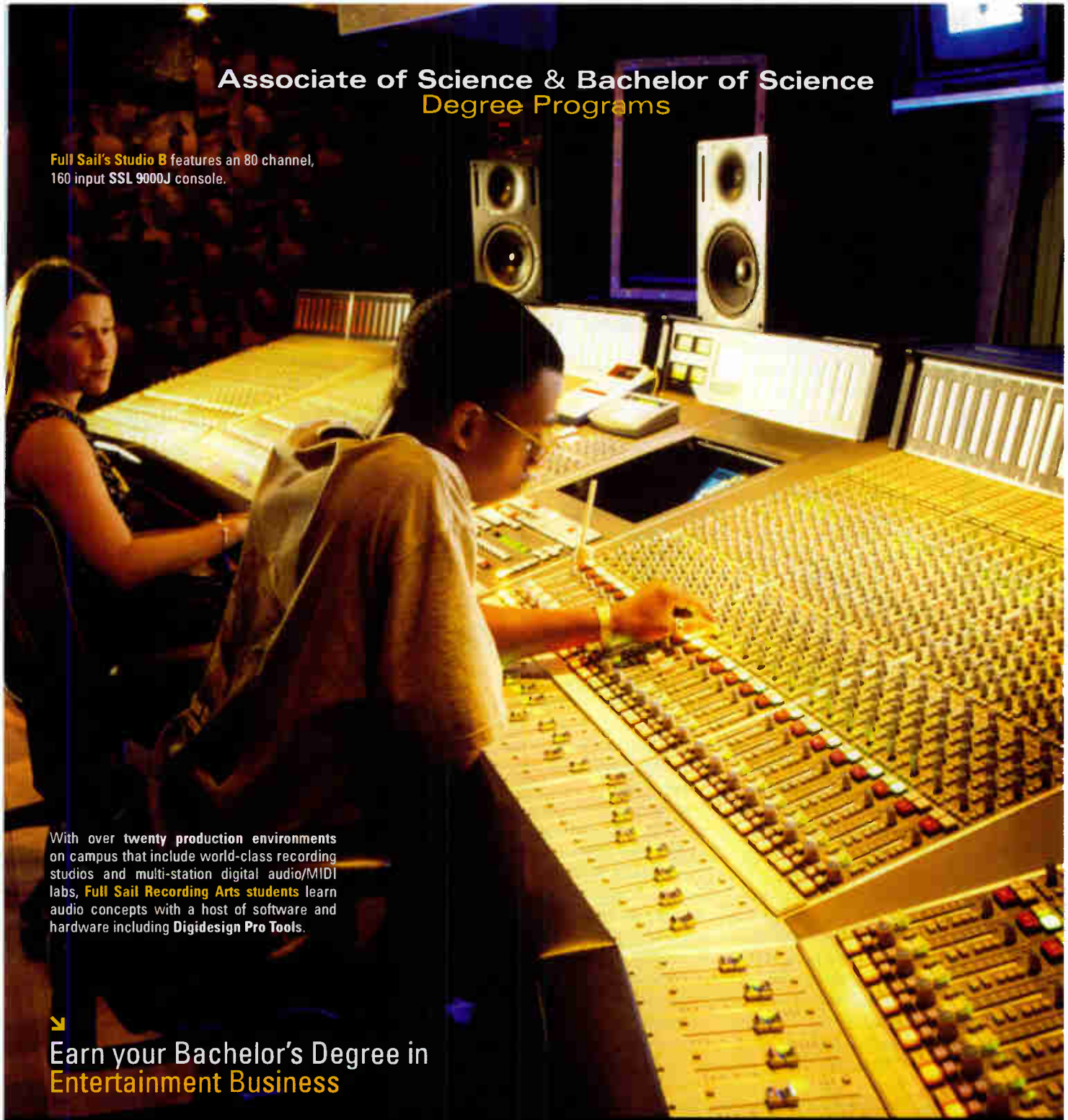


Studio Network Solutions' globalSAN systems are based on the iSCSI protocol, meaning an engineer in New York and a producer in Los Angeles can work on the same file.

One of the problems with any network, including storage-centric networks, is security. The iSCSI standard provides for strong encryption using the IPsec or IPsecure protocol for transmission of sensitive data over unprotected networks. When asked what security issues an end-user should consider, Eric Newbauer, director of operations for SNS, provides some details: "An iSCSI-based SAN can actually be configured to be quite secure. The amount of security measures that clients will realistically want to take [will] depend upon whether they will be transferring data over their LAN or over the Internet. If it's the former and they want to keep their data safe from the outside world, the obvious answer would be to create a closed, dedicated network or configure their firewall to block access to the iSCSI ports from the outside. For public networks—like the Internet—they can set up a VPN using the IPsec protocol." IPsec's strong encryption employs the Advanced Encryption Standard, the industry and government choice for mission-critical security.

Gary Holladay, SNS president and chief systems designer, sums up the value of the company's globalSAN product line, stating, "Most importantly, they offer performance nearing that of Fibre Channel over multi-Gigabit Ethernet. We'll certainly continue developing and supporting our line of A/V SAN PRO Fibre Channel systems, but we believe there's a substantial number of production companies that simply don't have the budget and/or the need for a pure Fibre Channel solution. For those that already have a SAN or have been thinking about implementing one, we've really opened up their options. Support for iSCSI will now be included with our existing SANmp volume sharing software.

"This means that, in addition to concurrently supporting Mac and Windows on the same network, the standard version enables volume-level shared storage networking for both FC and IP-based SANs," he continued. "For those that just need support for iSCSI, they'll have the option to use the new iSANmp version of the software. The realm of platforms and protocols that our software supports enables us to accommodate practically any facility's needs—large or small." ■



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BY RICK CLARK

5.1 Recording Vibes With ESE

NEW PRODUCTION

The dusk outside the Marin County, Calif., studio The Site was magical, with deep reds, oranges and grays mixed with clouds, mist from billowing coastal overcast drifting in and redwood trees towering outside the tracking room windows. Inside, Glen Moore, of the legendary acoustic fusion band Oregon, was improvising his own magic on his 300-year-old Klotz string bass. Its rich tonality filled the room, while an impressive complement of precisely placed microphones captured his performance. When I walked into the control room, it sounded like Moore was in the middle of the Neve console, and when I walked around the room, the bassist's position hadn't changed. Standing outside the array of Jean-Marie Reynaud speakers were producer/engineers Cookie Marenco and Jean-Claude Reynaud. After listening for a few minutes, Marenco exclaimed, "No bad seats!" She was right.

What I listened to were the fruits of almost two years of work, in which Marenco and Reynaud pursued a surround production approach that would bring a sound to live performance–oriented recordings that is intimate and expansive. They call this trademarked technique ESE, or Extended Sound Environment.

Marenco is no stranger to audiophile-level production and engineering, having worked with some of the music world's most creative talents and consulted for a number of innovative manufacturers. She also worked in A&R at Windham Hill, where five albums she produced earned Grammy nominations. Her production credits include *Winter's Solstice Vol. 2* (which went Gold), Ladysmith Black Mambazo, Paul McCandless (of the band Oregon), Turtle Island String Quartet, Tony Furtado and Alex Di Grassi. As an engineer, she has recorded many artists, including Mary Chapin Carpenter, Praxis, the Charlie Haden's Quartet West and Max Roach.

The odyssey that led Marenco's sessions at The Site began a few years ago, after she became frustrated by the record industry's puzzling acceptance of MP3 audio and overly compressed recordings. She took a three-month break to figure out what would make her happy, and if she even wanted to go back into the studio. "I knew that I had to go back in with a partner," says Marenco. "I needed somebody who would motivate me to love music and sound again."

A trip to attend a wedding in France changed things for her. There, Marenco spotted some Schoeps microphones used during the reception and was curious about who would use such fine mics for such an application. That's when Marenco encountered Reynaud. "I had learned a very classical kind of recording from great old-school engineers in France, and it seemed that everything I had learned was being thrown away by digital sound," says Reynaud (whose father manufactures the audiophile JM Reynaud speakers in France).

Marenco immediately realized that she and Reynaud shared many of the same feelings about audio. A few weeks later, the two began checking out surround audio setups at the 2002 AES Convention and, by and large, were somewhat disappointed by what they heard. They started to visualize ways to make multichannel recording more natural and satisfying. They booked time at The Site in December 2002 and began a series of surround recording experiments, aided by the generous help of Sony, Millennia, Pass Labs, JM Reynaud and Stephen Jarvis (who lent them an extensive collection of Didrik deGeer microphones).

PHOTO: RICK CLARK

Pictured: (top, L-R): Glen Moore, Garett Brennan, Felipe Neira, Rick Clark; (middle, L-R): Allisan Black, Samantha Moore, Dawn Frank, Rab Ickes; (bottom, L-R): Jerry Becker, Tony Furtada, Jean-Claude Reynaud, Cookie Marenco, Kevin Scott

After trying many mic and speaker configurations, Sony's Gus Skinnas suggested that the ITU layout [see diagram] might best-suit their goals. Not only did they utilize the ITU setup for the listening environment, they also echoed it exactly with microphone setups in the tracking space and in 19x13x17 live chamber. Additional close-miking was applied for the musicians. The session proved to be enlightening, and the team reconvened at The Site in December 2003.

"The ESE technique uses a combination of mic placement in the tracking room that is an ITU configuration in front of the musicians, in addition to close mic positions for a more 'direct' sound from the instrument. We find the combination of close and room miking more pleasing than using one and not the other, as well as providing an alternative to surround listening," says Marenco. "Surround listening offers only one 'optimum' listening position: in the center of the five channels. Our technique is designed to have a three-dimensional approach to multichannel listening and offers the listener the ability to listen outside the speaker circle and walk 'through' the speakers and in the center.

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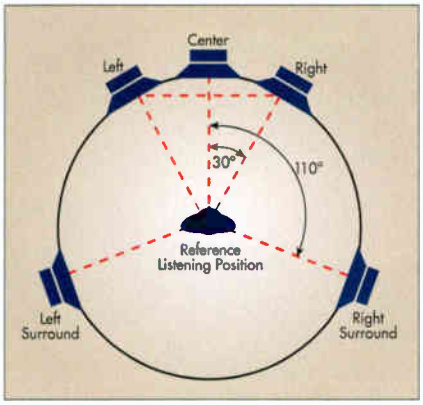
fects used," Marenco continues. The team recorded to 2-inch analog Studer A-800, with Dolby SR at 15 ips. The 5.1 mixdown was to a Sony Sonoma 1-bit DSD system; stereo mixdown was to the Sonoma system and a half-inch analog Studer A-80 with Dolby SR at 15 ips. This chain was also used as backup to the Sonoma system for 2-track editing.

The entire recording was done on The-Site's Neve 8078 console, which has 72 inputs and is modified for surround monitoring and mixdown, important to the ESE process. The signal was bused out to the Sonoma with Ed Meitner converters, recorded in DSD 1-bit and returned to the console with a 6-channel monitor section to Nelson Pass amps, which were wired with JM Reynaud silver cable to Offrande JM Reynaud speakers (single-wired) and a JM Reynaud Furioso self-powered sub.

"Because of the delicate phase issues created, we used one track for every mic used," says Marenco. "For our initial experiments, we intentionally kept the ensembles to duos and solo performances, with no option for overdubs. This led to our choice of exceptional musicians capable of great live performances and interactive dynamics. The use of headphones is not an option at this time.

"The choice of 1-bit recording and avoiding the use of PCM digital also led us to *not* use digital effects, instead choosing to use the chamber for additional reverb," Marenco adds. "We miked the chamber in the ITU configuration with two to four speakers placed inside with individual sends from the board. We used very minimal compression on some of the direct mics on mixdown only. However, we realized the issues [that were] created with compression and only used it sparingly—if at all."

For the tracking sessions, Marenco and Reynaud used five DPA or B&K 4003 mics and the Millennia 8-channel HV-3D mic preamp. All of the room mics were set facing up about 45 degrees toward the outside walls. Two DPA 4041s were used to close-mike the guitars and were placed about eight inches from the instrument pointing 45 degrees from the sound hole. Didrik deGeer mics, paired with Neve preamps from the console, were used for vocals and set about 24 inches from the singers. Only one DPA 4041 mic was used on guitars when a vocal was also recorded. For dobro, two DPA 4011s in an X/Y configuration about 24 inches above the instrument were used. For Moore's acoustic bass, a DPA 4041 was placed on top where the neck meets the body of the bass and a Didrik deGeer mic on bottom in front of the bridge, both mics through Millennia preamps.



The ITU configuration, which pits the engineer in the optimum listening position for 5.1 recordings.

Jean-Claude Reynaud and Cookie Marenco in The Site's control room.

PHOTO: RICK CLARK

Subsequent mixdowns were done at The Site and nearby Skywalker Sound; Skywalker mixdowns were done on their new 72-input Neve 88R surround console. The 80x60x30 scoring stage was used as the reverb chamber, and the ITU was enlarged to accommodate the larger space.

The feedback from the session players was most rewarding. "The musicians said that the recordings really sounded like them: 'It was not the sound of a guitar. It was the sound of *my* guitar. It wasn't the sound of a voice. It is the sound of *my* voice,'" says Reynaud.

Marenco enthusiastically agrees: "After four albums producing Tony Furtado, he came in and said, 'Cookie, you finally got my banjo sound!' I thought, 'Was this what I had to do to get your banjo sound: seven mics, a chamber and a 5.1 setup?'" she says with a laugh.

While the team was committed to the concept of no compromise with the equipment used, they were bound by the most important aspect of the undertaking—the event's emotional spirit. The striking intimacy and enveloping ambiences of the ESE recordings were most interesting in that they seemed to highlight the chemistry between the players even more so than before.

"You are capturing that moment in time, and that moment in time is about the vibe," Marenco says. "We tried putting great musicians with each other who didn't have that friendship from years and years of playing together and it didn't quite work. We realized that they needed to be friends on a musical level, because our technique was going to enhance that dynamic or lack of dynamic. When it worked, it was an amazing experience to see it come to life."

Encouraged by the team from Sony, Marenco decided to create Blue Coast Records; its first release will be a compilation of these ESE recordings available in SACD 5.1, SACD 2-track and CD-format hybrid disc in the fall of 2004. Marenco and Reynaud plan to continue experimenting with ESE and other innovative technologies that bring the artist's performances and vibe into the listener's home.

"Most people haven't heard this kind of sound in so long that even when we bring out our 2-track stereo mixes of these sessions, people say, 'Wow!' It invites people to listen," Marenco concludes. "It seems that people have stopped listening and are using music like wallpaper. It's part of the reason that the music industry is in a shambles. The way that much of the music is recorded now, it lacks emotion. The current fashion is to be over-compressed and to hit everything as loud as possible. It's horrible and we don't want to support it any more. We see ESE as an opportunity to bring back the beauty of real sound—the sense of real emotion—and that comes from dynamics and great vibes." ■

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BY GEORGE PETERSEN

NEW PRODUCTION

Rick Camp Travels With Beyoncé

Engineers tend to fall into two categories: live or studio. Occasionally, a studio denizen goes on the road and vice versa, but it's the rare engineer who's at home in both situations. Rick Camp is one of those individuals. With 22 years of experience, he's hardly new at this, having worked with top performers such as Earth, Wind & Fire, Madonna, Erykah Badu, Burt Bacharach and Destiny's Child, as well as recent solo tours with DC's Kelly Rowland and Beyoncé Knowles.

What's also unusual is that after mixing at front of house for Beyoncé's last tour, Camp immediately went back to his Reel Tyme Recording studio in Southern California to mix Beyoncé's concert DVD, which he recorded live at London's Wembley Arena and is slated for release this month.

These days, more and more live recordings are tracked simply by printing every channel from the house console to a strategically placed hard disk recorder or MDM rack. But with this project, Camp had the luxury of working inside a recording truck, which was provided by London's Sanctuary Mobiles. "We stored the 64-track show onto a Sony PCM-3348 and a couple DA-88s for the crowd mics and spill over," Camp explains. Ironically, after months of mixing FOH for Beyoncé on tour, Camp turned over the house mixing duties to someone else for these dates, but as he says, "It's tough mixing a show with 64 inputs, but it's easier to do the FOH mix than supervise the recording, and I needed to be in the truck."

After the show, the 64 tracks were transferred to 48kHz Pro Tools session files so that Camp could mix the live DVD at Reel Tyme. London-based Scarlet Productions was handling all of the video editing, which brought up a minor snag: "The whole thing was done in PAL, so I had to rent a PAL-to-NTSC converter to see the video."

Once into the project, things went smoothly. Camp used a hybrid mix that was partly done on his Sony DMX digital console using some favorite outboard goodies—Avalons and a Lexicon 480L—while the rest of the DVD was mixed entirely within Pro Tools with, as Camp describes, a "gang of plug-ins: Focusrite, Waves stuff, 1176s, Pultecs and more." For surround monitoring, Camp relies on Genelecs: "I have 1031s all around with *three* 1092 subs. I've never had a problem with these translating to anywhere. I love 'em."

After months of listening to Beyoncé live from the best seat in the house, Camp had his mind set on how to approach the DVD mix. "I'll move with the picture somewhat, but the overall mix is from the front-of-house perspective that I'm used to from mixing her on the road. It's me sitting in the center with the crowd around me," Camp explains. "I've listened to lots of 5.1 concert mixes and I don't agree with mixing the show from the perspective of the artist onstage." In addition to adding crowd ambience in the rear channels, Camp printed reverb and some of the band into the surround channels. "This creates what you'd normally hear bouncing off the back wall, just like the house engineer's perspective in a live show."

PHOTO: JORNA RIEF

Camp began the production process "by creating a stereo mix that I liked. I saved that stereo mix as another Pro Tools session and changed all the pan pots to 5.1," he explains. "I then started moving things around, like the crowd and some of the instruments to create the 5.1 mix. Going the other way around—starting in 5.1 and the doing stereo mixes—would have been twice as hard."

The project's studio part was relatively simple as compared to the logistical issues, but here, technology came to the rescue. "I finished the stereo mixes first. The finished DVD is due out in a month [May 1, 2004], and with customs delays and shipping, we didn't even have enough time to FedEx the mixes," Camp says. "I went to Universal Mastering in North Hollywood, took my stereo Pro Tools mix with timecode and sent it over Wham-Net, which is like a quad T-1 phone transfer but very private and very secure. We first 'Wham-Netted' the stereo mix so they could do the stereo playbacks in London. Then they'll FedEx the picture to Sony in New York for the final conforming and conversion to NTSC and do the Dolby Digital encoding on the final 5.1 mixes that I'm sending out tonight. The 5.1 mixes are delivered as a FireWire drive with mix files as Pro Tools session files, along with a backup on DA-88 tapes."

Camp has only positive things to say about working with this year's multi-Grammy Award–winning sensation. "Mixing Beyoncé is a pleasure because she's a real singer and makes it easy. There is hardly an overdub on this project—it's 95 percent live Beyoncé. In my 22 years of mixing, I've never come across anyone who could deliver like she does: vocally and her ability to do a show. I've seen this young woman run across a 60-foot stage, hit every note and never miss a thing. And that makes my job so much easier." ■

George Petersen is Mix's editorial director.

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BY HEATHER JOHNSON

Meredith Brooks Redefines A&R

NEW PRODUCTION

With the record industry seemingly more interested in fat bottom lines than long-term career development, many artists stopped grabbing at the "major-label record deal" brass ring long ago and began taking a more proactive role in their business affairs. In addition to writing great songs and playing them live, many take-charge artists, such as the multifaceted artist/songwriter/producer Meredith Brooks, also run their own labels, promote their own "product" and operate their own studios with respectable profit.

For her 2000 release, *Bad Bad One*, the self-reliant Brooks either wrote or co-wrote all 12 songs, played rhythm and lead guitars, edited and programmed much of the album, and co-produced and engineered with David Darling. Now, Brooks has enough confidence in her technical abilities to go it alone.

"Now I pretty much don't even use an engineer," says the self-taught Brooks, who works on a Pro Tools–equipped Apple Power Mac G4 and a Mackie HUI controller. She owns minimal outboard gear (though she often rents Neve modules and LA-2As), but works with signal processors such as Warp Factory and Filter Factory, a solid mic collection and, as a reflection of her guitar-wielding beginnings, ample six-strings and guitar amplifiers. "I don't do any direct or Amp Farm," she says. "That helps keep it real, because you can get bogged down in the whole Pro Tools thing."

Brooks also mixes both her own work and the tracks she produces for other acts. "It's actually blowing my mind, because the mixes sound great to me," she says. "It's really freeing that I don't have to wait for somebody to mix and then be unhappy with it afterward. I can just noodle on it for a couple of hours, let it sit and come back to it later."

Brooks recently put her mixing, producing, engineering, songwriting *and* guitar-playing skills to use with Bec Hollcraft, a 14-year-old singer/songwriter whom Brooks is developing. As the old music industry model crumbles, Brooks sees ways for non-Britney–level artists to succeed. "I view myself as the new A&R," she says. "I've gotten hundreds of CDs [from new acts] over the past several months, and they're all looking for a way to get their music out there. Because I own my own studio, I'm able to keep my costs low, so when I do find an artist, I can just go to one of the majors for a co-venture."

In this respect, Brooks says that she's okay with the machinery of the industry, even though, as we all know, it's got to change. "They're spending a million dollars on one record, and that's not even for promo. There's something seriously *wrong* with all that! You can't keep that going. Artists have to sell millions of records for anybody to make money off of those bloated budgets."

Ironically, Brooks wrote and produced "Party Up" for Platinum-selling starlet Hilary Duff's album, *Metamorphosis*, and the album *BareNaked* from another TV star-turned-pop singer, Jennifer Love Hewitt. Though Hewitt's album was mostly mixed at Can-Am Recorders in Tarzana, Calif., Brooks

does almost all of her work these days at her own studio. Even for recording drum tracks—which is when many project studio–owning producer/engineers venture to larger commercial facilities—Brooks now stays in the home environment. "I'm using a lot of drummers now—two in particular, Russ Miller and Dorian Crozier—who have their own Pro Tools studios with drums set up, and I just bring the files and we record there and it sounds great. For mixing, [big studios] are still a great way to go, but I mixed my record at Phil Kaffel's home studio, mixed and did additional recording on two of Bec's songs at my friend Rob Daiker's studio and the rest here."

While Brooks uses session musicians as often as possible, not every artist does, which hurts both the players and the studios they work in. "I feel the worst for musicians who don't have studio work," Brooks says. "Some artists are in there making records in the big studios, using [drummer] Kenny Aronoff and the big boys, and that still works for them and that's great. But when you don't have the budget or you'd rather see that budget go to your next piece of gear, why spend it on somebody else's studio? You'll spend it on your own."

As an artist with the talent, skills and equipment to create an album from start to finish entirely on her own, and one who can play multiple roles for the acts that she produces, Brooks keeps her calendar (and studio) booked with a variety of projects. Had she remained bound by the traditional recording artist model, many of these opportunities might have passed her by. "I've been able to transition and flow and change," she says. "If you can't, you're going to get stuck, and then you're going to be out of work—unless you've got an amazing fan base and can tour forever, if that's what you want to do. Frankly, I don't want to. I'm not into living in a bus forever. Even if it did have Pro Tools in it!" ■

Heather Johnson is a Mix *editorial assistant.*

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BY CRAIG DALTON

NEW PRODUCTION

Matthew Sweet: Happy at Home

Tucked away in the Hollywood Hills, surrounded by the sites of countless hit movie location shoots, is the home and personal studio of Matthew Sweet. Prolific crafter of acclaimed and successful albums such as *Girlfriend* and *Altered Beast*, along with being one-third of The Thorns, Sweet's warm, distortion-drenched guitars, lyrical voice and rock-pop songwriting talents have been a part of radio, film and concert tours since the mid-'80s. Having worked with top-level production vets such as Richard Dashut (Fleetwood Mac), Brendan O'Brien (Aerosmith, Train and Bruce Springsteen) and Fred Maher (Lou Reed, Korn), Sweet now has all of the knowledge needed to create new songs in his own Pro Tools|HD3–centered personal studio.

"I was always doing a lot of home recording," says Sweet. "For me, it was kind of how I got into writing songs." Surrounded by a growing collection of '60s art (he and wife Lisa are in the middle of writing a book on the subject), Sweet has created an inspiring environment that perfectly fits his musical history. With a great selection of vintage amps, original Electro-Harmonix processors, classic keyboards and an eclectic selection of guitars, there is no lack of unusual equipment. Taking a look into the small room that houses his drum setup, Sweet says that the lack of acoustic treatment and angles of the room help him track some "crazy, trashy drum sounds." All other tracking is done directly in the main room, which also houses his amps, keyboards and recording gear.

Sweet uses an Apple G4 OS X for his HD system and a Yamaha 02R for stereo playback through Event powered monitors. "We used Pro Tools for a few mixing things on *Girlfriend* [1991], my first breakthrough record, even though it's thought of as a real analog record. We used it to sequence the record and do little backward things; just the stereo [version] was available then. HD made me think I could make a record at home, and—even though it's funky because I engineered it and everything—it would be viable." Although Sweet often uses plug-ins such as the McDSP Filter Bank ("I can't say enough good things about it"), Chrome Tone and some of the Bomb Factory Pultec and Fairchilds, his basic technique also involves Tube-Tech, Neve 1066 and Ampex tube mixers in the input signal chain for instruments. He adds, however, "The beauty of Pro Tools is that you aren't stuck with one sound going in; you can change the plug-ins anytime."

Sweet doesn't see the need for bringing in outside engineers, but confides that most engineers would be aghast at his setup, although it works best for him. He credits Maher with helping him learn Pro Tools. Playing most of the instruments himself, and using some longtime accomplices such as guitarist Greg Leisz and drummer Ric Menck, Sweet doesn't need to track using a lot of different inputs. "Mike Clark from Southern Tracks [O'Brien's Atlanta facility] has been incredibly helpful to me," he adds. Clark advised Sweet on what serious

PHOTO: CRAIG DALTON

gear to obtain and helped him choose some of his classic mics, including a Neumann U49 that he uses for both drums and vocals. Other microphones include a Lawson M51 for "all kinds of things" and a selection of various Shure and Sennheisers. He records his guitars by miking amps and going direct to get "that nice Lindsay Buckingham sound."

Like Buckingham, Sweet prides himself on his self-reliance; in fact, he views it as essential in the current musical climate. "The fact that you can do [production, marketing and distribution] yourself makes for more chance of success. There is so much more out there that is not being covered well by the majors. It feels like there is kind of a critical mass of stuff waiting to happen."

Although he's still able to go to the majors for new projects, Sweet is exploring different release routes for his two completed personal studio projects. *Kimi Ga Suki*, which he describes as a "love letter to Japan," has been in limited release there through a Japanese distributor and in the U.S. on Amazon.com. Also coming soon is *Living Things*, which includes keyboard contributions from the legendary Van Dyke Parks. Both of these new collections should be available in wider distribution this summer and perhaps supported by a tour.

"In a way, for me, the art of doing music is really a lot about the home demo studio," Sweet offers. "Early on in my career, and even in the middle of my career, friends who I know really well have always kind of liked my demos better [than the finished albums]. Even with the successful records, there's something about the demos; they're just more personal, they're a little more artistic. They just have that 'painter on his own' kind of thing about them." ■

Craig Dalton is a Chicago-based freelance writer. Contact him at crdalton@sbcglobal.net.

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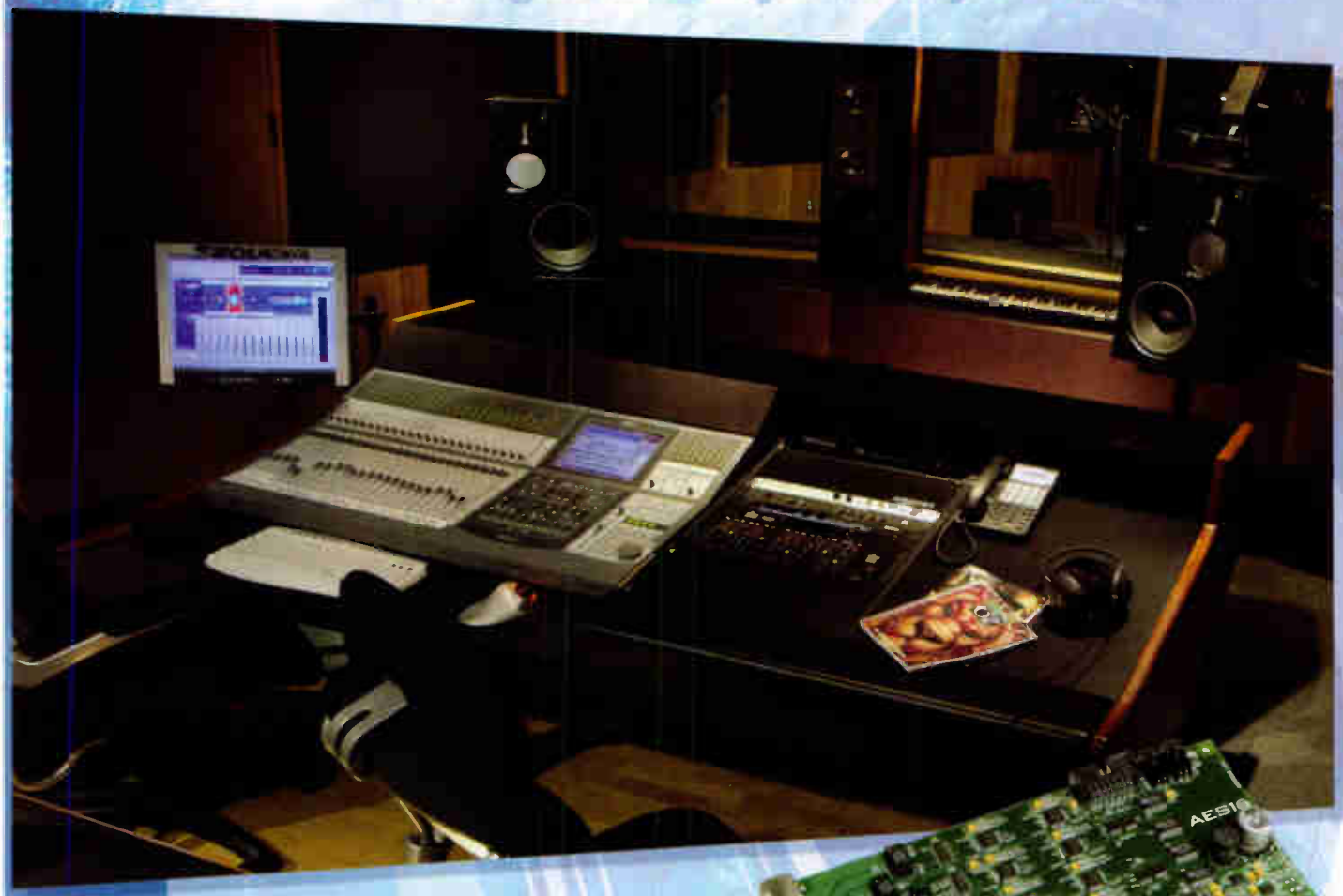

AES16

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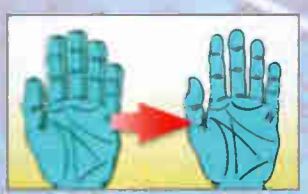

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BY DAVID WEISS

Wireless Ties Built for Speed

NEW PRODUCTION

"High-speed networking" ceased to be a buzz phrase sometime during the end of the last millennium, but its significance in pro audio is growing. There is an increasing need for recording studios, mastering suites, post houses and DVD producers to securely move media at speeds faster than DSL, T1 or old-fashioned FedEx—and still keep costs down. Fortunately, viable solutions to quickly move huge, uncompressed audio and video files are emerging in the form of wireless broadband networks, opening up new business models in the process.

At Masterdisk (New York City), the difficulties to achieve sufficient bandwidth were typical: Broadband solutions like DSL and T1 are too slow, and no direct fiber connection is coming to their building anytime soon. "So much of our work is the kind that can't be done fast enough at any price," mastering engineer Andy VanDette says. "On the production side, all of the major labels have electronic delivery and there are lots of international clients who are using that instead of courier or FedEx to send me masters."

Masterdisk had experienced the delays in trying to upload a typical 600MB CD master or 11.5GB DVD project to a remote server via T1, with throughput taking several hours. Several years ago, the expected solution was fiber's huge bandwidth capacity, but the logistics and costs of digging up streets to connect buildings and businesses to the main fiber pipeline (the dreaded "last mile") proved prohibitive in most cases.

After a recent experimental collaboration with Rainbow Broadband (www.rainbowbroadband.com), a new networking venture led by audio pioneer Russ Hamm, Masterdisk may have found an answer with a wireless broadband network based on radio frequency (RF) transmission. "I've seen networking as the next thing for quite a while," Hamm comments. "But it wasn't until a year ago, when Pro Tools|HD came in, tape started to *really* disappear and people like Andy got into posting files to servers with FTP [file-transfer protocol] that I thought the industry would actually be able to interact over networks."

To set up the test, Hamm needed another building in Manhattan with a fiber connection and a clear line of sight between that building and Masterdisk to establish the broadband wireless connection between the Motorola Canopy RF transceivers set up at both locations. Hamm found his fiber connection at One Penn Plaza, 12 blocks and four avenues away from Masterdisk, and set his gear up on the 56th floor. Operating in the license-free U-NII (Unlicensed National Information Infrastructure) and ISM (Industrial Scientific and Medial) bands at 2.4, 5.2 and 5.7 GHz, Hamm encrypted his "Air-LinQ" signal with SSL (Secure Socket Layer) for security and began beaming data from an antenna at One Penn Plaza direct to another antenna that was connected to a laptop and placed in the window of an office at Masterdisk.

The result was exactly what Rainbow expected and Masterdisk had hoped for: a true broadband wireless connection that took hours, not months, to set up and no messy construction. "Streaming video is the ultimate test, and here we downloaded a DVD MPEG-2 file from One Penn Plaza and watched it live on a Windows Media 9 player," says Hamm. "We also did FTP transfers across the network. An uncompressed .WAV file of a four-minute Aretha Franklin song came across in under 60 seconds."

PHOTO: DAVID WEISS

Masterdisk chief engineer Andy VanDette (left) and Rainbow Broadbond CEO Russ Hamm are enjoying a true broadband experience.

With the fiber on the One Penn Plaza side connected to core networks like AT&T's, the mastered music or DVD files that Masterdisk FTPs for client approval can be posted in a "digital workspace" behind a secure firewall, where the data is far less susceptible to loss or theft than if it was on physical media. "The radio link is extremely secure," Hamm notes. "The issue of security is really a psychological one. Many A&R people who are concerned about it use online banking every day and don't think twice about that."

In addition to being able to send finished, uncompressed projects to existing clients at extreme speeds, Masterdisk believes that when this true high-speed networking is available (it is in the testing phase now), it will become a new business paradigm for their facilities that they call Remote Ears. By quickly retrieving large audio files, VanDette can listen to a producer's posted file in his mastering suite and give immediate feedback. "With Cubase guys not going to major studios as much, mastering is more important than ever," he explains. "For a lot of my clients, the bass player in the band is producing the record and they're open to suggestions. They just send me the uncompressed audio, and that saves them the FedEx cost for delivery. It allows me to sell more studio time by charging my client to collaborate with him much sooner, and it pays for whatever broadband service I would need.

"And whereas major labels used to order a separate master for every territory where they're doing record production, they've learned that they can distribute the digital file set as needed. This is saving money on both sides." ■

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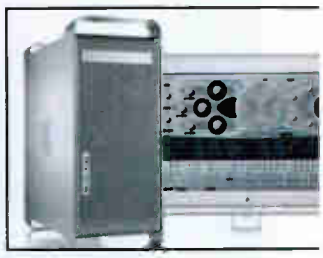

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The 76th Annual Academy Awards

Pointing the Way Toward the Future of Broadcast

By Howard Massey

It's another crisp winter night in L.A. Annie Lennox stands center stage at the Kodak Theatre on Hollywood and Highland, clad in jeans and faux fur and singing "Into the West" from *The Lord of the Rings: The Return of the King*, as if her very life depended on it. Backstage and in the orchestra pit, dozens of production crewmembers bustle about, setting up and adjusting microphones, tending to the needs of the talent and musicians, talking softly but urgently into their RFPLs and cell phones.

Half a block away, Tommy Vicari sits hunched over a Neve VRM console in David Hewitt's Remote Recording truck, fingertips darting from fader to fader as he deftly mixes the 55-piece orchestra accompanying Lennox. Behind him, Hewitt quietly moves between three Neve 961 subcars, putting on and taking off headphones as he makes minute adjustments to the string and woodwind submixes. From a squawkbox off to their left come the musings of an agitated director, alternately cursing out cameramen for missing their shots and cracking bad jokes about the dress sense of selected cast and crew.

In a TV satellite truck parked nearby, legendary broadcast mixer Ed Greene is in the hot seat, though you'd never know it to look at him. Seemingly unflappable, yet deeply focused, he divides his attention between two consoles: an analog Calrec and a digital Mackie D8B, blending the signal from nearly 100 onstage mics and numerous playback machines with Vicari's orchestral mix. Issuing forth from the Meyer Sound, KRK and JBL speakers surrounding Greene is a lush 5.1 spread of the entire melange.

And that's just the rehearsal.

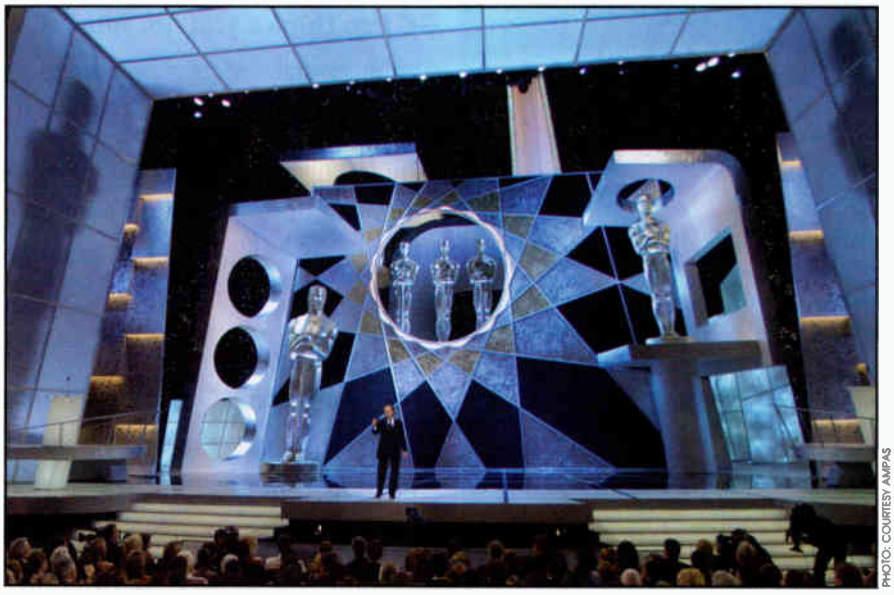

PHOTO: COURTESY AMPAS

Billy Crystal warms up the audience for the night's performances, transmitted via high- and standard-def.

PHOTO: COURTESY AMPAS

Emcee Billy Crystal—heard in surround

REPORTING FOR DUTY

It's common wisdom that it's big-budget shows like the annual Academy Awards that drive the broadcast industry forward. This year's extravaganza was a major case in point, transmitted simultaneously in both high-definition and standard-def, with two separate audio streams: a discrete Dolby Digital–encoded 5.1 mix and a Dolby Pro Logic II–encoded signal, complete with split surrounds. True, it was last year's Grammy Awards show that first broke the ice in that regard, but the higher-profile Oscars not only boast a longer pedigree, but also command a significantly larger worldwide audience.

Despite the leap forward, much of the production crew's approach taken this year was unchanged, thanks largely to the consistency of personnel. (Hewitt has been doing the show for the past 12 years; Vicari and Greene for the past eight.) "The shift to 5.1 hasn't really affected my job," says Vicari, "because for me, it's all about the music. I don't worry about the technical details. I just worry about getting the signal from the players cleanly into the console and mixing it so the listener can hear the arrangement—hear all the elements the composer had in mind. Mind you, it does sound glorious in 5.1, having the image wrap around you; it's inspiring to me."

It's a broadcast trend that all three men see as inevitable. "Surround sound is something that the public has embraced and nobody's going to go back," Hewitt says. "Actually, the whole surround phenomenon is kind of amusing to me and to most remote mixers, because our goal has always been to re-create what you're hearing in a concert. Trying to do that in stereo was always very difficult, but we always miked in surround, so to speak, to try and get the feel of the live venue. So, essentially, I'm not doing things a whole lot differently."

Clearly, it's Greene's role that has been

PHOTO COURTESY AMPAS

Betty Bonafassi fronts the jazzy rendition of "Belleville Rendez-Vous" from the film Triplets of Belleville, *alongside guitarists Benoit Charest (center) and John Goux.*

the most affected by the brave new world of multichannel audio. "Things are getting very complicated," he reports. "For this show, we actually generated four separate mixes: a domestic 5.1 for HD, an international 5.1 HD, a domestic SD-encoded and an international SD-encoded, with the international mixes excluding the show announcer and commercial bumpers. That's pretty complicated stuff for a program that's primarily a lectern show. I don't want to minimize it, but there's really just two lecterns and a center mic, plus the orchestra pit and a lot of film cues. The thing is, the Oscars are a very high-profile show."

Asked if he feels that production requirements are getting *too* complex, he responds with a laugh: "No, not so far, anyway. But every show now presents a whole new set of requirements. Certainly, the 5.1 mix I put together for this year's Academy Awards was a lot more adventurous than the one I did last year."

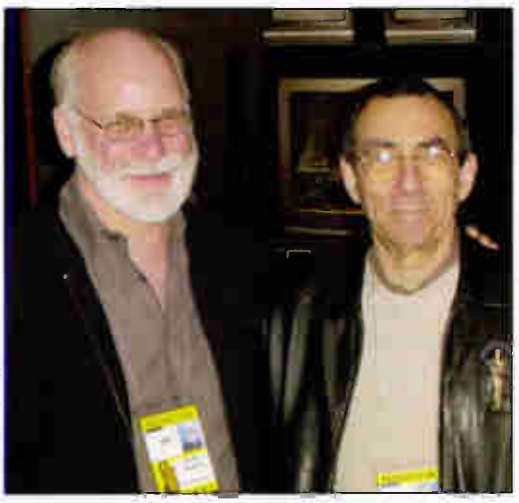

PHOTO: HOWARD MASSEY

Remote Recording Services' David Hewitt (l) and broadcast mixer Ed Greene looking calm, cool and collected

"It's a ratchet," Hewitt observes. "Every year it goes up one click, and it never goes back."

Greene's enthusiasm for surround sound is obvious. "It's a great new palette, and I'm convinced it's here to stay. DVDs are driving it, of course; it's delightful to watch movies that way at home. I'm even starting to watch movies off-air in 5.1 or even just SD-decoded. That's quite nice, too, but the biggest issue now is sync between the audio and video signals. Sometimes it's close and sometimes it's not so close—often two or three frames off, sometimes more. The problem is that the video gets processed so many different ways, and nobody really keeps track of where the audio is.

"In fact, I watched a live program not long ago that was two-and-a-half seconds out of sync for about 20 minutes. What happened was, the network took the audio from fiber and the picture from satellite, and then somebody called and complained, so they switched, but they switched both of them!" With a trace of resignation, he adds, "We often have no control over what happens to the signal when it leaves our trucks."

OPTING FOR DIGITAL GEAR

Another broadcast trend identified by all three mixers is an increased reliance on digital equipment. "I have a Mackie D8B," Greene reports, "which I also used at the Academy Awards show last year. It's a very good-sounding desk. I used it primarily for the two medleys in this show, and I haven't had a failure with it, but in broadcast, you always have to have a Plan B anyway. The contingency planning here included a stereo FOH mix coming up on the main desk, which I could immediately go to if necessary, and numerous backup microphones already onstage."

Hewitt notes that a requirement of HDTV is that broadcast audio must ultimately be converted to digital. At this year's show, the conversion occurred at the last possible stage via the Dolby Digital encoding process. But Hewitt foresees an inevitable shift toward having the conversion to digital occur at an earlier stage—eventually. "At the current time, digital equipment simply crashes with more regularity than I'm willing to tolerate," he says, "and there are a whole bunch of issues that aren't settled yet, things like sampling rate and bit rate, even format: PCM versus DSD, for instance. When the technology gets to the point where it is both standardized and stone-reliable, then I probably will make the move, not just to a digital console, but also to digital mic splitters because it's so much easier to pipe around that way, and it reduces wire size and bulk. It comes down to the same old two-step: reliability and sound. Sure, I'd love to have total resetability and remote control; that's very valuable. At the same time, it can get you into trouble. When

you're forced into doing too much just because the equipment can do it, then the quality can suffer."

Vicari takes a similar view, pointing out that this year, for the first time, all of the show's pre-records were done in the digital domain. His main concern, however, is with ergonomics. "Digital consoles are wonderful devices, and I use them every day in recording studios, but in this kind of situation, I want to be able to look at a fader and be certain that it's showing me where the level is. I don't want to be layers deep; I want to see everything in front of me." Greene shares that concern. "Many of these manufacturers don't consult with broadcast mixers until after they have built the product," he explains. "In fact, a lot of them don't understand what we do. A product may have everything you want in it, but unless it's got good ergonomics, it's really not very useful."

Greene also predicts an increasing reliance on console-based plug-ins, if for no other reason than time constraints. "Come what may, we know that at 5:30 on a Sunday night, we're going on-air; whether it's a full-fledged digital 5.1 mix or a string and a cup, we're going on the air. So you do the best you can with the time and tools available."

PHOTO: COURTESY AMPAS

Alison Krauss and Sting perform "You Will be My Ain True Love" from **Cold Mountain.**

GEARING UP FOR SHOW TIME

Rehearsal time, in fact, is typically so tight for these kinds of shows that all three engineers have developed the practice of recording rehearsals and then spending significant time afterward playing the tapes back to refine their mixes. "It's invaluable being able to do that, because it's expensive having an orchestra here," Vicari says. "During the few hours that we have them, we'll get a basic balance and echo level and then take a snapshot; that gives us a starting point. Of course, this is a grueling event: The players have to sit in the pit for eight hours at a time, so they don't really give their all until the show, which means that the level settings that I got in the rehearsals don't necessarily mean anything. I try to give myself some headroom, because I know that when the show starts, everybody gets excited and plays harder."

Like the musicians, everyone responsible for the audio at the Academy Awards plays a sharply defined role. In addition to doing the orchestral mix during the show itself, Vicari was charged with overseeing the pre-records at Capitol Studios in the days leading up to the broadcast. During that time, Hewitt and Vicari's brother, Dan, did the pit setup and cross-patching. Interestingly, the mix generated by the Remote Recording truck was not a full 5.1 channel. Stereo orchestral stems were provided to front-of-house mixer Pat Baltzell, and only left, right and LFE channels were sent to Greene, who then created the center and rear channels and handled all of the onstage mics.

"I certainly was not adding audience or dialog to the LFE channel Tommy sent me," Greene explains. "I simply added a little bit of bass and other low-frequency instruments, as well as a little bit of the clip playback—whatever seemed appropriate." Greene opted to use the center channel strictly for dialog and vocals, which were also placed in the front left/right speakers to create both phantom and hard center imaging.

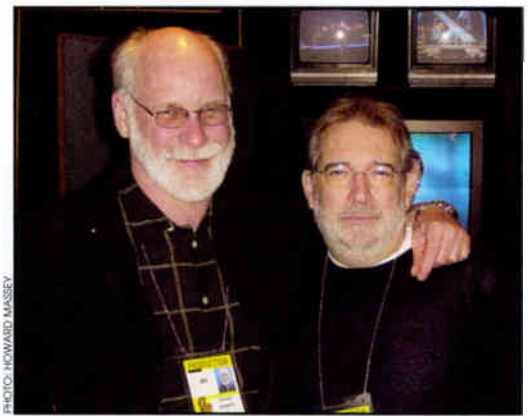

PHOTO: HOWARD MASSEY

Hewitt gets "buddy buddy" with orchestral mixer Tommy Vicari (right).

The content placed in the rear channels was a subject of considerable discussion during pre-production planning. "I never felt that music should be coming from the back," says Vicari. "I was never a fan of that in these kinds of situations, because the audience perspective is that the orchestra is coming from the front, and the listener should feel like a participant in the show." It's a philosophy that Greene agrees with: "You wouldn't want to have instruments happening in back of you for this particular project, which is really a proscenium show, so I basically just took Tommy and Dave's two-mix and spread it around the sides a little bit."

Greene's tools of choice for that purpose included more than a dozen strategically placed ambience microphones in the theater and a pair of venerable Lexicon 200 reverbs. "I view broadcast audio as being broken down into different areas," he explains. "Dialog or vocals are the story of the program; the music and effects are the feeling of the program; and the audience reaction is what connects the artist to the audience. That's the element that puts the listener at the venue."

However much time and effort is spent creating the 5.1 mix, Greene is a realist, noting that few viewers actually get to hear the show that way. "Especially with a program like this that runs so late, a lot of people are watching on TV sets in their bedrooms, so they're often listening in mono." As a result, once the basic 5.1 mix is set, he generally monitors in mono at modest levels of 70 to 75 dB SPL, relying mostly on metering (through a Dolby LM100) to keep track of the surround mix. This time around, though, Greene experienced things somewhat differently. "I found that when I was listening in mono or stereo, I wasn't able to hear some of the subtleties that were going

out in surround, so for about the last two hours of the show, I listened mostly in 5.1."

Over in the Remote Recording truck, Vicari and Hewitt had the luxury of switching between monitoring the 3-channel signal that they sent Greene and the pre-encoded 5.1 mix that he was constructing; with the use of their Martinsound controller, they even had the capability to downmix the 5.1 to mono or stereo. In essence, a symbiotic loop was created: As Vicari monitored Greene's surround mix, he was able to make adjustments to the orchestral contribution in real time that, in turn, affected Greene's final decision-making.

PHOTO: COURTESY AMPAS

Eugene Levy and Catherine O'Hara reprised their roles as Mitch and Mickey for the song "A Kiss at the End of the Rainbow" from A Mighty Wind.

Greene is a veteran of both the Academy Awards and the Grammys, and he points out that a key difference between the shows is that the music mix at the Oscars is easier to control because the orchestra pit is stationary; at the Grammys, he has to contend with stage instrumentation that's constantly changing. The Grammy audio production team also takes a different approach to creating the 5.1 mix, routing stems and musical elements to a separate truck dedicated to that purpose.

This time around, there were no significant audio hiccups at the Academy Awards; certainly nothing on the scale of the Celine Dion dead-microphone gaffe at the Grammys. "But that's what happens in live shows," Greene points out, "and unfortunately, the only thing that really sticks in people's minds. You can pull off the audio feat of the century, and as long as there's nothing that disturbs people at home, they just say, 'Oh, that's nice.' However, if one microphone goes out, 'Oh my God!' In the broadcast world, audio may still be the stepchild of video—see a dog, hear a dog—and it is true that the better it looks, the better it sounds. But," he adds with a grin, "it's equally true that the better it sounds, the better it looks." ■

Howard Massey's latest book, Behind the Glass, *is a collection of interviews with top record producers and engineers.*

Rod Stewart

Photos and Text by Steve Jennings

Rod Stewart's new tour has the rock star-turned-crooner singing his favorite hits from *It Had to Be You* and *As Time Goes By*. Front-of-house engineer Lars Brogaard took a few minutes to talk about the show.

"Sound Image is providing sound for the tour. We're using Meyer Sound's new Milo system with 60 Milo line arrays, 20 M3D subs and 11 UPA-1Ps, usually with 16 Milo boxes flown per side for the mains and 12 Milos per side flown for the side hangs. We also fly six M3D subs per side and have eight more M3D subs on the floor. Front-fills are all Meyer UPA-1Ps. The system sounds fantastic with superb vocal clarity, and has performed consistently well in the diverse venues we've played. Milo has swift, straightforward rigging, and we can have the entire system down and in the truck a half-an-hour after the show.

"We have one DiGiCo D5 at FOH and two at monitors: one for the singers, the other for the band. I've been using the D5 since they were launched. In fact, I have the first one ever made at FOH. The first half of the show is an assortment of Rod's old hits, and then we have a set and band change to accommodate songs from *The Great American Songbook* albums. During the interval, we must reset the entire console to deal with a different drum kit, 8-piece string section, upright bass and so on. The D5 does this in a single button-press, resetting everything from input channels, gates and comps to onboard effects and routing.

"We're using the new AKG WMS4000 on all vocals and wireless instruments. In-ears are AKG SST-1. We are beta testing the new TC Electronic EQ Station and MotorFader, using it for system EQ. This is a great unit, and you'll soon be seeing a lot of them."

Front-of-house engineer Lars Brogaard

FixIt

Mark Ballard

During the past couple of years, Mark Ballard has worked as a system tech or at front of house for Kylie Minogue, Travis and Bond. Recently, he was setting up to do some dates with former Spice Girl Mel C. A Mac fan, he's been using SpectraFoo's SpectraGraph, SpectraGram and Transfer Function applications for years.

"I use SpectraFoo in my usual mode to EQ the system and get it tied in together properly. [On a recent corporate gig], I took about three or four frequencies out—just minute slivers. I gained 6 or 8 dB of headroom as compared to doing it with a graphic equalizer. I got better end results without crucifying the audio system. I have it set on continuous resolution so it's very accurate, but you often find engineers who aren't used to looking at that kind of display. For the show, I'll put it into a different set of windows or a different set of resolutions that the engineer can read very easily."

inside

News

Pionist David Benoit ond FOH engineer Trinidod Sanchez (pictured) used True Systems mic pre's ond Neumonn TLM 103 mics during a musicol segment on Emeril Live.

The singers for **Treasure Island Resort and Casino's** (Las Vegas) newest show, *The Sirens of TI*, use **Sennheiser Evolution 550 Series** mics, transmitters and a twin receiver in a 19-inch, IU housing...**Acoustical Design Group** (Mission, KA), **ASCOM Inc.** (Grand Rapids, MI) and **Electro-Voice** installed a loudspeaker system for the Wings' **Stadium** (Kalamazoo, MI), which comprised 54 **E-V SX100 loudspeakers** attached to beams via specially designed build brackets...**Alcons' The Ribbon line array** systems were delivered to **Event Technology**, including 18 LR16 line array modules and six ALC2 controller amplifiers with cables, connector panels and dedicated processing...**McCauley Sound's** (Puyallup, WA) System Design Group program has grown in response to last year's projects, which included installations in houses of worship, night clubs, sports arenas, auditoriums and theaters. For more information, go to www.mccauley.com...**Pratt & Whitney's** new museum (East Hartford, CT) required a new loudspeaker system, facilitated by **Snow Sound** (Berlin, CT) and systems integrator **North American Theatrix** (Woodbury, CT). A total of eight dV-DOSC cabinets were flown in two hangs of four on either side of a permanent stage.

Chicago's Cubby Bear installed six Sound Physics Labs td1s and four ServoDrive B-DEAP32 subs driven by a Shure P4800 DSP.

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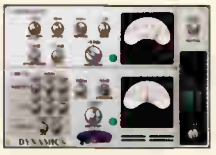

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* The VS8F-3 Expansion Board is compatible with Roland's VS-2000CD/2400CD/2480 series recorders. Support for the VS-1680/1880/1824 is planned for summer 2004. Five Roland plug-ins are included with the VS8F-3 (Stereo Reverb, Tempo Mapping, Pre-Amp Modeling, Mastering Toolkit, Vocal Channel Strip). All other plug-ins, VGA output, and monitor are sold separately.

Roland Plug In

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PHOTO: DANNY CLINCH

On the Road

Jereb Carter

Currently hitting the small-club circuit with New Orleans funksters Galactic during the band's Freestyle 2004 tour, front-of-house engineer Jereb Carter (who has also manned the FOH board for Garage a Trois) shares some insight into creating perfect sound in close quarters.

Is it harder to work in smaller venues?

Small venues can be easy and fun to mix. However, some bars can be a less-conducive mixing environment with loud patrons and small, unkempt P.A.s!

How much production gear do you carry?

I carry an outboard rack that comprises a PCM81, SPX-2000, TC Electronic D2 Delay, six dbx 166 comps and a Sony R500 DAT machine. I use this to supplement house P.A.s that sometimes don't have all I need to keep a consistent sound. For in-ears, we use Shure 700 Series. I use mostly Audix mics, with the exception of one 421 for guitar and one SM58 for sax. The Audix mics sound natural for drums, and the OM Series have great rejection for vocals and are very road-worthy.

Do you have any "must have" pieces of gear you travel with?

For kick drum, I always carry an Audix D6 and a SansAmp distortion pedal for snare: Do not try this at home!

Do you have any favorite venues you like to work in?

It's hard to say, but being from Colorado, I am biased. Some of my favorites include Red Rocks Amphitheatre, the Fillmore in Denver (and San Francisco), the Fox Theatre (Boulder), the Rico Theatre and Tipitinas in New Orleans. All these venues sound great and have some of the best staffs in the country!

What do you like to do when you're off the road?

I enjoy spending time with family and friends, playing music, snowboarding and the occasional bonfire!

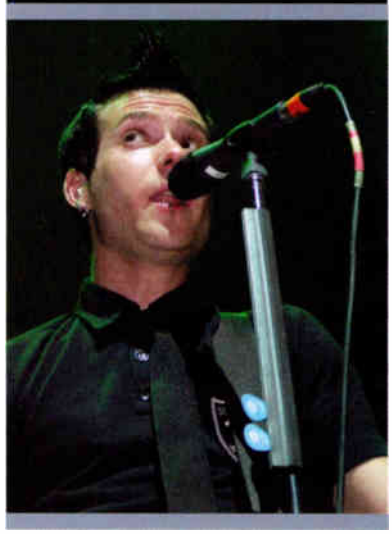
Now Playing

Ziggy Marley

Sound Company: Rat Sound Systems (Oxnard, CA)
FOH Engineers/Console: Errol Brown, Michael Ver Steegt/InnovaSon Grand Live
Monitor Engineers/Console: Keith Grant, Chriz Rymarz/InnovaSon Sy40
P.A./Amps: local/Crest 7001, 4801; Chevin Q6
Monitors: Microwedge 12, 15; Rat Sound sidefills, drumfills; Shure PSM 700
Outboard Gear: Lexicon PCM70, PCM 80; Yamaha SPX-990; TC Electronic D2; Klark Teknik DN360 EQ
Microphones: Shure SM58, SM98, SM91, KSM32, SM81; AKG 430; Audio-Technica 4050

Simple Plan

Sound Company: In-house and local production
FOH Engineer/Console: Trevor Coppen (also FOH tech)/Yamaha 48-channel PM 4000 master console that slaves the house console
P.A./Amps: In-house (prefers V-DOSC as Coppen is certified tech) or other line arrays
Monitors: In-house (two mono in-ear mixes and talkback line), Sennheiser 2-300 Series
Outboard Gear: Behringer Ultra-Curve (time alignment and notch filters) with Smaart; Lexicon MPX-550 (drums); and TC Electronic M-One XL (vocal reverb, chorus), D-Two (vocal delays), SPX-990 (doubling, pitch, symphonic effects)
Microphones: Sennheiser 550 Wireless Series (three guitars, lead vocal with 845 capsules), two hardwired 935 (vocals), 604 (snare bottom), proprietary version of Beta 98 (snare top)



The Ultimate Ambience Miking

When a Delta Rocket streaked into space to place a Global Positioning System satellite, freelance audio engineer Gary Faller relied on a stereo pair of DPA 4041S mics to capture all of the sonic nuances.

"I wanted to capture the sound of the rocket after the initial blast-off and it roaring up through the sky by using these large-diaphragm omni mics on a [DPA-provided] A/B stereo bar," he said. Faller mounted the bar on top of the historic U.S. Air Force Hangar AE (the site of the first Apollo launch) at Cape Canaveral Air Force Station, about a mile away from the launch pad. "The mics I used were rated at up to 144 dB SPL, so the mics and the preamps [DPA HMA4000] won't overload.

"The hardest thing is to keep the recording clean, because the rocket is making all different noises and harmonics and the airwaves are smashing—what I call 'vortex smashing of the air'—but the mics had more than enough headroom to let me capture the sound accurately with the right balance and impact."

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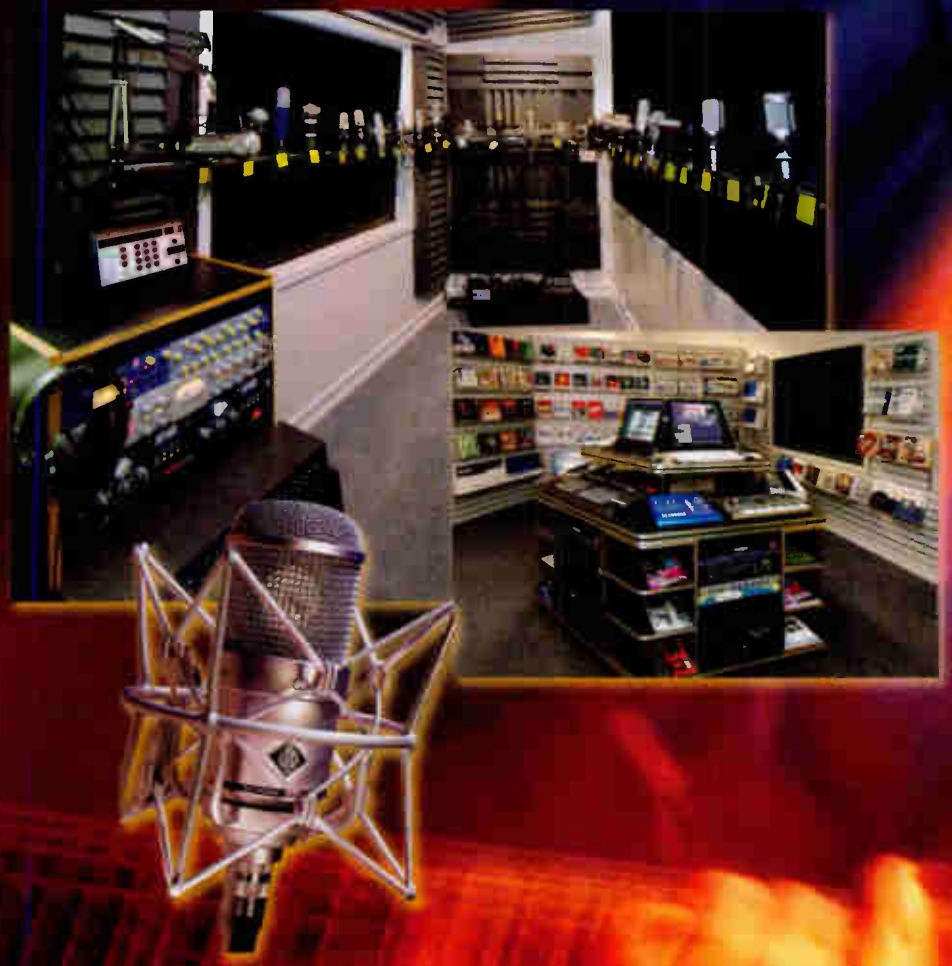

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On-the-Spot CD Release

Out the Door, That Night's Show In-Hand

BY SARAH BENZULY

Advances in technology have made the ability to do our jobs easier and—more importantly—faster. Why FedEx when you can e-mail? Why wait until you get home to call loved ones when you can do it on your cell phone while stuck in traffic. Go to the bank anymore? Why? You can hit an ATM or hop online to transfer funds. However, this technology has altered our collective minds—we want it now.

The same idea is now pulsing through the live sound industry. Why wait for a band to release a live CD or—better yet—hop online the day after the concert and download the set's tracks from their Website when you can shell out $20 for a CD of *that* show as you walk out the door. Amazing.

Though the practice of burning instant CD-Rs to be sold to fans as they walk out of the venue is in its infancy, the concept is raising some serious questions. What new responsibilities and issues lay beyond the front-of-house engineers' ability to just be in the "here and now" and mix a show? On the business side, will the engineer get a cut of the profits, much like a mechanical royalty for a studio-produced CD? On the tech side, will engineers need to re-learn their job? The answers are, we just don't know yet. *Mix* spoke with FOH engineers and two companies that are offering this service to discuss this relatively new idea.

MEET THE PLAYERS

Recording shows is nothing new to front-of-house engineer Robert Scovill (Def Leppard, Rush, Matchbox 20, etc.). He's been hitting Record for the past 15 years, going back to his 4-track cassette days. "My goal at that time was to hone my skill at pulling off a live recording, as well as do a concert at the same time," he says. "And I think subconsciously, or just underneath the skin somewhere, I always knew that we were going to be able to mass-produce and mass-distribute music after a show to an audience."

This thinking led him to become involved with DiscLive (where he currently serves as an advisory boardmember), a New York City startup in the concert merchandising and live recording industries that has been offering same-night live CDs since February 2003.

DiscLive supplies tours with a self-contained rig that incorporates the company's patent-pending file-transfer technology, in which an audio feed from the FOH board is cleaned up and distributed to a scalable number of servers and a CD-R is burned to produce 800 discs in less than 20 minutes post-show, with the first batch available in under five minutes.

"We consider the FOH engineer in a way a member of the band," says Sami Valkonen, president of DiscLive, "because of the level of input he has on how the CD sounds. Our specialization is what we term mastering: the sonic post-processing of the artistic vision of the artist and their FOH engineer to make the best-sounding CD possible."

Working almost exclusively with one act can solidify the "becoming one with the band" mentality. Front-of-house engineer Kevin Browning has mixed for Umphrey's McGees for many moons, burning in real time for himself and the band for more than three years. "I have always been conscious of trying to produce a high-quality live recording, as well as the live mix," he says. "The bottom line is that it's the engineer's primary responsibility to provide the best sound for the ticket-buying audience."

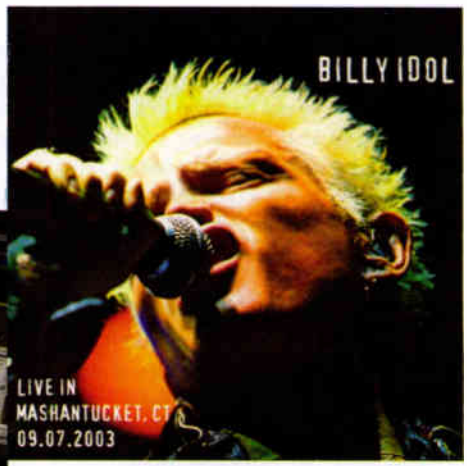
For the past six months, Browning has been burning CDs of Umphrey's McGees' shows to sell to fans via *UM Live*, a three-CD set of that night's entire performance available at the merchandise area for $15. "The recordings are high-quality matrix mixes containing the clarity of a soundboard feed with the ambience of a live show," Browning explains. "Sign up upon arrival as there are only a limited number of copies available. CDs will be available only minutes following the conclusion of the encore."

Front-of-house engineer Steve Young, who has been touring with .moe for the past nine years, has been recording that band's live shows for their live CD series called *Warts and All*. "They're just left/right mixes from the console with audience mics [a couple of 414s onstage] to record the crowd and that goes right to the DAT," he explains. On .moe's recent fall tour, the audio crew was accompanied by Clear Channel's Instant Live reps to record concerts using a combination of ambient mics and feeds from the soundboard. Fans can preorder when purchasing their tickets; those who don't attend the event can buy Instant Live CDs at designated Best Buy stores.

"This is about more than just technology expanding our ability to bring live entertainment to music fans in new forms," said Steve Simon, Instant Live project director and executive VP at Clear Channel Entertainment, in a release. "We are leveraging technology to improve the concert experience for fans and enhance the connection between them and their favorite artists."

Gearing up for Instant Live, Young consulted with reps from Clear Channel on how the racks were configured to make sure that

PHOTO: STEVE JENNINGS



the additional gear was road-worthy. On tour, Young worked with Clear Channel's Dave Tessler, who was situated at FOH and was responsible for recording the shows, "putting in the CDs, making sure of the levels, tracking the songs," Young recalls. "He was a .moe fan, too, so he could tell when they were going to go into a song while in the middle of a jam. All I had to do was make sure the mix was right-on. I took a couple aux sends so I did have control over certain things. The only thing I turned down was the effects return for the vocals, because they were a little too apparent on the tape. The left/right mix went to a TC Finalizer to perform simple mastering and it went right to the CD burners. It was real easy.

"They had road cases with CD-burning towers—three towers to a box—and each tower did a dozen CDs," he continues. "They had six of those cases at front of house. They would burn three masters: the first set at intermission, the first CD of the second set at the end of the show and the third CD after the encore. And with those three masters, in 15 minutes, they would have 100-and-something copies of the show already packaged. Usually a half-an-hour after we were done, the kids had the CDs in their hands and were already out the door."

IS IT TOUR MERCHANDISE?

One of the main challenges that Scovill raises is the classification of the CD-R when working with a major recording artist. Is it tour merchandise or a master recording for retail, or both? Scovill believes that, to some degree, if you are selling the item to concertgoers as they exit the venue, then you are treating the end product as merchandise, which means that the merch vendor and/or the venue may ask for a percentage of the sale. "Where it can get complex is when you consider that most major artists are going to have a recording/exclusivity clause in their contracts, meaning that if the artist wants to sell re-recordings of songs that have been recorded exclusively for that label, the label will mostly likely ask for a fee to do so. There will certainly be a need for somebody to mediate and negotiate all of this for a given tour. That's going to put more strain on the tour managers/accountants/artist management to cut those kinds of deals, not only for a given tour, but in terms of settlement every night."

If the CD-R was defined purely as a "master recording for sale," would the mixer deserve a mechanical royalty? "As much as it pains me, probably not," explains Scovill. "I'd love to tell you there is some kind of standard setup that we could borrow from the recording industry, but there's obviously not, in that in that side of the industry, not all mixers get points; they're more often than not paid a flat fee. My gut instinct tells me that it's one of those things where the artist will say, 'Well, we're already paying you to mix the show. Why should we pay you this much more just to hit the Record button?' In the end, they will have to see 'added value' in your work and feel you were truly contributing to the success of the product. I think as the concept starts to blossom, and reputations of mixers and their various results start to grow, you could see some value in 'who mixed the disc,' much as you do in recordings concerning producers and mixers. As for the live mixers and royalties, whatever gets established early on in the game will most likely stick around for quite a while until somebody is in a position to break from the tradition."

Browning agrees that engineers should receive some sort of royalty for their work and adds another reason why: "Mechanical royalties depend largely on who owns the gear being used. Obviously, engineers need to be paid for their time, but it varies after that. If an engineer is providing the gear to make the live sales happen, he should be compensated for that."

"I try to stay away from all of that," Young adds, "but I think we should get a royalty. The show's first and everybody's there working and making that happen. The tape is just a photograph of the show." Young did receive a credit on the CD, but the royalty checks haven't arrived.

CONSUMER MENTALITY

Because of the need to catch consumers before they leave the venue, these discs will not be reviewed by the artists nor are they necessarily mixed "for the medium" in which they are recorded: Will consumers buy the CD purely from a novelty standpoint or will they expect a studio-quality finished product? Scovill insists that consumers will maintain a bootleg outlook. "What they really want is to walk away from the show with the disc in their hands and listen to it in the car on the way home—warts and all," he says. "'I want my night, I want my town.' They don't want the perfect performance; they want the one that was special to them. And if it has mistakes in it—if the singer is singing flat, et cetera—the artists have to let down their vanity a little bit and relax. If you don't play to the impulse buy—somebody can walk out of the show with a disc in their hands—then I think you've really missed the golden goose." DiscLive hones in on this "grocery store checkout line impulse buy" by providing individually numbered CDs in a customized, pre-printed case.

"The fans really love the fact that they can drive away from the show listening to that night on CD and have it sound real good, be real clear and be able to hear all

the nuances," Young adds. "Even stuff that they hear on the CD that they didn't really hear in the room just because in the room, it gets kind of lost. Ever since we stopped doing it, a lot of people have asked, 'Hey, where do I get a CD tonight?' And I say, 'Oh, it was just a limited time.' I think they really, really enjoyed it and definitely want more."

RAISING THE "BOOTLEG" BAR

"My guess is some fans expect a studio-quality disc while others expect bootleg quality," Browning says. "I'm trying to make them one and the same. I have just added a TC Finalizer to try and give our discs a more consistent, better-sounding edge. Mastering to some degree is possible live, and as time goes by and standards are raised, fans will begin to expect more from the sound, as they should because it only encourages us to work harder."

Young also used a TC Finalizer to help in on-the-fly mastering. Also knowing that he will be providing the mix for the CDs over the course of numerous shows allows Young to "tweak" for the next night. "If you do it on a set of aux sends, then you can make adjustments over a couple shows," he says. "Like if you do the first night and you listen to it, if you decide something's a little too loud or a little too buried on the CD, you can go ahead and change that the next day."

While the industry may be a few touring seasons away from selling a fully mastered CD post-show, FOH engineers are going to have to become more conscious of how their mixes sound on the "small speakers." "I don't feel we should hold this process to the same bar or the same standard that we now hold when we're mixing records," Scovill says. "But this process is going to redefine some of the methodology at the front-of-house mix. [Front-of-house engineers] are going to have to think in terms of that 2-track mix and understand that what they're doing during the show is being printed. For my money, if there's an Achilles heel for this model, it is just this: A large percentage of the quality is reliant directly upon that front-of-house engineer's mixing abilities."

That's okay with Browning, who says, "Sound companies and engineers are there to provide fans and audiences with high-quality-sounding music in whatever context; formats make themselves available as outlets. There is no doubt that the demand for live recordings has increased and it has given us a unique opportunity to provide. It provides a needed service and can be a lucrative source of additional revenue for companies and bands."

"Overall," Scovill says, "it could stand to raise the bar of concert sound in total, because now you're going to have guys really concentrating on making that mix sound right and good coming off the console. You're going to see the focus of the band be a little bit stronger, because now they're going to know, 'Hey, I can't just get up there and sleep through it tonight. It's going to be on record to the public.'"

LONG AND WINDING ROAD

At the highest levels, things that seem simple on the surface can get very complex at their core, "especially in terms of money distributions and fees, labor, royalties, publishing, et cetera—even distribution of it after the show," Scovill says. "It very easily swirls into this very complex arrangement, where somebody has to be in charge of managing all of this activity, not only between the artist and the disc-makers, but between the venues every night, the promoters, the unions."

And even beyond the politics, this brings the "taping community"—especially within the jam-band scene—under scrutiny. "I do know of a lot of tapers that, when we were doing Instant Live, were really excited because they left all of their gear at home," Young says. "They just brought their $20 and walked out at the end of the night with a recording of the show. A lot of [artists] don't even let them tape their shows, but they might think differently if they can sell it to everybody at the end of the night."

In a sense, then, in this age where every company is looking for new revenue streams, same-night distribution can be seen as "free money." "The artist doesn't have to work one inch harder for it than they did before it was happening," Scovill says. "The venue doesn't have to work one inch harder than before. The labels don't have to put out one dime to get money coming in. From that perspective, it just seems like such a simple process and concept, but in the end, everyone will have an appetite for a piece of the proverbial pie. It's really in its infant stages—we haven't seen it really bloom into what it could be. It's going to be fascinating to see if the whole thing eats itself alive before the aforementioned pie even comes out of the oven." ■

Sarah Benzuly is Mix's associate editor.

Kevin Browning's Recording Chain

"I take a stereo matrix feed from the console, preferably Midas, and run it into a pair of channels on the Allen & Heath 14:4 Mix Wizard. I believe subgroups are the key to a balanced-sounding live recording. I start by assigning a healthy dose of the L/R mix to the matrix, but then fine-tune with subgroups. I do not assign the subgroups to the house, only the recording. That way, when I find I need a little more drums to tape, for example, I can boost them without crushing the house mix. If vocals seem to be excessively hot going to tape, I will increase the entire band behind them to even and smooth things out.

"Once I'm happy with the direct soundboard mix, I mix in a pair of microphones at front of house, usually Schoeps with 4V capsules, using another two channels on the Mix Wizard. I then send the soundboard feed to the delay unit using pre-fader aux sends and return it to another pair of channels on the mixer. I then time-align the soundboard feed with the mic feed to ensure a tight fit using Smaart, SpectraFoo or, more typically, by ear.

"I then put additional microphones onstage for crowd/stage ambience. Microphone choice and placement depend on venue size, sonic characteristics, FOH position and about a dozen other factors. For example, the Neumann dummy head works exceptionally well in many venues, but not all. Some spaces call for very directional hypercardioid mics, while others sound great using a wide omni pattern. The Focusrite compressor is inserted on the crowd mics, sidechained off the soundboard feed so that they'll remain squashed while the band is at a louder dynamic but open during lulls in the music to allow applause to cut through.

"Finally, I have just started to run the entire mix through the TC Finalizer to give it a mastered, more professional sound. The resulting 2-track mix goes to DAT and CD-R, which I track in real time.

"That is the basic setup, but it varies almost nightly in small nuanced ways: a different mic here, different placement there, varying EQ and compression details and so forth. I try to capitalize on the pros of each individual venue while minimizing the cons."

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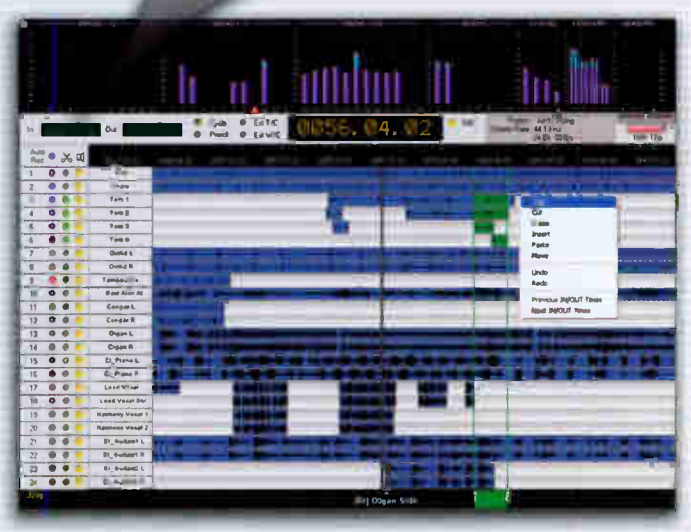

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switchfoot

Mix caught Switchfoot at their sold-out Fillmore Auditorium show in San Francisco, while they were out supporting their still-growing *The Beautiful Letdown* CD. The band has played a few different legs in the U.S. and Canada, and made quick trips to Hawaii, Australia and New Zealand. We spoke with production manager/front-of-house engineer Ryan Nichols anc band/stage tech Todd Cooper about the tour.

Photos and text by Steve Jennings

Switchfoot production manager/sound engineer Ryan Nichols

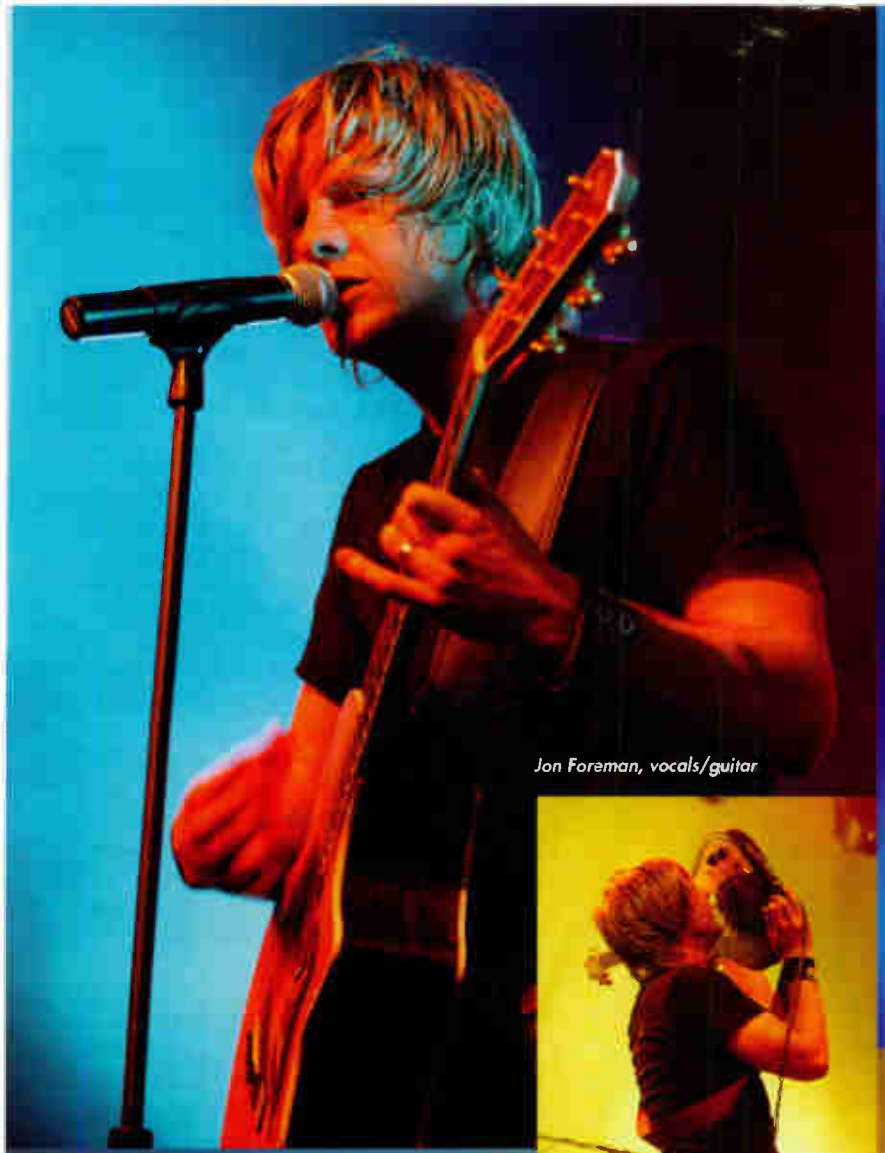
"We only carry band gear, a small supplemental light rig and merchandise," says Ryan Nichols, Switchfoot's production manager and sound engineer. "This is definitely the toughest obstacle for me to overcome: having different gear every night. Most of the venues we play in have sufficient P.A.s. Sometimes we have to supplement the monitors, but that's where advancing comes into play. We're trying to keep things as simple as possible, but I see the band touring with full production in the very near future.

"All three vocalists are on Shure SM58s. Tim [Foreman, bassist and vocals] and Jerome [Fontamillas, guitarist, keyboards and vocals] are on cabled mics for backing vocals, and Jon [Foreman, lead singer/guitarist] is using the Shure ULX handheld version. We started carrying our own mics a long time back. The reason I chose the 58s is because they sound very smooth on any P.A. out there and they are beyond durable. There are challenges involved, like drum and cymbal bleed, but, hey, this is live rock 'n' roll. As for monitor systems, the band tried in-ears a while ago and did not like the isolated, sterile world it created inside each musician's head. We've been using wedges, while Jon uses an in-ear in his right ear with just his vocal in it.

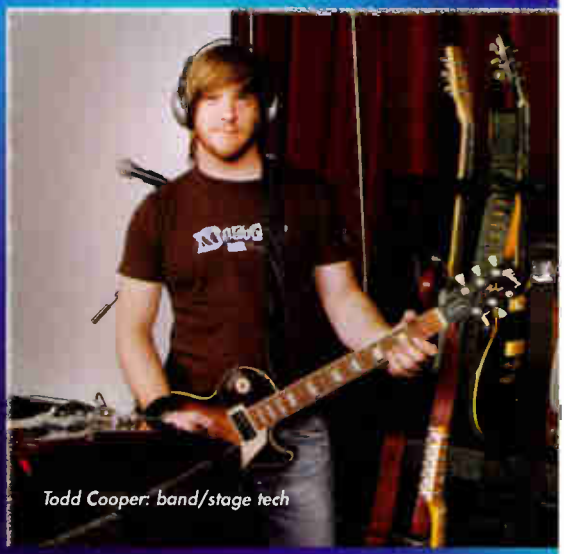
"Technically, I feel the most important aspect of the show is the vocals. Jon's lyrics have a true positive message, so making the vocals clear is important for the crowd to understand every word.

"[For outboard gear] I use an instrument reverb, a vocal reverb, a slight vocal chorus and a delay. I'll use a Yamaha 90ll, 900, 990 and Rev 7, TC Electronic M1 and D2, and Roland 1000 delay. I compress the kick, snare, bass, acoustic and vocals, and gate the second snare, rack and floor. Typical units there are Drawmer and dbx.

"We're currently in the middle of an extremely intense tour: 50 shows in 60 days. I really feel this is an amazing band with great songs. Everyone on tour believes wholeheartedly about what we are doing. It makes for a truly wonderful tour."



Jon Foreman, vocals/guitar



Todd Cooper: band/stage tech

Gear up onstage comprises guitarist Jon Foreman playing through a Vox AC-30; Fontamillas is playing an Orange OR 120 head through a Marshall 4x12 cab; and Tim Foreman's bass runs through a Tech21 SansAmp for the house and uses a Gallien-Krueger 2001 head through two 4x10 GK ported cabs for his stage sound.

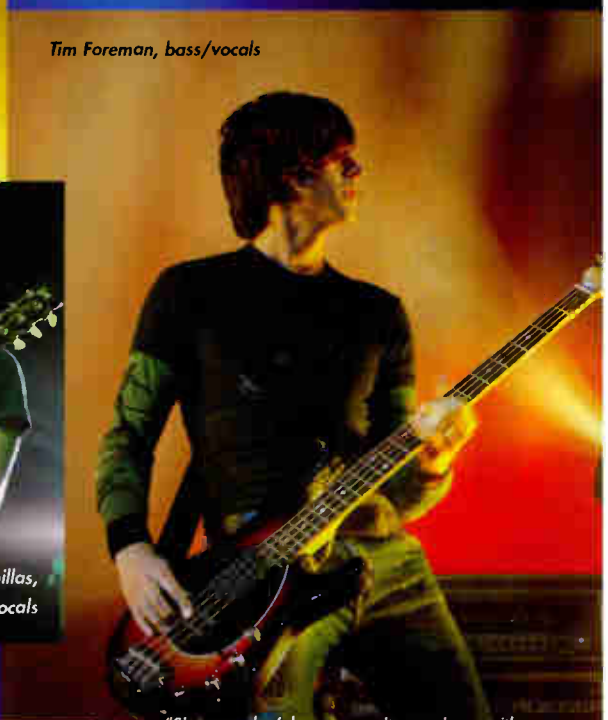
"My station is pretty simple," says Todd Cooper, band and stage tech. "I run the guitars through a Boss stage tuner, then through a Peterson VS II digital strobe tuner. I also run a line from there to a small Rock It belt clip amp that I use to hear the guitars to check the tuning audibly. I'm in charge of around 15 guitars now."

Chad Butler, drums

Nichols is also Butler's drum tech and is working with Shure to create a drum mic package. Currently, the snares are miked with SM57s, 98s on the toms, 81s on cymbals, and a 91 or Beta 52 for the kick.

Jerome Fontamillas, guitar/keyboards/vocals

Tim Foreman, bass/vocals



"Since we don't have a monitor engineer with us, Tim works with the house monitor engineer while each member puts together his mix," Nichols says. "I'm doing FOH at the same time. This lets each person have a solid mix, including being able to hear tones with or without the house P.A. on, and it doesn't overload the house monitor mixer."

Text by David John Farinella Photos by Steve Jennings

BLACK EYED PEAS + N.E.R.D.

Hip Hop Ensemble Goes Off the Deep End

As if it wasn't difficult enough to mix the Black Eyed Peas—a quartet of rapper/vocalists and a four-piece band who are living up to the reputation that a Grammy-nominated song ("Where Is the Love") demands—front-of-house engineer David Haines gets to his console and reports, "I just heard Robin Williams is here. That makes me want to mix the show even better."

The Black Eyed Peas (vocalists will.i.am, apl.de.ap, Taboo and Fergie, along with guitarist George Pajon Jr., drummer Keith Harris and multi-instrumentalists Tim Izo and Printz Board) have had a steady climb since their 1998 major-label debut. The collective's latest, *Elephunk*, has pushed them into the spotlight, and they spent much of this spring co-headlining a tour with this year's "it" band, N.E.R.D.

At the end of March, Black Eyed Peas and N.E.R.D. pulled into the Warfield Theater in San Francisco, two weeks into the six-week tour. Haines is understandably a bit worn out, because any scheduled day off gets filled with another date. They've been gigging almost constantly since May 2003.

LONGEVITY COUNTS

Haines has been with the Black Eyed Peas for the past seven years, meeting them when he was a senior in college. "My two best friends—the guitarist and keyboard player—joined them before they got signed," Haines recalls. "When I graduated, I got a job at Paramount Recording Studios in L.A. They got signed the same month that I started there and they came to Paramount to record that first album with me. Then they asked me to be their live sound engineer." While the band first did a number of club dates, their major tour debut was Smokin' Grooves in the summer of '98, which included a list of hip hop greats such as Public Enemy, Cypress Hill and Busta Rhymes.

During the seven years that Haines has manned the FOH position, things have certainly changed for the band. "It's been a slow growth, and every time I think we've hit a plateau, it's gone to the next level. It just hasn't stopped and I'm amazed at what's happening." The band has played mid-sized theater venues before, opening for OutKast and No Doubt. "It feels good to be co-headlining, though," he says. "Now we're drawing crowds for *us*. That's different."

This is monitor engineer Shaun Sebastian's first run with Black Eyed Peas and

N.E.R.D., although he's worked steadily as a FOH engineer for the past 12 years, plying his trade with Bad Religion, Lifehouse and Soul Asylum, and touring Ozzfest last year with Jason Newsted and Voivod.

ENTER STAGE LEFT

Sebastian's monitor gig changed dramatically when a DiGiCo D5 console was rented from High Tech Audio in San Francisco. "I was using house consoles every day and it was quite a struggle," he says. "We've got 60 inputs between the two bands and 26 mixes, mostly to in-ears. So it was pretty tough to make things happen on a daily basis with the console du jour." Rather than carry any outboard gear, Sebastian makes use of the D5's onboard tools.

The main difference between the two bands, Sebastian explains, is that the Black Eyed Peas still use wedges. "Four of the eight members are on in-ears; the others use the wedges," he says. "So it's not as clean of a mix. The N.E.R.D. guys are all on in-ears, so it's much easier and much cleaner-sounding." Both bands are using Ultimate Ears UE-10s, while the wedges are all house models.

According to Haines, each of the four front wedges get the same mix. "The four vocalists are such a whirlwind up there, it's silly to divide them out. They're running everywhere and they're not even in front of the wedges half of the show."

Both bands are fairly low maintenance for Sebastian. "Now that I have the D5 out here, I don't really do much," he admits with a laugh. "I really shouldn't be saying that, but everything is programmed now. There might be a move here or a move there, but for the most part, it's all consistent." For Black Eyed Peas, he'll move guitarist Pajon's wedges up during a solo, and at various times, he'll boost vocalist Fergie's in-ears.

UP THE MIDDLE

Just as Sebastian was relieved to pick up the D5, Haines is looking forward to getting his for this tour. "We're about to get one because the patching is a little bit of a nightmare between these two bands," he says. "We're both somewhat input- and outboard-intensive. I like a challenge, but this is getting to be a little much."


Monitor engineer Shaun Sebastian (left) and FOH engineer David Haines

For the Warfield show, Haines used a Yamaha PM3500 desk and rented an L-Acoustics V-DOSC line array system. "I like how they work, as long as it's set up right," Haines says of the system. He'll put vocals through the whole array, but he'll pump more vocals through the central cluster. "This is a loud band, so a lot of times, I need everything I can get to get the vocals over them. I like Yamaha stuff a lot. This is not necessarily top-of-the-line, but it's flexible and I can usually get what I want out of it."

Haines takes full advantage of the VCAs on the board: "VCAs are what makes life easy," he admits with a laugh. "I'd be chasing things around all night if I didn't use them. I just reorganized how I group things. I used to separate the kick and snare out on their own VCA, but I just started using a separate band VCA so I could change the whole band dynamics: drums on one, bass on two, guitar on three, keys on four, all the computer stuff on five, horns on six, vocals on seven and the entire band—everything but vocals—on eight. I can mix a lot of the show just riding seven and eight. If I needed to change the mix of the band within that band VCA, I can do that with the other VCAs. It makes it so I don't have to touch the actual faders that much during the show."

The computer "stuff" he refers to includes an Akai MPC that Izo uses during the show, and an Apple iBook that's set up on Harris' drum kit. Until recently, the iBook was running Digidesign's Pro Tools with an 002 mixer, but the system has been crashing. "There's something up with the interface between the two," Haines reports. "We're not sure what it is, but we've blown up three 002 mixers in the past few months. Normally, we have a separated click track and separated-out strings multitracked off of Pro Tools. Right now, we've condensed it into iTunes, and there's a stereo out of the iBook. It doesn't give us much flexibility, but it's more dependable."

Because the Warfield features spacious floor and balcony sections, Haines had to do a lot of EQ and driver tweaking. "We've got a couple front-fills that are dialed in just right," he says. "That's important, especially for vocal mics, because you don't want them feeding back. I EQ things differently for the balcony; there is definitely a lot of 125 floating around up here."

As he's polishing the mix at the beginning of the set, the subs have already been handled. "I just crank them up until they thump," he reports. "This band has a lot of

tricks up their sleeve onstage to give me the low end that I need." Although he won't cough up all of his tricks, he does point out that the bass parts being played on the Korg MS2000 by keyboardist Board and the sounds from the Moog Voyager are getting sent through the subs.

Haines has 33 inputs going into the board and about eight channels of outboard gear, which includes a TC-Helicon VoiceWorks, Eventide Eclipse, Yamaha SPX-990 and TC Electronics D2 and M1. The VoiceWorks is used for Fergie's vocals. "It helps round her sound out and makes her sound smoother. I also like it because it helps differentiate her voice from the guys; it gives a different characteristic to her voice," he explains. "I do some pitch correction with it. When you're singing and dancing that much, you get out of breath by the end of the show, which is when the hits are, and she needs to be in tune for them. Sometimes it's more critical than others, but I like to have it just so it's there."

As for microphones, Haines uses a combination of a Beyer M88 TG with a Shure Beta 91 on the kick. "I really like that combination, but the problem is that the 88 is a ribbon microphone so it gets thrashed really quickly. It's just really flexible with those two kick mics; you can get the broad range of tones." On toms, he'll use Shure SM98s; the top and bottom of the snare get Shure Beta 57s; bongos are miked with Sennheiser MD 421s; and for overheads, he uses a pair of Shure KSM44s. Shure Beta 57s are used on the guitars, a Shure SM58 is used on Izo's flute and saxophone, and a Sennheiser 421 on Board's trumpet.

On vocals, Haines has been using wireless Shure Beta 58s, but he's "thinking about switching to the Beta 87s because I like the EQ curve on those better," he explains. "We've been having some trouble with wireless recently. Not so much RF, but with mics cutting out and batteries coming loose. The mics are overloading, too, when they scream into them."

A Moog Voyager, Rhodes keyboard and the MPC get the DI treatment. Typically, Haines will use a Behringer Quad DI, but they are being repaired. So for tonight's show, they are using house DI—a Whirlwind Director—for those instruments. On the compression/limiter front, a rack of dbx 166s gets the call. Haines has his eye on an Aphex Dominator multiband compressor, which might just change the way he handles the live mix. "I'm interested in doing something like what DJs do: some filter effects on the fly with the band and doing some mix-minus stuff where you have the vocals untouched, but on the rest of the mix, you have filter effects." Ah, does the band know this yet? "No," he admits with a laugh. "I've talked to a few of the guys about it, but it's just something I'm toying with."

Beyond technology, Haines is consistently challenged by the band's musical ability and their tendency to play beyond what's been recorded. From musician to emcee, the band likes to stretch during a live set. "The way they are playing [live] is not like the album, so I try to create something new with what they are doing," Haines explains. "It's hard to create a studio sound with what they're doing onstage and they are not aiming for that—if they were, I would try to re-create it, but they are trying to go someplace different.

"I think that's what's always been really dynamic about a live Black Eyed Peas show: They don't just go up there and play the blueprint; they go up there and go off the deep end with it. So a lot of what I do is try to follow their lead or see where they're going." ■

David John Farinella is a writer based in San Francisco.

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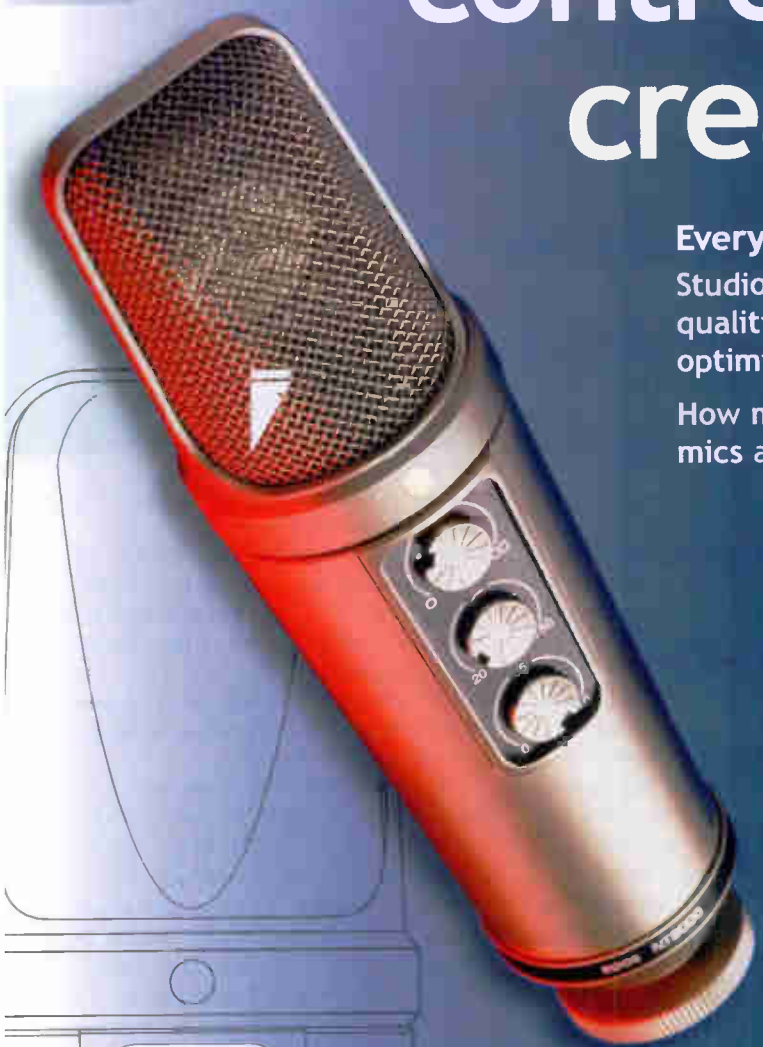

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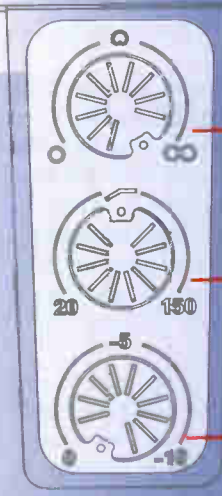

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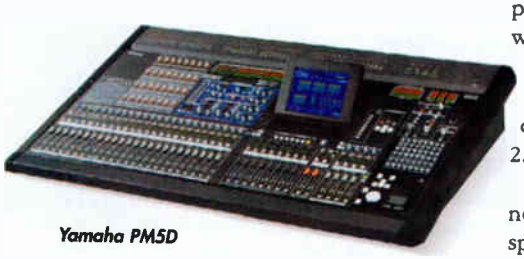
NSCA EXPO 2004

LIVE SOUND PRODUCTS TAKE CENTER STAGE

by Mark Frink

NSCA's return to the "other city that never sleeps"—Las Vegas—from March 19-21, 2004, kicked off with an unrivaled, Yamaha/Primedia-sponsored West Penn Contractor Caper, which secured the services of Rock and Roll Hall of Fame inductee Steve Winwood for the ExpoJam at the Hilton. Reversing a trend of notorious industry concerts, the performance provided an impressive showcase for an SLS RLA/3 compact line array system with ribbon HF drivers.

The Yamaha PM5D (www.yamaha.com) was the big buzz. A 24/96 digital 5k, its 48 mono and four stereo inputs all have connectors on the desk's doghouse side. Outputs include 24 mix (group/aux), two stereo (stereo A and B, or LCR), eight matrix, eight mutes, eight DCAs and eight stereo effects. The standard configuration has manually adjusted mic pre's based on the DM2000, each

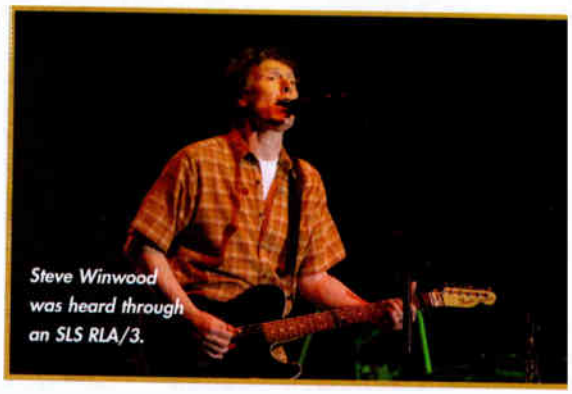


Yamaha PM5D

with balanced TRS inserts and four stereo line inputs. The RH model has digitally recallable mic pre's from the PM5000, with four stereo inputs that accept mic-level signals. All inputs have 4-band parametric EQ, independent compression and gating, and LCR and surround panning. Twelve graphic EQs can each be assigned to any mix bus or inserted to inputs. The control surface has 38 motorized 100mm faders for the two "layers" of 24 mono inputs, plus masters, stereo returns and eight DCA groups. There's just over a millisecond of latency at 96 kHz. Priced slightly lower than a new 4k, only a couple dozen will be available this June.

In related news, Aviom (www.aviom.com) announced its mini-YGDAI–format cart for Yamaha digital consoles allows audio in Aviom's A-Net™ protocol to be distributed via Cat-5 cable from the console to Aviom A-16 Personal Mixers; no other input device is required.

Cadac (www.cadac-sound.com) showed the prototype of its two-box digital mixer solution. The D16 is a 3U chassis providing a 16x16 matrix of 24/96 digital EQ and dynamics controlled from the company's SAM software and is compatible with all of the company's other consoles. The M16 is the companion 16-channel remote-controllable mic pre.



Steve Winwood was heard through an SLS RLA/3.

The LP48 Lake Processor expansion card for Mackie's (www.mackie.com) TT24 Digital Live Desk can be used as a 4x8 speaker processor with eight balanced analog outputs or to provide 12 channels of Lake-designed insert EQ, including Lake Ideal Graphic EQ™ and Lake Mesa EQ™ with asymmetrical filters. The card can also be split-configured as six channels of insert EQ and as a 2x4 speaker processor.

Renkus-Heinz's (www.renkus-heinz.com) new three-way LA/9 line array with a self-powered option offers a co-entrant mid-high waveguide with path length equalization technology. It is centered between dual-12s, employing 6.5-inch carbon-fiber cones and neodymium HF drivers with a 2.5-inch voice coil.

Turbosound's (www.turbosound.com) new two-box, four-way Aspect Series speaker system employs multicellular HF and MHF horns, or "polyhorns," to create a phase-coherent, curved wavefront and eliminates comb-filtering effects by providing sharply defined coverage angles. The system uses dual HF drivers, a high-mid 10 and dual-10 horn-loaded low-mids. The companion low box includes dual horn-loaded 15s.

Bag End's (www.bagend.com) Minima One self-powered option is an internal 5-pound, 1k-watt, high-efficiency switching amplifier that runs on all voltages.

Trantec's (www.trantec.co.uk) S6000 Wireless Microphone System, a high-end RF system in London's East End theater district, is offered in the States by Group One (www.g1limited.com). Each 2U chassis supports eight receivers and operates on three 70MHz splits from 590 to 806. Its extremely compact transmitters provide eight hours from a AA battery and can be configured via IR from a Palm PDA or the receiver.

Peavey (www.peavey.com) introduced the next-generation MediaMatrix called NION ("nee-on"), a 24/96 system in a 2U chassis housing the power of three or six SHARC processors.

DPA's (www.dpamicrophones.com) new Cardioid Headset mic provides additional gain for louder environments.

Clear-Com (www.clearcom.com) unveiled its futuristic 600 Series party-line single- and dual-channel beltpacks that can be used with other manufacturers' intercoms.

SIA Software's (www.siasoft.com) newest SMAART measurement system is the SoftRTA bundle that includes a compact, purpose-designed USB preamp.

StarDraw (www.stardraw.com) showed a Lite version of its A/V software for less than half of the price.

Other software releases of note: Klark Teknik/Midas (www.midasconsoles.com) ELGAR software for the Heritage 1000, BSS (www.bss.co.uk) SoundBench2 for Windows XP, L-Acoustics (www.l-acoustics-us.com) SoundVision array prediction software and TC Electronic (www.tcelectronic.com) Reverb 4000, which has 20 new presets ported from the M5000 and Mac OS X compatibility.

Attendance was up more than 10 percent, at well over 11,000, and there was 25 percent more booths—good news! Logistics dictated a vain attempt to cover 40 rows of booths in just two days; an apology to those I missed at the Expo. See you next March in Orlando, Fla. ■

Mark Frink is Mix's sound reinforcement editor.

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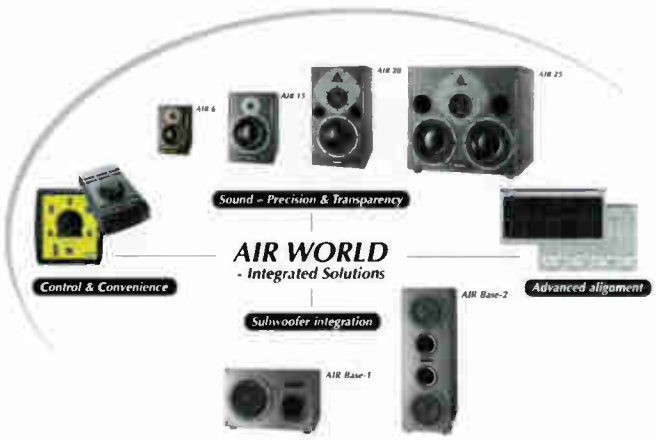

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BY OLIVER MASCIAROTTE

A Profound Audio Loss

Codec Alternatives to Keep Files Intact

This month, I'm taking a look at an increasingly viable alternative to bulky linear PCM sound files and lossy-compressed, but compact, audio files. That alternative is a lossless codec, which trims the fat without sacrificing aural satisfaction.

Let's start with my "viable alternative" descriptor. In some parts of the world, notably Western Europe, the Pacific Rim and Canada, Fiber-to-the-Home and Fiber-to-the-Curb (FTTH and FTTC, respectively) have arrived in urban neighborhoods with little or no fanfare. Essentially the same service with either a domestic or commercial marketing slant, FTTH and FTTC are names given to utilities that bring optical fiber directly to a home or building rather than delivering converged data services through a lower-bandwidth copper connection.

In the old-school scenario that FTTC replaces, an individual subscriber's copper, usually an unshielded twisted pair (UTP), is eventually aggregated into existing fiber-optic trunks that serve an entire neighborhood. The more copper involved, the lower the potential bandwidth that any subscriber can expect. Cable modems or digital subscriber line (DSL) services "piggyback" data on those existing copper connections that we use. Though there are small-scale exceptions, this is the typical approach taken in the U.S. of A. Elsewhere in the universe, FTTH services are normally subsidized by less myopic governments to bootstrap their national information technology (IT) infrastructure, and as a result, end-user costs are kept quite low. This is what was done to create our original phone system, but the move away from government's support of public programs in the 1980s has resulted in unchained former monopolies and short-sighted profiteers, aka "market forces," dictating our current public IT utilities build-out. Nowadays, for what I pay for very low-rate ADSL in San Francisco, my buds in Tokyo receive several tiers higher-speed service, but I digress.

Suffice to say, now that broadband data services are available to most locations in the States, audio geeks can pass sound files over public networks without too much of a transit time penalty. Still, it would be nice to speed things up a bit, and that's where lossless codecs come in. Through the miracle of mathematics, it's possible to reduce a file's size by about 40 percent to 60 percent without discarding any information. This can be done simply (Huffman Coding) or sublimely (MLP), and as a result, there are far too many codecs to choose from. Unless you have, for example, Dolby Labs' marketing muscle, your product can get lost in the shuffle. Claude Cellier, president of Merging Technologies and maker of the LRC lossless codec, opines, "While probably being the audio company that 'invented' lossless audio compression in its modern form, filing for a seminal U.S. patent as [far] back as April 1995, we are not even a tenth as active at marketing and promoting it. If building, enhancing, fine-tuning and improving Pyramix wasn't drawing on most of our resources, time and energy, we'd surely be more active in promoting LRC, but days [only] have 24 hours."

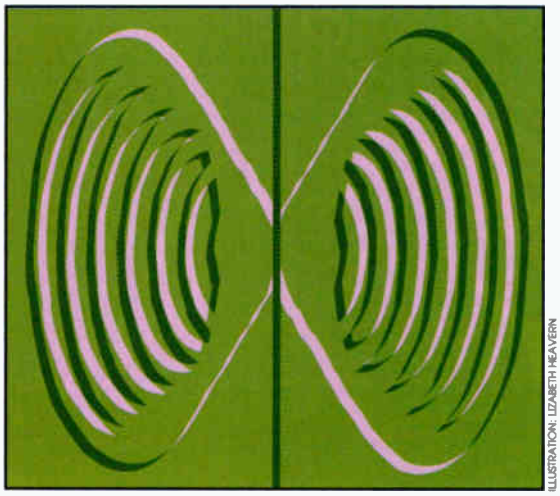

ILLUSTRATION: LIZABETH HEAVERN

Among the scrum of competing offerings are a few that have been standardized or mandated, such as the lossless codecs in Windows Media 9 and Philips' Direct Stream Transfer process built into SACD. Dolby controls MLP, the lossless codec mandated for use in the DVD-Audio format, and the company's sometimes-strident promotion of the format keeps licensing fees flowing in. But there are many other codecs available, including several Open Source choices. FLAC, or Free Lossless Audio Codec, competes with the less-developed Monkey's Audio and WavPack for developers' attention. There are also closed or proprietary applications, such as La, LPAC, Shorten and OptiFROG. Shorten, in particular, is quite popular with hobbyist music traders. In keeping with its vision of a universal media standard, the MPEG machine is also adding a lossless option: Audio Lossless Coding, or MPEG-4 ALS. According to Tilman Liebchen, one of the authors of the LPAC codec, "An improved version of the LPAC algorithm was recently chosen as [a] reference model" for MPEG-4 ALS.

Modern lossless codecs are rather complicated affairs, but basically, they often work by applying carefully selected filters to the audio, noting the filter coefficients and only storing those filters' coefficients and residual audio output. There are, however, some simple forms of lossless compression that you probably use every day to streamline your work and you may not even know it. One is the Zip file format that was created by PKWARE

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and used everywhere to reduce file sizes for transmission over the Net. Another is run-length coding, which is built into data tape drives, their so-called "hardware compression" option. Run-length coding comprises searching for repeated runs of a single symbol in a data stream or file and replacing that run with a single instance of that symbol and a run count. Here's an example: At the end of a song recorded at 44.1 kHz, let's assume that there are two seconds of digital silence. So instead of explicitly writing 88,200 identical samples to tape, a backup would write the equivalent of "zero amplitude sample 8.82EE4 times." You can imagine that this would save a fair amount of space on the medium.

Last month, I mentioned some products that I've been listening to, and I want to discuss one in this column. The folks at Shure have a new series of consumer in-ear monitors that essentially re-brands the transducer component of its pro personal monitoring systems—same products, different package. At last year's Home Entertainment [June 2003, San Francisco] show, I briefly listened to the E3c and E5c and "understood" the timbre immediately. Shure's marketing crew subsequently provided me with a pair of E3cs for evaluation, and I must say, if you want to replace your iPod ear buds with something much better, buy an E3c. After a short break-in, I was surprised by their low distortion, lack of resonance and unhyped character. They're comfortable enough for extended wear, and as they provide very good isolation, they allow you to monitor at lower volumes. Also, if you want something with even lower distortion and extended frequency response, audition the E5c.

That's all for this month's techno-babble. Next month, I'll head back to my "Pedants In a Big Box" IT glossary. In the meantime, grab your pocket protectors and continue to rock! ■

This month's column, my 50th installment of "Bitstream" (Oy!), was written while multitasking at O'Reilly's ETech conference in southerly San Diego, where I filled other geeks in on UWB basics.

Pedant In a Box

Huffman Coding: A member of the entropy coding family of algorithms, Huffman Coding employs a simple concept with a wide range of applications in data storage and transmission. Entropy encoding uses statistical symbol substitution to quickly and effectively reduce file size. This is equivalent to taking dictation with shorthand rather than writing out each and every word. Here's how it works: First, you build a probability table for all of the "symbols" in a particular lexicon. These symbols could be the letters of the alphabet or, in our case, the 2^{24} or 16,777,216 amplitude values of 24-bit AES/EBU audio. So for each available sample value in the millions of choices, you have to decide the probability of any specific value appearing in a particular sound file. If you scan the entire file, you can assign "custom" probabilities for that file. Once you have those assignments, you then take the lowest-probability pair of two adjacent samples—the least-likely combination—and substitute that pair with a unique symbol. This replaces two samples with one placeholder. Then, repeat this process with the next least-likely combination, taking rare pairs and replacing them with a smaller, shorthand equivalent.

After repeating the substitution cycle many times, you will end up with a table of replacement symbols and much of the entropy or randomness removed. When it is time to reconstitute or decode the compressed data, simply look up each entry in the substitution table in reverse order—i.e., from end to beginning—until every symbol has been replaced with the original sample pair. Huffman Coding is often used to further compress the data from the filter bank processing.

David Huffman wrote his original paper on optimizing Shannon–Fano coding in 1952. Claude Shannon, one of the authors of the earlier work, was the same fellow who provided insight into the information theory that forms the basis for much of digital audio's current implementations.

MLP: the mandated method for lossless storage of linear PCM data in the DVD-Audio standard. MLP employs several individual tools to the original data, each one providing additional compaction to the data set. Though an explanation requires most of an article, let's just say that MLP reduces a data payload by at least 4 bits, and often more than twice that. MLP has modest computational needs, which is good from a CE manufacturer's perspective, and is also able to deal with constant or variable bit rate (CBR and VBR, respectively) and mixed sample rates in a multichannel data stream. For a more in-depth explanation, check the "Papers" section in Seneschal's Info Annex at www.seneschal.net.

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musikmesse

Pro Light+Sound 2004

Product Hits From Frankfurt

By George Petersen and Robert Hanson

It's difficult to describe Musikmesse/Pro Light+Sound (March 31-April 3, 2004) to anyone who's never attended the show. It's like a NAMM/AES/NSCA/LDI/DJ Expo all rolled into one huge convention that fills 14 exposition halls on the Messe fairgrounds in Frankfurt, Germany. It's *huge*, to say the least. This year's show featured nearly 1,500 exhibitors and 92,000 attendees from more than 100 countries, all looking for the latest music and pro audio toys. Coming on the heels of NSCA (see report on page 98) and NAMM shows, you might think there was nothing new, but there were plenty of debuts to see and hear. Here are our picks for best of show.

CONSOLES

Yamaha (www.yamaha.com/dmi) launched its flagship PM5D digital console (see NSCA report for more), but also showed new preamp cards for its PM-1D, as well as new remote preamp racks and other accessories. A far more interesting development was the Studio Connections alliance from Yamaha/**Steinberg** (www.steinberg.net), which develops new protocols for using Yamaha's Studio Manager 2 software to integrate Yamaha hardware with Cubase SX and Nuendo, as well as VST plug-ins. Keep an eye on this one.

Digidesign (www.digidesign.com) didn't exhibit, but held a spirited press event to announce its Command|8 automated mix controller for Pro Tools. This Digi/Focusrite co-design puts eight bankable faders with rotary controls, soft buttons, transport control, alphanumeric channel displays and analog monitor control into a compact housing with MIDI and USB interfacing to your TDM or LE system.

Allen & Heath (www.allen-heath.com) unveiled its third-generation MixWizard line of multipurpose 12 to 16-input stereo analog mixers, with enhanced preamps and jumpers for customizing aux sends and direct outs; a 14x4x2 version with 6x2 matrix is also offered. The company also debuted Ledlamp, a 4-pin XLR console lamp on an 18-inch gooseneck with built-in thumbwheel dimmer, offering cool white light and less current draw.

Alto Pro Audio's (www.altoproaudio.com) Typhoon offers a 16-channel/8-group mixer that fits in a 19-inch rack and a 48-channel model in a 48-inch-wide/50-pound package. Features include 4-band sweep EQ, eight mute groups, eight auxes (pre/post-assignable), built-in intercom and direct out and insert on all inputs.

INSTRUMENTS!

Musikmesse wouldn't be Musikmesse without instruments. **Roland's** (www.rolandus.com) new V-Accordions feature digital modeling of accordion and other instruments with bellows articulation, MIDI output and unpowered (line-out) or built-in speaker versions. In the new genre of vocal synthesis/simulation [see "Insider Audio" on page 26 for more on this], **Virsyn** (www.virsyn.com) demoed Cantor, an 8-part vocal synthesis engine where you type in lyrics and they "sing" back to your MIDI melody. This Mac/PC app can run stand-alone or as a VST2/AudioUnit/ReWire/RTAS plug-in, and offers plenty of editing parameters to make the voice sound as natural or as strange as you want. **Sonic Reality** (www.sonicreality.com) and **IK Multimedia** (www.ikmultimedia.com) announced StudioPhonik, which combines an entire band's instruments—with reverb, delays, effects, stomp boxes, comp/limiters, EQ, etc.—to create a virtual band for any sequencer platform from a single Mac/PC plug-in.

With a ton of new products, **Native Instruments** (www.native-instruments.com) pulled out all the stops—literally. The BD4 ($449, or $559 with software) is a hardware controller for its B4 virtual organ software, with nine drawbars, 22 dedicated buttons and two rotary encoders. NI's new Guitar Rig system ($499) combines a hardware pedal controller with software that emulates classic and neo amps, cabinets, microphones and effects/stomp boxes. Elektrik Piano ($229) recreates Rhodes, Clavinet and Wurlitzer sounds with 256 simultaneous voices. The company supports all major sequencer and plug-in formats.

MICROPHONES

The most talked about pro product at the show was **AKG's** (www.akg.com) next generation of its industry-standard C 414 studio condenser. Available in C-414 B-XLS (ultralinear) and C414 B-XL II (transformerless) versions, the new mics have the same pricing as their predecessors but incorporate many new improvements, such as five polar patterns (wide-cardioid was added), 6dBA self-noise spec, internal elastic iso capsule-mount, three bass roll-off choices, three-position pad (-6/12/18 dB), +6 dB more sensitivity and a provision for future optional remote control of all functions. Also new: AKG's WMS 400 wireless puts many of the features of its flagship WMS 4000 systems into a more affordable package.

Audix (www.audixusa.com) unveiled the RAD-360, its first wireless system, which pairs its OM Series capsules with a 193-frequency system in the 638 to 806MHz UHF band, with menu-driven, true-diversity receivers. Bodypack and guitar versions are also offered.

STUDIO ESSENTIALS

KS Digital (www.ksdigital.de) demoed ADMControl, a stereo/5.1 controller for its acclaimed ADM monitors, offering bass management, FIR equalization, mute/solo

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and level functions. These are sweet with startling imaging. Oooooh! **Roland's** DS Series studio near-fields feature analog and digital (AES/EBU or S/PDIF) inputs at up to 192kHz sampling. All are active bi-amped, two-way systems with 5, 6.5, or 8-inch woofers and 1-inch dome tweeter. **Wharfedale Pro** (www.wharfedale.co.uk) finally debuted pro versions of its popular consumer Diamond 8 speakers. The new Diamond Studio Pro Active 8.1 and 8.2 have 5- or 8-inch shielded woofers, with dome HF and onboard bi-amping. **ADAM** (www.adam-audio.com) launched the ANF-10, an unpowered, compact two-way with 7-inch woofer and ART folded-ribbon tweeter at an affordable $700/pair. **Quested** (www.quested.com) showed the first of its new Silver range, with two compact, bi-amped near-fields: the SR6 (6.5-inch woofer) and SR5 (5-inch LF), both with 1⅛-inch dome tweeters.

Interfaces and DAW front ends were everywhere. **Mindprint** (www.mindprint.com) updated its popular En-Voice tube preamp/EQ/compressor channel strip. The new En-Voice Mk II has optional USB interfacing, 24-bit/96kHz conversion and an internal switching power supply to work anywhere in the world. **Terratec** (www.terratec.net) added FireWire to its successful Phase 88 interface rack, which features eight analog balanced I/Os (and two mic preamps), S/PDIF digital I/O and two FireWire ports. The company also debuted Producer Phase 24 FireWire, a 2-channel interface with 24/192 capability, MIDI I/O and 114dB noise spec. **RME** (dist. by Synthax, www.synthax.com) showed several new interfaces and converters, but the coolest of all was the FireFace 800, a single-rackspace 24-bit/192 box that crams a total of 56 I/Os (analog, ADAT, S/PDIF) that can be used simultaneously to record up to 35 sources onto 28 tracks. Whew!

Randall MTS Series

SOME HITS YOU MISSED

Behringer (www.behringer.com) kicked off its 15th anniversary with 16 new products, including new bass cabs and modeling guitar amps, but its Vintager AC108—a 20-watt amp with an 8-inch speaker and a tube preamp stage—smoked us, especially with its $79 list/$59 street pricing. **DSound** (www.dsound1.com) showed a software solution that allows real-time audio/MIDI streaming between two PCs over a single FireWire cable. Launch a VST host on one CPU, a VST host on the other and enjoy the power of a multiprocessor system. Slick! **Neutrik's** (www.neutrik.com) Combo XLR/¼-inch connector is an industry standard. Now, the company has expanded the line with Speakon® Combo, which puts a ¼-inch jack down the center of a 2-pole Speakon panel jack. Yeah! **Randall's** (www.randallamplifiers.com) MTS Series tube amps are based on a 2U chassis that holds four interchangeable preamp sections, each based on the actual tube front ends of classic amps. The buyer chooses four modules from a list of 15 or so and can add more as needs grow. A matching dual 50-watt power amp lets players switch between 6L6 or EL34 power tubes for more tonal variation. A studio dream!

There were plenty more products to see, and we'll run these in our upcoming new product columns. Meanwhile, mark April 6-9, 2005, for next year's Musikmesse. See you there! ■

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Tools of the Trade

FOCUSRITE FORTE SUITE

The newest plug-ins from Focusrite (dist. by Digidesign, www.digidesign.com), the Forte Suite for Pro Tools models the ISA 110 EQ and ISA 130 dynamics processors, which are two-key modules from Focusrite's Forte analog console. The Suite includes a 6-band EQ, compressor, gate and expander. To keep screen clutter at a minimum, Forte is scalable, offering the ability to use the modules together as a channel strip or as separate components. For sessions larger than stereo, the ISA 130 compressor supports all Pro Tools surround formats. The Forte Suite supports TDM and RTAS on Mac OS X and Windows XP.

COYOTE R&D TWO-CAN

The Two-Can from Coyote R&D (www.coyoterd.com) is a turnkey, two-rackspace audio workstation with room for three internal hard drives. The base unit includes one serial port, one parallel port, one VGA output port, one 10/100 Base-T Ethernet port, three FireWire ports, four USB ports and 512 MB of RAM. The unit is optimized for audio and suitable for running sequencers, DAWs, soft synths and samplers. Prices start at $1,595; many upgrades are available.

PEARL ELM-B/ELM-C

Pearl (dist. by Independent Audio, www.independentaudio.com) takes rectangular mic capsules to new extremes with the figure-8 ELM-B ($2,425) and cardioid ELM-C ($2,000). The black-chrome–finished mics feature a 7:1 length/width capsule ratio, with more than twice the surface area of large-diameter round capsules, and offer a 12dBA self-noise and none of the in-band resonance found in more traditional designs.

PRESONUS EUREKA DIGITAL CARD

PreSonus (www.presonus.com) debuts the AD192, an optional digital output card for the Eureka pro recording channel. The new card features word clock I/O, AES and S/PDIF outputs; 24-bit wordlength; and sample rates of 44.1/48/96/192k. A balanced TRS line input is also included so that only one AD192 is needed to use two Eurekas in dual-mono or stereo applications. Price: $250.

SYMETRIX AIRTOOLS 6200

Unveiled at NAB, the Symetrix 6200 (www.airtoolsaudio.com) is a dual-channel, DSP-driven voice processor offering complete signal processing of mic or line-level signals, in dual-mono or stereo. Processing blocks can be edited from the front panel or from a Windows-based GUI accessed via USB or Ethernet. Processes include filtering, parametric EQ, compression, de-essing, gating, room simulation and more. The 6200 also supports HomerLink, an interconnect protocol that's compatible with the Studio Matrix system.

MONSTER POWER PRO AVS2000

Monster Power's (www.monstercable.com) Pro AVS2000 rack-mountable automatic voltage stabilizer provides maximum protection from voltage sags and a consistent 120V output, even if AC input fluctuates. The $1,700 unit features sequential power-up with programmable delay, illuminated digital meters for monitoring voltage/amperage/correction, a warning light indicating any serious power fluctuations and six outlets.

MACKIE DXB•400

Aimed at pro recording and post, the latest version of the Mackie (www.mackie.com) X Series digital console features a 96x96 channel I/O matrix (48x48 at 192 kHz) and 72 channels of EQ and dynamics at 96 kHz (36 channels with DSP at 192 kHz). The

dXb•400 improves on the •200 by offering more advanced surround sound functionality, including 24 buses, flexible panning assignment and full surround monitoring features. The standard UAD-1 DSP card offers access to a wide variety of plug-ins.

POWERFX MIRACLE BEATS

Loop/sound effect/sample creator PowerFX (www.powerfx.com) offers Miracle Beats, a $99 sample CD/VST instrument combo. A LoopMorph feature takes individual slices of drum loops and automatically splits each drum kit element onto individual tracks with each slice. The collection contains more than 500 beats and a unique VST instrument interface, allowing complete creation, control and manipulation of beat loops.

M-AUDIO OCTANE

The 8-channel Octane mic preamp from M-Audio (www.m-audio.com) is designed as a front end for any Lightpipe-compatible

hard disk recorder. The $749.95 unit features an M-S matrix encoder, analog direct outs for each channel, word clock and 44.1/48kHz operation at 24-bit. I/O is balanced XLR and TRS; phantom power is switchable in groups of eight channels.

AUDIX I-5

The Audix (www.audixusa.com) I-5 is a dynamic cardioid instrument mic for stage and studio, with a durable cast-zinc alloy body, dent-resistant grille and black E-coat finish. Every model is laser-etched with its model and serial number. Frequency response is 50-16k Hz, and SPL handling exceeds 140 dB. Retail: $179 with mic clip and carry pouch.

GROOVE TUBES GLORY COMP

Carrying on in the ViPRE mold, Groove Tubes (www.groovetubes.com) offers the Glory Comp, an all-tube compressor employing seven vacuum tubes. Features include dual-isolated output taps and a custom-wound output transformer for interfacing with -10dBV or +4dBu gear. Controls include 1:1 to 10:1 ratios, attack and threshold controls, and 10ms to two-second release times. Users can select between logarithmic and linear release modes, and, like ViPRE, can view the backlit VU meter in seven different modes. Price: $2,999.

MARATHON G5 RACKMOUNT

The "too tall" nature of Apple's Mac G5 is solved with Marathon's (www.marathoncomputer.com) rackmount solution. The $199 G5 Rackmount places up to two G5s side-by-side in 12 vertical rackspaces. The mount is constructed of heavy-duty aircraft aluminum, has rigid cross-bracing to prevent sagging, fits rack depths from 19 to 34 inches and does not require modifying the G5 case.

VOXENGO PHA-979

The PHA-979 from Voxengo (www.voxengo.com) is a PC VST plug-in that lets users apply an arbitrary phase shift to a DAW audio track. The $39 plug-in will simultaneously shift all frequencies across the signal's active frequency range by the given phase-shift value. Features include phase control for each channel, two quality modes, mono-to-stereo or stereo-to-stereo processing, and support for up to 96 kHz.

TERRASONDE STUDIO TOOLBOX

TerraSonde's (www.terrasonde.com) new Studio Toolbox offers powerful audio tools in a compact package. Features include a graphical backlit 64x128 LCD, encoder input control, mic and built-in speaker. I/O is on balanced XLR and ¼-inch jacks, in addition to unbalanced RCA and MIDI I/O. All graphical functions can be assigned to 40 nonvolatile memories and transferred to a PC or Mac for printing. Also featured is a level meter, transport controller, SMPTE reader/fault detector/jam sync, cable tester (MIDI and audio), phase alignment test and more. The unit is AC or battery-powered and priced at $899.

GEFEN FIREWIRE EXTENDER

Gefen's (www.gefen.com) FireWire Extender lets audio pros put noisy computers far from the listening environment. The system uses a sender and receiver to transmit data at an average rate of 350 to 400 Mbps over multimode, LC-terminated fiber-optic cables. Price is $899, including connection cables and external power supply.

KJAERHUS AUDIO CLASSIC PHASER

PC users should check out the new Classic Phaser from Kjaerhus (www.kjaerhusaudio.com), which emulates analog phasers

from the '70s and '80s. The plug offers up to 12 filter stages, a phase shift area between 50 to 20k Hz, mod rate of 0.1 to 10 Hz, full VST automation and support for sample rates upward of 44.1 kHz.

URS GRAPHIC EQ BUNDLE

URS (www.ursplugins.com) now offers two new EQs: the A10 (10-band) and N12 (12-band) for Pro Tools. Features include a numeric window allowing 0.1dB gain adjustments, operation up to 192 kHz, and Pro Control, Digi 002 and Control 24. The new plugs are ported for Windows XP and Mac OS 9 to 10.3.2 and are fully TDM-compatible with Pro Tools|HD Accel, HD and Mix systems (software V. 5.3.1 to 6.2.3); RTAS versions will work with MBox, Digi 001 and Digi 002. Sold direct, the plugs are $499 each or $899 for a bundle.

TANNOY TS8 AND TS10 SUBS

Designed for studio use, Tannoy's (www.tannoy.com) active TS8 and TS10 subs measure less than one cubic foot in size. The $399 TS8 has a downfiring 8-inch driver and 200-watt amp; the larger $549 TS10 uses a 10-inch driver 300W amp combo. The units operate down to 32 Hz and 29 Hz, respectively, and utilize Tannoy's BASH amplifier technology, combining the best of Class-D and Class-A/B designs. I/O is on XLRs; the output can be selected as either a direct feed or switched to provide an 80Hz highpass filter.

PCAUDIOLABS D.I.Y. DAW

Like to do it yourself? pcAudioLabs (www.pcaudiolabs.com) lets buyers build their own audio-optimized PC online. The company's Website walks buyers through a building process, offering a variety of components features and advising the user of any potential audio hardware incompatibilities. The company also offers desktop tower models, rackmount systems, mini PC enclosures and laptops.

LINPLUG ALBINO 2

The $199 Albino 2 synth plug-in from Linplug (www.linplug.com) has a 32-step arpeggiator, three types of oscillators, two separate stereo filter modules with two filter types, four LFOs and a sophisticated effects section. The plug is ported for VST (PC and OS X) and AudioUnits (OS X) and requires VST 2.0 or AU-compatible software and a minimum 500MHz host processor.

Upgrades and Updates

API Audio (www.audiotoys.com) **is shipping its 8200A** summing mixer. The single-rack-space unit offers Solo and Mute functions, direct control over level, panning, a balanced insert and two aux sends on each of the eight balanced line input channels...**Applied Acoustic Systems offers Nord Modular users** substantial savings on the **Tassman Sound Synthesis Studio**, now $199. Also, Nord users can upgrade to Tassman 4 free of charge. The offer is available for a limited time at www.applied-acoustics.com...**Cadac released Version 1.07 of its Sound Automation Manager (SAM) software**, featuring new multiconsole control capabilities, multilingual version support and enhanced MIDI facilities. Download it free at www.cadac-sound.com...**IK Multimedia is shipping T-Racks RTAS** for PC, AmpliTube and T-Racks AU and VST for Mac OS X, and is offering new upgrade prices on its Digidesign Bundle. Visit www.ikmultimedia.com...Ambient Alchemy, Skillz 2 Pay the Billz and Sounds of Unseen Worlds are **three new loop libraries from M-Audio** (www.m-audio.com). The new loops offer bass wobbles, digital glitchery and atmospheric signals derived from plants, rocks, fungi and short-wave radio in .REX2, .WAV, .AIFF and Acidized .WAV formats that are stretchable across a tempo range from 80 to 160 bpm. Price: $49.95...The new **exclusive distributor for Ambient Recording GmbH** products in the United States is **Sound Devices** (www.sounddevices.com). Ambient makes a full line of boom poles, mic support accessories, timecode products and miniature mic solutions... Aimed at the education market and digital music production novices, **Steinberg's** (www.steinberg.net) **Cubase SE** is now available as a stand-alone product. SE offers 48 audio and unlimited MIDI tracks for $149...**Digidesign** announces new **Pro Tools LE Factory and Blue Factory bundles**. LE Factory bundles either an Mbox, a Digi 002 Rack or a Digi 002 and more than $2,000 worth of Bomb Factory plug-ins. The LE Blue Factory bundle offers greater savings and a Pro Tools LE Factory system, Blue Bluebird mic and accessory kit. Owners of current LE systems can save by exchanging their current system for a Factory system. Visit www.digidesign.com for details...**Quantec**, the German audio manufacturer that brought you the Yardstick room simulator, is now being **exclusively distributed in the U.S. by Independent Audio**, www.independentaudio.com...**Propellerhead's ReWire** software (www.propellerheads.se) is now **supported by Tascam's GigaStudio 3**. Among many other things, ReWire allows real-time streaming of up to 256 audio and up to 4,080 individual MIDI channels from one audio application to another...**Manifold Labs** and **Superwave** announce the inclusion of the **Superwave P8 in every Plugzilla**. Additionally, Superwave announced plans to support Plugzilla with its pro line of instrument plug-ins, including Superwave Performer, Superwave Professional and the forthcoming Superwave P8000. Visit www.plugzilla.com...**discoDSP** (www.discodsp.com) **releases Version 2.0 of its Vertigo** additive synth for the PC. New features include advanced CPU optimization (250% faster than Vertigo 1.x), a Spectrogram editor, stretch envelope, Play mode (poly, mono, legato) and improved morphing with time stretch. ■

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BY K.K. PROFFITT

Solid State Logic XLogic Multichannel Compressor

A 5.1 Unit With That Old Familiar Sound

Solid State Logic continues the modern tradition of large-console manufacturers by adding processor units to its inventory with the latest release of the XLogic series, which employs the Grammy-winning SuperAnalogue technology introduced with the SL 9000 for excellent bandwidth and dynamic range, as well as surface-mount technology for compact profiles.

XLogic modules include the XLogic Channel (with G and E Series "Twin-Curve" 4-band parametric EQ and optional 96kHz A/D converter), the XLogic G Series Stereo Compressor (a new version of an old favorite, with twin VCA design and auto-fade) and the XLogic 4-Channel Mic Amp (a smaller version of XL9000's Super-Pre with motorized control for mic gain that can be adjusted on the unit or via remote). It also includes the SL944 remote (which can control two of the XLogic Mic Amps) and the answer to DVD multichannel audio engineers' prayers: the XLogic Multichannel Compressor.

SAVED BY TECHNOLOGY

Unless you're one of those audio engineers who has steadfastly eschewed the center channel in favor of the retro "quad" version of surround, or one who refuses to recognize the frequent need for the LFE in professional multichannel productions, you'll immediately appreciate the flexibility and control offered by the XLogic Multichannel Compressor. It's the solution to the common multichannel mixing dilemma: how to maintain the bottom end while controlling the center channel, without losing the total surround soundstage.

The XLogic Multichannel Compressor owes much of its heritage to the traditional SSL mix bus compressor, but adds the XL9000's DC-coupled design, yielding better specs than older implementations. Looking under the hood reveals 56 THAT 2181LA VCAs with trims for in-circuit adjustment for low distortion and excellent feed-through performance, as well as LT1115 op amps (touted as being the lowest-noise op amp available) and LT1010 buffers to increase op amp output and reduce thermal feedback. There's also a turn-on relay to prevent audio thumps.

We measured 101 degrees with a probe over the vents of the unit in open air with a room temperature of 71 degrees and the unit sitting on half-inch spacers with no heat-producing gear under it. If you rack-mount this box, heed the mounting instructions to leave one rackspace above it for ventilation.

FRONT PANEL FEATURES

The compressor provides a clean, clearly visible layout with the traditional SSL square, lighted push buttons and the six-LED "Max" display, an alluring piece of eye candy that shows channel contribution status to the sidechain.

It can run in two modes—multichannel or dual-stereo—which allows it to function as separate 2- and 4-channel compressors. Dual-stereo mode reassigns controls so that the upper set governs left, center, right and LFE, and the lower set provides compression for the surround channels.

An illuminated gain reduction meter is lighted by a ghostly white LED. Users can switch between monitoring the main 5-channel sidechain to monitoring either the LFE or stereo B sidechain, depending on dual-stereo mode status. Although the controls are well-defined, the engineer should keep in mind which channels are contributing to the signal path and their allotted levels and behavior. Next to the meter are two compressor sidechain controls with In switches, and threshold, attack, ratio, release and makeup controls.

In multichannnel mode, the upper set controls the five full-bandwidth channels, while the lower set is assigned to the LFE channel. This is the traditional multichannel mix setup, where the LFE is often used for sound effects that can push to maximum headroom allowance in a split second.

If the surround channels seem to be the problem area (often encountered in live or upmixed situations in which the audience is primarily in the back), then you can switch to dual-stereo mode so that the lower sidechain controls work only with the surrounds.

The center of the front panel is the mode section, which comprises two switches: Sidechain Sum and the dual-stereo mode discussed above. Sidechain summation is used when one instrument or element is too prominent in all of the channels. When one channel has an element that is too prominent, XLogic's RMS detector works well to trigger compression. With a multichannel signal, however, it's best to sum the channels to finesse the overly loud element. Summing in the traditional sense falls prey to phase cancellation (especially in recordings of acoustic environments), so SSL engineered this aspect appropriately: They rectified the signals prior to summation.

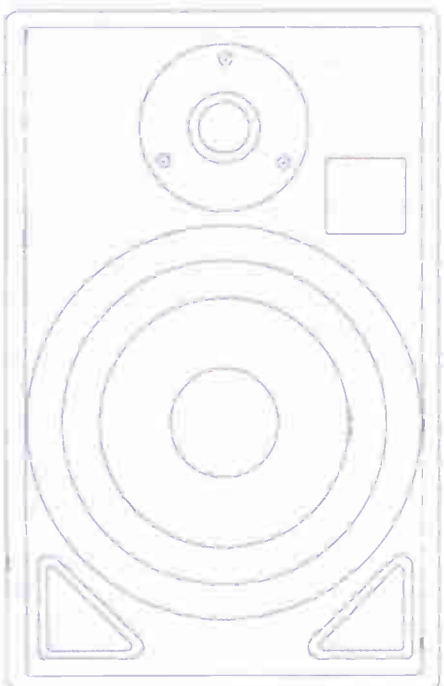
The sidechain-adjust section dominates the right half of the front panel, and it's the most important and innovative area. The circular Max display with five bi-color LEDs in a pentagon around a center LED for the LFE is remarkably intuitive for indicating which channel is driving the compressor.

Four sidechain trims control how much of each channel or channel pair contribute to the sidechain. These include left/right, center, LFE and surround. Center and surround may be disconnected from the sidechain input by activating their respective iso switches, but they will still be controlled by the master level control.

The Link switch allows the LFE to merge with the main channels, incorporating it with the sidechain for the main compressor and switching the control of the LFE signal path to the main compressor. There's also a 12dB per octave, 120Hz filter switch and a 10dB pad switch to reduce the level of

THINK YOUR PASSIVE MONITORS STILL PERFORM TO SPEC?

THE KRK ST SERIES



THINK AGAIN.

Years of professional use will take it's toll on even the most durable transducer. Many of the most popular monitors over the last ten years are no longer in production and in some cases; it's impossible to get replacement parts. The fact is, your old standard is running out of gas. With the new KRK ST Series you'll be able to keep your amplifier investment and make a significant upgrade to your monitoring system.

The KRK ST Series is an all-new design that incorporates the latest in driver and crossover technology. The net result is a passive monitor that delivers the precision that professionals demand at an affordable price. The KRK ST Series – the new standard in passive near-field monitors.

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the LFE if the mix has been made to Dolby Digital specifications. It would be nice if the 120Hz filter could be expanded to include 80 Hz, as current Dolby recommendations for the LFE use in music mixing call for 80Hz lowpass to accommodate playback in consumer systems with bass management.

The far-right section has two controls with their respective In switches: master level and auto-fade. Master varies from ∞ to unity gain. Auto-fades can range from 1 to 60 seconds. Releasing the lighted auto-fade switch creates a fade-in, while engaging the switch creates a fade-out.

ON THE BACK

SSL arranged the XLR inputs and outputs in the standard ITU grouping: L, R, C, LFE, Ls and Rs—an excellent choice. There's also a big heat sink, but you'll still need that space above the unit if you place it in a rack. Next to the power switch and IEC cable input is the housing for a removable vertical PCB that can be configured for settings of 100V, 120V, 200V and 240V.

FAMILIAR SOUND IN A NEW SETTING

Working with the compressor brought back many fond memories of working with SSL consoles. I used to call the Quad compressor the "make-it-bigger button," and I distinctly remember that compressor's characteristics.

With XLogic, however, the engineer should tweak very carefully, because it is easy to misuse the box and render a formerly spacious mix into a cramped space that sounds like a closet. I also found that with certain channel trim settings, I could put the machine into a state that caused radical changes on an acoustic guitar (recorded multichannel) by simply changing threshold from 1.5 to 2, while varying the attack throughout its range seemed to do relatively little.The answer to these problematic situations lay in the trim control section. The prudent engineer will want to focus immediate attention on exercising variations in trim control relationships.

Of course, a little compression goes a long way. For one session, I recorded a vocalist/guitarist in surround. Although the vocalist was closely miked, his guitar still bled into the vocal microphone. Because his vocals were also picked up by ambient microphones, I faced a mix with a very dominant center-channel vocal, a stereo front that was mostly guitar and surround channels that were nearly perfect.

I needed to make the vocals "sit" in the mix rather than dominate it. Again, the solution involved tweaking the channel trims. I let the center channel contribute most to the sidechain, with a bit of the left and right channels also going to the sidechain. I isolated the surrounds from the sidechain so that they were only affected by the main out and not the compressor. I also summed the sidechain so that the main contributor to the compressor was the vocal and not the guitar. Finally, I set the top compressor controls with a fairly slow attack and release and a very gentle ratio of 2:1.

I had to work with the trims quite a bit so that the compressor didn't squash the front ambience. At certain settings, the wall behind the guitarist seemed to leap forward, but after playing with various settings, I was able to make the guitarist sit comfortably in the center with his vocals focused but not overbearing. The ambience remained relatively untouched.

The XLogic Multichannel Compressor is elegant with logical yet complex routing, excellent components and, most of all, the classic SSL bus compressor's sonic signature. The unit gives the engineer ultimate flexibility and control over multichannel mixes in the analog domain.

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K.K. Proffitt is chief audio engineer of JamSync in Nashville.

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BY BARRY RUDOLPH

Yamaha Pitch Fix, Vocal Rack and Final Master

Hardware Effects Enter the Plug-In Realm

Workstation users, rejoice: A trio of new plug-ins brings Yamaha's proprietary digital processing technology to your VST/AudioUnits-based projects. The Pitch Fix pitch-correction tool, Vocal Rack effects processor for vocal tracks and the Final Master multiband compressor/limiter mastering processor borrow DSP algorithms found in Yamaha's digital consoles and stand-alone effect processors. They also support up to 24-bit/96kHz operation, dynamic automation of all parameters and snapshot settings recall.

PITCH FIX

I successfully installed all three plug-ins in my flat-panel iMac (Cubase SX 2, OS 10.3.2), Hewlett-Packard PC (Wavelab 4, XP Pro) and a super PC (Nuendo, XP Pro) and they ran perfectly with minimum CPU drain and no differences in features, performance or sound quality from one platform/OS to another. (Plug-ins are Windows XP/2000/ME/98/98SE and Mac OS 9.x/X-compatible.)

My immediate favorite was Pitch Fix, the first software implementation of Yamaha's formant/pitch correction and pitch-shifting technology, as it offers simple real-time operation, ability to retain formants and good sound.

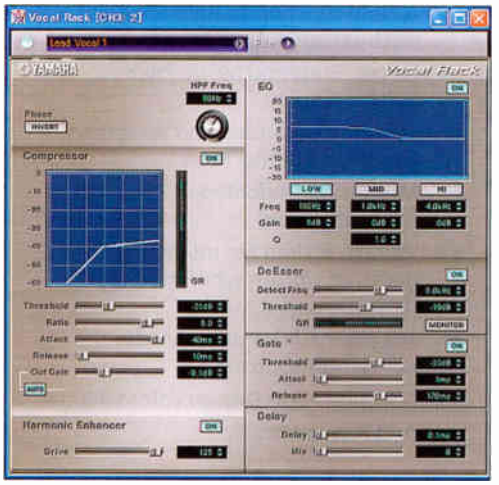
While Pitch Fix does not offer a Graphical mode, there are other ways to define its operation with the compact GUI. When instantiated, the plug-in defaults to automatic detection and correction. The Type button selects Normal (default), Male for low voices or Female for soprano. Normal mode worked fine as a quick tune-up for a rough lead vocal on a demo song that needed backing singers. After those vocals were recorded, I had the lead singer record a final vocal. I pulled a few difficult-to-pitch phrases from the tuned track and dropped them into the new vocal take—they matched perfectly. I found with most vocals, once I got the window and rate knobs tweaked, Normal mode worked well on the fly about 90 percent of the time.

For a few tough spots, I used an external MIDI controller or the onscreen octave keyboard to "play" target pitches. You can play a scale of target pitches here or click on a customized set of acceptable pitches above each keyboard key. The high/low limit faders set the maximum operating pitch range and increase pitch change accuracy. The onscreen keyboard lights with every corrected pitch, and a linear tuning meter reads incoming pitch and deviation from true pitch, which is defined as concert, or A = 440 Hz. There are controls to change this if you need to re-reference the plug-in. There are also choices of song key, major or minor scales, or chromatic (every half-step) to automatically set the universe of acceptable target pitches.

Pitch Fix works in real time and retains formants.

Pitch Fix's biggest feature is that, by default, it uses formant shifting to preserve the original signal's quality without creating artifacts or distortion. If Keep Formants is set to Off, then formants raise and lower with the pitch. Moving formants up or down produces strange vocal affectations that are still in pitch even though they sound cross-gender.

If you use several different Pitch Fix setups throughout a song, you can store snapshots (called Scenes) and recall them using keyboard shortcuts chosen from a drop-down menu. This feature is good for songs that change scales or modulate to new keys.



Vocal Rack offers six processors and 20 factory presets.

VOCAL RACK

Vocal Rack comprises six main vocal processors and 20 factory presets. The eight processing stages include highpass filter, phase flip, compressor, harmonic enhancer, 3-band parametric EQ, de-esser, gate and delay. The 20 presets are good starting points—similar to tutorials on vocal chain processing for novices—though most are set over the top. Also good for students is the classic audio textbook input vs. output transfer function graph, where you can see threshold, ratio and output control fader changes. The Auto mode automatically readjusts the output level as threshold is changed—a nice feature. I liked the sound of the compressor, though I found it a bit fiddly when making subtle adjustments. Unfortunately, only Pitch Fix lets you click on a parameter box and type in a value.

The graphical 3-band EQ does not let you grab a point on the graph and drag it, but rather you must first select one of the three bands and then click-and-drag only that band. Control+click changes the Q of the midrange band from 1 up to 12. All three bands generously overlap and boost or cut up to 12 dB. I found that they worked well for any instrument track or vocals.

The de-esser has just threshold and frequency controls, but does the job well, even on vocals with hard-to-detect 'ess' problems. A Monitor feature lets you listen to the band of frequencies being reduced. Both the compressor and de-esser have non-calibrated gain re-

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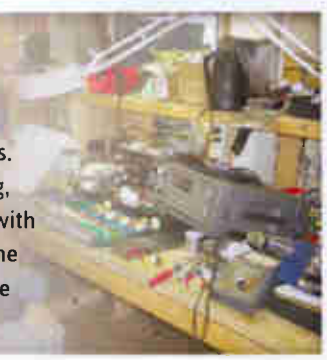

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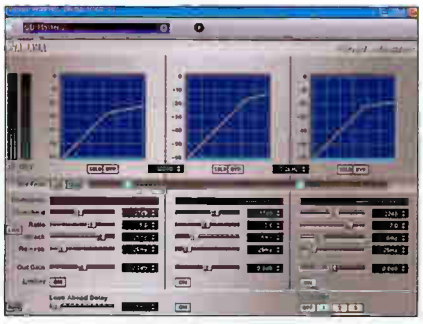
duction meters that only intermittently work—difficult to make fine adjustments. This was true even on the 2.4GHz P4 system running Nuendo.

Although noise gates are not normally needed for vocal processing, this section worked fine for suppressing headphone leakage. I found the same thing with the harmonic enhancer (a brightener that works in moderation on extremely dull sources) and delay (which only goes to 50 ms and has no feedback or LP filter controls, limiting you to a simple mono doubling effect) sections.

FINAL MASTER

Final Master is a stereo 3-band compressor/limiter with adjustable frequency control, three soft clipping models and look-ahead technology, as well as two adjustable crossover points: one between the low and mid-band and the other between the high and mid-bands. Multiband compression works well to get a tight and compressed low end, yet retains a transparent midrange and high-end openness. This plug-in reminds me a little of the 3-band compressor in the TC Electronic Finalizer, although I'd use the Finalizer if I wanted a more brutal sound.

Final Master was perfect for an acoustic guitar and bass-only track recorded live to DAT. After transferring to Cubase SX 2 and without any way to remix, I was able to jump the level up and re-balance the two instruments for a more listenable final result. I soloed or bypassed to check any combination of the three bands for quality. I also liked the immediate change that the overall mix's sonic signature took when sliding the crossover points up and down. Each band has a complete set of compressor controls and gain-reduction meter. Once you are close to the sound that you want, click Link and move all similar controls together while keeping their relative positions intact. You can Unlink and change something in one of the bands and then go back to Link to proportionately change them.



Final Master is a stereo 3-band compressor/limiter.

Like Vocal Rack, Final Master's Auto mode adjusts all three bands' output level together relative to threshold. Look Ahead sets the delay of all three outputs together so that the detecting algorithm has time—important for very fast attack time settings and running the plug-in on a slower computer. There are also three choices of soft-limit clip curves that suppress excessive peaks in the overall audio.

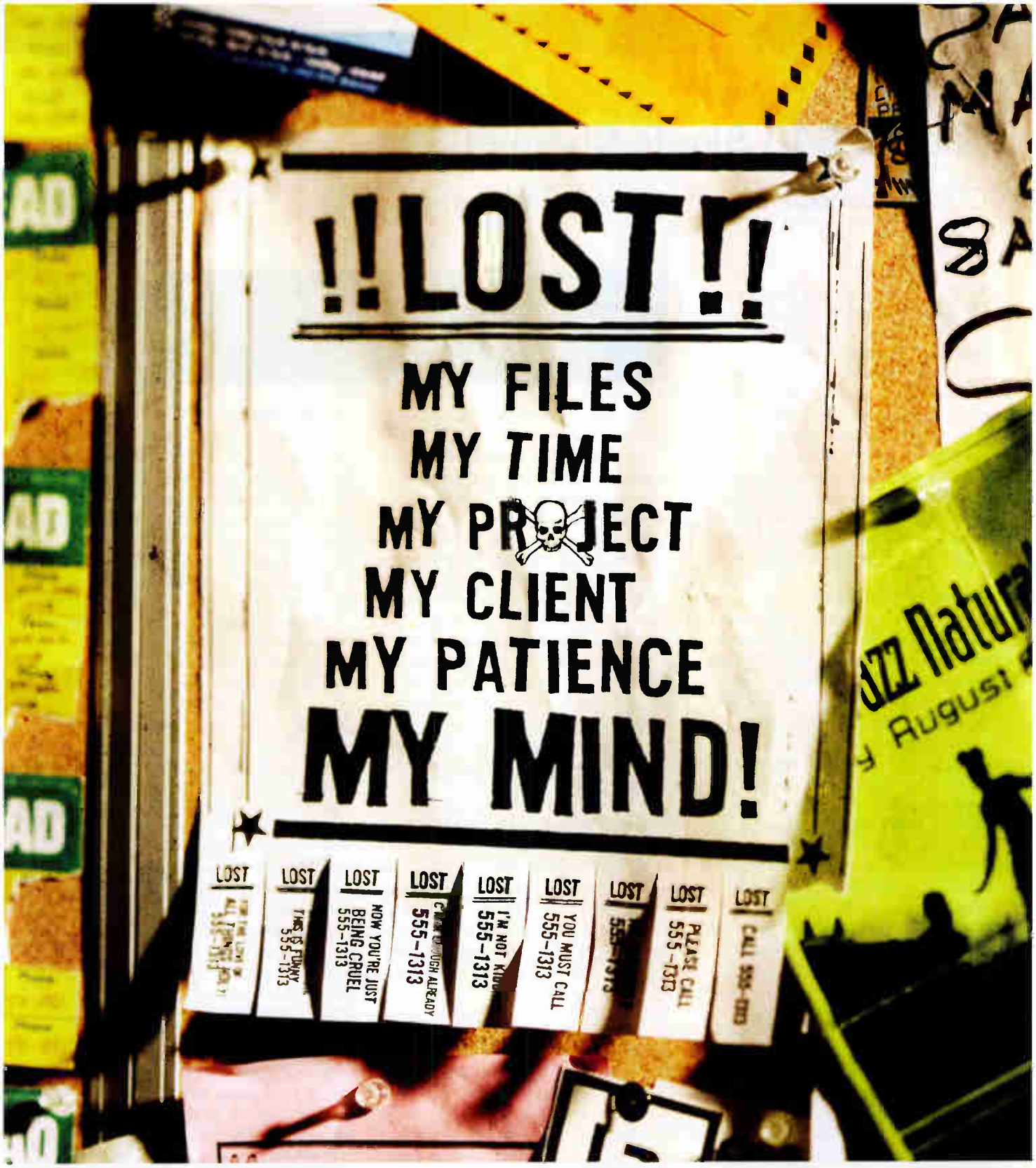
A GOOD COLLECTION

Great for the beginner to the seasoned audio pro, these plug-ins make for a good starting collection from Yamaha with their ease of use and great sound. I found Vocal Rack and Final Master to be good tools, although a bit pricey. On the other hand, Pitch Fix is as good, or better, than other pitch-change plug-ins that cost much more.

MSRPs: Pitch Fix, $299; Vocal Rack, $199; and Final Master, $199.

Yamaha Corporation of America, 714/522-9011, www.yamaha.com/dmi. ■

Barry Rudolph (www.barryrudolph.com) is an L.A.-based recording engineer.



BY BARRY RUDOLPH

Trident S40 Single-Channel Strip

Classic Console Sound in a Two-Rackspace Chassis

With its signature black-anodized front panel, colored aluminum knobs and small rectangular push buttons, the S40 is clearly the progeny of Trident's Series 80 and TSM consoles. Housed in a two-rackspace cabinet, this single-channel recording strip uses the Series 80 4-band EQ and TSM's high/lowpass filters. A fitting tribute to Trident designer John Oram's 40th year in the business, I found the S40 to be exactly as a Series 80 console's input module. From the no-nonsense style of the smooth controls to its clear, present and upfront sonic character, the S40 has it all.

ANATOMY OF AN S40

The S40 retains the classic Trident sound with Class-A circuits and the latest chips for lower noise and slower TL070 ICs. The front panel is divided into four sections: a mic preamp, a compressor/limiter, a 4-band semi-parametric EQ with overlapping mids and an output driver/meter stage. The all-steel cabinet offers good construction with many surface-mounted components, handwired pots and Elma switches. The English-made unit has an internal 110/220 VAC power supply.

The mic pre has a detented gain pot for smooth, continuous control with up to 60 dB of gain (plenty for any mic), switches for polarity flip and phantom on/off and a peak LED that lights at +9 dBu. Based on the TSM, the transformerless mic preamp has a 200-ohm input source impedance, -126.4dBu EIN, +28dBu max output and a dynamic range spec of 154 dB. A front panel ¼-inch input jack is ready for any piezo transducer or the impedance-sensitive passive pickups of your favorite Fender P Bass.

The dynamics section is from the Oram Sonicomp range and in the new Trident Oram Series 80 5.1 console. The compressor uses a VCA but is configured as a feedback element of an amplifier, so the main signal path remains untouched. The S40 has rear panel control voltage-in/out jacks for external control of gain or stereo linking. This workhorse compressor/limiter has continuously adjustable attack times from 0.1 ms to 40 ms, and threshold (-45 dB to +18 dB) and release times from 0.05 to three seconds. I'd like to see even slower attack time choices offered. The nonlinear ratio control range is good, as the lower ratios are spread out to easily set a 1:1 to 1.5:1 to 1.75:1 to 2:1 and 15:1 for hard limiting. Gain reduction is always read on the meter, even when the compressor is bypassed—great for setting up for an upcoming song in a live sound mix.

The Pre button inserts the compressor before/after the EQ section. The S40 borrows this feature from the Oram GMS Al Schmitt Pro-Channel, and it offers no excuses for lazy engineers who would patch an outboard compressor after EQ and never bother to repatch to hear it the other way around. I found the compressor useful and mostly transparent for light duties: lower ratios and higher thresholds for 1 to 4 dB of RMS gain reduction. For a purposeful "squashed" sound character with lots of personality, the unit is capable of all the "sturm and drang" you can take. I wish the compressor section had a makeup gain control for A/B comparisons of compressed to uncompressed at the same level.

The S40's 4-band EQ is accurate and smooth. The two sweepable midsections overlap, covering 150 Hz to 2 kHz and 1.5 kHz to 15 kHz. With broad half-octave Qs, these sections are excellent tools for subtle touch-ups or severe carving of an individual track or program mix. The shelving LF and HF bands offer two corner frequency choices: 50 or 150 Hz and 7 kHz or 12 kHz, respectively, and smooth 4dB/octave curves. The high- and lowpass filters are tuneable: LF from 5 to 200 Hz, and HF from 1 kHz to 50 kHz. Bandwidth-limiting tracks with these filters can keep useless frequencies out of the track's total energy band. Boosting with the low- and high-shelf equalizers at the same frequencies produces a unique equalizer sound.

On the back, a balanced output driver stage gives an added 6 dB of gain. I ran this at center-detent position unless I needed makeup gain. The small VU meter shows output level (blue) or gain reduction (green) changes—easy to spot from across the control room.

IN THE STUDIO

The S40 is straightforward to use. I recorded narration tracks using a stock Neumann U87, my voice-over talent's favorite mic. With the 87, the S40 had a clear and present sound without any additional EQ. Recorded singing voices took on a certain clarity—a forward sound without sounding EQ'd.

My quick and unscientific reference A/B test against Brent Averill–restored Neve 1073 module showed that using a U87, with both modules set to 50 dB of gain and no EQ or compression, the S40 produced the same output level and overall sound but had a punchier low end. With EQ in, there is a slight increase in low-frequency distortion rising to 0.1% at 20 Hz.

Making a song harder-sounding to compete with an aggressive rock track, I used a combination of bandwidth limiting, EQ and compression. However, the next session may be all about purity and naturalness. Here, the S40 would score again with the transparency and headroom of the mic preamp section.

I recorded a Tobias bass using the ¼-inch DI input. Slightly overloading the preamp and compressing with a 1.5:1 ratio yielded a very cool, distinctive rock bass sound. Reducing the preamp gain produced a smooth jazz tone that was great on a ballad.

Setting the gain to 0 dB, the S40 becomes a line-level processor. I liked the equalizer and compressor to post-process guitars, keyboards, drums, vocals, etc.

With all of the new preamps that promise to sound like vintage equipment, the S40 delivers the classic Trident console sound. From meticulous high-fidelity recordings to over-the-top aggressive processing, the S40 does it all and belongs in the pantheon of classic vintage recording gear. It's sold exclusively in the USA through Guitar Center at a retail of $2,495.

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BY NICK BATZDORF

Tascam FW-1884 Control Surface/Interface

FireWire Mixing and Automation for Your DAW

A control surface/FireWire audio/MIDI interface describes most of what Tascam's FW-1884 does, but there wouldn't be enough space on the box if the product name were to paint the whole picture of its functions. It's a 4x4 MIDI interface/patchbay, 18x10 24-bit/96kHz-capable audio interface and motorized DAW controller. Essentially, the FW-1884 and a computer running ASIO-compatible DAW software can become an integrated production rig. In a second mode, the FW-1884 functions as a stand-alone digital monitor mixer, and in a third mode, it becomes a MIDI control surface. You can easily program sends for each physical control on the surface.

Connected to a computer, audio and data run down a single 6-foot FireWire cable. (Fifteen feet is the specified maximum.) You can use the FW-1884 on Mac OS 9 or X and Windows 2000 or XP. As of this writing, MOTU Digital Performer 2.7 and above, Emagic Logic 6.1 and above and Cakewalk Sonar offer dedicated FW-1884 drivers and can use its native control surface codes. For other DAWs, the unit emulates a Mackie Control or Mackie HUI.

The I/O comprises eight balanced XLR mic/line inputs with unbalanced inserts on a TRS send/return cable, eight channels of ADAT Lightpipe I/O (switchable to S/PDIF optical), coaxial S/PDIF I/O and eight balanced TRS analog outputs. Phantom power is switchable in groups of four channels, and word clock I/O lets the unit play with other digital equipment in a larger setup.

PEAKING UNDER THE HOOD

The unit's monitor section offers a level encoder that can be switched to control two, six or all eight of the analog outputs. This allows it to be used for stereo, 5.1 surround plus cue mix or aux sends, or even eight channels of surround.

Surround monitoring makes the FW-1884 fit a number of post-production–related applications that don't need a conventional mixer, such as voice-over or Foley work. Its most likely application is for MIDI and overdubs in a musician's project studio, with the unit performing double-duty as a small digital monitor mixer for live gigs.

The FW-1884 comes with a teaser 24-voice version of Tascam GigaSampler software, which turns a PC with a GSIF-compatible soundcard into a disk-streaming sampler. If you use GigaSampler or other software instruments in a multicomputer setup, the FW-1884's ADAT Lightpipe port is a logical place to plug in a soundcard's outputs.

It's easy to fill two MIDI ports if you have numerous software instruments running on a computer. But anyone who's using the unit's four MIDI I/Os will need more than its eight analog inputs to accommodate all of those synthesizers. In this instance, there are several affordable 8x analog-to-Lightpipe converters available on the market. An old ADAT you have hanging around would also unlock eight more inputs and may solve the problem.

SCRATCHING THE SURFACE

The FW-1884's surface boasts nine touch-sensitive motorized faders: eight in the standard channel strips and a master, which isn't active in HUI mode because it's not part of the protocol. Like all control surfaces of this ilk, you can scroll the eight regular faders up and down in banks of eight tracks or one at a time, thus accessing many more than eight tracks.

There are eight rotary encoders that change function, depending on which array of lighted buttons you push: pan or auxes 1 through 8. A Flip button temporarily swaps functions, assigning the auxes to the faders and channel volume to the rotary encoders.

Other buttons include an array of keyboard equivalents—shift, option, cut, paste, etc.—and a button to call up the unit's control panel, which only worked at 44.1/48kHz sample rates under Mac OS 9 on the test Quicksilver PowerMac G4. Without listing all of the buttons and knobs, there's also an EQ control section with buttons to select the band and encoders to adjust the frequency, Q and gain; transport and shuttle controls; edit in/out points and nudging; and a rotary jog/shuttle wheel.

Whether the controls actually do what's screened on the surface depends on the software being controlled. This becomes a very minor issue after you spend some time with the unit as you don't look at the labels once you learn your way around.

The FW-1884 also has a stereo 12-stage plus overload meter, and signal present and overload lights on each of the eight channels. There are no V-pots with lighted spokes to indicate rotary encoder positions, nor are there electronic scribble strips that reflect the onscreen track names in the DAW.

To get around that, Tascam has written a rather clever program for OS X called SoftLCD that runs in the foreground and shows the name of the currently selected track. Some DAWs indicate, in one way or another, which eight tracks are remote-controlled. Digidesign's Pro Tools, for example, draws a blue line around the selected tracks. Between SoftLCD and your DAW's graphics, you shouldn't miss the scribble strips too much.

With the exception of the fader bank switches' location and operation (you must hold down a modifier to scroll by individual channels), the control surface's ergonomics are sound. I also agree with Tascam's choices regarding which features to implement or leave out, such as the decision to not make

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the control surface insert plug-ins remotely. Rather than overdesigning the FW-1884, Tascam correctly treats the computer screen, keyboard and mouse like the useful controllers that they are.

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To get a feel for the FW-1884's sound, I recorded cello, recorder, acoustic guitar, percussion, and sung and spoken voice into it. The FW-1884's sonics are clean and neutral, with an input path that's clearly better than the first-generation FireWire interface I used for comparison. Its mic pre's have about 56 dB of gain, which is healthy, and its headphone amp is powerful enough to drive low-impedance headphones at a decent level.

The performance of any native audio interface depends on the host computer, but I was able to record all 18 tracks at 96 kHz while playing back another 18 channels on a dual 1GHz G4 PowerMac. It wasn't hard to make the system gag at 96k by looping a two-bar section with a certifiably insane amount of automation, but at 44.1 kHz, a similar loop played back with only slight hiccups at the loop's beginning. If your computer is modern enough to have good FireWire implementation, then you're not likely to encounter glitches—unless the faders are doing aerobics.

I checked the system on Mac OS 9 in a variety of programs—Steinberg Nuendo, Digidesign Pro Tools (in HUI mode), Emagic Logic and an old version of MOTU Digital Performer—without encountering any problems other than the minor ones mentioned above. Perfunctory tests (I only have one foot in OS X at this stage) showed it also worked fine with Logic Audio on Mac OS X Panther.

MORE FOR YOUR MONEY

Retailing at $1,599, the FW-1884 sells for just over what you would pay for a comparable FireWire audio interface without a motorized control surface or built-in 4-port MIDI interface/patchbay. Tascam has hit the sweet spot for a lot of applications, making it a solid contender for a variety of users in search of a versatile DAW control.

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Nick Batzdorf is a composer, producer, engineer and writer living in Los Angeles.

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Until you look closely at the front panel LCD, Alesis' Prolinear 820DSP appears to be a garden-variety, two-way, active studio monitor. It has a conventional soft-dome tweeter centered above a standard 8-inch woofer and flanked by two front-firing ports. Its standard-issue black cabinet is "midfield-size" (15x9x12 inches deep) and weighs 25 pounds. The rear panel features Neutrik XLR/TRS combo jacks, a level control and heat-sink fins for the 40-watt and 80W RMS power amps.

What you don't find on the back panel is the standard set of DIP switches to adjust a pair of shelving filters. Instead, there are 9-pin In and Out ports to daisychain all of the 820DSPs in your rig to a Windows-based computer. That's where the "DSP" comes in, explaining the mysterious LCD on the front. The 820DSPs contain digital crossovers and a built-in 4-band parametric equalizer. Remote editing software for the equalizers is included. Using either this software or the front panel, you can adjust the setup parameters (via four fully parametric EQ bands), as well as overall volume and muting on each speaker individually or all at once. Best of all, this can happen from a laptop or desktop PC without ever leaving the listening sweet spot. The same software also works with the smaller 720DSP model, if you happen to be using them for surrounds. (Alesis also makes a regular 820 and 720 without the DSP.)

USER POWER

Each speaker includes eight presets and eight user slots to store your EQ programs, but you can also store them on a disk. The user slots come loaded with programs such as Warmth, Bass Boost, AM Radio and Treble Boost, among others. You can also store "corrective" EQ settings, keeping in mind the conventional wisdom that overdoing speaker EQ is only going to mask problems.

The presets include simulations of popular speakers and bear names such as White Cone and Faux Finnish. The 4-band equalizer can produce caricatures of NS-10s and Genelecs, but not accurate simulations. This is an amusing and interesting feature, but probably not an extremely useful reference because the frequency response is only one of the characteristics that make up a speaker's overall sound.

However, the equalizer presets are useful. For example, the BBC Dip preset, which cuts the 1 to 3kHz range slightly, is very pleasant. The AM Radio setting rolls off the top and bottom, which is also a very realistic reference.

ON FIRST AUDITION

Given enough bands of equalization, one might think it's possible to make a perfectly flat speaker, but EQ only takes frequency domain into account. There's also phase response—i.e., the time domain—which is much harder (impossible, by all accounts) to completely nail down.

While it may seem meaningless to discuss the frequency response of a monitor with built-in DSP, it isn't. The 820DSP is very well balanced in its Flat setting preset. Swept sine waves don't make the crossover point obvious at all, nor do they reveal any significant lumps or dips. These speakers are quite neutral.

The 820DSP's specs quote a frequency response of ±1.5 dB from 50 to 20k Hz, with the bass down about 3 dB at 43 Hz. In fact, there's usable low end a good half-octave below that—not enough to shake your bones the way a subwoofer does, but enough to alert you when there's something alarming going on in the sub-rumble range.

Monitors usually lean toward being either dry and constrained or bright and resonant, but the 820DSP sits close to the middle. The only foible I can point to is that they have a slightly "boxy" midrange, almost as if the cabinets had no Fiberglas stuffing inside them, although they do. This makes them sound slightly more hard than warm. While this is a subtle characteristic, I found it to be consistent at all volume levels.

STAND UP AND DELIVER

I did most of the listening to the 820DSPs in my small (10x18-foot) and fairly dead project studio, which has a tendency to make speakers and instruments sound on the brittle side. Listening in a bigger, very live room didn't change anything. To evaluate speakers, I generally use a Pro Tools session containing a variety of music styles and some original music stems that I mixed to see how well the results translate. The 820DSP mixes did not have any problems translating to other speakers.

These monitors are not designed to be sweet-sounding living room monitors. The imaging is solid—I'd give it an eight out of 10, as I didn't struggle to find the center—and the dispersion (including vertical) is good. It's nice to be able to stand up and listen without the sound radically changing. They also get plenty loud.

CONCLUSION

The 820DSP monitors offer a lot of versatility and are competitive with other products in their price range. Their most notable strength is how little time it takes to get used to them. They do a credible job of presenting what you're listening to, which allows them to fit easily into any production environment. Bottom line, these are speakers that I can work with. Price: $549/each.

Alesis, 401/658-5760, www.alesis.com.■

Nick Batzdorf was the editor of Recording *for more than 10 years.*

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BY EDDIE CILETTI

Thinking in Time

Using Your Workstation As an Analyzer

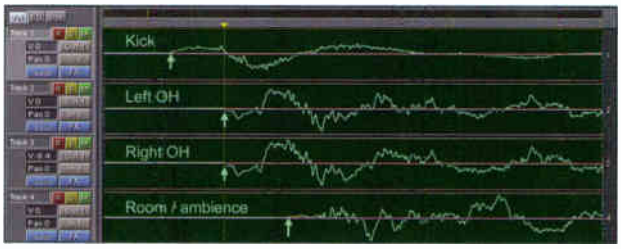


Figure 1: Time delay from kick, overheads and room mics

Normally, I'm down in the hardware trenches with my soldering iron, but in the spirit of this month's "The New Means of Production" theme, I thought I'd step into the virtual realm. I see workstations as versatile tools. They let us fix all of the sonic frailties that make us human, and most of the time, that's our job. For me, the ability to tweak is an addiction worse than watching television—a complete black hole. But at the fundamental tool level, I'm talking analysis here. (We can talk about getting me off the couch later.) Let's look at a few examples of ways you can use your DAW for some fancy sonic detective work, no matter which platform you work on. We'll start with the organic stuff: live drums.

I love to zoom in to see time in great detail and examine things such as how long it takes the snare sound to reach the overhead and room mics. (See Figure 1.) Zoom in a little closer and you can compare the phase of the kick and snare. This addiction to detail can mean the difference between struggling for a sound or bringing it upfront, phat and forward—and for stereo tracks, improving the focus. It could be as simple as finding an out-of-phase mic.

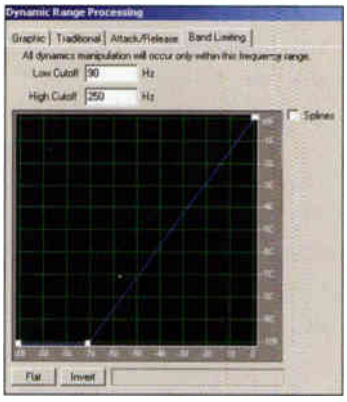


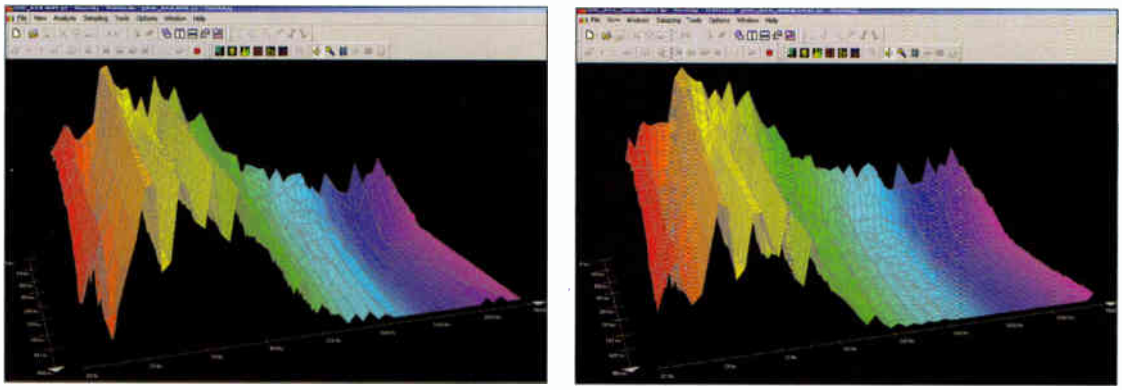
Figure 2: Controlling kick drum resonance

Here's a cool trick for taming kick drum resonance that can be applied to anything. One day, with my head in the hole area, I noticed a lot more resonance than was needed (or wanted). The ordinary solution would have been to find a way to dampen the head but there was no time. Back in the control room with Adobe Audition, EQ wasn't the fix—although it revealed the problem areas—and an expander/gate wasn't quite doing the trick, until I discovered that its parameters could be narrowed to a specific frequency range to apply selective processing via Audition's Expander. (See Fig. 2.)

To be more scientific, I popped the before and after kick samples (Figs. 3a and 3b, respectively) into Steinberg's Wavelab for a 3-D time/spectrum analysis. Many people pull out frequencies between 150 Hz and 800 Hz with EQ. By using a frequency-selective expander, this same frequency range was tamed after 250 milliseconds. This was a two-step process: first to treat the most offensive area and then tame a wider area (below 3,500 Hz). With low-frequency instruments such as a kick drum, it is important to remember that there really is plenty of low-frequency energy—the spectral analysis proves this—even if it doesn't seem obvious to the ear.

KNEE JERK

I've been studying compressor/limiters from every angle: real hardware on my test bench and in the virtual reality



Figures 3a and 3b: Wavelab's 3-D spectral analysis of raw kick drum signal (left), and with frequency expansion applied

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FIRST WE LISTEN

Figures 4a and 4b: The Soundscape dynamics module configured as a compressor (l) and as a peak limiter

of an audio workstation. The most significant discovery has been the importance of focusing the processing at "the knee." This is not as easily accomplished as it sounds, however, because the compressor's variables—threshold, attack and release—make the location of the knee a moving target.

Figure 4a shows a Soundscape Dynamics module configured as a gentle compressor, while Fig. 4b is the same module as a peak limiter. As we know, a compressor's job is to raise low-level signals (between -45 and -36 in this instance) while lowering high-level signals (-26 and above). The "three compressors," from COMP-1 to COMP-3, are used to create the green "curves" just by increasing each successive ratio with the respective threshold control (the vertical lines). No curves—see the faint diagonal line from lower-left to upper-right—yields no processing. The blue line represents an expander ratio of 1:1.30.

The slow attack and fast release combined with the threshold settings focus the activity around the knee (the "cursor" indicates processing activity), allowing some of the dynamics to slip on through. If the signal dips below -45 dBFS, then the expander inverts the COMP-1 ratio of 1.25:1, reducing gain to minimize low-level noise. Seeing this in action is an educational experience: connecting the visuals with the sound and vice versa.

Note how different the peak limiter looks. All of the activity is focused between -9 dBFS and -3.5 dBFS. The attack is 4.1 ms, while the release is just over two seconds, helping the "cursor" stay in the knee while signal is present—all in the name of preventing peaks from slipping through to prevent digital "overs."

These tricks can take several passes through different processors to achieve the desired goal. It is better to do a little each time than be heavy-handed. In hardware, each processor has a sweet spot and sometimes it's a very narrow window.

THE SUMMING BUS

Yes, having so much power can be addictive, but I've found that the benefit of binge tweaking is a heightened awareness of what counts in a recording: pre-production and simplicity (as in using fewer but better-placed drum mics). Have fun! ■

Eddie Ciletti belongs to BTA, Binge Tweakers Anonymous. You can join at www.tangible-technology.com.

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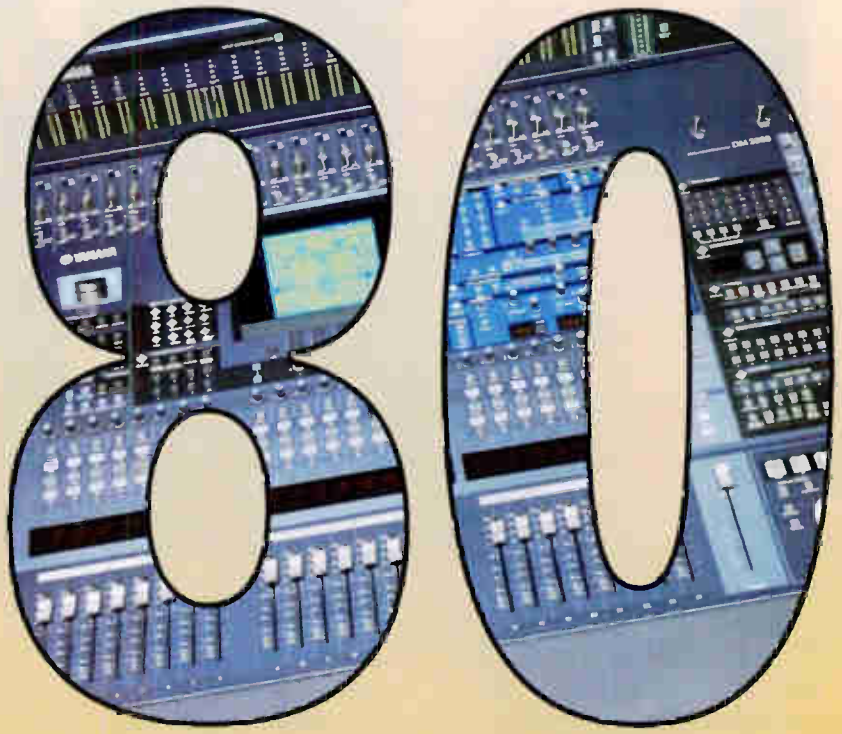

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VELVET REVOLVER

OUT OF THE ASHES OF GNR AND STP

By Elianne Halbersberg

Given their pedigrees—former members of Guns N' Roses and Stone Temple Pilots—it would be easy to label Velvet Revolver as either the next rock 'n' roll supergroup or a potential knockoff of their previous incarnations. (Stone Temple Roses, anyone?) Instead, VR members Slash (guitar), Duff McKagan (bass), Matt Sorum (drums), Dave Kushner (guitar) and Scott Weiland (vocals) are adamant that their debut album, *Contraband*, should stand on its own merits while their past is left behind.

"Of course, there are elements of GNR and STP," says McKagan. "By that I mean the raw emotion of each song, whether it's fast screamers or beautiful ballads. We don't need 15 guitars, synths or tons of effects. We just need a raw, in-your-face, in-your-gut sound. We're not 22-year-olds. If we came out with a slick produced record, it would be a death knell. You can be a follower or a leader, and our previous bands were leaders, so we're just doing what we've always done."

The roots of Velvet Revolver were planted when former GNR members McKagan, Sorum and Slash joined forces at a benefit concert following the death of fellow musician Randy Castillo (drummer with Ozzy Osbourne and Mötley Crüe) to raise funds for his burial. "In the back of my mind," says Sorum, "I thought it would be great to play with these guys again. There was chemistry between us that wasn't about financial gain. [At the benefit] it was obvious that we were still contenders wanting to show the world that we have something to offer. It took a year to make this band happen because we were waiting for Scott [Weiland, who was still battling his well-publicized drug addiction and undergoing rehab]. It required a lot of hard work and dedication and not knowing where we were going. But we wanted to make a great record with the best singer for the job."

According to McKagan, Velvet Revolver is a comprehensive collaboration that borrows from some elements of its members' histories while reflecting the maturity that has come with time, age and sobriety. "The biggest change for me is that I remember everything now," he states candidly. "I don't need lines of coke and downers, and a half-a-gallon of vodka to get through a gig. But we play with the same intensity. In fact, it's probably up a ton. I know that I've changed mentally and physically to where I can focus and become a lot more aggressive than I was ever able to be with Guns."

To capture the raw sound that McKagan refers to—a sound that is being called modern rock by their record label, but which also brings to the table an unmistakable hard rock edge—the band

—CONTINUED ON PAGE 138

JOHN WESLEY HARDING

BRITISH FOLK-ROCKER DELIVERS AN ALBUM WORTH WAITING FOR

By Heather Johnson

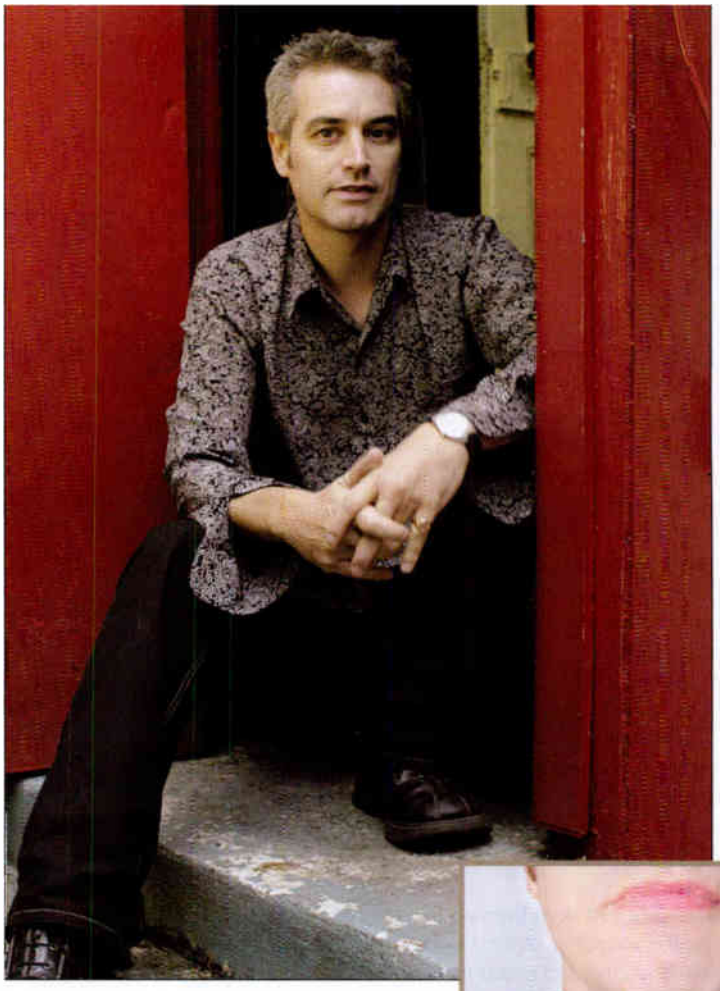
John Wesley Harding waited almost three years to release *Adam's Apple*, his 11th album overall and first for DRT Records. But the British singer-songwriter recorded the album in a matter of months, working with two different producers in two distinctly different environments: a high-end commercial facility with the large-format console and a Pro Tools–based home studio.

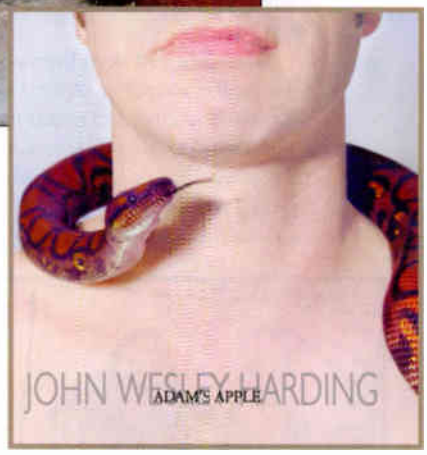
Rather than release the project himself after his then-label, Mammoth Records, shuttered and folded into Hollywood Records, Harding (aka Wesley Stace) delayed *Adam's Apple*'s release until he found the optimum label offer for what he considers his best work yet. "I don't see many situations in which all the pieces fall into place so incredibly well, and with such good fortune, luck and love," says Harding from his New York home. "The professionals that played on it, the people that worked on it...I can't see those things ever falling into place again, so I really felt that it was worth waiting for."

For Harding's first commercial recording since *The Confessions of St. Ace* (2000), Mammoth president Rob Seidenberg recommended co-producers Julian Raymond, Capitol Records' senior VP of A&R, and Eric Kupper, an in-demand keyboardist, remixer and producer in the pop and dance scenes. "Basically, [Seidenberg] was less interested in me making folk music," Harding admits. "He thinks my strong suit is my pop songs, and this album was his idea to really present me making pop music in the best possible way with the best people."

Raymond, whose production credits include Fastball, the Cash Brothers and the Suicide Machines, brought ace musicians such as drummer Vinnie Colaiuta, bassist John Pierce and guitarist Michael Ward to Henson Studios in Los Angeles to play on six of the album's 12 tracks. Working with engineer Greg Goldman, Raymond helped polish Harding's hypnotic, acoustic-based melodies without burying his smart, witty lyrics.

"Julian really believes in paring a song down to its bare essentials," Harding says. "It's the first time I've ever had that kind of discipline for myself. If there's not an absolute necessity for a thing to be there, it's not going to be there."





Harding, a skilled producer in his own right, admits that his strength lies in arrangements and melodies rather than technical prowess. "We had no intro to the song 'Nothing At All' at first," Harding admits. "And I thought, 'There's got to be *something*,' and I remember saying to the bass player, 'Why don't you just go, "ba-da-da-da," but more Motown, with these notes.' We're all listening and Julian said to the bass player, 'Wow, that's a *fantastic* intro, John.' And I was like, 'Great! I think so, too!' Because I'm just humming new parts in my mind the whole time."

Raymond may have given Harding's intro a thumbs-up, but he didn't approve of a brief guitar line played by Kirk Swan, a member of Harding's touring band, the Radical Gentleman. "It was this very big guitar riff and it's very loud and unlike anything else on the track and I really wanted it to be there," Harding says of the part, which appears on "Nothing At All." "Julian heard it and said, 'Bang goes the radio. That's the end of that one! It will *not* be a single now.' To him, it was one of those extraneous moments."

In addition to keeping the songs uncluttered, Raymond also inspired some of Harding's best vocal performances, even joining in on a few. "Julian is a fantastic harmony vocalist," Harding says, adding, "but there is nothing better than me singing with Chris von Sneidern, who I've been singing with for years. He's co-produced loads of albums with me and he's the bass player of my touring band; I'm on his records and he's on mine. Plus, he comes up with the power-pop harmonies that I don't quite have in my head. So to me, it was just a no-brainer to get him to sing [on this album]."

—CONTINUED ON PAGE 139

THE DOOBIE BROTHERS' "WHAT A FOOL BELIEVES"

Clockwise from upper left: Patrick Simmons, Jeff Baxter, Tommy Johnston, Michael McDonald, Keith Knudsen, Tiran Porter and John Hartman

By Robyn Flans

No one was more surprised than Michael McDonald when the song he wrote for the Doobie Brothers, "What a Fool Believes," earned Grammys for Record of the Year and Song of the Year, as well as Best Arrangement Accompanying Vocalists at the 1980 awards ceremony. The album it was on, *Minute By Minute*, also took Best Pop Vocal Performance by a Duo, Group or Chorus, even though, McDonald recalls, the record executives had predicted the opposite.

"The famous quote at one of the production meetings was, 'This is the end of these guys. This is over.' We weren't so sure it wasn't true ourselves," McDonald admits. "We felt like we weren't sure what we had done. We dove in head first and made the record."

The song had been brewing for a couple of years. In fact, during the recording of the Doobies' previous album, *Livin' on the Fault Line*, McDonald would play the riff for producer Ted Templeman and he would always say, "You gotta finish that song. That's a hit." McDonald was forever replying, "Yeah, yeah, I will, I will," but it eluded him, until the day Kenny Loggins drove down to North Hollywood from his home in Santa Barbara to write with McDonald for the very first time. Upon his arrival, he heard McDonald noodling around on the piano, playing that riff.

"I answered the door and he said, 'Whatever that was you were playing, can you remember it?' I said, 'Sure, it's something I've been messing around with,' and he said, 'That's the one I want to write," McDonald recalls. "We wrote a bridge to the song and I think the next day over the phone, we wrote the chorus. It was just one of those 'right time, right place, right people' things."

Recording the song, however, did not flow as easily. In fact, McDonald says that the two weeks spent at Amigo Studios in North Hollywood cutting the entire album was fairly tortuous, although he says there was one bright spot: "There was a basketball net in Studio A and one of my fondest memories is that I got to shoot baskets with James Taylor, who was recording in the next studio."

Amigo's Studio A was where the Doobie Brothers cut all of their tracks, recalls McDonald, and according to him, it was not "exactly an interior designer's fantasy. It was like many studios of its time: fluorescent lights, white linoleum floors, walnut paneling and orange fabric walls. Even the couches were uncomfortable."

The console was a classic API and everything was recorded on 3M 2-inch 24-track machines. And although McDonald doesn't recall the specific outboard gear used other than "it was mostly stuff of that era like the 1176 UREI limiter/compressor," he does recall the arduous process.

"We would work until three or four in the morning and either sleep on the floor in the studio or go home and be back by 10," McDonald recalls. "Those were the crazy days of recording—it's all you did and all you thought about, and we were immersed in the thing."

The recording of "What a Fool Believes," in particular, was *brutal*, McDonald emphasizes. "We cut so many versions of it. It was just a funny song to learn to play. We'd have a good verse section in one take and then the chorus would fall apart. We had big boxes of 2-inch tape piled to the ceiling on just that one tune. We had gone through God knows how many rolls of tape trying to get that song. We just didn't feel that we were capturing the groove. I believe Ted Templeman played drums on that track."

Templeman confirmed that fact in Fred Bronson's *The Billboard Book of Number One Hits*: "We tried to cut it over and over and over, and we couldn't get it to where it felt right. We must have cut that thing for five or six days straight. I finally—just to get the feeling right—ended up playing drums on it myself along with [regular Doobies drummer] Keith Knudsen. I just wanted a sort of floppy feel and if you listen to it, it's really kind of a floppy record. It flops around, the drums aren't perfect, nothing's perfect on it. You know, a Rolling Stones record may not be perfect, but it's got a feel to it."

Little Feat keyboardist Billy Payne and McDonald spent a day working on the synthesizers for the track. "He played some and programmed some for me, and we started building parts on the track, which brought the thing to life a little bit," McDonald says. "The opening riff was an acoustic piano [a 7-foot Steinway] accompanied by an Oberheim 8-voice analog

Cool Spins

The Mix Staff Members Pick Their Current Favorites

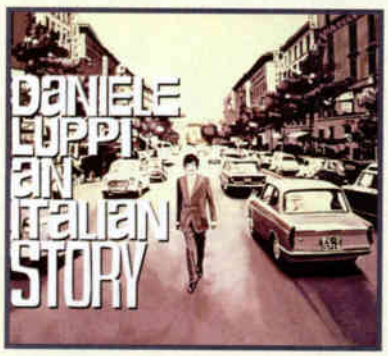
Graham Parker: *Your Country* (Bloodshot)

Graham Parker has always had a little bit of a country twang hiding behind his new wave and pub-rock leanings; more rockabilly than Nashville, I suppose, but there nonetheless. Much of the material on this album is more overtly country, but really, it's just a matter of choosing country cadences and settings than actually conforming his writing to a new style. Truth is, when I heard most of these songs for the first time, I could hear the driving, unmistakably Parker-esque rockers they *might have been* through the country arrangements he ultimately selected. Does that mean that this is a false step for one of our most reliably great singer-songwriters? Not really. The songs are still strong and the lyric sentiments are typically complex and well-developed. I really like "Things I've Never Said" and "Anything for a Laugh." But it does feel a little forced in places. The rockabillyish numbers mostly ring true, however, and the two cover tunes are interesting: a truncated version of the Grateful Dead's "Sugaree" and Parker's updated take on his own classic originally cut by Dave Edmunds, "Crawling From the Wreckage."

Producers: Graham Parker and John Would. Engineer/mixer: Would. Studio: Stanley Recording Studios (Venice, CA). Mastering: Joe Gastwirt/Joe's Mastering Joint. *—Blair Jackson*

Daniele Luppi: *An Italian Story* (Rhino/Belmondo)

This won't be everyone's glass of Campari, certainly, but if you have a soft spot for semi-cheesy Italian film music from the '60s and early '70s—we're talkin' *La Dolce Vita*–era and later pop- and electronic-influenced craziness—the young Italian composer Daniele Luppi might be right up your alley. Luppi grew up adoring that sound, wrote pieces in that style and then went as far as tracking down some of the original musicians who played on those soundtracks—the Marc 4, or as the liner notes colorfully call them, "the Italian Wrecking Crew" (after Phil Spector's group, of course). The result is a marvelous retro excursion filled with Farfisas, B3s, slinky guitars, fat bass lines, wheedling Moogs and the occasional moody whistling. The titles



say it all: "Fashion Party," "Nightclub," "Free Love Sequence," "Jet Set"—you know what these sound like without me telling you. Camp? Perhaps, but also definitely *cool*, and the playing is tight and inspired. The Via Veneto has never sounded so good. A real find.

Producer: Daniele Luppi. Recorded by Aldo Amici. Mixed by Jeff Peters. Studios: Telecinesound (Roma; tracking), Sonora Recorders (L.A.; mixing). Mastering: Joe Gastwirt/Oceanview Digital.

—Blair Jackson

Ben Kweller: *On My Way* (ATO)

Any sunshine-y "ba-bas" and "la-la-las" heard on Ben Kweller's 2002 solo debut, *Sha Sha*, have fallen by the wayside on his follow-up, making room for more inventive guitar work and personal, plain-spoken verses. Produced and mixed by Ethan Johns (Kings of Leon, Ryan Adams), the album's lead track, "I Need You Back," gets the head bobbing with a seamlessly played,

—CONTINUED ON PAGE 141

synthesizer. I still own the Oberheim I used on the session.

"We tried a lot of different wacky overdubs on that track, like at one point, we were stomping on a piece of plywood on the floor to re-create that kind of Four Seasons '60s pop thing, like on 'Sherry' and 'Walk Like a Man,' and some of the Beach Boys' tracks," he continues. "We were trying anything. We felt the track had a certain pop sensibility that was kind of retro in a way, and that always seemed to be where our heads were. Whenever we cut a track, we were constantly comparing it to stuff that was done years ago, either production value-wise or song-wise."

There were so many takes on the song that McDonald isn't sure if the vocal—most likely recorded with a Neumann U87—ended up being cut live. "Whenever we cut a track live, I sang a live vocal, but it seems to me when I look back, most of the time I wished the live vocal was what we did use. Most of the time, I didn't have all the words at the point of the first cutting. That particular song was written and we did have all the words, so it's quite possible that was a live vocal. In any case, where we could use the live vocal we did, and I would just punch in and fix any words I flubbed."

Despite the many takes, McDonald says that Templeman truly knew what he was after. "As we were playing it, we were getting increasingly more frustrated, as you can imagine, snapping at each other. There were some pretty famous comments after each take toward the end," he says with a laugh. "There were too many expletives to say them in print, but it was like, 'I hate this *blankety blankety blank* song.' We finally got so frustrated, we just quit. Ted said, 'Don't fret, I know we've got a take here. I know which one it is.' I'm looking at boxes of tape, literally, piled to the ceiling, and he says, 'Take number one on box three, and then from the bridge out, on take number one, box 12.' I said, 'Come on, Ted!' And he said, 'I'm telling you, I've kept track of it the whole day.' So we pulled out those two boxes of 2-inch tape, and right then and there, they cut it and spliced it together. That was the take of 'What a Fool Believes' that you hear on the radio."

By the time the mixing process began, McDonald was exhausted. "I only lived a couple of blocks from the studio, but when Ted called me to come to hear the mix, I said, 'Ah, I couldn't listen to it and be objective at this point. If you think it's good, it's fine with me.'"

Thankfully, Templeman had faith in the song and its recording. "When I hear [McDonald] singing those high parts, it just

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Scott Burgess, Pro Audio Review

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Fett, Songwriter Magazine

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Mitch Gallagher, Editor EQ Magazine

"Soundwise, I was very impressed that the V69 could hold its own against an industry standard like the U47. It struck me as very versatile and of higher quality than other budget tube condensers."

Pete Weiss, Tape Op Magazine

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kills me," he said in an interview years ago. "It just sounded like a hit. It was pretty obvious."

It may have been obvious, if only to Templeman. McDonald got a different reaction when he played it for his friend and group publicist at the time, David Gest (recently famous as Liza Minelli's husband). "We were sitting in the May Company parking lot on Laurel Canyon and I had rough mixes of the album. He said, 'Put it on, I want to hear it.' I said, 'I don't know.' He said, 'I'll tell you the truth.' I knew he'd be honest with me. I played the whole record and I said, 'Well, what do you think?' And he said, 'I think it's a piece of shit.' I said, 'Yeah, I'm not sure I don't agree with you.'"

Gest and any of the nay-sayers were probably comparing the songs on *Minute By Minute* to the disco sound du jour that dominated the airwaves. The day when "What a Fool Believes" hit Number One—April 14, 1979—it was completely different from the Number Two song, the disco classic "I Will Survive," and the Number Three tune, Ami Stewart's disco treatment of "Knock on Wood"—proof that an R&B-infused pop record could still be appreciated.

"What a Fool Believes" was also very different from the last (and only other) Number One song that the Doobies ever had, the folksy, gospel-flavored "Black Water" in 1975, prior to McDonald's joining the fold. That song, and other Doobie compositions pre-McDonald, had more of a raucous rock feel. McDonald entered the picture in 1975, when recommended by Doobie bassist Jeff "Skunk" Baxter, with whom McDonald had played in Steely Dan's band. His first recorded effort with the Doobies was the 1976 *Takin' It to the Streets*, and immediately you could hear McDonald's R&B inflections, both in song structures and vocals. They charted well with the title track, written by McDonald, followed by "It Keeps You Runnin'," and his influence remained throughout the latter '70s and early '80s. To this day, McDonald remains modest and humble about his place in the Doobies.

"I think some of the strongest material the Doobies will ever play is the original stuff they did, which Tommy [Johnston] and Pat [Simmons] wrote," he says. "I was only thrilled that along that period of time, *Minute By Minute* and *Takin' It to the Streets* kind of seemed to fit in there somehow and find a place in the show. I never really thought anything I did with the band ever replaced what the band was originally."

Nonetheless, it can't be denied that "What a Fool Believes" and the attention the group received at the 1980 Grammys catapulted the band to another level. It became even more obvious, when even Gest changed his tune.

"I'll tell you a funny story," McDonald says. "Under my pile of junk on my piano was the envelope I had written the lyrics to that song on, with some drawings I had doodled while I was thinking about the verses. One day, David came over and he was standing by the piano. He said, 'Hey, can I have this?' I thought, 'It's just an envelope with some words on it.' The next time I saw it, it was about two years ago when I was in the Hard Rock Café in Philadelphia. I was eating and looked up, and just above my head was a frame with a bronze plaque with the envelope with the lyrics." ■

VELVET REVOLVER

FROM PAGE 132

brought in Josh Abraham to co-produce and Ryan Williams to engineer. Both men agree that *Contraband* moved quickly and with little disruption, thanks in large part to the amount of pre-production the band had done prior to the Abraham/Williams team entering the picture.

"Drums and bass were cut in 10 days at NRG Studios," says Abraham. "We did vocals at the same time as guitars, four weeks at the most, with two studios going: Pulse Recording, which is my studio, and Scott's home studio in Burbank [Calif.]."

"Scott's studio has a good selection of gear," says Williams. "For his vocals, we had a Neumann U47 tube mic and a Teletronix LA-2A compressor. He has a Soundcraft board and Pro Tools.

"Josh used Shure SM57s on the guitars at his studio and we had a pretty big selection of amps. Each guy had his main rig. Slash uses Les Pauls and Marshalls, his signature tone that guitar players can identify. Dave uses Marshalls with a lot of effects that he throws into the chain for ambient textures. We used an SSL G Series board for that. Everything at NRG was recorded on a modified Neve 8078 with 24 channels of 1073 modules.

"My drum setup is Sennheiser 421s and Shure 57s," Williams continues. "I use Coles ribbon mics for the room. They have good low end and I compress them a lot, which keeps the cymbals from being too overbearing—it's a lot smoother-sounding. People always ask what I do for drums and how I mike them up, as if there's a secret to drum sounds, but every engineer can use the same mics in the same position and it sounds different. There's no secret. You set them up, get them in place, turn them up and it sounds like your sound.

"Knowing when something sounds good—drums, guitar or bass—if the source sounds really good, a good mic with a good mic pre, that's most of the work right there. It's just being musical about it and not having a purely technical approach."

Abraham and Williams have been a production team for more than three years. "I need someone with my ear that I can rely on and sit with and understand, and Ryan is that perfect person," says Abraham. "We get a sound up and it's the sound I want to hear. Ryan engineered everything on this album except for the vocals that I did at Scott's studio—the mics, compression and vocal chain."

People always ask what I do for drums and how I mike them up, as if there's a secret to drum sounds, but every engineer can use the same mics in the same position and it sounds different. There's no secret. —*Ryan Williams*

"In general," says Williams, "the role of the engineer is to make things really easy on everybody, and almost, in a sense, to make the process invisible to where the artists can be creative and just do their thing. Obviously, these are very seasoned players who know what they're doing, so it's very flattering to be involved with them.

"I worked on three STP records," he continues. "I started at the studio where

they did *Tiny Music*, and I became house engineer and worked on their fourth and fifth records—their last, *Shangri-La Dee Da*—so I'm familiar with their music and what's inside the songs. It's all about healthy balance. An element of what these musicians are known for comes through naturally. At the same time, they don't limit themselves to that. They're willing to try new things and take a step forward."

A seasoned studio and touring musician and producer/engineer, Sorum was hands-on in the making of the album. "We cut a lot of it on the fly," the drummer says. "I found tempos I liked and I was adamant about recording to tape with a Neve console. There is something lacking in music today, although I'm not sure what—tape, live performance, lots of things. We come from that school of Led Zeppelin, Queen, Black Sabbath, Cream—they were *bands*, they played together, there was great chemistry between them. So I said, 'Let's do it like they used to and cut with all four of us in the room and Scott singing.'

"Neve is the warmest, fattest console there is," Sorum continues. "It sounds great and has great depth. We did edit on Pro Tools, but a lot of our tracks were cut from beginning to end with no major editing.

"The guys in the band have seen what I've done since Guns split up. They've always respected me as an arranger and a drummer, but I'm more outspoken this time because this is my band. I'm not 'the guy who replaced the guy.' I had an idea, sonically, of what I wanted to do on this record—big rock. I did stuff at NRG in Studio B. It's nice and ambient, with a wood floor, great mics: Coles ribbon mics, a 47 on the kick drum and Schoeps for overheads. On the rock 'n' roll stuff, we baffled the kit for a tighter sound, and on some tracks, we opened it up to let the room breathe. We used some compression, but it's very clean through the board to the tape machine."

Working with such seasoned professionals made the job infinitely easier for the production team. Says Williams, "They had recorded pretty good demos of the songs and we were all able to sit and figure out what worked and what needed a second look in terms of approach. Sometimes doing an album can be a nightmare because everyone gets demo-itis. Luckily, we didn't go through that with this group. They practiced for hours every day like a brand-new band. They're really committed to do the work and do it well."

"Making a record doesn't really move faster than this one did," says Abraham. "I could have actually recorded it faster, but I think because we were trying to create a masterpiece, there were days when I preferred to take my time and revisit certain things. We could have recorded live with a couple of overdubs and been done—that's how good these guys are—but that's not the way I envisioned it sounding.

"A lot of it was cut live, which not many bands can do, and we just added textures," he says. "Occasionally, there was a vocal comp, but Scott has one of the greatest voices in rock and we didn't want it to be too perfect. He'll sing something four times and if I comp, I comp big pieces: a verse, a chorus. I like capturing the honesty of the vocals, and people could misuse the meaning of comp with Pro Tools. You lose the honesty of the songs when you dissect them. I captured as much of the vocals as I possibly could." ■

JOHN WESLEY HARDING

FROM PAGE 133

For the six-song, six-day Henson sessions, Harding and crew set up in Studio B, home to an SSL 6056 E/G, Vincent Van Haaff/A&M main monitors and a wide assortment of vintage outboard gear. Overdubs took place in Studio C, which houses a 96-channel Euphonix CS3000. Goldman used Pro Tools for editing, Logic for keyboard loops and Sony 3348 HR as the recording format. "As much as I love analog, we knew we wanted to be on digital eventually, and Chris Lord-Alge [who mixed several tracks at Image Recording Studios in Hollywood] likes to work off of 3348," Goldman explains. "Plus, digital's so much better for doing vocals."

With the exception of Harding, who was isolated in one of Studio B's two booths, Goldman positioned the band in the 13x9-foot main room. He used a Neumann U47 FET on the bass drum, Shure SM57s for the snare, Neumann KM84s on the hi-hat and ride, AKG C12s on the overheads and Sennheiser 421s on toms. Miking guitars involved simply "sticking a 57 in front of the amp and running it through a Neve module and an 1176. Nothing fancy," Goldman explains. "If you have really great players, good instruments and good amps, you get great sounds."

Working in one of L.A.'s finest facilities was admittedly a refreshing change for Harding, who tends to record "on the cheap." "To me, it was great luxury, having somebody there with printed-out copies of the lyrics, all the vocal takes in order," Harding says, complimenting Goldman's organi-

zational skills. "And there was a very nice scene around the barbecue where I met Rupert Hine. It was a very good experience."

Harding later enjoyed the luxury of time at Kupper's Weston, Conn.–based home studio, Hysteria Recording, "where the only wildlife is Keith Richards walking down the road every now and then," Harding jokingly says. "I would go up there for just two days at a time, every couple of weeks. [Kupper's] work [ethic] is he just *goes*. Once he started, I was not offered a cup of tea, water…you're lucky to eat a sandwich at the beginning of the day!"

The focused Kupper works on a Pro Tools Mix | 24–equipped Macintosh G4 computer, sans control surface. Though he records and mixes inside the box, Kupper's studio is "stuffed to the gills" with vintage equipment and instruments.

"My drum kit's always miked up and the guitar amps are always ready to go," Kupper says. "It's set up for complete creativity. All the guitars—like 30-something guitars—are hanging on the walls like a guitar shop."

The band, which at Hysteria included Fairport Convention drummer Dave Mattacks, guitarist Gary Burnette (who produced Harding's last album) and Kupper, who contributed keyboards, bass and drum programming, nailed most tracks on the first take. "A lot of people use Pro Tools to get absolute perfection, but for me, it's about capturing that raw performance, and it's very often on the first take. You can clean something up later. Sometimes, it's more natural to do it electronically than have someone sit there and sing a part 20 times till they just completely lose the vibe.

"For me, the challenge here was to capture that raw emotion and try to add technological elements to Wes' music that he hasn't used before," Kupper continues. "We both wanted to push the envelope a little bit, and we did. I think we got some quirky, interesting tunes going on."

> For me, it's about capturing that raw performance, and it's very often on the first take. You can clean something up later.
>
> —*Eric Kupper*

For example, on "Monkey and His Cat," Kupper incorporated loops with a '60s drum sound. "It's not lo-fi, but it's not superglossy hi-fi either," he says. "Sort of like if you got an old hi-fi version of a Kinks record."

Kupper also relied on such plug-ins as McDSP and DUI and choice pieces of vintage gear. For vocals, Kupper chose the Neumann CMV-563 microphone running into a Tube-Tech MP1A preamp, through either a Joe Meek SC-2 compressor or Summit TLA-100A tube-leveling amplifier, and then into Pro Tools. "If I needed a little EQ along the way, I'd put a vintage Calrec or Neve EQ in-line," Kupper adds. To record Mattacks' drums, Kupper used TL Audio and Millennia Media mic pre's, and dbx 160X and UREI 1176 compressors to complement an assortment of Sennheiser, Audio-Technica, Shure and AKG microphones.

Kupper used a Shure SM57 to mike Burnette's guitar amp. "Or if I was feeling adventurous, I'd use what I call my 'Beatles channel,' which is an old AKG D19 going into a Telefunken B72 preamp into an Altec 438-C compressor."

With both Hysteria and Henson sessions under wraps, Harding jetted to London to record "Sussex Ghost Story," which features string arrangements by modern classical composer Gavin Bryars. "It was a pretty left-field idea, but it was just the kind of centerpiece the album needed," he says of the song, which was recorded at Electric Earth East by engineers Martin Terefe and Gavin Olsson. Neil Perry mixed the track, along with a few Raymond-produced cuts, at Chung King in New York City. The album was later delivered to Bernie Grundman Mastering, where Grundman and Brian Gardner added their finishing touches.

Despite the big studio/small studio dichotomy, Harding's latest and, arguably, his strongest album to date flows seamlessly from acoustic to electric, and from arty folk to melodic pop with consistent sonic integrity. Kupper sums it up best, noting, "It ain't about the gear; it's about the ear." ■

Cool Spins, *FROM PAGE 136*

hard left/right-panned, call-and-response guitar riff between Kweller and Mike Stroud, leading into the first of 11 highly infectious power-popish melodies. "Hospital Bed" incorporates a

bouncy, '60s-themed piano line, while "My Apartment," an homage to Kweller's tiny Manhattan living space, soars with another round of clever dueling guitar parts. Kweller deviates from his typically upbeat fare on the title track, a dark murder ballad of sorts that resembles one of the Violent Femmes' gothic folk tunes. He jumps right back to the album's stripped-down rock 'n' roll framework, however, on "The Rules" and "Down." Kweller writes with more maturity on his latest release, delivering a strong sophomore effort that's smart and sweet, but the life of the party at the same time.

Producer: Ethan Johns. Engineers: Johns, Steve Mazur. Studio: Sear Sound Recording. Mastering: Greg Calbi/Sterling Sound.

— Heather Johnson

Carina Round: *The Disconnection* (Interscope)

Blending pop and punk with euphoric vocals that evoke the spirit and visceral poetry of musicians such as Jeff Buckley, fellow Brit PJ Harvey and Tori Amos, 24-year-old Carina Round is overflowing with intensity, and she's chosen to follow the path of her literary and musical mentors to let it all out, weaving unconventional, honest lyrics into a profound and beautiful soundscape. Strong drum patterns, an octet of stringed instruments, trumpets, trombone and sax, backing vocals and some delicate sampled loops drive her moody, Brit pop–influenced sound. Still, her voice always sits out front in the mix—intimately and soulfully communicating current and fleeting desires as if it was still the exact moment of rev-

elation. No wonder her music has transfixed Ryan Adams and David Gray, with whom she has toured. Round's ability to channel deep emotion into a collection of beautiful, self-defining songs is a rarity in itself. And even more unusual: The *entire album* is compelling, encouraging us to discover new layers in her story and to eagerly anticipate the next move this burgeoning artist makes.

Producers: Gavin Monaghan and Carina Round. Engineer: Andrew Taylor at Magic Garden Studios. Mixed at The Thought Ranch by Tom Livermore and Carina Round. Mastering: John Dent. *—Breean Lingle* ■

L.A. GRAPEVINE

by Maureen Droney

Record business bloodletting continues, and with it the collateral damage to the recording industry. But as you've probably noticed, rising from the ashes is a lot of pretty interesting stuff. Investors are looking toward the future, and even *The Wall Street Journal* has reported that aspects of the music industry are looking viable. This month, I checked in with three of Los Angeles' most respected and knowledgeable studio operators to find that not only are they coping, they're thinking that 2004 is off to a pretty good start. "Cautiously optimistic" is the phrase that probably best describes the feedback I got from studio owners Kevin Mills of Larrabee, Allen Sides of Ocean Way Recording and Jeff Greenberg, president of The Village.

PHOTO: MAUREEN DRONEY

Allen Sides' business model reflects the current industry rule: remain flexible.

Known as a master dealmaker, Sides combines a canny business sense and survivor's instinct with a pair of golden ears. That's a combination that's kept him in the business for more than 25 years and makes his opinions always worth listening to.

In 1999, Sides downsized his studio holdings by selling off the 6000 Sunset portion of Ocean Way (three main rooms, which had been part of Bill Putnam's original United Western studios) for a very nice price. Now, he operates a total of six rooms: four at Ocean Way in Hollywood and two at Record One in Sherman Oaks. Sides' other companies include Classic Equipment Rentals, Ocean Way to Go (a rental service that provides full, long- or short-term studios tailored to individual clients' needs) and Ocean Way Sales, which outfits installations with equipment packages and wiring. And, of course, Sides is also a busy engineer who in the past few months has worked with such diverse artists as Polyphonic Spree and Burt Bacharach.

His take? "I would say that things are looking up. We've been through a period—to some degree we're still going through it—where there were so many changes in label staffing that it was difficult for anyone to make a decision. I'm sorry for people who've lost their jobs, but you have to think that reducing the size of the companies as much as they've done is ultimately a plus. The amount of records being made had been cut by a huge percentage from what it was three or four years ago. Consequently, the companies, which were relying in a large part on catalog, along with a minimal amount of new artists, were overstaffed.

"Now, if you look at what Interscope has done with A&M and Dreamworks, and Warner with its consolidated labels, there are various divisions with one central organization that handles overlapping areas. Previously, they were set up with a duplication of services that was very costly. The companies are becoming profitable again, and they're doing it with smaller sales."

Sides also points out the impact of anti-piracy measures. "It's true that getting people to stop downloading for free is virtually impossible," he admits. "But with the lawsuits and the film companies—who have much deeper pockets than the record business—jumping on the bandwagon, the uploaders are thinking twice about putting material up for others to download. There's no gain for them, so why should they put themselves at risk? All of the countermeasures are starting to have some effect.

—CONTINUED ON PAGE 145

NASHVILLE SKYLINE

by Rick Clark

Since I first heard about producer/engineer Roger Moutenot several years ago, his name has regularly popped up in conversations about a variety of interesting projects that are not the usual mainstream Nashville fare. As a producer, his credits include Yo La Tengo; Guster; Beulah; Heather Eatman; Freedy Johnston; Joe, Marc's Brother; The Pierces; and Josh Rouse. Moutenot's production (with Joe Pisapia) of The Pierces was a wonderful album that should be in everyone's CD collection who loves great, melodic Crowded House–type pop. As an engineer and mixer, Moutenot's credits have included such diverse, notable artists as Lou Reed, Olu Dara, Bill Frisell, Manu Katche, Me'Shell NdegéOcello, Ryuichi Sakamoto, Gillian Welch, They Might Be Giants, Paula Cole, Shawn Colvin, Rosanne Cash and Robert Earl Keen Jr., among many others.

A mutual friend of ours, Andrea Pizzano, told me that Moutenot was in the studio with singer/songwriter Chuck Prophet. Since the mid-'80s, Prophet has created a rich body of work as a solo artist and with his old band, Green on Red. Upon hearing that Moutenot and Prophet were working together, I decided that it was time I made the call.

Moutenot's Studio 491 is located just south of downtown Nashville on Humphreys Street. When I arrived, Prophet was tracking a laid-back, funky groove with bassist James "Hags" Haggerty, drummer Marc Pisapia and keyboardist Jason Borger, while Moutenot added percussion.

There is no separation between control room and studio in Moutenot's setup, which is a large, high-ceilinged, wood-floored space with piles of gear and instruments (old MIDI synths, drum machines, vibes, piano, organs, Moog, full-size and toy drum sets, guitars, bass and amps) scattered around, and a Soundcraft console set up on the other side of the room.

"I finished my room and was up-and-running about eight months ago," says Moutenot. "I made the control room large so I could have the musicians right there in the

control room with me, which I think makes everyone more comfortable."

When the musicians took a break, I learned that this was part of an ongoing multi-city guerrilla undertaking that also included recordings at Wavelab in Tucson, Ariz., in Los Angeles and at friend's apartment in San Francisco. This would be Prophet's second album for the New West label.

"I asked New West what kind of record they expected and they said, 'We just want a Chuck Prophet record.' They have had faith in me from the get-go," says Prophet. "I've kicked around 10 songs or more so far, and I'll kick them around until the money runs out," he says with a laugh.

Prophet's manager, Dan Kennedy, offers another take on the project: "Chuck is a master at finding a way to record an album on an indie-label budget through his creative energies, ever-expanding circle of collaborators and dedicated work ethic. When all is said and done, this album will have been tracked in three different studios with three different engineers."

Prophet first encountered Moutenot last summer when he was in Nashville on a songwriting trip to work with friends Angelo, Kim Richey and Dan Penn. "It was completely like a chance meeting," Prophet says. "A

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NEW YORK METRO

by David Weiss

Street-level producers, engineers and musicians are buzzed about the next wave of production techniques, and a lot of them are wondering where big recording studios fit in. In New York City's flagship studios, owners are constantly asking the same question, and the high cost of square feet demands that they answer it quickly—month after month, year after year.

PHOTO: DAVID WEISS

Right Track general manager Barry Bongiovi in his new P2 production room, one of two new affordable suites.

With everything from well-equipped personal studios to make-music-yourself software such as Apple's GarageBand impinging on what used to be their exclusive turf, you'd think large facilities like Avatar (www.avatarstudios.net), Right Track (www.righttrackrecording.com) and Sound on Sound (www.soundonsoundstudios.com) would be getting creative with ways to compete—and you'd be right. "The reality is that our studios, as well as other studios, are a part of the industry that's going through some changes right now," says Kirk Imamura, president of Avatar Studios. "The labels are restructuring and budgets are being sized to what should be reality.

"I think there is room for innovation: If you're trying to make better use of your time and resources for a given budget, there's probably things that you could do. They can be as small as trying to work a console in an ergonomic fashion, because time is money and you're trying to cut things down to be able to do them quickly. And maybe some things are preparation for a session: You don't come in disorganized; you come in prepared. It's not just a technical issue; it's organization and it's ergonomics."

Although excellent acoustical spaces and the ability to properly facilitate advanced techniques like DSD and 5.1 surround recording are a premium draw for large studios, such services are still out of budgetary bounds for many of their clients. The solution at Right Track is to make their considerable expertise available in the form of two new production rooms—P1 and P2—at their 38th Street location. Equipped with niceties such as Blue Sky 5.1 monitoring, Yamaha DM2000 digital consoles, Digidesign Pro Tools and Tube-Tech EQs, the rooms offer a more affordable option (under $1,000 a day) to serious producers who need to mix and add overdubs in a high-quality environment. "They're important for a place like Right

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PHOTO: RICK CLARK

Funk and mayhem, according to Chuck Prophet. (L-R) Producer Roger Moutenot, James "Hags" Haggerty (bass), Prophet, Jason Borger (keys) and Marc Pisapia (drums)

SESSIONS & STUDIO NEWS

Paris-based vocalist Angélique Kidjo was at Jarvis Studios (New York City) recording overdubs and mixing for her forthcoming album. Dave McNair engineered, and Los Lobos saxophonist Steve Berlin produced. L-R: studio owner Dave Snyder, Berlin, Kidjo and McNair

NORTHEAST

Get ready for the release of Anthrax's greatest hits! The band was in at **Avatar Studios** (NYC) working on the collection, and used an audience of their fans during one new performance. Anthony Ruotolo engineered and was assisted by **Peter Doris**; Anthrax's **Rob Caggiano** produced alongside **Scrap 60**. Meanwhile, French artist **Bernard Lavilliers** was in recording with producer/percussionist **Mino Cinelu**, engineer **Neil Dorfsman** and assistant **Aya Takemura**...**Sound on Sound Studios** (NYC) hosted sessions for **Wonderful Town** (with producer **Hugh Fordin** and engineer **Cynthia Daniels**), **Lake Effect Mud** (with engineer **Eric Enjem**) and Casablanca recording artists **Ryan Leslie** and **Ali Vegas**, who were in with engineer **Paul Logus**. Grammy-winning producer **T Bone Burnett** was at **Sear Sound** (NYC) working on the soundtrack to the recently released Coen brothers' film, *The Ladykillers*. The session was engineered by **Mike Piersante**; T.J. Doherty and Steve Mazur assisted.

SOUTHEAST

Nashville's **Cartee Day Studios** featured a variety of sessions, including country artists **Jamie O'Neal**, **Dierks Bentley**, **Keith Urban** and **Trace Adkins**—all working with producer **Scott Hendricks** and engineer **Ben Fowler**. Guitarist **Zakk Wylde** of Ozzy Osbourne fame came in to track for **Black Label Society**; his session was engineered by **Steve Crowder**...Rappers **Disturbing tha Peace** were in at **Doppler Studios** (Atlanta); they brought in **The Neptunes** and **Icedrake** to produce tracks for southern rapper **Chingy**. Engineers **Exit** and **Mike "Hitman" Wilson** were also on hand; **Mac Attkisson** assisted...**The North Mississippi Allstars** hit Memphis' **Ardent Studios** to mix tracks for their new DVD (ATO Records). **Brian Newbauer** engineered and **Curry Weber** assisted...**Masterfonics** mastering engineer **Benny Quinn** added the final polish to **Diamond Rio**'s new single, "We All Fall Down" on Arista, which was produced by **Mike Clute** and the band.

Midtown experienced a bonding moment during mixing sessions for their newest release, Forget What You Know, at Ruby Red Productions (Atlanta). L-R: producer Butch Walker, guitarist Tyler Rann, Gabe Saporta (bass), Heath Saraceno (guitars/vocals) and Rob Hitt (drums)

NORTHWEST

Paul Revere & The Raiders' former frontman **Mark Lindsay** was at **Doctor Digital** (Portland, OR) mixing the fruits of his 2004 New Year's concert for CD/DVD release with studio owner/engineer **Mark Frethem**...**Nettleingham Audio**'s (Vancouver, WA) **Kevin Nettleingham** tracked country artist **Carl Wirkkala**, artist **Tim Current** and **The Martindales**...**Frequency** Mastering (Portland, OR) reported an eclectic group of sessions, including **Tin Hat Trio**'s latest for Ropeadope Records (engineered by **Mike Coykendall** and mastered by **Ryan Foster**) and soulful rocker **A.C. Cotton**, whose newest, *Notes for the Conversation*, was also produced by Coykendall and mastered by Foster.

SOUTHWEST

Eagle Audio (Ft. Worth, TX) hosted the **Cooper-Hall Project** for mastering sessions; studio owner **Jeff Ward** was onboard as engineer, and **Dave Cooper** produced alongside **Shelley Hall**...Houston-based rock band **J.W. Americana** was in tracking at **SugarHill Recording Studios** (Houston) for their first full-length release. Sessions were engineered by SugarHill staffer **Tim Wehrle**... **Wextrax Mastering Labs** (McKinney, TX) was the location of choice for mixing **Creede Williams**' CD, produced by **Rob Wechsler** and **Cary Pierce**, and engineered by Wechsler.

SOUTHERN CALIFORNIA

The Backstreet Boys were in at **SoundMoves Recording & Mastering Studios** (Burbank) to track demo material with producer **Beau Dozier** and studio owner/engineer **Michael Woodrum**...Producer/engineer **Rob Brill** was in mixing **Poltrana**'s debut CD for Maverick Records at **Scream Studios** (Studio City). ■

Send your session news to blingle@primediabusiness.com. High-resolution photos encouraged!

L.A. GRAPEVINE FROM PAGE 142

"I have to say that for the last few months, business has been very good at Ocean Way. If things turn around, record companies are now positioned to produce as much, or more, revenue than they did in the past with much lower overhead. Of course, they're taking advantage of the situation now with studios. It's been so hard for so long that they were able to make ridiculous deals. Let's face it, a lot of studios were basically giving away time. We've always been a bit of the exception to that, but it has made it more of a struggle."

Mills agrees that 2004 is off to a positive start. For several years as one of the most successful Los Angeles studio owners in terms of the number of facilities and rooms, Mills has also positioned himself to deal with downturn economics. Just recently, he made a real estate play, opting to sell the building on Santa Monica Boulevard in West Hollywood that housed, for more than 30 years, the two original Larrabee Studios.

"Now that the reconstruction of Santa Monica Boulevard is complete and with real estate values way up, I wanted to diversify my assets," he comments. "Obviously, not entirely—I still have five rooms and the rental company [Gearworks]. It's no secret that 2003, especially the end of the year, was very slow. But this year since January, we've been running five to seven rooms. Clients who were slow are all getting projects and working now. It seems to be true a lot in town. I can see it on the rental company side.

PHOTO: MAUREEN DROONEY

Studio owner Kevin Mills has been bringing top pop and R&B projects into Larrabee Studios.

"We've been having very good months, and we've done some big albums: a lot of the OutKast record, Alicia Keys, Usher, J-Kwon. I think pop and R&B [records] are doing quite well. I do notice that rock projects seem to have lower budgets, unless it's a really big artist. We do both, but we've always been strong in pop and R&B and that's helped us. The vintage Neve consoles at East [Larrabee North is all SSL] also help us with diversification, as, obviously, does the rental company.

"But I've also restructured the company so that our expense level is much less than it used to be," Mills continues. "I've sold some equipment, paid off some debt and refinanced other debt. I reorganized the way the company is run in terms of techs and runners. We're more streamlined now so that if things get a little slow, we don't get killed. It's a different dynamic; there's not quite as much pressure.

"So for the moment, things look good. I don't expect business will return to where it was a few years ago because of home studios, Pro Tools and a lot of other issues. But that doesn't mean one can't make a moderate living in this business. That's what I intend to keep doing. I enjoy the business, and as long as I can make some money in it, I will stay in it."

Meanwhile on the West side, The Village, according to Greenberg, also had a strong opening for 2004. Greenberg, whose background is as an agent and promoter, is known for using those skills with great effectiveness to generate and maximize business in a wide range of areas, from pop, rock

and R&B records to film scoring and advertising. Location helps: The Village is situated in an area where many entertainers live, close to major film studios and the Santa Monica media district. It also helps that the complex has numerous small suites that can be rented out to musicians and composers. But the sum is more than the parts: The Village just plain has a buzz.

"There are two different mindsets in this business right now," Greenberg states. "The minute you cross the line into desperation and cynicism, you lose your attraction for those who might want to work with you. People are attracted to positive and creative energy. That's what we work on having here. We've got some of the greatest artists around in residence: Jimmy Jam and Terry Lewis, Robbie Robertson, Keb' Mo'. It's very private for them if they want it that way, but on the other hand, we've got a community of people who bump into each other in the hall and sometimes end up playing on each other's records. It's a creative and economical alternative, the antithesis to the isolation of working at home alone."

The Village has recently invested in a complete renovation of Studio A, its vintage Neve room, adding new wiring and an upgrade to the 8048 console. The Pro Tools network has also been upgraded to HD Accel. "I think part of the reason we're doing well," Greenberg suggests, "is that we were one of the first studios to jump in and embrace Pro Tools. We got in early, and we have a great relationship with, and great support from, Digidesign.

"Another thing we do is get involved in the music community. We honestly feel it's our mission to actively seek out ways to counter all the negativity and gloom and doom. We sponsor music events, like South by Southwest, and I'm the president of SPARS because I think it's important. Our current advertisement says it best: 'Music Lives.' Some studio owners are saying record companies don't want to work with studios. In my opinion, record companies want to work where they get good results, where their artists are happy and where what they hear is exciting."

In conclusion, Greenberg points out something many have forgotten: "Using a good studio is a great investment. For a label, it may actually be one of the best investments on the planet! Think of what they get for their dollar: a completely together, technically buttoned-up environment, where nonproductive down time is very rare. Thanks to our founder, Geordie Hormel, who has always believed in the marriage of art and technology, we've got the plug-ins and the original gear, as well as the live echo chambers, the mics and the tech support. As a matter of fact, we have a lot of producers and artists working here who've come back out of their houses!" ■

Got L.A. news? E-mail MaureenDroney@aol.com.

NASHVILLE SKYLINE ***FROM PAGE 143***

songwriter friend of mine went to visit and when I walked in there, Roger was working on something that he was writing himself, and I could just tell that he had a sideways take on things and I liked his sensibilities. He had an Abstract Impressionist approach to making records. We hung out and never really made

PHOTO: RICK CLARK

Middle America meets Latin America at Starstruck: Maria Matto with producer Gene Evaro (center) and engineer Bob Bullock

any formal arrangements or anything, but I wrote another batch of songs and he said, 'Why don't you come out?' So I came out here to do some writing and said, 'Would you line up some musicians and we'll just dive in?' I've got a lot of faith in the process, and after being here, I love it. I told Roger that with him and his studio and these players, there isn't anything that we can't at least attempt."

"It's a real treat working with Chuck," says Moutenot. "He's an awesome songwriter and a great musician. I recorded to Pro Tools and will mix to half-inch 2-track just to get some warmth and depth of tape. As far as cutting, I use Neve mic pre's and very little compression. I moni-

tor through my Soundcraft console."

Adds Prophet, "With all of this equipment available to people, it's easy to get bogged down by pouring the songs from beaker to beaker. I'm just into capturing the magic. For me, the songs have their own needs, but really, it's how you cast the movie, you know? It's about the characters and the instruments more than anything else. I try to track something that has enough mystery in it that makes me want to return to it, and I don't always return to everything I track."

Besides Prophet, Moutenot has recently worked on projects with Marykate O'Neil (with help from Jill Sobule), New York City–based the Honorary Title and local band Character, whose album Moutenot just released on his Fictitious Records imprint.

A few miles away from Moutenot's studio, producer Gene Evaro was working at Starstruck Recording on Maria Matto's solo debut for Sony Discos. Unusual for Nashville, the session featured some of Miami's best players and a handful of local session aces. Bob Bullock, one of Nashville's finest engineers, manned the console, while Matto ran down the vocal and a 10-piece ensemble laid down a percussive Latin pop groove with great precision.

The mood in the control room was very up, and Evaro was clearly happy with the way the sessions were turning out. "I've worked in most of the wonderful rooms in Nashville, but hands down, Starstruck was the place to do this," he enthuses. "Bob Bullock's knowledge of song, production and tech surpasses any other engineer I could have ever gotten for this project."

Evaro first met Matto last year at a Sony showcase. "I was completely amazed with her songwriting and performance style," he says. "Her vocals were totally unique. Maria's ability to combine Latin and middle-American melodies was special, and her lyrics tell unique stories with a refreshing style. My approach as the producer was to create an album that combined Maria's Latin roots with American country and pop. I feel the relationship has always been there, but nobody has ever tapped into it. I've been working on this concept for many years, and Maria's project gave me the opportunity to do it. My approach for this album was to track everything live—no samples, no programming and no synths. I just wanted to get back to everyone just playing."

The project was recorded through an SSL 9000 console to Pro Tools|HD 24-bit 48k. For Matto's vocal signal chain, Bullock used a Telefunken 251, Neve 1073 preamp and a Manley compressor. Among the tracks recorded include "El Hombre Que Yo Amó," "Rising Above" (which was inspired by 9/11) and "Sad," which Matto describes as "a song

that reflects upon young mothers' heartbreaking stories when they have to put their kids up for adoption."

"I've always heard Nashville is a magical place to work," says Matto. "Gene thought there was no other place to do this album, and now that I'm here, I see he's completely right." ■

Send your Nashville news to MrBlurge@mac.com.

NEW YORK METRO FROM PAGE 143

Track because they keep our client base close to us and provide a more full-service facility than when we just had high-end rooms," explains Barry Bongiovi, general manager of Right Track. "So far, a very broad spectrum of our client base has used these rooms: Mariah Carey, Pat Metheny, David Bowie. They're not just for lower-budget projects—they're for a segment of projects that fits comfortably in a room like this."

At Sound on Sound, its fully dedicated Pro Tools|HD3 Studio D has been addressing a similar audience for several months, and is also part of one of the studio's latest business model concepts. "We've forged bonds with producers that we're trying to get off the ground, and it's like the old-fashioned spec deal from the jingle world," says Dave Amlen, president of the studio. "We're going to give half-a-dozen people these tracks to demo, and the one that we like the best gets the gig. So we're basically forming a production company model with these known quantities so they don't reach into their pockets and they don't get compensated unless they get the gig. If we have a paying gig in those rooms, naturally that supersedes any of that kind of work."

In Amlen's opinion, DAW-based production is going to cast a larger and larger shadow over the huge desks that most major studio control rooms are built around. "I think the large-frame consoles will still be there in the future, but they'll be the ones we have now—Neves or SSL 9000 Js in various phases of rebuild. So you're looking at a lot of technology that peaked in the mid- to late '90s. You might find third-party developers coming out and turbo-charging the ones out there now. Instead of buying an SSL K Series, someone will buy a J and a box that allows them to do auto-panning the way they want."

Imamura points out that in larger studios, with their steady stream of different clients, dedicated maintenance staffs and organized

communications, the potential, at least, is there to create such improvements in-house. "Our front-line people, so to speak, are the assistant engineers who actually do the work, understand what clients go through and experience the difficulties in-session. They are the people we talk to to find out how to improve things in the control room—we do that on a constant basis. If our chief engineer Roy Hendrickson sees a way to make something better, he can implement it. In the old days, studios were known to build gear and come up with circuitry for their own sound effects."

That doesn't mean that Imamura is planning on getting Avatar into the gear business. "I don't know how much studios are responsible for pushing the envelope on technology design, because most of the innovation is going toward improving the home and project studios," he says. "Some people here feel that we have enough equipment to do what we need to do. We don't necessarily need new equipment, because there's plenty of equipment already, and in some cases, a digital plug-in is just replicating what an analog piece of gear already does."

Sound on Sound president Dave Amlen opines that the future is DAW.

With their demanding clientele, however, large recording facilities can often help get feedback to hardware and software designers that helps shape the next generation of products. "I think the studios are a main source of information for the manufacturers," Bongiovi notes. "At the end of the day, the studios are the ones that are able to communicate on a professional level. We're close to Yamaha on these consoles, for example."

Because, by nature, top New York City studios have the sexiest compressors, consoles and mic pre's available to them, it's not surprising that the areas they'd most like to see targeted for change lie in more basic realms. "If someone would build a better backup system, I'd invest in it tomorrow," Bongiovi says without hesitation. "Backup is horrendous in the digital domain. It's time-consuming, unreliable—you name it. Clients don't realize that they spend eight or 10 hours in a session, and then it takes three to four more to back it up properly. It's not just time, but the reliability of what comes back is 50 percent at best. We built these rooms to do economical work, and when the production portion of the project is completed each day, the nightmare of backup begins."

Imamura has similar needs: "Hard drives fail—that's a fact of life. If we could reduce the odds of hard drives failing and develop a backup system, that may be worthwhile. Compared to computers and hard drives, the odds of a tape machine or console failing are probably a lot less."

Likewise at Sound on Sound, the focus is on constantly developing methods of organization commensurate with the quality of their acoustical spaces. "File management is a skill set that we've had since we were keeping track of physical tape," Amlen notes. "A big part of our existence is being able to play back something that we recorded six months ago. So to push the envelope, we're figuring out a way to help make the major labels' job easier when it comes time to get everything together. They actually see that a part of getting people to record in studios is that they have more control over file management."

For major facilities, too, one of the biggest jobs is monitoring the demands of the consumer market for sound experiences like DSD and 5.1 surround, and matching those up with the expectations of labels, artists and engineers before purchasing the necessary gear for themselves. "For studios, it's very difficult to be on the bleeding edge unless you become a beta site for a manufacturer," says Imamura. "It's got to be tested, accepted and enough engineers and clients have to be requesting it, especially if it's a hefty price tag investment. If they come in and say, 'I want to use this,' and you get enough requests, you're going to be doing that."

Keep in mind, however, that *not* changing too fast is also an important part of a major studio's strategy. Many of New York City's most storied facilities are famous for their distinctive sound, and they plan on keeping those sonic qualities intact. "A studio like this has a long tradition," Imamura points out. "Prior to being Avatar, it was Power Station, and we try to uphold the traditions of Power Station. Things were done in a certain way, but we're constantly reassessing and re-evaluating not just placement of gear, but making things easier and quicker for our clients." ■

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—FROM PAGE 24, TOY TIME

opportunity to actually step into that future, experience it and bring back a little chunk to drop into the song you are doing today.

Personally, I go between frustrated and sort of awestruck at being able to do this at all. Vocaloid is a lot of work for a little piece of the impossible. You have to give everyone involved credit for bringing the technology, the libraries and the interface into existence so that we may each be a part of this groundbreaking experiment. Truly, the epitome of bleeding edge.

Let's take Lola. What is she good for right now? Well, I would not personally use her for a lead vocal, but she *can* be used for certain backup vocals if you invest the time.

And why, exactly, wouldn't I give her a solo? Well, if put up front, Lola at first seems to have a slight unidentifiable accent, but then you realize that she sounds as if she might be a deaf cocaine user.

This isn't a tasteless joke. When a hearing adult is rendered deaf, they must form sounds from memory, and unfortunately the accuracy of this incredibly difficult task fades as time goes on. Lola sounds as if she has been deaf for about a year. The most fragile and expressive nuances in speech are the ones that are the most difficult to control when you can't hear them, as they are the most difficult to accurately produce when you are synthesizing. So it is really not too surprising that there would be similarities between deaf speech and this emerging technology.

And then there's that special coke sound. Kind of like an impacted sinus cavity and a missing septum. Okay, if you've never recorded a coke user, it's what you sound like when you try to answer the doctor while he has a fiber-optic camera shoved down your throat...through your nose. Yeah, that's pretty much it.

Certain formants are very good, while others leave you a bit uncomfortable and sympathetic.

But, being a bit off-center, I did find an interesting thing to use poor Lola for. First, I must say that while she is fairly difficult to whip into shape, she is horribly easy to abuse. As "humanoid" describes cheap sci-fi aliens and many drummers, Vocaloid is the perfect name for what I like to do. Lola is very good at making unearthly vowel sounds—human-like, but not really. Vocal-like, but not really. Vocaloid. A whole new kind of eerily expressive synthesizer. I'm keeping her.

Now with all that said, there is *no* question that, given time, Lola (or more likely her descendants) will be outsinging 99 percent of her organic competition. Sing along, now: "People, eliminating people, are the most technical people in the world."

And the very fact that people got together and made Lola in the first place begs the question, "If software chuckles smugly to itself between takes but nobody hears it, will we all wish we had listened later when we become its slaves?" I guess it depends on how much finesse it uses.

I have already heard enough to convince me that the time will come when a person buying or stealing a new song will no longer be able to tell what is real and what is virtual. For certain software-based sampled instrument libraries, that time may be here now. More on that in coming months. ■

SSC is starting over, cramming more and more of his control room, synth room, vocal booths and main studio into his laptop every day. He got his drums in there last week.

—FROM PAGE 28, GHOSTS IN THE MACHINE

"For example, Spectral, our voice-modeled EQ, detects these factors and can choose different EQ for different sounds," he adds. "So it can punch the voice without adding too much 'ess' sound. Old approaches looked for unvoiced sounds by analyzing the noise content or transients, but our algorithm actually trains itself to be much more discriminating.

"Our first product, Intonator, had an adaptive low-cut filter that changes with the input pitch. It gets rid of hum, but it also gets rid of room noise. Pitch correction sounds better when you do this, since you're not pitch-shifting the noise.

"Getting the right level of correction of the voice is the hardest thing," he adds. "You can't mess with pitch contour and vibrato, since that alters the style of the singer. For example, someone can scoop to a note and get a stable, confident pitch. You don't want to change that. But there are a lot of heuristics that you can apply. With more intelligence in the tools, you can get more done. Of course, it's much easier if you have the file and you're not trying to do it in real time, so you can look forward and back for stylistic characteristics."

Taking a completely different tack is Yamaha's Vocaloid. It's been getting lots of press, not only from our industry but also from the likes of *Popular Science* and *The New York Times* because, at first glance, it looks like it does something far more radical than expand the range of human singers: It could actually make them obsolete.

Like a lot of technologies that Yamaha has brought to the music industry, the company didn't invent this one itself. It actually came out of 10-year-old Music Technology Group at the Universitat Pompeu Fabra in Barcelona, Spain. The group is currently involved with (or just finished) more than a dozen research projects that deal with subjects such as algorithmic orchestration, machine recognition of music, how to intelligently browse millions of online music files, and developing and distributing free Linux- and GNU-based tools for audio.

The group began working with Yamaha in 1996 on frequency domain–based signal processing, and its initial research resulted in a paper titled "Voice Morphing System for Impersonating in Karaoke Systems"; in other words, "how to make anyone who walks into a bar sound like Elvis, Celine Dion or Tom Waits," which doesn't sound terribly different from things IVL has done. However, Yamaha decided that the idea couldn't be made into a marketable product, and in March of 2000, the consortium switched their attention to vocal synthesis. The first product was released this past fall.

While the Spanish group developed the basic technology, Yamaha built the application engine and development software. The voice "libraries" that are sold with the product are from yet another source: The English company Zero-G came up with Leon and Lola, the male and female "vocalists" that you get when you purchase Vocaloid in Europe or America. And by the time you read this, the company will have released a third library, Miriam, which is based on the voice of Miriam Stockley, a solo and backup singer well-known in Europe. Yamaha also built several virtual vocalists who sing in English and Japanese, but they're only for in-house use.

The amount of control the software gives you over the generated vocal track is phenomenal, but you have to know what you're doing to take advantage of even a small portion of it.

The way that you create a library, very simply, is this: You make recordings of the subject's voice, put them through proprietary frequency-domain processing and break them up into segments, or phonemes. The segments are put into a database, where front-end software extracts them. Besides playing the basic phonemes, the software also needs to interpolate between segments so that transitions come out smooth.

Immodestly, I have to admit that this is an idea I came up with a number of years ago. Why not create a sample set, I postulated, containing all of the known phonemes in the English language, assign them to MIDI notes and then control their pitch and inflection with various MIDI controllers and pitch bend? Of course, I never attempted to actually make such a system, and now I'm glad I didn't; it would have been a heck of lot more work than I realized. According to Hideki Kenmochi, group VP at Yamaha's Advanced System Development Center, it takes some two to three months for a team of engineers (who know what they're doing and use specialized software) to develop a single voice and the resulting database fills a CD-ROM.

Yamaha licenses its development software to very few companies: "It's not very user-friendly," says Kenmochi. "There will probably be more voices available soon from other sources, but their identities are so far not public knowledge."

So how is it? Well, if you've heard the demos, you know that Vocaloid can be pretty impressive. But in the small amount of time I've worked on it, and the slightly larger amount I've helped a student create a project on it, I've found that getting really useful results out of Vocaloid is far from trivial. Yes, creating perfectly tuned, pristinely modulated voices is not too hard, but just like making a drum machine sound like a real drummer, getting Vocaloid to sound close to human takes a whole lot of work. Drummers have always made the best drum programmers (at least until the machines' mechanical feel somehow became their own reward), and similarly, you have to know quite a bit about singing to get anything interesting out of the program: phrasing, timing, how to use vibrato, when and how to scoop and slide the pitch, when to voice and un-voice consonants, and the many, many other parameters that determine whether a vocal is actually conveying meaning and emotion or is just carrying a tune. The amount of control the software gives you over the generated vocal track is phenomenal, but you have to know what you're doing to take advantage of even a small portion of it.

Using the Vocaloid engine for speech synthesis is not yet possible, says Kenmochi, because speech requires complex nonmusical pitch contours to sound realistic, and the pitch and timing of speech has to follow complex linguistic rules: The relationships between words in a sentence have a major bearing on how the words are spoken. I suppose if you have a terrific musical ear, then you might be able to fake speech using the tools that Vocaloid provides, but it would require an even more formidable amount of tweaking, much of it nonintuitive, and I suspect that you'd never really get away from having it sound "sing-song."

But it's just this problem that may prove to be Vocaloid's major limitation. Although while writing a song, you specify pitches and rhythms, a real singer doesn't perform the song exactly that way, any more than a real saxophonist plays a chart precisely the way it's written. Beyond what a saxophonist does, however, a singer uses words, and when a vocal performance is convincing, it's in large part because the words inform the

music. The inflections of speech are laid on top of the notes and rhythms, altering them in minute but critical ways. Because Vocaloid doesn't "understand" what it's singing, there's no way to automate that, and the amount of work involved in doing such exquisite adjustments by hand could be truly daunting. For a few phrases here and there, Vocaloid seems manageable, but to create a whole song, making sure each and every syllable sounds right and real, seems like far more trouble than it's worth.

And here's another thing to consider: When you want to use synths or samplers to simulate horn parts in a sequence or recording, by far the best way to make them sound at all realistic is to play the parts in "live," ideally using some kind of wind or breath controller, but a keyboard will do fine if you know how to simulate a horn's natural phrasing, breathing, vibrato and so on. (To me, it's heartbreaking to see classical composers invest thousands of dollars in computers and soundware so that they can hear what the music sounds like without hiring an orchestra, and then enter all of the music into the system by drawing notes into Finale or Sibelius.)

However, you can't record into Vocaloid in real time—not with a microphone, a MIDI keyboard or anything else. "Information must be sent to the engine far in advance," says Kenmochi, "so the software has time to set up the phonemes. For example, a consonant at the beginning of a syllable may actually sound before the beat that the syllable is on so that the vowel can happen right on the beat." Of course, a look-ahead buffer on a fast machine might overcome that, but then there's the problem of what are you going to use for an input device? You can import MIDI files created elsewhere into the software, which can be helpful in that this allows you to play an instrumental line and have the synthetic vocalist more or less follow it. But there's no direct feedback when you're inputting from the vocal sound, which is a crucial part of achieving musical realism.

Conversely, the software generates MIDI files so that you can import a Vocaloid "track" into another—VSTi-compatible—sequencer, which then uses the track to play Vocaloid as a VST instrument in sync with whatever other MIDI or audio tracks you want. But if you look at the Vocaloid tracks, you'll see a bewildering procession of dozens of text events, followed by hundreds of Non-Registered Parameter Number controller commands and no notes at all. In other words, although they're legal MIDI files, no other device on earth could generate them or understand them.

Will Vocaloid overcome these problems? Quite possibly. Many of us are old enough to remember when it was an ironclad rule that the maximum number of simultaneous audio tracks you could ever hope to stream off a hard disk was four. Computers will get faster, synthesis engines will get more efficient and perhaps we'll see the day when someone with a 3-D holographic control console will produce stunning vocals—in any language, in four- and six-part counterpoint, in real time—by blowing through a straw and waving his or her fingers in the air. Or maybe we'd just rather hear somebody sing.

So while you might be able to save a few bucks on backup singers by using Vocaloid (if you get really good at it and the parts are pretty simple) or a TC-Helicon voice processor, I wouldn't fire your lead singer just yet. ■

Paul Lehrman has invented many things that he never got around to making, which is just as well, as he enjoys telling the people who do make them what they did wrong.

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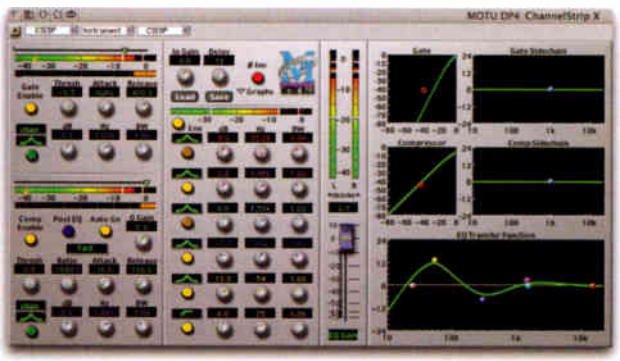

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The Singer and the Song

PHOTO: ©KEN VEEDER/MPTV.NET

While we've spent the past 171 pages bombarding you with information on console-workstation interfaces, codecs for remote delivery, mixing "inside the box" and network storage, we'd like to leave you with the reminder that all the tools and all the techniques are for naught if you don't have a song. And it doesn't get much better than Frank at Capitol, 1950.

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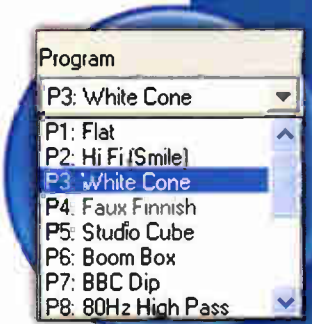

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