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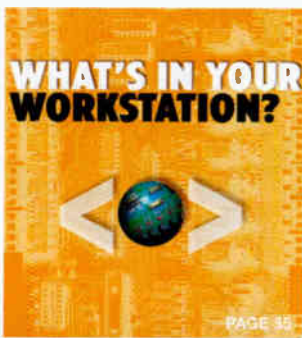
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MIX

PROFESSIONAL AUDIO AND MUSIC PRODUCTION
October 2005, VOLUME 29, NUMBER 11



special section

What's Inside Your Workstation?

All too often with computing, out-of-sight is out-of-mind: You learn what you need to know to get through the session, but don't dig deeper. But what you don't know *can* hurt you in terms of efficiency, productivity and, more importantly, your mix's sound quality. To help you make the most of your computer-based audio system, *Mix* takes an in-depth look at what is *really* happening inside. Turn to page 65 for these featured topics:

- The Next Generation of I/O
- The Resolution Project
- 64-Bit Processing Comes of Age
- Controlling Your DAW
- Managing Media Assets
- Dealing With Latency
- Manhattan Producers Tackle OS X

30 Broadway Sound

New York City and Broadway go hand-in-hand. Take an inside look at the sound design for *Dirty Rotten Scoundrels*, *The Light in the Piazza* and *Spamalot*.

36 Audio Gains in Videogames

Videogames are huge, with technology and budgets rivaling feature films. Find out how music is incorporated into these visual-laden soundscapes.

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Aretha Franklin, Herbie Mann, Chaka Khan, Carly Simon, the Bee Gees, Norah Jones—*Mix* sits down with this year's TEC Awards Hall of Fame inductee.

138 Milestones

Travel down memory lane: Apogee, 20 years; Fairlight, 30 years; Dolby, 40 years; Ampex Sel-Sync, 50 years; and Sennheiser, 60 years.



On the Cover: Alicia Keys and Kerry "Krucial" Brothers, with assistance from engineer Ann Mincieli, Dave Malekpour and the John Storyk design team, have opened The Oven Studios in New York City. **Photo:** Courtney Spencer.



The 2005 AES
New Products Guide
begins on page 169.

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Power...At a Price

Technology doesn't appear overnight. The first commercial sampling tools for digital audio go back some three decades with pioneering systems from Fairlight (profiled in this issue), New England Digital and even a spate of affordable D/A cards and software packages for the Apple II. After IBM's PC debuted in 1981 and Apple's Macintosh in 1984, computers began to find a home in the control room for chores other than running automation systems.

With the growing popularity of MIDI and the 1989 arrival of Digidesign's landmark Sound Tools hardware/software—for "low-cost" (\$3,995, less computer) editing of digital audio files—the studio computer went from accessory to necessity.

Fast-forward to 2005, and it's clear those ubiquitous CPUs have changed audio production in ways that we never would have imagined. Huge libraries offer every instrument imaginable—re-created with stunning realism—at our fingertips, and cut-and-paste audio production is standard operating procedure rather than the occasional edit to fix a flaw. Our beloved outboard racks are being reduced to dongles and software box stacks, while the rise of native processing lessens the importance of hardware interfaces.

However, all of this newfound power comes at a price. Once upon a time, studio survival skills involved aligning a multitrack. These days, knowing how to deal with upgrades, the nuances of ever-changing operating systems and keeping those so-handy plug-ins plugged in is a major chore.

Unless you're a casual home user who likes to cut a few tracks in between running spreadsheets or looking for cheats on *Half-Life 2*, you probably depend on your CPU(s) for your livelihood. And when your job depends on an engine's performance—just like a NASCAR driver or an airline pilot—you must also be attuned to the relative health of your rig. Performance that becomes sluggish may mean a software conflict, corrupted driver, fragmented hard disk, bad DIMM or even a virus, and, like it or not, knowing how to deal with such issues is part of the new studio landscape.

Understanding the nuances of your system—XP, Tiger or whatever—is just as important today as the ability to note high-frequency losses that accompany head wear on an analog deck. Likewise, asset management—storing, archiving and creating backups of session files—is essential and doubly so when something goes south and a copy of the original needs to be found. Not to be overlooked in the need for documentation: What's stored where? What version is this? Are there adequate logs/tracksheets so someone can reconstruct this stuff next week, next year or in 20 years?

In keeping with this month's AES in New York City, we thought it appropriate to take a detailed look at the changing face of the workstation, examining some vital topics: 64-bit processing, latency, storage, controllers, I/O options, upgrades and more. Changes in the industry are like roller-coaster rides—exhilarating, scary and fun all at the same time. So get your ticket now and we'll see you at the Javits Center.

George Petersen
Editorial Director

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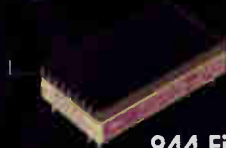
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Letters to Mix



WHEN MUSIC HAD SOUL

I feel compelled to add my voice to your editorial in the June 2005 issue of *Mix*. I'm a budding engineer and am devouring your magazine as much as I used to devour guitar magazines. [Stephen] St.Croix is perfectly right in calling for real content (and soul) within today's modern music ["The Fast Lane," "That Special Loving Feeling..."]. With the exception of the classical and jazz realms, popular music is hideously permeated with karaoke wannabes and horribly untalented purveyors of "bäng," and our addiction to modern recording technology has helped these non-talents [become] media stars. For example, my band's first CD was Acid-ized and Pro Tools-ed into existence. Vocals and guitars were moved, cut, pasted and otherwise abused with effects. Drums were simulated and sampled. It was never meant to see duplication, but the results of that digital manipulation sounded too good to be true.

As the band has gone from home studio project to full, the CD no longer even resembles how the band performs those songs. And, as our writing progresses, it's no longer representative of our sound. Mistakes and all, our new material has more soul than all of the *Billboard* Top 40 combined. We are now an organic, growing organism with a purpose, [using] technology as a tool, not a crutch. That is my mantra. I remember when there was no karaoke, rappers had talent, guitarists could play with soul and people told lousy bands to quit stinking up the stage. Time to start that archaic practice again.

R. Fowler
FlightPath Studios (Des Moines, Wash.)

RAGE AGAINST THE MACHINES

An outstanding article written by Paul Lehrman in the April 2005 issue of *Mix* ["Insider Audio," "An Open Letter to the Head Apple"] points out many of the shortcomings and short-sightedness of the head of Apple, and his article was

published just before the announcement from Steve Jobs that Apple was switching to the Intel family of processors.

Now, we find out that after years of criticism by Jobs and the Mac fanatics of the "Wintel" community, Jobs has decided to switch Apple to the "MacTel" platform. This proves a couple of things that I've been preaching for years: Never believe what the head of a corporation and publicity clones communicate, and never put your proverbial "eggs" in a single corporate basket and expose your business to the motives of corporate strategies.

I feel sorry for the Mac fanatics who have invested thousands of dollars in hardware and software applications, and a wealth of knowledge that will have to be rewritten to work on the new MacTels. I almost invested a substantial amount of money on a Mac-based Pro Tools system, complete with a control surface and all of the applicable Digidesign interfaces, but I caught Lehrman's open letter to Jobs, [which] led me to dig further into other concerns and other options available from other companies.

Frank A.
Santa Clarita, Calif.

THE AES 42-2001 STANDARD INTERFACE BLUES

I don't understand how to interface the AES 42-2001 standard used in the Neumann Solution-D 28-bit microphone. What type of computer motherboard would be most appropriate other than speed needed for hard disk 28-bit multi-channel recording? If the motherboard has the S/PDIF standard, is that the same thing?

The new Pentium 4 extreme chip—combined with the new ASUS pn5 Series motherboards and four SATA hard drives operating together in Striped mode—can produce a throughput of around 3 gigabytes of data per second.

I keep seeing computer motherboards with built-in 16-bit, 8-channel recording capabilities. Should I wait until a motherboard comes out that has the built-in AES 42-2001 standard and will record in 28 bits (though the chances of that happening are about as likely as little green men on Mars)? Do I need a special and expensive multichannel computer card? If so, who makes a 28-bit version?

Is the "big advantage" of the AES 42-2001 standard that it's only raw data and all I need is a relatively simple software program to be a mixer, etc., and I'd be able record the data directly on my hard drive with multiple drive letters using partitions?

Charles K. Ross

Charles,

The AES 42-2001 connection is used to connect the mic to its DMI-2 interface module, which outputs the signal as a standard 24-bit AES/EBU data stream on a male XLR connector. I know of no motherboard that has a built-in AES 42-2001 or even AES/EBU port. However, there are numerous pro recorders, consoles, workstations and computer audio interfaces that support the AES/EBU standard.

Right now, it's probably best to think of AES 42-2001 interfacing as a means of future-proofing the Solution-D. When these ports show up on consoles, recorders and the like, you'll be ready for it. Meanwhile, the DMI-2 lets you use the mic with lots of currently available gear.

George Petersen

TALKING TRENDS

This is in reference to the August 2004 "Editor's Note," "How About a Little Promotion, Mr. Promoter?" As an audio pro, I analyze the business in terms of trends after the fact. It's very hard to make a real conclusion when a trend is in motion. We are now in October of 2005, and I have a possible answer to the declining ticket sales of last year, which continues today.

Sony was caught in the illegal trade of paying for spins, as was Epic. Sony's engagement in this practice was particularly blatant: The company had to pay the New York AG's office \$10 million in fines. What this tells me is that the artists who are being sold as a "big hit" aren't as big as they would seem. As in advertising and marketing, the tail can wag the dog. If you think it's a hit, then it is a hit. This didn't transfer to ticket sales. It's one thing to buy a \$15 CD at Walmart [and another] to buy a \$40 to \$60 ticket for a concert.

I think fans are not into these artists enough to follow through with that process. Simply put, these new artists are propped up by a false sense of popularity. In the '80s, when there was very little promotion for bands such as Bon Jovi and Aerosmith, they'd sell out. If the artists were strong in the first place, then they would sell tickets based on their strength as an artist and their video rotation and airplay.

Larry Shaw
Eclipse Group/MAS Recording

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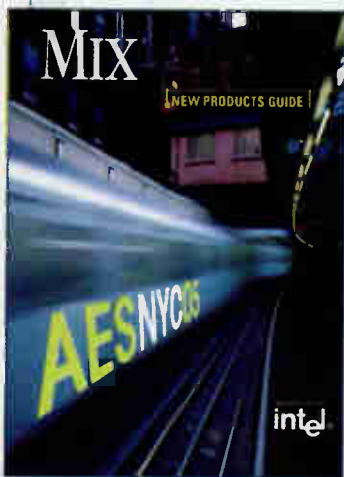
WELCOME TO AES!

Welcome back to the city that never sleeps! New York City is once again hosting the AES Convention (October 7 to 10, 2005), where audio comes alive! It's been two years since

audio pros trampled through the streets of the Big Apple, and *Mix* wants to help you have a great time—both in and out of the Jacob Javits Convention Center.

Each year, *Mix* offers our *AES New Products Guide* (page 169), where you can find the latest technologies that will be debuting—or showcased—at the show. We are also offering our *AES Survival Guide* online at www.mixonline.com/aesny, where you can find out about great restaurants, clubs, places to go when you want to take a breather from the show floor and much more! And, we'll keep you posted on product and industry news as it occurs with our minute-by-minute Blog and nightly e-newsletters.

See you at the show!



BOB MOOG, 1934-2005



After months of struggling with brain cancer, electronic music pioneer Bob Moog passed away on August 21, 2005, at his home in Asheville, N.C.

Working with his father in 1954, Moog began building theremins. While working on his Ph.D. in engineering physics, Moog created the first Moog Modular synthesizer, unveiled at AES in 1964. He formed the R.A. Moog Co. (which became Moog Music in 1971) and delivered several modular synthesizer systems, mostly to academic and experimental composers, including Wendy Carlos, who made extensive use of the Moog on the landmark *Switched-On Bach*.

Sensing a larger market, Moog took the most requested modules from his large modular systems and put them and a small keyboard into an easy-to-use package that didn't require patch cords or programming knowledge—creating the Minimoog, which was unveiled at AES in 1970.

In 1977, Moog left Moog Music to form Big Briar and later served as VP of new product research at Kurzweil Music Systems from 1984 through 1989. In 2003, Moog reclaimed the rights to use the Moog Music and Minimoog trademarks and changed the name of Big Briar to Moog Music Inc. During the years, the accolades for Moog were many, including the TEC Hall of Fame (1992) and a Technical Grammy Award in 2002. Moog will posthumously be honored with a TECnology Hall of Fame Award for his development of the Minimoog at a ceremony held during AES.

Moog is survived by his wife, Ileana; his five children, Laura Moog-Lanier, Matthew Moog, Michelle Moog-Koussa, Renee Moog and Miranda Richmond; and the mother of his children, Shirleigh Moog. Dedicated to the advancement of electronic music in Moog's memory, his family has established The Bob Moog Memorial Fund. More information is at www.moogmusic.com.

EMERALD SOLD AGAIN

BOGDAN, KOPPE RETURN TO FACILITY

In the latest chapter in the evolution of Nashville's Emerald Entertainment Group, the legendary studio complex was purchased by Dan and Kim Voss of Voss Development Corporation. The company will do business under the name Masterfonics and will continue operating the facilities as Emerald Sound Studios, The Tracking Room and Masterfonics.

This development also sees the return



Back row (from left): Milan Bogdan, general manager; Auburn Hager, VP of legal affairs; front row (L-R): Mark Dowdle, president/COO; Kim Voss, controller/owner; and Dan Voss, CEO/owner

of key figures who played a role in the complex's success years ago: co-founder of the Masterfonics mastering facility Milan Bogdan and former Emerald Sound Studios chief technical engineer Kerry Kopp.

Mark Dowdle, president/COO for Masterfonics, said, "Dan [Voss] and I have known each other for 30 years and discussed doing something like this together in the past, but the timing wasn't right. We got together in February and started looking into the possibilities and, immediately, Masterfonics came up. Knowing its history and reputation, I knew it was a viable option for us as far as being something we were interested in purchasing."

The complex is being upgraded and restored. The Tracking Room, a Tom Hidley-designed facility, was the first to receive refinements; Michael Cronin, of Michael Cronin Acoustic Construction, is consulting with Hidley on the work.

"What we are looking for is a family feeling," said Kim Voss. "We have hired the staff to make this a technically excellent facility."
—Rick Clark

WEB-BASED RECORDING FOR ALL

A high-level pro audio think tank took place in New York City this summer to help prepare eSession (www.esession.com) for its mid-September launch. eSession founder and CEO Gina Fant-Saez, who also serves as head engineer of Austin's Blue World Studios, oversaw a presentation to a group of industry professionals and fielded their input for final site improvements. A new spin on the concept of Internet-based recording, eSession offers a sophisticated user interface to facilitate sessions and provides access to a database of world-class talent. Using eSession, Platinum artists and indie bands alike can contact and exchange A/V and financial negotiations with top-level engineers, producers and session musicians. Creation of custom tracks, mixes, remixes and final masters can be coordinated via a relatively streamlined Web process.

PHOTO: RICARDO MONCADA



From left: Coolbirth (eSession Web architect) art director Richard Moncada, eSession.com partner Kevin Killen, CEO Gina Fant-Saez, Coolbirth executive producer David Landa and Coolbirth creative director Mike Piliero

—David Weiss

SADLER NAMES NEW OWNER, PRESIDENT

Rick Klejmont, longtime chief engineer and staff producer at Sadler Recording Studios (New York City, www.sadlerrecording.com), is now its owner/president. Klejmont bought the studio from John Sadler, who recently retired. During the past five years, Klejmont served as Sadler's acting president. Klejmont's future plans for the studio include increasing radio and TV commercial production, DVD production, authoring, mastering and casting.



INDUSTRY REACTS TO HURRICANE KATRINA

The impact of Hurricane Katrina has compelled people throughout the world to look for ways to help the victims sort through the devastation—whether it be donating to the Red Cross, calling in and making a donation on the recent *ReAct Now: Music & Relief* MTV special or finding other means to make a charitable contribution. Not only has the hurricane left hundreds of thousands of Americans stranded, looking for some semblance of normality, but many in our own industry are fighting their way through the water-logged streets, hoping to rebuild in the near-future.

We have already heard of studios being destroyed and venues underwater, and while you may have already donated to help those in need, our industry is creating new avenues for audio professionals to help out.

The Recording Academy and its MusiCares Foundation committed an initial donation of \$1 million for music people affected by the hurricane. Assistance includes basic living expenses such as shelter, food, utilities and transportation; medical expenses, including doctor, dentist and hospital bills and medications; clothing; instrument and recording equipment replacement; relocation costs; school supplies; insurance payments; and more. In addition, each of the Academy's 12 regional



chapters will designate local programming that will continue the fundraising efforts. To help, log on to www.grammy.com/musicares.

NAMM (www.namm.org) has made a donation to the Red Cross; future plans include getting musical instruments back into the schools, working with Mr. Holland's Opus Foundation to rebuild these musical programs in the affected areas.

The New Orleans Musicians Clinic is working to find New Orleans-based musicians and temporary housing for them. The clinic can be contacted at musiciank@swlahec.com. The Jazz Foundation of America will address the longer-term needs of these musicians who lost everything. In addition to raising funds and distributing monies for the musicians to get new housing, the foundation will also help them replace their instruments, working with manufacturers

and music stores to replace these lost treasures. Donations can be made online at www.jazzfoundation.org.

In addition, manufacturers are also responding; Telos, Omnia and Axia Audio are helping broadcast facilities with priority technical support, troubleshooting and loaner equipment.

Stay tuned to *Mix*, where we will provide more in-depth coverage of the aftermath caused by Hurricane Katrina.

CRAS RECOGNIZED BY ACCSCT

The Accrediting Commission of Career Schools and Colleges of Technology (ACCSCT, www.accsct.org) named Conservatory of Recording Arts and Sciences (www.cras.org) a 2005 ACCSCT School of Distinction. This award recognizes member schools that have demonstrated a commitment to the expectations of ACCSCT accreditation and delivering quality educational programs. "It is a great honor to be picked from a list of over 800 schools to receive this award," commented Kirt Hamm, administrator of CRAS. "The ACCSCT has given us a wonderful validation of our mission: to provide the best education we can to motivated, up-and-coming audio professionals."

From left: ACCSCT Elise Scanlon, executive director; Kirt Hamm, Conservatory administrator; and R. Michael Harter, ACCSCT chairman



INDUSTRY NEWS



Eben Carr

Tim Shuttleworth joins Cerwin-Vega and KRK (Chatsworth, CA) as VP of engineering...New QSC (Costa Mesa, CA) director of product management is Gerry Tschetter...One Union Recording (San Francisco) promoted Joaby Deal to senior engineer and hired senior engineer Eben Carr...New York City-based mad.house welcomed John Grant to head up its audio business... Charles M. Salter Associates (San Francisco) promoted Randy D. Waldeck and Peter K. Holst to senior consultants and welcomed Josselyn Salter as business development associate...Based in Bangkok, Thailand, Andy Pearce is Biamp Systems' (Beaverton, OR) new Asia/Pacific regional manager... Mary Cook joins EAW's (Whitinsville, MA) team as support group manager...Aviom (West Chester, PA) appointed Jeffrey Lim, director of international sales for Asia, and Jonathan Parker, regional sales manager for Southeast U.S....Susanne Kelly is Headroom Digital's (NYC) director of marketing...New distribution deals: Digigram (Grenoble, France) hired GLS Marketing (Huntington Beach, CA) for Southern California and Nevada; MI7 (Sweden) is distributing NHT Pro Audio (Benicia, CA) studio monitors in France; Ashly Audio (Webster, NY) is the new North American importer/distributor of CAMCO amp products; SLS (Springfield, MO) appointed Pearson & Pearson Marketing (Rocky Mountain region), Faultline Marketing Group (Pacific Northwest) and Bencsik Associates (South Florida, Caribbean); TransAudio Group (Las Vegas) is now distributing Heil Sound mics in the U.S.; and HME (Poway, CA) signed Northeast Marketing (Northeast), Tech Rep (northern Midwest), Spoiled by Technology (Midwest), More Technologies (Asia), Orbital Sound (UK) and Apex (Belgium, Luxembourg, Netherlands).

A STAR IS BORN STARCITY INHABITS ANGEL MOUNTAIN LOCATION

Audio professionals Jeff Glixman, Carl Cadden-James and Lily Salinas opened StarCityRecording (Bethlehem, Pa., www.starcityrecording.com), an 18,000-square-foot location once occupied by Angel Mountain Productions.

All control rooms contain soffitted monitors and automatic drop-down microperf screens with projectors to handle lock-to-picture. The main mix/tracking room is outfitted with an SSL

XL 9000 K Series; a scoring stage can hold a 40-piece orchestra; and the post room is attached to a 33x17-foot Foley studio, which can also be used as additional tracking space. Purpose-built for 5.1 productions, StarCity's 30x40-foot THX-specified mix theater offers a 96-input Harrison digital film console and 6.1 Dolby Digital EX monitoring.

StarCity has retained original designer Martin Pilchner (of Pilchner Schoustal International) to redevelop the facility, including adding lounges, a private entrance and a new mastering/editing suite.



E-MU WHIPS UP SAMPLE LIBRARY

E-mu's soon-to-be-released grand piano sample library has chosen Whip Studios' (Berkeley, Calif.) piano for the job. According to studio owner/engineer David Landon, E-mu has locked out the studio for a week and is recording every note on the piano with various dynamic levels and 10 different mics. Landon (right) is engineering with help from E-mu's Tim Swartz and Ed Dickson (left).



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PILKIN FINDS REDEMPTION WITH STORYK

From left: John Storyk, and engineers Tommy Hayes and Mike Pilkin (seated)

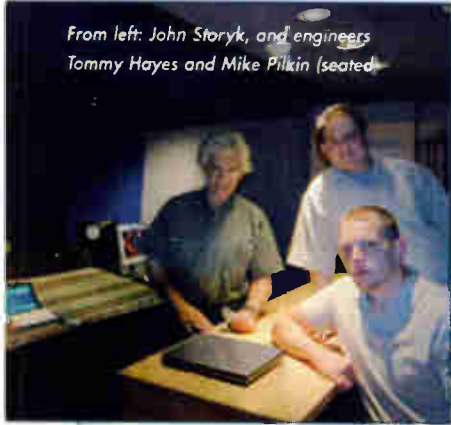


PHOTO: CORMACKEY ENGINEER

Engineer Mike Pilkin has opened Redemption Studios (Clifton, N.J.), which features a live room and two control rooms. Control room A offers a vintage Neve VR60 48-track desk, while B offers Pro Tools|HD3. Also onboard is engineer/primary mixer Tommy Hayes, who has a slew of technology at hand: Quested and Yamaha monitors, Studer A827 and a wide range of outboard gear, mics and instruments.

Studio design was handled by Walters-Storyk Design Group's John Storyk, who brought in a top-notch team of professionals to work on the design and construction. Gregory Davis of Audio Engineering Services is on-call to maintain the Neve board.

"We expect word of mouth on Redemption to be a major component in driving artists here and we knew that quality makes the vibe," said Pilkin. Storyk added, "It's interesting to see young engineers and studio owners who are committed to doing things the right way. We're proud to have had the opportunity to help bring this studio together."

FUTURE DISC TAKES HOME DVD AWARD

Future Disc Systems' (www.futurediscsystems.com) Mastering and Sovereign Artists took home the Music DVD Audio Excellence Award at the 2005 DVD Association Awards, held in New York on July 19, 2005, for the DVD of Don Grusin's *The Hang*. *The Hang*, mastered by Future Disc's Steve Hall and authored by Future Disc's Dave Conrad, was captured onstage with a high-definition, six-camera shoot and 96k/24-bit surround sound. Pictured at Future Disc's Studio 6 are Steve Hall (L) and *The Hang*'s mix engineer Paul Klingberg.

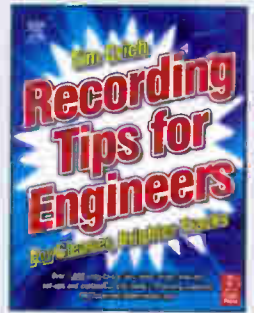


BOOKSHELF

Pyramid Institute for Digital Audio Training co-founder Matt Donner has penned *Pro Tools Overdrive!*, an advanced book on Pro Tools (up to Version 6.7). Tips offered include automating Reason synths within Pro Tools, making higher-quality mixes through better gain-stage management, creating multiple headphone mixes for artists during recording, setting up 5.1 mixes, and saving sessions to travel with your client to another studio or to another application. Thomson Course Technology, \$39.99; www.pyramid.com.



Tim Crich has released the second edition of his *Recording Tips for Engineers*, which is geared toward engineers of all levels who encounter a problem mid-session and don't have time to pore over manuals. Topics include mic choice, setup and placement; EQ and compression; recording drums, guitars and vocals; and advice on how to prepare and conduct recording sessions of different durations (three-hour, three-day, three-week, etc.). Focal Press, \$29.95; www.focalpress.com.



TWENTIETH CENTURY FOX JOINS BLU-RAY

A member of Blu-ray Disc Association's (www.blu-raydisc.com) Board of Directors, Twentieth Century Fox will release content on the new high-definition Blu-ray Disc format through its subsidiary, Twentieth Century Fox Home Entertainment LLC. According to Mike Dunn, president worldwide of Twentieth Century Fox Home Entertainment, "The advanced functionality, picture quality and data capacity [25 GB of data for single-layer; 50 GB for dual-layer] at a competitive manufacturing cost fully realizes the promise of a next-generation format."

In related news, the AP reported that Toshiba and Sony (a Blu-ray member) have ended negotiations over the next-generation digital media format. Toshiba claims that manufacturing costs for HD DVD are lower, while Sony says that Blu-ray's higher storage capacity is a more important issue. Toshiba has delayed plans to bring HD DVD players to market, while Blu-ray will be featured on the PlayStation 3 (launched early next year).

At AES, on October 7 and 8, from 3:30 p.m. to 5 p.m., two Dolby-sponsored sessions, entitled "The Next Generation of Consumer Disc Formats: HD DVD and Blu-ray Disc," will teach attendees about each format's structure, authoring tools, disc replication and the impact on music, game and video markets. Panelists include Mark Waring (director, Sanyo Technology Center USA), Gateway Mastering's Bob Ludwig, David Anthony (co-founder of Giant Interactive) and Randy Hudson, president of Broadness LLC, as well as Dolby Labs' Steve Venezia and DTS' Lorr Kramer. Sessions are open to all attendees for free; room assignments will be announced at the show.

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The tools of the trade.

The Oven Studios

By David Weiss

When old school hooks up with new school, watch out. That's exactly what has happened at The Oven Studios, a world-class facility created for Alicia Keys and Kerry "Krucial" Brothers, founders of KrucialKeys Enterprises (www.krucialkeys.com). Designed by Keys, Krucial and a dedicated team, the facility successfully builds on a pre-existing high-level recording studio in the New York area and puts it into a 2005 context, perfect for a nine-time Grammy-winning songwriter growing increasingly skilled in her role as a producer.

"I've always written, I've always played the piano, and when I heard these songs in my head, I would know what I wanted the feel and the sound to be," says Keys, who produced or co-produced 11 of the 15 tracks on the 2003 multi-Platinum *The Diary of Alicia Keys*. "Krucial was one of the first people to encourage me to take things into my own hands. That's why producing is so important to me. I'm able to hear my thoughts and voices, and I can present it as only I know it should exist."

After the smashing success of *Songs in A Minor* and *Diary*, KrucialKeys decided that a purpose-built recording studio was in order, with a choice between renovating an existing facility or building one from scratch. Realizing that vibe settles in like a vintage wine, the partners opted for the former and purchased an established facility built into an old house, with a quiet town setting and calming shade trees just outside.

"The basic idea is that we've always been very hands-on and always been working in 'The House,'" states Krucial, referring to Keys' early demos that were recorded in a small Harlem apartment. "We're both into the old sound and we don't mind the big studios, but there's something about the home environment that's more comfortable, so we figured the best way was shaping the studio so it's an extension of the home."

KrucialKeys got the process going by huddling with longtime engineer Ann Min-



Alicia Keys and Kerry "Krucial" Brothers at the SSL AWS900/Pro Tools-based control room

cieli, who started working with the pair at New York City's Quad Studios in 2000—a relationship that officially went full-time during the recording of *Diary*. Mincieli did her research and built a tight, top-tier team capable of guiding the studio's extensive renovations and rebirth: Krucial; Keys; Dave Malekpour of Professional Audio Design; and John Storyk, Beth Walters, Dirk Noy and Chris Bowman of architectural and acoustical design firm Walters-Storyk Design Group.

"Everyone's input went into it," Mincieli stresses. "Everything in the pre-existing structure would lead us to ask, 'Why do we need that? How do we revolutionize this? How do we change the face of the industry? How can we be a leader ourselves?' We had the team, and if you look at the rooms, they're from everybody's input and decisions. It was nice because someone else would frequently have a way of looking at things that you might not have thought of."

"Creating The Oven was a big experiment, really," Mincieli continues. "Our mic panels aren't everyday mic panels, for example: They have our logo, and the Mytek headphone system built into it has been

modified so the noise from the power supply is in the basement, not the live room. All these details we came up with wouldn't have gotten to that level if we didn't have the whole team helping each other. I've been to a lot of studios, but I haven't seen one with a thought process like this—constantly asking, 'What can we do that's unique?'"

The Oven answers that question first with its relaxed atmosphere, accenting the house environment with green hues and earth tones in the rooms and corridors that surround the fully outfitted upstairs production rooms—Studio B and Studio C—and the heart of the facility, Studio A on the first floor. "My first decision was to get an SSL AWS900," says Mincieli. "It's a dual-function desk: 24 channels of SSL mic pre's and EQ with a DAW running as a HUI. The design of the modules on the desk is the same as on a K or an XL, but the signal path is shorter, so it sounds even better than an XL. I'd love a K, but I don't have the real estate. This little AWS900 came out and it was perfect, so I made that my foundation."

Adding to the 230-square-foot control



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room is a wide selection of mic pre's, including the 24 ultralow-noise preamps in the AWS900, plus four more external SSL mic pre's, 16 additional channels of API and two original Neve 1073s. The highly flexible SSL patchbay was custom-made by PAD for The Oven, laid out to maximize integration between the console and the 24-in/48-out Pro Tools|HD system, while keeping all cables concealed via an under-the-floor routing scheme. The Augspurger and Yamaha NS10 monitors, multiple mics and myriad other gear build on a perfectionist attention to detail within the recording space, sporting a matched look with Aston Martin Metallic Silver 2001 paint selected from a local car dealership.

Everything is set up to capture the magic that awaits in the adjoining live room, a 535-square-foot space with a stone wall and a staged floor plan created especially for Keys' vocal and piano mastery. "The pianos in that big live room have such a clear, crystal, gorgeous clarity," Keys says. "At the same time, we can set up anything else we want. It has the stones on the wall that gives a more intimate, personal feel. The point of the room is to capture a multitude of sounds." Also on The Oven floor are a 160-square-foot drum room and 80-square-foot iso booth.

When hard drives are rolling, Mincieli frequently employs a Telefunken Ela M 270 stereo mic for recording Keys' Yamaha piano and a Telefunken U47 or Sony C800 for her vocals. "Knowing that there's going to be a piano in the room and that the other primary instrument will be a world-class vocalist, you do things differently," says Storyk, lead acoustician for the project, of the live room. "You make this room as reverberant as pos-

sible, while still ensuring mid- and high-frequency reflection control. Most pianists like a wood floor, and so does Alicia. Some people think that the resonators we used for low-frequency absorption are meant to look like the black keys on a piano, but the rhythm of their placement stems from the fact that they're affixed to columns in the walls. The end result is an appealing mixture of architecture, acoustics, aesthetics and ergonomics."

Is the melding of living spaces and workspaces an emerging trend? "I would hope so," Walters adds regarding Studio A's aesthetic. "They spend a lot of time here [in Studio A], and their work branched out into the rest of the facility, as well. This is definitely as much of a living space as it is a workspace."

Studios A, B and C combine to make The Oven a full-service facility—not just for KrucialKeys, which recently mixed Keys' *Unplugged* here for J Records, but for their collaborators and select outside clients such as Donna Summer and Keyshia Cole. Especially enticing is the Pro Tools|HD3-equipped Studio B, where dark wood and natural light combine to create a naturally meditative state and an extremely attractive destination for writing, recording and pre-production. Studio C offers a complement of Korg and Roland synths and Akai MPC workstations to add to the available sonic palette.

According to Malekpour, The Oven is a perfect example of the direction that accomplished artists are now taking with their personal facilities. "At PAD, what we've seen happen is a shift from larger-scale commercial facilities to artists wanting their own larger-scale personal-use facilities. They're built around a person's way of working, and they want to be in there without the clock ticking so that even if they go away for two weeks on tour, they can get right back to working the way

that they want to work.

"This studio has ramped that up: It's a pro facility that's privately owned, and they've considered how to use it for session work when they're not using it themselves," he continues. "I won't be surprised if we replicate this kind of studio in the future: a mid-sized room with great acoustics and everything in the control room within easy reach designed around production and creation as opposed to having this giant object there. The SSL AWS900 has such a small footprint that it allows you to do a lot more.

"It's also exciting to work with someone who really cares about the end result. Alicia's a unique artist because she's involved with all aspects of her production, and when you see her perform, you see that this person is deeply devoted to her craft. She's also surrounded herself with some good people, and that's a key component to every studio environment."

With the creation of The Oven, it seems that one of the world's most successful performers is happy to find herself fully immersed in the science of recording. "When it comes to songwriting, the essence is the voice, the song and one special instrument," Keys reflects. "So it starts in this simplistic way, but when you get into the audio aspect of making a record—not a song, but a whole record—it really makes a difference; not just the people you're working with, but the types of things you're working on. A good song is a good song whether you have good audio engineering or not, but it does enhance the experience. We're blessed with having so much to create the best audio experience for the listener."

David Weiss is Mix's New York editor.



Alicia Keys celebrates engineer Ann Mincieli's Pro Tools move, while Kerry "Krucial" Brothers looks skeptical.



The team that built The Oven. Front row: Keys and Brothers. Back row, from left, Beth Walters of Walters-Storyk, engineer Ann Mincieli and Dave Malekpour of Professional Audio Design

LightViper Update

LightViper - Digital Fiber Optic Audio Snake System



The LightViper System

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Lifetchangers Church • Chicago, IL Installation by Audio Analysts

"The scope of the project was to design and build a state of the art Vertec line array system with the installation of 2 projectors and screens for their video staff. The audio system was to have a three way split. One for FOH, one for a future monitor desk and one for broadcast.

"We chose Fiber-Plex because of the flexibility. We didn't know what the format would be for future broadcast or monitoring but, because of the simultaneous analog AES/EBU signal we could do what ever we wanted at a later date and be compatible with any desk they would put in. We also realized that we could save the client a substantial amount of money over copper and get much better performance.

"Buddy and the guys were great and were at our beck and call throughout the installation. They stand behind their product and gave us a guaranty on performance. Manufacturers' support is very important to us. We won't work with anyone who won't stand behind their line. Besides I like those guys.

"Right now LightViper is the only system that does what I want it to do at the price I want."

—Robert M. Langlois, Audio Analysts, Colorado Springs, CO



The LightViper VIS-4832 Digital Snake Head

NEW!

The VIS-4832 Digital Snake Head is the newest member of the LightViper family. It features 16 AES3 inputs (32 audio channels) via (2) 25 pin D connectors and 4 AES3 returns (8 audio channels) via (1) 25 Pin D connector with simultaneous line level analog outputs via a second 25 pin D connector. Natively, the VIS-4832 will pass 96kHz digital data. However, by syncing the VIM-1832 (air front of house) with a 48kHz word clock, the system will pass 48kHz digital data as well.

The VIS-4832 also offers the option of two additional fiber outputs, providing lossless digital splitting of all 32 inputs for use in monitor mixes and/or broadcast or recording mixes. These optical outputs must be used in conjunction with a VIM-1032 at the tail end for each split output.

VIS-4832 Applications:

Mic Pre-amp snake: Provides a perfect solution for transporting 32 channels of digital outputs of remote preamps to a digital console.

Digital Drive Snake: Gives you a complete 32 channel drive snake. The VIM-1832 at the tail end puts out both analog and AES3 digital signals, so you can address amps that have digital inputs and amps that have analog inputs simultaneously.

Digital Audio Transport System: Connecting the outputs of a digital console to the inputs of the VIS-4832 allows you to create a digital audio transport system. Example - If you need the identical outputs of your digital console to route to stage, amp room #1 and amp room #2, you simply use the VIS-4832 on the outputs of the console and route these signals via fiber to one VIM-1832 (stage) and two VIM-1032 (one located in amp room #1, one located in amp room #2).

AES—Always Exciting Stuff

Or Maybe, Another Excuse to Slack

The second half of the list whose first half was last month's column has been moved to the second column after this one, including this one, at the request of my editor. The previous sentence is the first half of my punishment for this request. The second half of his punishment will be my compliance—specifically, a column “relevant” to this month's theme, AES. It is unlikely that he will make such a request again soon.

As you wander aimlessly about the AES floor, mildly annoyed with yourselves for becoming distracted by some new display or by somebody you haven't seen in a year or 10, fearing that you may not ever get to the booth you are trying to get to, stop. Think. Which is actually more important, doing business or catching up with friends?

Well, if you have mortgaged your company to pay for a booth or are pumping a vendor to get a deal to keep your music store alive, I guess the business is more important.

But if you are a musician, engineer or other user, screw 'em if they can't take a loan. You will get to the booths you need to see. Probably. Mostly. But when you stop and talk to that old near-lost friend, you are doing something that really matters.

ALL WORK AND NO PLAY...

I have always been a proponent of slacking at trade shows, whether playing Victim (walkers who are seen as targets by the vendors) or victim (those who man the booths, the spider webs, the gaudy, crass Renos of “technology” that comprise the sea of noise and light), whose entire purpose is to assure that you, the Victim, leaves but your money does not.

As a manufacturer, I have repeatedly abandoned my booth to check out some cool new toy or have lunch with a friend I hardly recognized, only to be chased down by angry co-workers. Their emergency was always the same—come do a demo, schmooze a dealer. The power supply is on fire or Germans have taken the cover off the prototype again.

And as a musician, engineer or columnist, I have usually taken at least half-a-day to lay by the pool drinking beer while on the clock.

No doubt this behavior has cost me millions over the years, but I have some great memories and absolutely none of them have to do with actual work, except when one of the Digidesign guys caught my PARIS demo and his brain blew up. To this day, I smile ear to ear when I think of anyone taking it that seriously. I *still* get e-mails from people who were in the audience.

A LOFTY GATHERING OF PROFESSIONALS

What a freakin' system, trade shows. The elixir of capitalism, the medicine show of modern times. Absolutely every damned industry has them, *every* industry. Audio, weaponry, airplanes, cars, marijuana, prescription drugs, aluminum, car paint, porno, religion, videogames, cosmetic surgery, aliens. Basically, any noun has its trade show.

And everybody there has been blackmailed into showing up.

The vendors are there because the other vendors are there. Every one of them needs to show their New Toy and see the New Toys of others so they can sleep at night knowing that they have not been out-teched by the competition.

As a manufacturer, I have repeatedly abandoned my booth to check out some cool new toy or have lunch with a friend I hardly recognized, only to be chased down by angry co-workers.

The dealers are there to get the New Toys first, negotiate favoritism and get free dinners and alcohol. If they don't show, they don't know.

And finally, the end-users are there to offer confusing and conflicting input about what's not right with these New Toys. Unless, of course, they are *endorsing* artists and engineers. Then, they are there to observe for the first time how their year of input has been misunderstood, compromised beyond recognition, or—as is usually the case—totally ignored, as terms like “feel” and “warmth” don't translate real well into certain languages.

THE PERFECT BUSINESS MODEL

Manufacturers show non-existent equipment, dealers order it with non-existent money. The manufacturers then go try to actually make it, dealers try to get delivery, retail customers buy magazines that tell them how cool the toy that they have been waiting for is going to be and then...it all starts over again.

The union guys get about \$23,000 for moving a couple chairs to a vendor's booth, and the vendor is of course forbidden under pain of death to do it himself. Every hotel in town is booked solid, even the ones that

—CONTINUED ON PAGE 191

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The Library of Congress Gets Busy With Our Recorded Heritage



ILLUSTRATION: PETER BENNETT

Should you ever encounter the words “recording industry” and “legislation” in the same sentence, run away as fast as possible. For those of us trying to make an honest living in this business, most of the bills that have affected us in the past few decades have not been our friends. From the failed tax on blank tape in the early 1980s, the more successful Miscommunications Act of 1996, the Sony-Bono-and-all-his-Descendants-unto-the-Seventh-Generation-Term Extension Act and the Dismal Millennium Copyright Act (my names, not theirs), these bills have been designed to promote and protect the interests of the major corporate players in the entertainment world at the expense of just about everyone else.

But there are exceptions to every rule, even this one. In November 2000, a bill was quietly signed into law by former President Clinton called the National Sound Recording Preservation Act (NSRPA). This act stipulated that the Library of Congress establish the National Recording Registry, which would contain re-

cordings that “are culturally, historically or aesthetically important, and/or inform or reflect life in the United States.” Beginning in 2002 and each year following, 50 recordings—out of scores of nominations—have been added to the registry. The idea for the Recording Registry follows on the success of the National Film Registry, which was established four years earlier and includes 25 new entries each year.

The sound recordings in the registry cover a tremendous amount of territory—from Edison cylinders to rap records, from ethnological field recordings to political speeches. The most recent list, for example, includes Sophie Tucker’s first recording on a 1911 cylinder; Woodrow Wilson’s Armistice Day broadcast of 1923, believed to be the earliest surviving electrical recording; Glenn Miller’s 1939 recording of “In the Mood”; the 1953 low-budget smash “Songs By Tom Lehrer”; a set of 1989 recordings of Asian elephants by Cornell University scientist Katharine B. Payne, which revealed

—CONTINUED ON PAGE 192

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World Radio History

A Sound Design Triumvirate

Acme Sound Partners Has a 2005 Broadway Hat Trick

This past spring, three Broadway musicals captured 10 of a combined 36 Tony nominations: *Spamalot*, *Dirty, Rotten Scoundrels* and *The Light in the Piazza* opened within seven weeks of each other, and all were designed by Acme Sound Partners (www.acmesoundpartners.com). Of course, you couldn't open up a newspaper without seeing some sort of coverage on *Spamalot*—as the success of *Monty Python* helped spur on national recognition. However, Acme Sound brings the same amount of attention to detail, professionalism and technical know-how to all of their endeavors—Knights of the Round Table notwithstanding.

WHO ARE THOSE GUYS?

Acme Sound's three partners—Tom Clark, Nevin Steinberg and Mark Menard—met when working on *Side Show* in 1997; Steinberg was the production mixer, Menard

was the sound vendor rep for ProMix and Clark was the sound designer. Resulting in a strong partnership, Steinberg was called on to co-design *The Full Monty* with Clark, which would hit the stage in 2000.

While working on *The Full Monty* in 1999, Clark was designing for *Annie Get Your Gun*. As that show was hitting the road, Clark was again called in to sound design Lily Tomlin's *Search for Signs of Intelligent Life*. In the midst of working on *The Fully Monty* and *Search for Signs of Intelligent Life*, Clark had already committed himself to designing Radio City's Christmas Spectacular and *Jane Eyre*, a co-design with Menard.

A year later, *Class Act* and *Bells Are Ringing* were the first Acme Sound Partners' designs with Clark (usually serving as lead sound designer), Steinberg and Menard all contributing.

While there's no Tony Award for

Sound (the one department left out), since winning the 2003 Drama Desk Sound Design Award for the Broadway revival of Puccini's *La Bobeme*, Acme has gone on to design R-rated puppet musical *Avenue Q* (winning the 2004 Tonys for Best Musical, Score and Book) and last year's revival of *Fiddler on the Roof*, both of which are still running, as are three other Acme Sound designs: *The Boy from Oz*, *Never Gonna Dance* and a revival of *Gypsy*.

SIZE MATTERS

Both *Spamalot* and *Scoundrels*—which are within a block of ether other and have similar proscenium theaters—employ the D5T, the theatrical version of the DiGiCo digital console, along with the companion D5Tc theater controller and a D5T RE redundant mix engine, which instantly takes over in case of a malfunction. While the Imperial's (where *Scoundrels* is showing) mix position is a dedicated area that takes up no seats, Acme was able to put four *Spamalot* seats back on sale at the Schubert, which, totaling more than \$3,000 a week, could pay for the console in a couple of years. Of course, this economics only applies to sold-out shows.

Though it has double the inputs of a D5 Live, the D5T is the same 41-fader control surface with four LCD touchscreens, but is connected to a 72-bus mix engine with a 32x32 matrix. It has 128 channels, unless onboard output EQ or reverbs are used. Production mixer "Bones" Malone, who uses 115 inputs on *Spamalot*, describes the board as "the most engineer-friendly of all the digital desks I've used." To save space, his D5T sits sideways in the small 6-foot-square front-of-house area with the D5Tc surface, which Malone does most of the mixing on, facing the stage next to it.

The D5Tc is basically a Go button and



Acme Sound's co-partners, from left: Mark Menard, Tom Clark and Nevin Steinberg

By Mark Frink

a bank of 16 “heads-up” assignable faders or DCAs, whose specific assignments can change from one cue to the next. In practice, faders on each end are always assigned to reverbs, band and drums, with the 10 in the middle changing among performers, depending on who’s onstage. Each cue is written with only actors who have lines, and other mics are muted. Also, as actors move around the stage, delay times and panning are used to align their reinforcement with their acoustical voice, so there are often sub-cues within a scene. “Having a delay on each channel makes that easy to do,” *Scoundrels* production mixer Bob Biasetti comments. “We used to have racks of XTAs backstage.”

SPEAKERS IN THE HOUSE

Steinberg points out that just prior to *Scoundrels*, the Imperial hosted *The Boy from Oz*—another Acme design—and used an almost identical speaker package and the same operator. “This was the first time we used that style of P.A., and we loved it,” Steinberg comments. When Acme returned to the Imperial with *Scoundrels*, the only major change was the console.

Not only was Acme familiar with the Imperial, but the company had also worked at the Schubert, having designed *Gypsy* two years prior. Both theaters seat about 1,400, but the Schubert’s mezzanine and balcony are taller, while the Imperial’s are wider. The Schubert’s main array for *Spamalot* is a nine-box dV-DOSC center cluster that covers a large portion of the audience in

all three levels. In the Imperial, *Scoundrels* has a five-box-wide ARCS center cluster and three-box-high dV-DOSC array just above it that reaches into the balcony’s highest section. “Normally, we like a single shot—front row to back row—with a center cluster,” Menard says.

Fill speakers at each side of the stage on the orchestra level for *Scoundrels* are two-box L-Acoustics ARCS arrays turned sideways to provide 60 degrees of horizontal coverage, with 45 degrees of vertical coverage and a high output. Higher up on the proscenium, a single ARCS covers the balcony’s widest sections without having to bounce sound off of the Imperial’s side walls. “At *Spamalot*, the band fills are pointed up at the ceiling to get ‘bounce’ and provide indirect sound, which is how you naturally would experience the orchestra,” Menard explains. “For *Scoundrels*, we know orchestrator Harold Wheeler’s material requires more of a direct delivery.”

Another Acme P.A. favorite is the Meyer MSL-2 because of its generous 70x60-degree dispersion, high output, small size and full response. The MSL-2s are used in *Scoundrels* for orchestra-level down-fills

Above: *Dirty Rotten Scoundrels* stars (from left) Norbert Leo Butz (Tony winner for Best Performance by a Leading Actor in a Musical), John Lithgow and Sherrie Rene Scott. Left: Light in the Piazza’s Victoria Clark (Tony winner for Best Actress in a Musical) and Kelli O’Hara

from the FOH electric. These provide a music-only mix that covers orchestra-level seats, which are shadowed by the sunken nature of the pit. For *Spamalot*, a pair of MSL-2s is also employed for pit-fills; however, they’re aimed up at the Schubert’s ceiling to create dispersion. The MSL-2s are also used as proscenium speakers.

Acme also relies on the d&b E3, a passive speaker with a dedicated amplifier employing a 5-inch cone and a rotatable 60x90-degree horn. “They get quite loud and the fidelity is fantastic,” Clark notes. The E3s are used in all three designs for underbalcony or front-fill speakers.

Surround speakers are used to intentionally bounce sound off the walls. Acme chose EAW JF60 for the job, with the UB-12 a close second. These can be found distributed liberally around side and rear walls on all levels. In the Imperial, the surround speakers are actually firing back toward the ceiling and walls to increase dispersion and reduce localization. “That’s more of a room ‘spatializer’ than anything else,” Menard says. “We don’t want the audience to hear any directivity from the surround speakers; we just want them to feel the space is more alive.”



A Sound Design Triumvirate

UPTOWN OPERATIC

About 20 blocks “upstate” to the Lincoln Center’s Vivian Beaumont, *The Light in the Piazza* has enjoyed commercial success and has been extended through the end of the year, perhaps due to its Tony win. When *Mix* caught up with the show in late July, production mixer Mark Salzburg was on his first vacation in six months; deck assistant Gary Simon was ably covering the mixing chores on a 64-input Cadac J-Type with a Midas Venice 160 sidecar for the strings.

The Beaumont is a modern theater with 1,100 seats arranged in a 140-degree half-circle around the stage’s thrust. Here, Acme used five Meyer MSL-2s in the main ring and a pair for music-only down-fills, as well as one on each side for proscenium fills. The balcony is covered with UPA-1Cs from the same catwalk; UPM-1s are over each balcony section. A UPA-1P in the grid and one in each wing are dedicated for the sound effects in the piazza, where there’s also a pair of USW subs and a second pair on the deck.

Acme almost exclusively uses TC Electronic digital reverbs, XTA DSP for speaker management and PRAM for wireless control of XTA’s AudioCore software throughout the venue. “We’ve used a lot of different products from home-grown to rental shop solutions, and we found the PRAM is the best of the bunch,” Menard says. “The WiFi situations in theaters is getting ridiculous. There’s usually several



Spamolot sound mixer Bones Malone Inset: the mischievous knights of Spamolot

other applications going on at the same time and pretty soon, it’s going to have to be managed.”

They almost always employ Meyer Sound’s SIM for initial room tuning, with Menard performing the operator duties. “The SIM measurements are enormously important to the process, and though we make small adjustments afterward, they’re mostly balancing levels,” Clark explains. “A huge amount of the work is done before the cast is even on the stage.”

Menard has been using SIM since the early ‘green-screen’ days of Version II. “We’ve done shows without SIM’ing, but it provides a great comfort factor,” he comments. “We can have the cast onstage



the next day and we know it’s okay.” He points out that SIM provides a robust baseline for the system, that the EQ and delay times rarely change after a SIM session, and it’s usually only adjustments to level that help with imaging. “We could literally walk in and do a show,” he adds.

This is an enormously important aspect of Acme’s job, or as Steinberg points out, linearity and even coverage are hallmarks of good theatrical design because successful shows don’t allow the designer or operator to listen from any but a few select locations after a show opens. The Acme partners reached an early agreement about the sound designer’s role that Clark calls, ‘You, only louder.’ By this, he means that their job is not to determine how loud the show will get, but to put speakers in place that will reproduce faithfully at all levels. Acme has spirited discussions about equipment choices and their triumvirate approach guarantees both tiebreakers and minority opinions. If two heads are better than one, then three is a bonus.

One extra benefit is that during the hectic rehearsal time between the SIM session and the first preview, there are almost always two Acme partners present: One stays at the console to work with the operator during an incredibly intense period of programming,



Monty Python’s *Spamolot’s Knights of the Round Table*, from left: Sir Robin (played by David Hyde Pierce, who is holding the chicken of Bristol), Sir Lancelot (played by Hank Azaria), Sir Dennis Galahad (Christopher Sieber), Sir Bedevere (Steve Rosen) and King Arthur (Tim Curry)

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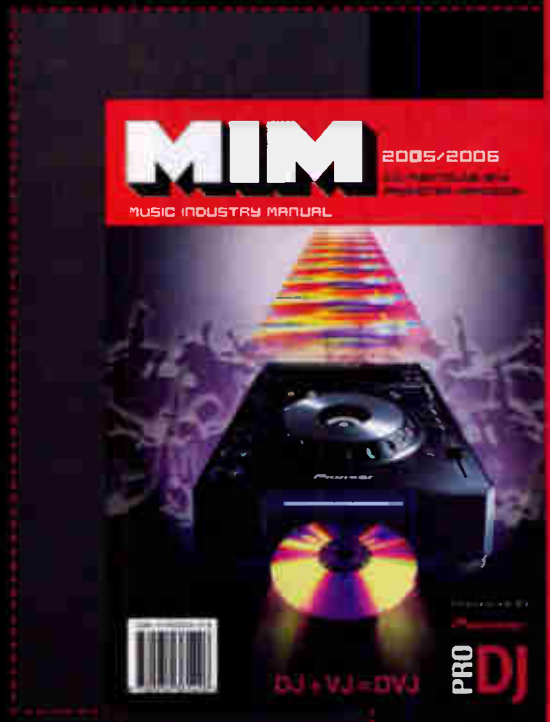
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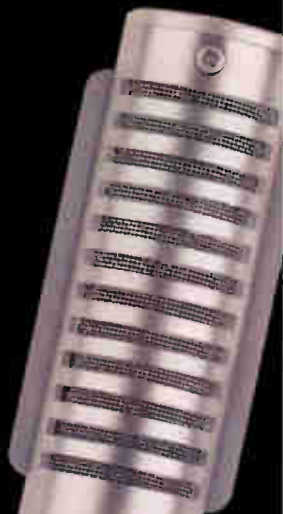
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A Sound Design Triumvirate

while the other is free to walk the venue, observing the system's behavior. A great number of adjustments must be made in a few days, when suddenly costumes, wigs and orchestra appear.

IN THE PIT

In *Spamalot*, the orchestra is using Hear Technologies personal mixers with Sony headphones or Galaxy HotSpots, while in *Scoundrels*, they're using Aviom A-16 mixers. For *Piazza*, there's no electronic instruments nor click track, so Acme spent some time arranging the musicians so they could all hear and play acoustically without monitors.

As with their speaker selections, the Acme partners have favorite microphone choices for various applications. The actors' radio mics are all DPA 4061 miniature lavalieres with Sennheiser SK-5012 miniature bodypack transmitters. A venerable problem-solver for RF is the Professional Wireless Helical Antenna, which appears on all Acme bid lists.

DPA mics also are featured prominently in the pit. The 4021 compact cardioid microphone—which has the same capsule as the 4011 with its preamp remoted—is used heavily for woodwinds, string overheads, piano, harp and congas. Their secret weapon for all brass instruments is the 4006 omni condenser. Old-school mic picks on drums include Sennheiser 421s for toms, SM57 for snare and RE-20 on kick. The Aguilar DB900 tube DI is an Acme prize for nylon- or steel-string acoustic guitar, mandolin or banjo, providing natural

sound while allowing them to blend with the microphone. "Putting a DI on an electric guitar is a questionable decision to begin with, but this is more usable than a solid-state DI and gives us a warmer sound," Steinberg points out.

The Acusound miniature gooseneck condenser is used on close-miked strings. The AKG C414 is a workhorse for percussion and acoustic guitar, as are the Neumann U89 and U87 (which have also been used on low reeds).

For sound effects playback, Acme specifies Stage Research's sound effects software. "SFX is an inexpensive, reliable, graceful program, and everything that it does, it does well. It's quick and easy-to-use," Clark comments. "In Lily Tomlin's *Search for Signs of Intelligent Life*, there were 380 cues in 90 minutes, and it played six months on Broadway and two more in L.A. flawlessly."

TAKING IT ON THE ROAD

While *Spamalot* made its debut on Broadway—and continues to sell out shows in this New York City theatrical hot-spot, it has been in high demand for theater-goers across the U.S. A North American touring production of *Spamalot* opens next March at Boston's Colonial Theater; a production in London's West End is also planned for next year. Other Acme designs taking flight include *Avenue Q*, which will open in Las Vegas, *Anyone Can Whistle* at the Ravinia Festival and *Irving Berlin's White Christmas* at a theater near you. ■

Mark Frink is Mix magazine's sound reinforcement editor. Thanks to Sten Severson, assistant designer for *Spamalot*, and Jeffrey Yoshi Lee for *Scoundrels* and *Piazza*.

Acme Sound Credits (in alpha order)

A Class Act
Anyone Can Whistle
Avenue Q
Bells Are Ringing
Dirty Rotten Scoundrels
Disney's On the Record
Dracula: The Musical
Elaine Stitch
Fiddler on the Roof
Flower Drum Song
Gypsy
Harlem Song
Henry V
Irving Berlin's White Christmas
Jane Eyre

La Boheme
Light in the Piazza
Measure for Measure
Monty Python's Spamalot
Much Ado About Nothing
Never Gonna Dance
Rshomon
The Boy From Oz
The Full Monty
The Seagull
Thunder Knocking at the Door
Twelfth Night
Twentieth Century
Two Gentlemen of Verona



Avenue Q

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Audio Gains In Videogames

Music Moves Into the Foreground

Everyone from KISS to Green Day to 50 Cent has had a song or two on a videogame soundtrack. Gamers can hear their favorite bands while virtually racing cars or fighting space aliens, as well as listen to old and new game music, themes and effects on videogame radio stations and even catch composer interviews on the G4 cable network.

If gamers want to venture outside, they can hear music from *Halo*, *Zelda* and *Mario*, among others, performed live by U.S. symphonies, courtesy of large-scale multimedia productions such as Video Games Live, which is touring North America this fall. Stand-alone soundtrack CDs accompany most new games—some shipping with the game itself, others selling in retail outlets online and off.

With \$7.3 billion in revenue (U.S. computer and videogame software sales in 2004, according to the Entertainment Software Association), the videogame industry is catching up with film box-office receipts and is reportedly the *only* entertainment sector that has shown growth during the past decade.

With technological improvements such as more memory-rich DVD releases, incorporating surround sound, THX licenses, higher bit rates and 44.1k playback, audio designers have more freedom than ever to create captivating musical “foregrounds” that hold their own against high-action battle and sports scenes and corrupt virtual universes.

The path that music takes from pre-production to final mix closely resembles a film soundtrack's creation, right down to its balance when played against dialog, Foley, field recording, sound design and original and/or licensed music. To illustrate the process, we asked composer Jack Wall and members of the Edmonton, Alberta-based BioWare Corp. audio team to walk us through the Xbox™ game *Jade Empire*™, published by Microsoft Game Studios. In contrast to this big-budget

production, we picked apart PlayStation title *Rise of the Kasai*, an all-MIDI game with music composed by Rod Abernethy, Jack Wall, Keith Leary, Mikael Sandgren and Mike Reagan; Chuck Doud, music director for Sony Computer Entertainment America, served as audio director.

PRE-PRODUCTION

Set in mythological China, the single-person roleplayer *Jade Empire* blends ancient martial arts and mythical culture with gigantic serpents, mechanical insects and sweeping scenery. A highly complex production, *Jade Empire* contains 15,800 lines of recorded dialog and 6,900 vocal combat sounds from more than 400 speaking characters, not to mention layers of original sound effects and more than 90 minutes of score.

“Initially, Dave Chan, our former audio producer, wrote up an Audio Vision document that detailed the audio experience for *Jade Empire*,” says Steve Sim, BioWare's senior sound designer/audio technician. “We wanted the game to have an authentic Asian atmosphere and a very organic sound to complement the rich, lush visual environment, but to also have ‘Kung Fu movie-isms’ for critical elements in the game like combat.” The game's producer and design crew met with the audio team to determine the sound design and music's direction. BioWare then presented their chosen composer, Wall, with inspirational reference pieces, concept art and story synopsis.

Rise of the Kasai, the action-packed sequel to the 2002 Sony PlayStation game *The Mark of Kri*, also features warriors and an Asian-themed score, but with greater emphasis on intense combat. The game features an all-MIDI-driven soundtrack rather than streamed .WAV or MP3 files. In this case, pre-production involved recording drum samples, chants and Tibetan monks, which

were then given to the composers. Audio director Doud oversaw the recording process of these elements, which took place in San Francisco, San Diego and L.A. studios. “We really went overboard with the amount of effort we put into this soundtrack,” he says. “We even hired a guy who builds his own custom instruments. He came in for a day and we made sample banks of those instruments and then shared those with the composers so they could incorporate them into their palette of sounds.”

COMPELLING COMPOSITION

BioWare brought Wall in early during *Jade Empire*'s development, which, in his opinion, led to a better score. He first traveled to BioWare's headquarters, where they “divulged the secrets of the game. At the time,” he says, “they had a prototype level they were getting ready to show at E3 2004.” BioWare had been working on the game since early 2003.

Wall's score combines Western orchestral music with Asian instruments and percussion, but had to be palatable to Western ears. “I would write based on the fact that I needed music for various areas and various characters of the game,” he explains. Zhiming Han, who is fluent in Chinese and English music and languages, consulted with Wall on incorporating Chinese instruments into the score, then contracted the musicians, converted Wall's parts into Chinese notation and translated Wall's ideas and direction to the Chinese-speaking players.

“I'd give [Han] a piece of music, and say, ‘I think we ought to record this with a bawu, dizi or the 23-string guzheng,’” says Wall. “We also used erhu and janghu, sort of the Chinese violin and viola, and Zhiming is a master of the yangqin, which is a Chinese hammered dulcimer. He was essential to this project.”



Rau goes after a dragon in *Rise of the Kasai* (above). Right: Watch out for Cannibal Mother, a nasty creature from *Jade Empire*.



Wall used Private Island Tracks in Hollywood and Martinsound in Alhambra, Calif., to record percussion, which included a set of Taiko drums, a 42-inch-wide Hira Odaiko and a set of Shimi Daikos, among other pieces. Engineer Sam Lewis handled the Private Island sessions, recording through a Trident board into Pro Tools and Digital Performer, while Dan Blessinger engineered the Martinsound sessions. The remaining instruments were recorded at Wall's nearby studio.

Rather than hire a 70-piece orchestra (which he did for *Myst 4*), Wall turned to libraries, choosing from the Vienna Symphonic Library, Project SAM for brass, SAM True Strike Orchestral Percussion library, Sonic Images sample library, Peter Siedlaczek's Advanced Orchestra for some of the woodwinds and "a sprinkling" from the Gary Garritan Orchestral library. The result was more than 90 minutes of score (including cinematics and in-game) that was then divided into tracks that were one-and-a-half to two minutes long.

Faced with a very different, yet highly challenging composing experience on many levels, Abernethy entered *Kasai's* world at the midway mark. He and his Raleigh, N.C.-based Rednote Audio team—Jason Graves and Dave Adams—were given video and game play to fiddle with, a prequel to draw from, Doud's samples and a basic concept delivered by Sony Entertainment Corp. From there, Abernethy and crew chopped up Doud's samples, recorded more percussion, drums and drum hits of their own, and triggered it all with MIDI. Abernethy estimates each level of audio at about eight minutes long, "but you can't say linear minutes because it plays all those tracks at different times. It's almost an unlimited arrangement."

Abernethy composed on Digital Performer 4 on a Mac G4 that sits alongside an 80-channel Otari Status console, working

with mostly original samples. "We were using three Mac G4s, one Dell PC, BIAS Peak, Cool Edit Pro, two E4-X2 samplers and three ASR 10s," he explains. "We put our samples into the proprietary Sony sound tool, which has its own MIDI player, and then programmed our sequences within the tool."

Rather than running straight to an interface, Abernethy often runs mics through vintage API 512 and Neve 1272 pre's. "It makes a difference," he says. "Whether gamers are really paying attention, who knows, but in the long run, the little things do add up."

The music then split into bass, vocal and percussion parts—all MIDI files, all playing the downloadable samples. In addition to arranging these samples, Abernethy made sure that all the data fit into the PlayStation's memory budget. The memory budget for *Kasai* was 800k per level using a 4:1 compression. A typical PS2 game has a total memory budget of 2 MB, with additional audio streamed from the game disc. "Some samples were 22k/16-bit, some were 6k/16-bit, so we had to pay attention to whether the samples needed better high end or if they were real low bass sounds where we could cut off the top end and use a lower sample rate to save memory," he says. "When you're recording a regular pop CD, you're just trying to get the best sample rate you can; in this case, we had to really pay attention to conserving memory space and what sample rate we could use."

That said, popular sites such as MusicForGames and

GameSpot gave high marks to *Rise of the Kasai's* audio, which banished any assumptions of early MIDI-cheesiness and considerably altered the user's experience. "This MIDI technique really changed the gameplay experience," says Abernethy. "It was a true second-by-second adaptive soundtrack with the player—stomping around, pulling out the sword, et cetera. The music changes with each action, and you never hear the same loop twice." How fast the gameplay and its coinciding music changes depends on the ultimate mixer—the player.

INTEGRAL INTEGRATION

While the composers are busy scoring the music—MIDI, a full orchestra, live instruments or symphonic music libraries—the rest of the audio team works with sound effects, Foley and dialog. The elements unite at the end of the process—much like they do for a feature film. But the fact that dialog cues are short, music ranges from short blips to long phrases to song clips, and effects



The BioWare team, from left: Steve Sim, senior sound designer/audio technician; Shauna Perry, director of audio; Michael Kent, sound designer/audio technician; and Michael Peters, sound designer

Audio Gains in Videogames

have to pop for the youth market means that the mix becomes infinitely more complicated and nonlinear. (Look for in-depth coverage on the creation of game dialog and effects, and the implementation/programming process in upcoming issues of *Mix*.)

Once all audio elements are created, recorded and mixed, they join the visual elements during implementation, which comprises about 70 percent of the work. Often, composers will deliver their .WAV or MP3 files to the audio director and away they go, leaving their detailed score in the hands of

one or more audio programmers.

However, many composers want more control over how their music plays. Wall provided input as to where to put certain pieces of music and pointed out when the audio did or didn't match the story line. For *Jade Empire*, Wall also created custom mixes—percussion/no percussion—that were chopped up into 80 additional cinematics and placed into the game. Using a special Xbox development kit, Wall played the game at various stages and provided suggestions as to which tracks would work for different gameplay aspects and storylines.

"RPGs [role-playing games] have to be very story-driven, so it's almost like an

interactive movie," Wall explains. "You'll have a conversation with a character and based on that conversation, you'll go to a different place. So the score needs to reflect what's going on at any given time. I had pieces of paper all over my studio, noting which pieces are happy, romantic happy, then you've got the sad, the mystery/suspense, the dark and creepy, the haunted—the whole gamut. I could take from that list and just script the pieces into the game."



Chuck Doud

Meanwhile, Sim mastered and edited the files and the game's volume adjustments. BioWare's designers assigned the music to different areas of the game and scripted specific tracks to be triggered to critical story moments. Audio coder Dan Yakielashok handled most of the transitions and cross-fades from one piece of music to the next.

For *Kasai*, Abernathy and the Rednote team transferred all of their samples into Sony's proprietary music engine, a device that allowed him to plug sounds into the tool, sequence and program. "The best thing about this tool is that it puts 99 percent of the power in the hands of the composer," says Doud. "With a lot of other interactive music tools, the composers have to rely on a programmer on the game side and that's always a risk. Composers complain about that all the time. Guys like Jack tend to be lucky, where they've got really strong support on the programming side, but that isn't always the case. With our engine, the instructions that go out to the programmer are very minimal. Most of the work is actually done on our side, so by the time we dump the music into the game, it already knows what to look for. As a composer, that's the kind of system that you want, but if you're not working on one of our games, you're screwed!"

PLUGGED-IN POST

RAM budgets, which vary depending on the delivery platform, have to be considered at



Rednote Audio's Rod Abernathy (L) and Jason Graves

PHOTO: COURTESY OF SONY COMPUTER ENTERTAINMENT AMERICA

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nearly every stage of the game, especially during the post mix. The Xbox is currently the most powerful console, audio-wise, with Dolby Digital 5.1, a healthy amount of RAM and a built-in hard drive. PlayStation 2 carries 2 MB of audio RAM.

It takes savvy audio management skills to mix for large-scale games with massive amounts of dialog, effects and music tracks. Audio directors often have to pick their battles (so to speak!), downplaying Foley or certain ambiences to make room for more prominent features. They also have to apply higher sample rates to weapon fire and other high-priority sounds, and lower rates, say, 18 kHz for dialog and 11 kHz for far-off explosions or background noises. Format also has to be considered as each platform has its own requirements: Xbox uses 5.1-channel Dolby Digital surround; PlayStation and GameCube use Dolby Pro Logic II.

"The bulk of our post processing was done with plug-ins," says Sim, who handled *Jade Empire's* final mix in about two weeks at BioWare's studio, which features a live room for Foley and demo voiceover, a Nuendo workstation, PreSonus dual-servo

preamp and Digi 001. "We used Waves and Sony Media plugs, the TC Electronic Native and the plugs that come with Nuendo. I use the L2 or Sony Waves Hammer for a lot of our hit and impact sounds and visual effect sounds to bring them a bit over the top. We did not mix the cut scenes or music for *Jade* in 5.1 because with 16,000 lines of dialog, space on the DVD was limited." Lucky for *Jade*, Xbox offers real-time Dolby Digital encoding via the APU, which means that the unit handles the 5.1 mix itself and Sims just had to make sure the placement of the sound's directionality was correct. *Rise of Kasai* didn't require a conventional mixdown, "because we didn't need a final mix," says Abernethy. "The game is doing that. Like any MIDI player, you're giving it an assignment to play things at a certain volume level. That's what so cool about this game: You're sort of mixing it as you play."

A NEW GAME AHEAD

With the launch of new platforms such as the Xbox 360 and PlayStation 3, the list of



Jack Wall (far right) conducts a percussion session for *Jade Empire*.

capabilities and the quality of audio and video will only improve. Sim notes that the compression software encoding is getting better all the time, "which allows us to make higher-quality audio while using less space and memory."

Doud reports that in addition to the more popular streaming method, Sony will continue to use MIDI, "but instead of controlling tiny sample banks, we'll be able to use that MIDI functionality to control full-res .WAV files. We'll have that dynamic flexibility without having to make sacrifices on the fidelity of the music. That's extremely exciting for me." ■

Heather Johnson is a Mix assistant editor.

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Nick Batzdorf MIX May 2005



"The AT2020 allows (and even begs) you to try it in applications that you might not consider optimal for a condenser. Since the mic delivers on all accounts, it's hard not to envision a few of these in the mic cabinet."

"You should be able to use this mic for everything from insect mating calls to jet propulsion testing."

Darwin Grosse Recording June 2005



"Judging by the price, (the AT2020) is aimed at project and budding home studios. But given the horizonlike frequency-response chart, this puppy may be aimed at more experienced studios, as well. Who couldn't use an extra studio condenser or, at this price, several?"

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"Simply put, the AT2020 is a fine mic at any price, but at \$99 it's a value proposition you almost can't afford to refuse."

Michael Molenda Guitar Player April 2005

"If the \$100 price range is your budget, then rest assured that the AT2020 is as good as it gets in a condenser mic that can handle vocal and instrument duties."

Steve Langer mojopie.com April 9, 2005

"With the introduction of the AT2020, Audio-Technica has broken the price barrier without sacrificing sound quality or rugged reliability."

Chris Gill Future Music June 2005

audio-technica

TEC Hall of Fame Honoree Arif Mardin

A Golden Career From Atlantic's Heyday to Norah Jones

Conversing with Arif Mardin, it's possible to be transported back to a different and maybe better time. Although his production of Norah Jones' smash hit album *Come Away With Me* in 2002 reaffirmed his contemporary credentials (and earned him a Grammy for Producer of the Year, Non-Classical), Mardin's career actually spans more than 40 years, with its genesis in an era when pop music was sophisticated, cool and classy. Add warmth and humor to those adjectives and you get a pretty good description of Mardin. Doubtless one of the most important and influential record producers, he's garnered close to 60 Gold and Platinum albums, more than 15 Grammy nominations and 12 Grammy Awards.

His work transcends genres and includes a huge roster of artists, among them Aretha Franklin, the Average White Band, the Bee Gees, Phil Collins, Hall & Oates, Herbie Mann, Willie Nelson, Carly Simon and Barbra Streisand, to name a few. Many of the songs he's worked on have become classics, from the Young Rascals' 1965 Number One "Good Lovin'" to Chaka Khan's groundbreaking "I Feel for You" and Bette Midler's Grammy-winning Record of the Year, "Wind Beneath My Wings." He's also worked on numerous Broadway cast albums and television and film soundtracks.

Born in Istanbul and educated there and in London, Mardin has been a New Yorker since 1962, when he went to work for Atlantic Records' legendary founders, Nesuhi and Ahmet Ertegun. He served as studio manager, house producer and arranger, and was made VP in 1969. After retiring from Atlantic in 2001, he took on the job of VP and co-general manager of EMI/Manhattan Records. There, he produced Jones' Blue Note/EMI debut and multi-Platinum follow-up, *Feels Like Home* (co-produced with Jones) and other projects such as Dianne Reeves' *A Little Moonlight*, which won the 2003 Grammy for Best Jazz Vocal Album. In late 2004, he retired again, this time from his position at Manhattan Records. Since that second "retirement," he's continued to work on selected projects, including co-producing, with his son Joe Mardin, songs for Queen Latifah's *The Dana Owens Album* and the debut release for guitar player/vocalist Raul Midón. He is certainly a most worthy recipient of this year's TEC Hall of Fame Award.

I've heard that until you saw a performance by Dizzy Gillespie and Quincy Jones, you never considered a career in music.

Not exactly. I was a jazz fan long before I was able to play. In Istanbul in the '30s, my two sisters listened to American pop music at home: the big bands, Bing Crosby, the Andrews Sisters. When I was 10, I made my



PHOTO: JULE MARDIN

mother take me to buy a Duke Ellington record. Jazz, you see, was the American pop music of the '30s and '40s. It kind of died in the '50s and gave rise to rock and R&B. But that's how I started: I was bitten by the jazz bug. So I started to write. I took piano lessons, I wrote for friends who played instruments and, from practice, I became an arranger, writing parts and melodies. In 1955, I think it was, Dizzy Gillespie's band came to Istanbul and we all went completely berserk to hear this amazing, dynamic music played live by a great band. I went to all the concerts. Quincy Jones was the arranger and in the trumpet section, and we became friends. Later, I sent him some of my compositions.

At the time, Voice of America funded jazz radio programs that were broadcast behind the Iron Curtain. It was propaganda, of course, but the idea was that jazz was an international language that brought people together. So, although Turkey wasn't behind the Iron Curtain, Voice of America financed the recording of my compositions. It was, "Here's this young man from Turkey who wrote this wonderful jazz music." Quincy recorded it in New York with an A team of musicians. When they sent me a tape, it was played so incredibly—I couldn't believe it was what I had written. Quincy also sent those pieces to

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the Berklee College of Music and I got [the first Quincy Jones Scholarship].

And then your life completely changed.

When I told my father I got a scholarship, he was so worried about my future. He wanted me, of course, to have a regular job. But I wanted to be a big band arranger. So my wife, Latife, and I—we had been married less than a year—went from a very comfortable life in Istanbul to Boston, where we lived in one room in a boarding house, sharing the bathroom with other people. But it was, in 1958, such a wonderful, idealistic life. I was learning and perfecting my craft.

Berklee formalized your education.

Before that, no one had really taught me. I just heard the arrangements [in my head]. In Istanbul, I'd been in a "rehearsal band." That was a group of businessmen and professional people who were very enthusiastic amateur musicians. They got together once a week to play the stock arrangements for big band hits that you could buy in the marketplace. I was the piano player, and I wrote some arrangements. I'd ask the bandleader, "Can I write three trumpets with these voicings?" And he'd say, "No, that's too high." And I would write ridiculous lines for the saxophone player and he'd say, "I can't play this; it doesn't exist on the instrument!" That's how I learned, until I went to Berklee.

A producer is not a "yes" man.

That's very important.

But a hit is made when

it touches people somehow.

I've read that you "sbunned" rock 'n' roll until you had your first hit with the Young Rascals.

[Laughs] Yes, jazz went to the back burner when that happened. But, no, I didn't shun rock 'n' roll. When I joined Atlantic Records, I had, in my knowledge, all those sophisticated jazz chords, those avant-garde voicings—things like that. And when I was told to write horn arrangements for someone like Wilson Pickett, I knew I couldn't use them. I had to go to the basics and use certain lines and harmonies that were simpler. It wasn't so much that I was putting rock 'n' roll down, I had to learn another language!

It was at Atlantic where you hooked up with Tom Dowd.



Aretha Franklin, Donny Hathaway and Mardin in session

Tom was my mentor and my contact with technology. He could mix a record on the spot into a perfect mono mix. He was also a genius with the 8-track.

What are some of the things you learned from him?

Tom had an aesthetic about mixing, especially in the R&B tradition. He definitely had a mix style: proportions, balance and how the bass and kick drum would almost dominate the mix. The bass, kick drum and vocal would hit zero on the VU meter. Those three elements would be the same and the others would fall in musically as taste would require.

He wouldn't mix a beautiful pop string date like that, of course. But for R&B, it was a certain bottom-heavy mix that percolated with the kick and bass and backbeat. The vocals were a little inside, but he would never lose a lyric.

Also, Tom was a can-do person and amazing with technology. We were working one day on an Aretha Franklin album cut. Somehow, we pressed the wrong button and erased eight bars. Aretha was in the building, so we asked her, "Can you redo these eight bars?" She said, "I already did it!" And she went home. What she meant was it was on the previous take. But there was no click track and the song had been played by humans! Every bar had a wonderful, elastic, natural flow to it. The vocal [on the other take] definitely did not match the tempo of the track that we'd erased. So Tommy, who'd recorded on 8-track, re-recorded the vocal to a mono tape. He worked on the syllables, edited the pauses and, finally, he flew it into those eight bars so it fit like a glove. Today, we have time compression

and sampling; he did it with a razor blade and his ears. I watched him, and I thought, "There is no stopping this man."

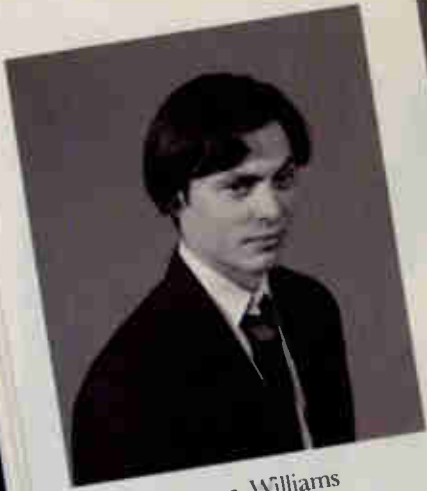
Eventually, you mixed a lot of records yourself.

I learned from Tom and from mixing all sorts of different things, like live recordings. We sometimes had to cheat a little bit: Say there wasn't applause and we had to take it from somewhere. We did what we do today, but by lining up tape recorders and using loops—things like that. So I learned what technology could do. Don't ask me what model number a certain device is, but I know what can be done! I tell my engineer, "Hey, that gray box or the blue box? Let's compress this, let's do that." I know exactly what has to be done, but I don't attempt to memorize all model names.

What was it like to be a house producer?

Here's how it worked. Jerry Wexler was one of the founders of Atlantic. At first, Tommy and I were his helpers. Then, Jerry made us co-producers and we became a team, like on the famous *Dusty* [Springfield] in *Memphis* album. Jerry was senior producer, selecting the songs. One of my assignments was arranging with the musicians, which was fabulous because we had wonderful musicians. The guitar player would play something great and that would become a hook. It was, "Please play it again eight bars later." Working with them was like supervising the making of the soup.

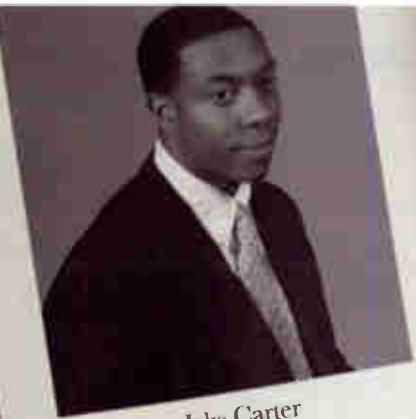
I experienced that again in 2001 and 2003 with Norah Jones, where four or five wonderful musicians played grooves and we got the songs together. It was a great feel, like going back to the '60s and '70s. *There was more of that element then, of*



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everyone having to perform their best quickly.

Exactly. The clock was ticking and we had to do it all in a very efficient way. In the big cities—L.A., New York City, Miami—you had an A team of extremely capable musicians. At Atlantic, you're talking about people like Bernard Purdie, Cornell Dupree on guitar, Chuck Rainey and Gerald Jemott on bass. We had an A team of three or four musicians for every instrument.

How do you think that compares to recording today?

Well, it's very interesting today. A guitar player in New Jersey can send by computer his part to the producer's home studio. I don't think live music is dead; it's just being recorded a different way.

You have songwriter/producers who are extremely powerful because they make sure that their song is represented properly and the lyrics are heard. You have wonderful engineer/producers like Hugh Padgham and Tommy, although Tommy was also very musical; he played bass, although he never boasted about it. And you also have musical arranger/producers like me. But my kind of producing, with musicians in the studio, I don't think exists much anymore.



PHOTO: COURTESY ARF MARDIN

Dizzy Gillespie, who inspired Mardin back in the '50s in Istanbul, with Mardin and Chaka Khan

Can you describe your style of working with artists?

At Berklee, I had a wonderful teacher, Herb Pomeroy, who used to joke and kid around in rehearsal with the big band musicians. Then he would get 200 percent out of them. So I learned to create a wonderful

atmosphere, seemingly very relaxed, but actually, you kept things moving.

In a way, you are also performing.

Yes, it's a little like being an impresario, acting in the middle of it all.

What was a typical session with Aretha like back then?

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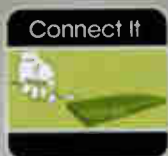
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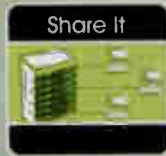
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First, Jerry Wexler and Aretha would agree on a song. Aretha played the piano and she would always come in totally prepared. The musicians would be there, and she'd start playing the song. Tommy and Wexler would be in the control room. I'd be in the studio with manuscript paper, and we'd start looking at her hands and what kind of voicings she was using or what kind of bass line that the bass player could benefit from imitating or copying. While she played the groove, the musicians would look and make notes: "Oh, we have to use a little stop here; I can double her in bar 5." Things like that.

Then they would play and she would sing live with some isolation between the piano and the voice mic. It wasn't enough [isolation], but still, she would sing live because that's what the song was about.

Then we'd get directions from the control room: The intro should be four bars instead of eight, et cetera. The suggestions would come flying and I'd be trying to write down the chord changes and conducting—say if there was a ritard at the end or something like that.

After the take was done, Aretha would maybe do another vocal or two. Even

though she's the "natural woman," she doesn't mind technology. She'd say, "Use my first verse from take 2." After all, she's a genius and she sang it!

You recently did a song with Aretha in quite a different way.

Yes. We were working on "House Is Not a Home" for a Luther Vandross tribute record. She was in Detroit and I was in a New York studio. We did it on EDnet and it was wonderful. I also did that a few years ago with Barbra Streisand listening in her California home to our mixes at Right Track in New York. She'd say, "I'd like to sing the third line in yesterday's mix again." We had instant recall on a digital board and—boom—we did it. It was fantastic.

Do you think you have a particular affinity for working with women artists?

[Laughs] That's what my wife asks! Maybe I put them at ease because I'm not a male chauvinist. There are some producers who will say, "What does that girl know? C'mon, do as I tell you!" But you can't do that with these wonderful singers. You'll get killed!

How did you come to work with Norah?

That's my retirement joke. After I had retired from Atlantic in 2001, Bruce Lundvall called me and said, "We have this wonderful singer. She made an album, but I think they went away from the original feeling of the piano-oriented demos," which he loved. What they'd recorded was more guitar-oriented and he wanted the original feel. I agreed. I loved the way she was singing and playing the piano, and the songs were wonderful. So I started to work with Norah.

She seems to be a strong-minded person. Did you ever argue with her about things?

My job is to alert the artist if I think it can be better or if the project is going in the wrong direction. With Norah, the project [when we started working] was not going in the wrong direction. Of course, I had ideas and I've been known to add string sections and horn sections, vocal groups and things like that to my productions. But working with Norah, it was an exercise in restraint.

I would say, "Can we add some strings to this song?" And she would say, "Only one violin, Arif." It was a give and take. When there was something that I thought wasn't right, I would say so. She would either agree or we would come to terms.

With Norah, at the beginning, we had a meeting and I told her, "You are the boss; I work for you. I bring in ideas; we talk about them. That's all." When our journey started, we had this understanding. I'm not a producer who puts his stamp on the sound. She doesn't want synthesizers, but



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Arif with son Joe at Euphoria rehearsal studios, 2003, getting ready for Melissa Erico shows

an organ would be fine. She doesn't want a big string section, but a duo or string quartet—maybe.

How do you express your opinion without being threatening?

Here's an example. On "Come Away With Me," the lyrics suggest that she is going away on a bus, her face pressed to the window and she is sad. So I said, "You know, I can feel this, almost like in a film. There's an Arizona desert here, with the horizon a straight line and telephone poles along a lonely road. How about this organ part that has common notes going through all the chords in the chorus? When we hold this note, it will be like picturing the lonely horizon."

How could she say "no" to that? So the trick is in how you present an idea.

Well, it wasn't a do-or-die situation; it was an idea. The song would still have been good without it. But she liked it. And I do love to play the film director. Maybe I should have been one!

Do you often explain things visually?

I love to do that. I learned so much about that from Bette Midler. She's a wonderful actress and a wonderful singer. When she did a song, she would explore at least three different voices or characters. "Should I be this person? Am I happy here? Am I wistful?" Then she'd decide on the character and sing the song like that person. It's a wonderful dramatic exercise. The same way I went to Aretha's school of gospel and soul, I went to visual drama school with Bette. So now I often talk about horizons and things like that. I probably drive people crazy!

It has been your job to create hits.

Yes, and I need to fulfill that job. A producer is not a "yes" man. That's very important. But a hit is made when it touches people somehow. In the case of Norah's first album,

when we were done, we knew it was musically wonderful. But we wondered how we could compete with the teen-oriented radio music that was dominating. And we decided, "Well, this is wonderful music. Maybe the second record will be more commercial." But we were wrong. It was picked up by radio, then the TV morning shows, then the big TV shows. All of a sudden, it became an avalanche because it appealed to people.

With "Wind Beneath My Wings," we got Grammys. But for me, the most important thing was we received a lot of letters. "My mother has cancer, she heard this song and it gave her solace." "My wife and I are getting divorced; we heard the song and decided to give it another try." Letters like that; it was fantastic. It touched people.

Are you optimistic about the future of pop music? Do you think if great music is put out there for the public, they will buy it?

Yes, because a good song is always a good song, and there are great singers and they are listened to. I do wish we had more real song interpreters. I heard Beyoncé at two Grammy Awards telecasts. She sang beautifully! Here's a woman with a great voice, great interpretive skills. Artists like her are making hits, so I'm in no position to advise. But with the pop framework she's in, the songs aren't that challenging.

But I don't want to talk about "today's" music. To me, what's important is to give yourself to a project and to try to do your best. You have to give 200 percent of yourself to get 200 percent from the artist.

I know you'd like to tell us a little about your latest release, Raul Midón's State of Mind, which you co-produced with your son Joe.

We co-produced, but Joe was actually the architect on this project, shaping sounds and choosing songs. We added very little: a bass when needed, a guest soloist like Stevie Wonder.

Raul was signed to Manhattan Records on the sheer strength of his artistry. It's a bit of a parallel to Norah. Bruce Lundvall signed her, saying, "This is great. I don't care what anyone says, I'm going to sign her," because of her musical merit.

The same thing happened when we saw Raul play live. We were mesmerized. Then he came to our office and played a little bit. I told him to stop and left the room. He thought I didn't like it, but I was out getting all the department heads. And we signed him. We weren't thinking about a segment of pop radio; we didn't care. So, we will see. The album is getting incredible reviews and national TV exposure; hopefully, we will be proven right!

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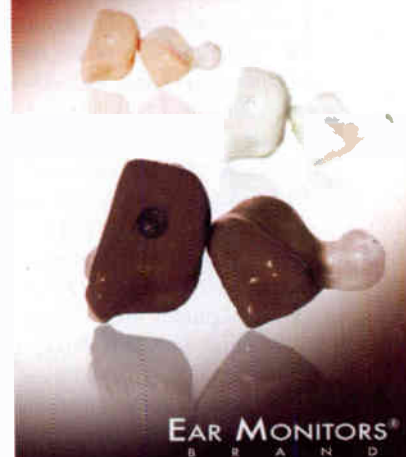
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Andy Wallace

Talking Tech With the Mixer Who Defined '90s Rock

Driving up to Andy Wallace's farmhouse, nestled on 200 acres in northwestern New Jersey, one gets the sense of a man who is at peace with himself. Had a tractor been parked in front of his barn instead of a black and silver 1930 Rolls Royce Phantom II, I might have guessed I was at a country farmer's home rather than at the refuge of one of the hottest mixers in the music business.

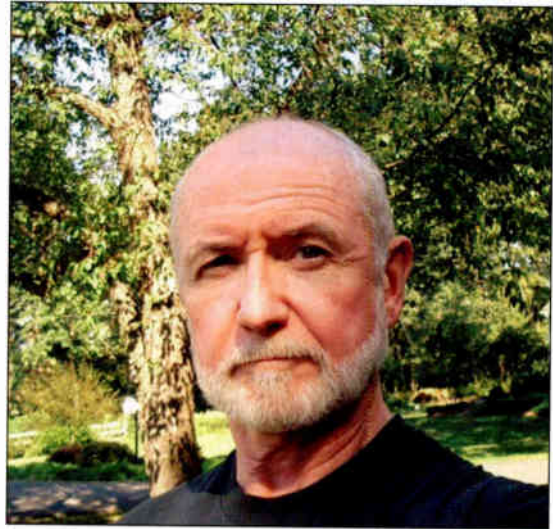
From fashioning his own humble garage studio in Cresskill, N.J., to founding Hit City West recording studios in Los Angeles, through his involvement with seminal recordings such as the Run-DMC/Aerosmith hit, "Walk This Way," and one of the defining albums of the '90s, Nirvana's *Nevermind*, Wallace's career has been a success story. More than 80 million albums have been sold with Wallace's mix credit on them, and since his breakthrough with the Nirvana album back in 1991 and the subsequent shift away from the "big rock" sound of the '80s, his synthesis of danceable drums and in-your-face guitars has taken rock well into the 21st century. The Beastie Boys' *Licensed to Ill*, Linkin Park's *Hybrid Theory*, System of a Down's *Toxicity*, the Grammy Award-winning Velvet Revolver album, *Contraband*, Puddle of Mudd, Limp Bizkit, Rage Against the Machine—these and dozens of others have kept us all accelerating along life's highway with radios blasting.

As a producer, he has helmed albums by the likes of Jeff Buckley (*Grace*), Bad Religion, Faith No More and Phish, among others. For the past three years, however, he has put his production ambitions on hold to satisfy demand for his mixing talents. It was precisely because of his

busy schedule and because he and I share Advanced Alternative Media for management that Wallace and Universal Records entrusted me with the surround sound versions of his mixes on the new 3 Doors Down album, *Seventeen Days*. Sitting behind recalls of his work in Studio G at Soundtrack Studios New York, I was provided with a unique opportunity to get a bird's-eye view of some of Wallace's

personal mix techniques. Graciously, he has acceded to my request to share some of them.

You use very little outboard gear: A few digital chambers, a symphonic effect more or less on the bass, a couple of delays, but, by and large, you stay with the compression and gating on the SSL. Is this for ease of recall or because



you prefer the SSL sound as compared with older equipment like Pultec or UREI?

It's a little of both. The primary concern is not so much ease of recall, although that's definitely a good benefit, but I like the way the SSL compressors sound and, for the most part, I'm happy with the gates. I have been known to patch in Drawmer gates from time to time, just because I can fine-tune them better and they have nice ducking abilities and that sort of thing. But for the most part, I'm happy with the onboard compressors. I don't really know if I would say that I prefer them to the old gear, but I guess I don't prefer the old gear enough to warrant fiddling around with it.

That's fair enough.

I do a lot of riding anyway, so I'm not relying on the compressor solely for level control. It's usually more for the sound, and the SSL compressors are pretty aggressive-sounding. One exception to that is that I used to like to use the old LA-2As for vocals. When I was recording, I would almost always use them.

There is a unifying, overriding personality about your sound that says "Andy Wallace." Part of it is the very present, crisp drum sound; part of it is that the guitars are brutal and outrageous; and part of it is a dynamic sense that comes from your own musicality. Do you do your drum rides first?

Not generally. I listen to the song and try to get a feel for it. If it's a rock song that has a section that's really rockin', I'll sometimes go to that first and just work on that section, getting the band to really kick ass. I'll do that just to kind of make sure that that's my level. Then I'll work it down and build up from there, but that's the place that's really got to be rockin'. And that's usually where I find out how hard I



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want to hit the quad compressor.

Which I've noticed you consistently set at 4:1 on automatic release.

Pretty much.

And you usually leave the makeup gain at unity?

To my ears, the gain makeup sounds like a noisy amplifier. I suppose it's paranoia, but I figure I can achieve the same end by how hard I hit the compressor. As long as I can get a reasonable output, which I can, I'll usually only use seven groups to put everything on and then I assign all those groups to group number eight, which serves as kind of a universal pre/quad compressor trim. So I can adjust how hard I can hit the compressor by moving that without having to adjust the makeup gain.

From watching you in past years up at Bearsville, I was under the impression that you ran your compression between -2.5 and -4 at 4:1. I was surprised to see it running between -4 and -6 on the 3 Doors Down Seventeen Days album. That's pretty slammed in there. How would you advise a young kid mixing today to handle stereo compression without ending up with a tiny mix? It's a trick.

Yeah, it is. I don't really know. I mix through the compressor right from the beginning—maybe not the very beginning, but while I'm still working on that loud section.

Do you begin by defining the size of your bottom end?

Yeah, and *everything*. Defining the impact. And I usually do it pretty fast. Usually, when I'm working on a mix after I've gone through and done my little road map and decided, "I'm going to work on this part of the song," within about 15 or 20 minutes, I've got the basic energy slamming the way I want it to sound or pretty close. Then I'll just keep going over and trying to find out how loud I can have this guitar and have it still feel right or how quiet.

And all your records seem to have a really ballsy kick drum that's never defeated by the compression.

I like to have the kick drum really in there. I guess it's from the old club record days. And, for the most part, it seems to work. Every once in a while, I'll say, "Okay, maybe it's more appropriate to tuck this one in a little bit." I don't like super-bright kick drums. My kick drums usually have a good snap on them, but not that little typewriter thing.

I believe that dynamics are really, really important. Most mixes I hear that are unexciting to me, that's usually one of the faults. Things just are too mashed together, which passes as kind of a sound at times, but to me just sounds uninteresting. It's kind of like

watching a movie that's out of focus.

I noticed that you ride the overhead tracks of the drum kit up in the choruses. Having seen it, I've listened for it and can hear it in other albums that you've done, so it's obviously a dynamic thing that you bring to all your mixes. When did you start doing that? I mean, did you just find that you were burying the cymbals with guitars?

Well, first of all, I ride them a lot of times because sometimes a cymbal won't be as loud as another cymbal or something. So there's that. But also, in a greater sense—and I think that this is what you're referring to—every cymbal crash will be ridden up maybe 5 or more dB.

Sometimes I will feel that I'm hearing more ambient stuff in the overheads than I want to hear in the mix. So when I get that loud section rocking the way I want, I'll end up with the overheads balanced where I want to hear the ambience and sometimes the cymbals simply won't be loud enough to have the impact that I want.

Speaking of ambience, there's another interesting difference between you and other mixers. You use samples in virtually all of your mixes, but unlike other mixers who use samples either to replace a drum or to repair a deficiency in a drum sound, you tend to use your samples as drives to ambience.

Right. Exactly.

I find that very interesting. On the Seven-

teen Days album, you only used a snare sample, but I'm told that you also used a kick sample.

I have a similar thing I do with kick drum, sometimes.

But just to drive ambience? Then do you design the drum sound to fit into that ambience?

No, not exactly. I use the samples more to drive reverbs. If you killed the reverb, you'd still hear the sample. And the thing I like is that I can EQ them so that I can really tune the ambience and where it sits in the whole frequency response.

Again, more so than I can with the overheads because I usually EQ those so that the cymbals sound the way I want them to sound. Not always, but often, when the cymbals are sitting where I want them to sit, I'll hear more ambience from that. I'd rather keep that down and be able to shade with a little more control using my ambient sample.

And just ride the cymbals for the actual bits?

Right. And then after I end up getting the guitars happening, the vocals in and everything, I'll find that the cymbals to be effective need to be a little louder. But, as I said, I don't like to flood the drum sound with too much ambience. It depends on the nature of the song, but especially if it's a dense song with a lot going on in it as

Selected Discography

P = producer; E = engineer; M = mixer

A Perfect Circle: *Emotive* (M, 2004), *Thirteenth Step* (M, 2003)

Bad Religion: *21st Century Digital Boy* (P, 1995), *Stranger Than Fiction* (P/M, 1994)

Jeff Buckley: *Grace EPs* (P/E/M, 2002), *Sketches for My Sweetheart the Drunk* (M, 1998), *Grace* (P/E/M, 1994)

Sheryl Crow: *C'mon, C'mon* (M, 2002)

Disturbed: *Believe* (M, 2002), *Sickness* (M, 2000)

Everclear: *So Much for the Afterglow* (M, 1997)

Limp Bizkit: *Chocolate Starfish and the Hotdog Flavored Water* (M, 2000), *Counterfeit Countdown* (M, 1999)

Courtney Love: *America's Sweetheart* (M, 2004)

Nirvana: *Nirvana* (M, 2002), *From the Muddy Banks of the Wishkah* (E/M, 1996), *Nevermind* (M, 1991)

Puddle of Mudd: *Come Clean* (M, 2001)

Sonic Youth: *Dirty* (E/M, 1992)

Soul Asylum: *Grave Dancer's Union* (M, 1992)

3 Doors Down: *Seventeen Days* (M, 2005)

Velvet Revolver: *Contraband* (M, 2004)

The Wallflowers: *Bringing Down the Horse* (M, 1996)

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opposed to an old Led Zeppelin thing with one guitar and bass and drums for miles. You can get away with a lot more interesting ambience with that kind of a thing. But there are not that many records out there that are that sparse.

The Jeff Buckley album Grace is, by my reckoning, a masterpiece, yet you no longer produce. Why?

Well, I never made a conscious decision to stop producing. And I like producing a lot. I kind of like doing both producing and mixing, but in a production, you're really working from the ground up. That was my whole initial drive in the first place.

So it's not something you've given up permanently. It's just that you've focused more on mixing these past three years.

It came about in a funny way. I had an opportunity to produce two albums that I really wanted to do. One was the Phish *The Story of the Ghost* album and the other was Skunk Anansie's *Post Orgasmic Chill*. And I thoroughly enjoyed doing both albums and had a great time up at Bearsville. But the problem was that the [albums] came back-to-back. I can't remember if I mixed an album in-between them or not, but in any event, I was out of the mix game for about six months. Right about

that time, I was getting a lot of good mix work and I was on a roll, so to speak, with A-level projects mixing. And I do like mixing, so it was certainly to my advantage to keep that ball rolling. I lost a lot of momentum over that six months when I was out of the game,

I like to have the kick drum really in there. I guess it's from the old club record days. I don't like super-bright kick drums. My kick drums usually have a good snap on them, but not that little typewriter thing.

so we—we meaning Andy [Kipnes] and Mark [Beaven of Advanced Alternative Media] and I—kind of put our heads together to regain that ground. They really helped get the ball

rolling in the right direction and helped mend a few bridges.

You mentioned Bearsville as the studio you used for productions. You mix on an SSL G Series. Do you prefer the Neve for recording? I tend to like old, non-automated consoles for recording. I'm pretty open-minded. I can just move pretty quickly on a console like that without a lot of frou-frou.

You and I started before the days of Pro Tools. When did you first start using Pro Tools?

The first time I used it—and probably the last time I used it without having an operator—was when I did the Blind Melon *Soup* album. I did vocal comps. Somewhere in the middle of it, we had to clear out of Daniel Lanois' studio, Kingsway, for about four or five days. So I took that opportunity to go to another little studio down there [in New Orleans] to do vocal comps.

Did you enjoy that?

I found it fascinating. It's always kind of cool to learn something new, and it certainly did give me the opportunity to do a little more precise editing, although I had a very rich bag of tricks for editing analog tape. Not just editing and cutting tape, but bouncing and moving things around and shifting guitars ahead—as well as back—30 milliseconds

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and this type of thing. And not just the whole track, but even certain sections or just one little bar. I did that for years.

The Pro Tools thing is a mixed blessing. The younger guys who have never had to cut tape or edit by bouncing on analog have a different perspective and are more easily caught up in over-editing. Not so much to the detriment of the material, although that can certainly happen, but just taking up too much time. Editing stuff to a degree that doesn't matter. You're never going to hear it.

With the advent of HD 96k recording, do you think that the difference between analog and digital has become minimal enough as to make analog tape superfluous?

Probably. I mean, I realize that analog tape has a certain tape compression that I've relied upon in a lot of productions, but I don't think that that's the be-all, end-all. The first thing I liked about digital was the absence of hiss. When I first discovered noise gates. I thought, "God has smiled on me," because I really, really like to get rid of noise and you're so far ahead of the game in digital without having that hiss.

And then, being able to edit—as I've said, as long as you don't get caught up in it and lose sight of what you really need to accomplish—it's wonderful. Even with the 3348, being able to bounce drums in and not have a hole every time you punched in—things like that were great. Not that I'm the world's greatest critic of fidelity in recording anyway, 'cause I always operated with whatever I had and did whatever I had to do to make it sound as good as I could get it to sound. But I have to say that the new manifestation of Pro Tools really sounds pretty good.

To get back to the recall of your work on the Seventeen Days album, I was fascinated to see how you constructed your delay reverb. You pan your delay on the vocal slightly off to one side and then make up the difference on the other side with reverb return. Then you crack the pan on the vocal just off detent to open up the middle of the record.

Yeah. I do a lot of little things like that where I don't put things down the middle. Just moving them a little bit sometimes seems to open [the mix] up, which is one of the reasons I like to use the symphonic [effect]. Not so much as, "Dig the flange on that bass," because I kind of prefer that nobody even knows it's there. Sometimes it gives it a growl, which is kind of cool. But a lot of times, I use that just to open things up a little bit so that everything is not kick, snare, bass right down the middle. Not that there's anything wrong with that, but sometimes it feels sonically a little more interesting to me.

You are among the most in-demand mix-

ers in the music business today. To a large extent, radio has changed to accommodate the sound of what you do. Your mixes sound completely different than mixes sounded, say, 15 years ago. Do you mix for radio or primarily for the sound of the CD, or a combination of both?

It's a combination of both. Primarily, I mix so that the thing sounds good to me, which I guess translates to how the CD sounds. But I grew up with radio and I guess I kind of like the way mixes sound on the radio with that compression, which is why I probably have gotten a little more aggressive with it over the years. Years ago—10 years ago—I probably rarely drove the SSL compressor beyond that -4 mark. But I found that occasionally I'd

Not that I'm the world's greatest critic of fidelity in recording anyway, 'cause I always operated with whatever I had and did whatever I had to do to make it sound as good as I could get it to sound.

get things hitting harder without even realizing it. I'd say, "Oh gee, I'm getting 8 dB of compression here," and I'd say, "I better back this thing down." But when I backed it down, I didn't like it as much. It was rockin' that way.

A long time ago, I learned that the great amount of compression in radio broadcasts was seriously changing how the low end [of my mixes] sounded and the balance: how much low end was there, how much of the bass I could hear and other things. That's when I really started experimenting with a substantial amount of stereo compression. And I found that if I had something compressed ahead of time and was happy with the sound of it, the additional compression from the radio station had less effect. So I sort of felt that I was doing damage control, as well as the fact that I liked the sound.

I found that I was automatically compensating by bringing up the bass in my balance, and I don't know if this bears out in reality, but it seemed it was true that the mixes I compressed more aggressively and then compensated for in the process of doing the mix held up better with additional radio compression.

Soundtrack New York has designated Studio G as the "Andy Wallace" room. How important is it to you to have a regular home base in which to do your mixes?

It is nice to have a room you're familiar with. Not just sonically, but you know what's

where and you're physically comfortable in the room. For years [it's closed now], I used to mix in L.A. at Enterprise Studio E.

I asked you a long time ago what project you felt was the biggest turning point in your career and you mentioned Nevermind by Nirvana.

Sure. That has to be about the biggest.

What is one of the most satisfying moments for you in a recording studio?

As far as my career of producing and mixing records, it's really hard to say, but working on Jeff Buckley's [Grace] album was phenomenally satisfying. It was aggravating at times because Jeff could be very hard. Not that he was an aggravating person, because he wasn't and I got along really well with him,

but he could be very scattered at times and difficult to reel in. Anytime you're working with an intense artist like that you're going to have frustrating moments.

You got such personality out of his vocal performances. I remember coming up to Bearsville and doing a project in Studio A while you were in B. I don't know if it was the Jeff Buckley project, but you had speakers set up and the artist wasn't using headphones because you felt he performed better without them. How important is the ambience that you set up for an artist to perform in?

Well, it's pretty important. I never had any formula as to how I would get an artist in what I felt was the right state of mind to do a recording, but a lot of it is creating a certain personal trust: They're in good hands and that an intelligent person is listening to what they have to say and maybe not agreeing, but at least not missing the point.

Working with Jeff was extremely satisfying in the sense that you really felt that you were working with a uniquely gifted artist. Had he lived, I think he would have been one of the very great artists like Bob Dylan or Paul Simon. It was gratifying to be able to capture that and be a part of the inspiration of making it happen.

What has been your most difficult moment in a recording studio?

It's difficult for me when I have a mix that I know is sounding good and the artist and the producer, or whoever is appropriate,

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starts getting too involved in little things that really don't make a big difference; they're not making a better mix out of it, they're just changing things. I don't mind that to a point, but if it gets almost endless—you know, where they just can't let go and need to keep changing things—then I feel like I'm just doing damage control, trying to keep the thing from eroding. Sometimes that'll happen. They'll ask me, "What do you think?" and I'll say, "I liked the way it was when I played it for you; otherwise, I wouldn't have played it." Is it possible to make some changes to it without my hating it? Sure. Are any of the

changes you're making, in my estimation, making it any better? No. And, collectively, when you keep doing it, sooner or later we're going to get past where we are. So that's always difficult when I get into a situation like that where it's getting overboard.

The mix is degrading.

Yeah, and then I really can't just pop back into it and repair it all. I mean, I can repair it all by recalling settings and such, but as far as the mind thing, I'm out of it.

I've also had a kind of a thing where it's sort of like breaking up with a girlfriend or something like that—where, after get-

ting into a thing for a couple of mixes, you realize that you're not the right guy for the job and that you're not giving them what they want. I may not agree with what they want, but it's their record. Usually, it's something where they want it to sound real garage-y or super-muddy. I can certainly get something to sound garage-y, but I can still make it have definition and such. That's just a matter of ambience. That's not a matter of clarity, you know? But that's happened a few times. It's usually mutually felt by all of us that we're not nailing it.

Aside from the change in compression you mentioned, have you made a conscious effort during the years to change what you do to change with the times?

I don't really have any particular approach toward what I'm doing, either in terms of changing with the times or really even toward the style of music. I pretty much go into it with the same head, whether I'm doing Sepultura or Jeff Buckley or Sinéad O'Connor or whatever.

Did you have any idea that Linkin Park was going to be as big an album as it was when you were mixing it?

No. And I would say the same thing holds true for *Nevermind*. We knew we liked it as an album. We knew that it was a particularly strong record. But given that there was no track record for that kind of music on a major label and you only had indie sales to go by, 50,000 looked good!

And so we all thought, "Wow. Maybe it'll go Gold." In fact, I remember I recorded the band live at the Paramount Theater in Seattle on Halloween, and we'd just gotten word that night that the album had gone Gold, and we were all like, "Yeah!"—totally naive to the fact that it had gone Gold in about three days. So this indicated something was up. But you never know. Because when a record sells multi-millions, it's a combination of so many different things that led to it.

Luck and timing.

Yeah. And, of course, a good record is a big part of it, but no one can hear a record and say, "Oh, that's going to sell 15 million."

Last question: Who would you most appreciate having an opportunity to work with, if given the chance, of all the artists you've never worked with?

The Beatles. ■

Michael Barbiero is a noted producer/engineer/mixer with credits on a slew of albums by top artists, including Ziggy Marley, Metallica, Guns N' Roses, Gov't Mule, Maroon 5, Counting Crows, Blues Traveler and so many others.

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World Radio History

Magneto Studios

A Guitarist's Hobby Takes a Serious Turn

Take the irresistible attraction to indulge your whims in the recording studio and throw in the ghost of a rock guitar icon, and you have the spirit of Magneto Studios (Greenwich, Conn.). Founded by owner Mark Cattano just up the road from New York City, Magneto shows what can happen when a professional musician gets a little taste of audio engineering.

A guitar-wielding veteran of metal acts and a solo project that enjoyed regional success in the 1990s, Cattano was increasingly impressed by the results that his colleagues were getting from their living room setups. "A light bulb went over my head, so I ended up getting one of those Boss BR1180 hard disk recorders," Cattano explains. "I got a cheap pair of monitors, plugged my guitar in and you know what happens after that! You get a titanium laptop, better monitors, a MOTU, and it's been this money hole ever since."

Fast-forward to 2005, when Cattano's move from New York City to a former guest cottage in more family-friendly Connecticut took him out of his living room and into a larger basement space—perfect for a fully functioning personal studio. While Cattano readily admits that the L-shaped room lacks the classic trappings of an acoustically ideal space, careful attention to the signal path brought extremely satisfying results for recording drums, guitars, vocals and more. "The front end is where I really shined," Cattano confirms of the setup. "The last two records I did were mixed and recorded on an old Neve console, so I got it in my craw that I wanted some Neve modules, which are super-expensive. Fortunately, now we've got these Neve-alikes, and I ended up getting four channels of Vintech X73i, which is their less-expensive 1073 reproduction. It sounded just like going through my friend's board, except none of the pots were scratchy! It had the same Neve midrange fuzz that my ears have grown to love.

"That's my mic pre/EQ front end for tracking drums. All I'm doing is sticking an AKG D112 on the bass drum, Shure SM57 on the top of the snare and taking two KSM 44s on the overheads," he continues. "They go through my four mic pre's, and the drums sound phenomenal."

At the computer, Cattano experienced audio interface issues running Logic 7 on his Mac G5 until someone tipped him off about the RME Audio Hammerfall DSP Multiface interface for eight channels of analog I/O and sweet stability. "I'm all analog—I don't have any MIDI stuff in my rig," he says. "I'm a rock 'n' roller. If I'm just recording drums, guitar, bass and vocals, all the guys I



Mark Cattano and his Bob Quine collection at Magneto Studios

play with can play. We lay down a track live, and I use Logic like a tape deck: I press Play, Record and Stop."

One man who probably would have been happy to hear about Cattano's philosophy is the late Bob Quine, an uncompromising guitar innovator who made his mark playing with such artists as Richard Hell & The Voidoids, Lou Reed, Brian Eno, John Zorn and Matthew Sweet. Cattano and Quine first met at one of New York City's main hubs for six-stringers, Carmine Street Guitars, and built a friendship that lasted until Quine, stuck in a deep depression after his wife's untimely death in 2003, tragically took his own life in May 2004. In addition to an impressive musical legacy, Quine also left behind an astounding collection of gear: approximately 250 guitars and basses, 50 amps, 300 effects boxes and much more.

To Cattano's amazement, the collection's caretakers informed him earlier this year that he would be given priority access to this gear to purchase. "Bob was such an amazing player, and he really did influence a lot of serious cats," Cattano recalls. "If you were talking gear with him and mentioned a classic guitar or amp you liked, he'd invariably say he had one, and he did." With his choice of the Quine collection in front of him, Cattano selected such niceties as a Korg DD1000 digital delay, a 1985 Roland SRV2000 digital reverb, Trace Elliot Velocette Class-A guitar amp, 1982 Fender Twin Reverb II amp, Peavey Combo 300 bass amp and a dozen different pedals.

The result is an extra touch of magic for Magneto Studios. "I can't tell you what a difference it's made having some of Bob Quine's equipment here," Cattano reflects. "He was a heavyweight. The physical side of that coin comes when you bring home a 1959 Fender Bassman, plug it in, mike it up and play it back. A smile definitely comes across your face." ■

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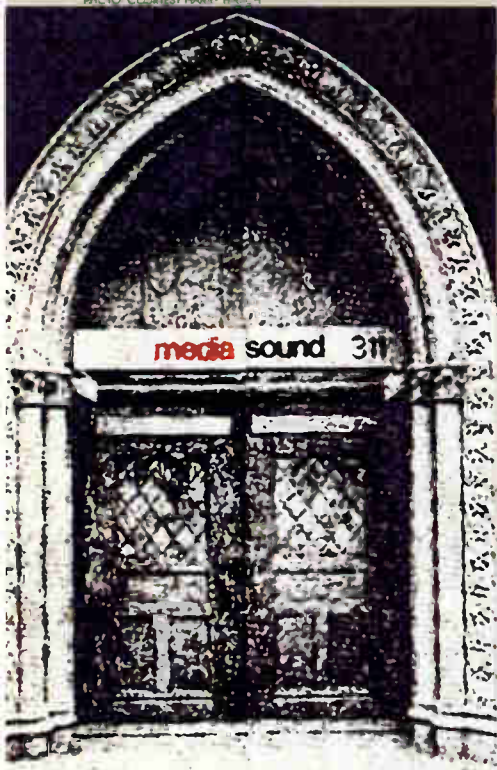
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Mediasound

Studios

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The fabled entrance to the Studio of the '70s

PHOTO: H. WARD ERIAN



The live room, home to the hits, with, from left, the late Joe Jorgensen, chief engineer Fred Christie and founder Harry Hirsch

Bob Clearmountain, Godfrey Diamond, Michael Barbiero, Michael Delugg, Harvey Goldberg, Joe Ferla, Jeff Lesser, Alec Head, Bill Stein, Ron Saint Germain, Michael Brauer, Don Wershba, Ed Stasium, Gregg Mann, Carl Beatty, Kol Marshall, Lincoln Clapp, Joe Jorgensen, Alan Varner, Doug Epstein, Liz Saron, Trudy Schroder, Ramona Janquitto, Ron Dante, Charlie Calello, Tony Bongiovi—these are just some of the names that became the nucleus of Mediasound.

In New York City, from the close of the '60s through the birth and death of disco, Mediasound was a hit machine. Founded by Harry Hirsch, with assistance from Bob Walters and financial/business backing from owners Joel Roseman and the late John Roberts, Mediasound opened in June 1969 at 311 West 57th St. in the heart of Manhattan. Once home to the Manhattan Baptist Church, today the site is occupied by Providence (formerly the trendy Le Bar Bat), where you can still see the Gold Records on the wall.

The original idea came out of a random talk between Hirsch and Walters, who then went looking for money. "There were many 4-track studios in New York City," recalls Roseman. "There was room for a state-of-the-art facility, one that could handle any kind of recording, tape copies, mastering—so we decided to change the scope of the idea. We went from the original \$100,000 investment to over \$1 million. It took a very long time to find the space, but Harry Hirsch found the Baptist church on 57th Street."

"I will always be grateful to John Roberts, Joel Roseman and Bob Walters," Hirsch says, "who listened when I told them, 'I found a church from heaven on 57th Street,' and trusted me to design, build and be its first president."

Fred Christie, chief engineer and a sort of father figure to, as he calls it, "all my kids," remembers: "To get the studio in shape, we first had to build up the floor on the main level because it sloped out toward the altar." Roseman adds, "It was a raked floor so that the people in the back of the church could see, but we had to install a huge floor shim to make everything level. Those huge wooden front doors set the tone for the church, and we retained much of that atmosphere throughout, including all the stained glass, especially in Studio A."

Before the walls were even up, word got out that the studio was being built, and Roseman and Roberts were approached

A contemplative Barry Manilow in the live room. Producer Ron Dante: "I brought in my new recording artist Barry Manilow to record his second album—the one that included our first breakthrough million-seller 'Mandy.' Right away we knew that Mediasound was the place to make the best-sounding records in the business."

PHOTO: BOBBY BANK



The friendliest general manager in New York, Suson Ploner. Owner Joel Roseman: "Suson was such a veteran. She could be in the room with anyone and they would always say that she was the most considerate and fair-minded person."

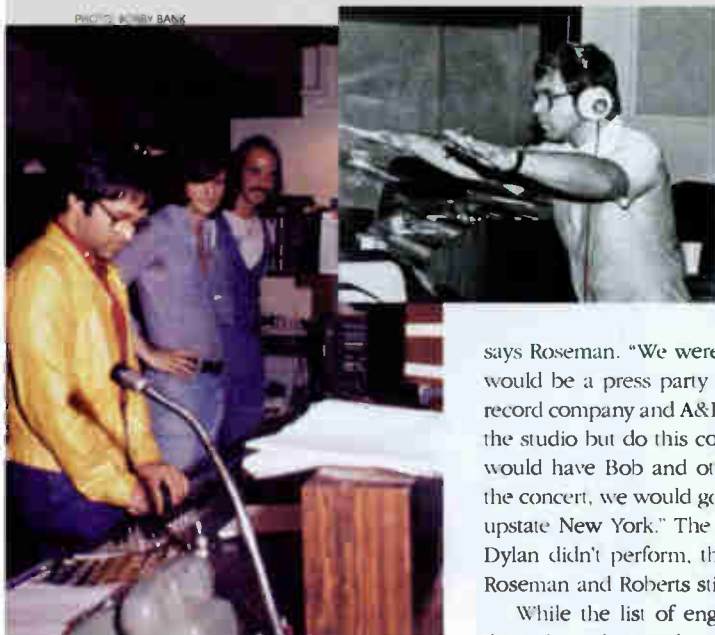
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World Radio History

By Bobby Bank

PHOTO: BOBBY BANK



From left, Charlie Callelo, Bob Clearmountain and Michael Borbiero in Studio A. Inset: Callelo conducting in the former church's live room



Bob Clearmountain (Kool & The Gong, Sister Sledge, Gloria Gaynor and countless others) was handpicked to change the light bulbs 40 feet up in the cathedral ceiling. "I was the only one nuts enough to go up there!" he recalls.

and sporting a beard, just coming off 57th Street wanting to take a look at Studio A.

Of course, the producing and engineering talent went on to other studios and long careers—perhaps most notably, Bongiovi and Walters heading a few blocks away to open the premier 1980s recording studio, Power Station, now known as Avatar.

Still, you can't forget the magic. As Bongiovi recalls, "Mediasound's room was good for musicians. We developed and implemented a few ideas that came from Motown, such as talkback directly into the headphones, switch tracks on and off, switch the echo send on and off or the effects send on and off. We put the four switches in, which was great. But mostly, it was a big church with a very live room—a sound that no one else had."

Elliot Mazer will conduct a presentation of historic New York recording studios on Sunday, October 9, at 1:30 p.m. at the AES Convention.—Eds. ■

about doing a second facility, this one upstate. "We were not sure about the upstate recording studio, but went anyway to check it out,"

says Roseman. "We were told that if the studio was built, there would be a press party with Bob Dylan mingling with all the record company and A&R executives. I said, 'Why don't we skip the studio but do this concert idea that I had with Dylan?' We would have Bob and others perform, and with the profits of the concert, we would go ahead and build the second studio in upstate New York." The "concert," of course, was Woodstock. Dylan didn't perform, the second studio was never built, but Roseman and Roberts still managed to throw quite a party.

While the list of engineer-producers that made their way through Mediasound is impressive enough, the flow of artists and musicians was equally noteworthy. Tony Bongiovi did Gloria Gaynor's "Never Can Say Goodbye" in Studios A and B; Godfrey Diamond engineered Frank Sinatra, with Charlie Callelo and Joe Beck arranging and producing on the Paul Anka tune "Everybody Ought to Be in Love"; Ron Dante brought in Barry Manilow for "Mandy" and Pat Benatar for her second record, the hit *Crimes of Passion*; Michael Brauer got his break with Luther Vandross. Add in Frankie Valli, Nancy Sinatra, Englebert Humperdinck, the Rolling Stones, Ben E. King, Stevie Wonder. Then there were the session players such as Will Lee, Paul Shaffer, Richard Tee, Andy Newmark, Steve Gadd, Rick Marotta and Bob Babbitt of the Funk Brothers.

"Mediasound was a studio that had everything going for it," Babbitt says. "I was able to get great bass sounds, especially from Studio A. It had a sound that no other studio had, complete with stained glass that was kept intact." Studio A became the talk of New York; it was architecturally flamboyant and the scene of many hit sessions. Hank Meyer, booking manager, remembers Mick Jagger wearing a mink coat

PHOTO: BOBBY BANK



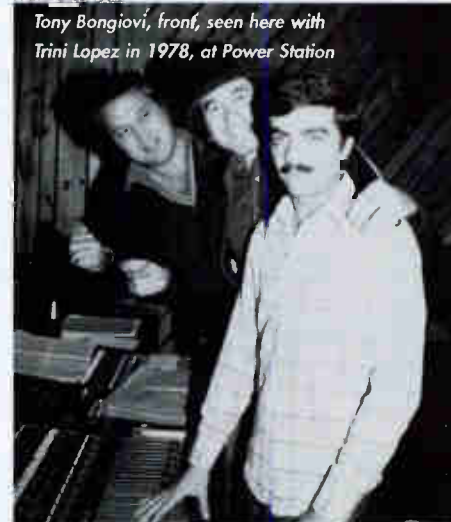
The owners, at Woodstock '94, 25 years after the original: Joel Roseman (L) and the late John Roberts

PHOTO: BOBBY BANK



Producer Ron Dante with Pat Benatar. Dante: "Being in Mediasound always made you feel like you were about to create a hit."

PHOTO: BOBBY BANK



Tony Bongiovi, front, seen here with Trini Lopez in 1978, at Power Station



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Original score by Harry Gregson-Williams

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WHAT'S INSIDE YOUR WORKSTATION?



it's almost too easy to make a record with a workstation. With everything right there on the computer screen, mere mouse clicks let you load up audio, layer effects and edit tracks to perfection. With GUIs carefully crafted to "hide" the technology, it's certainly a far cry from the hands-on analog world. But unlike chaining outboard gear in your patchbay or troubleshooting a faulty switch in a console channel, dealing with a DAW's inner workings can be nebulous, and whether you're a 15-year veteran or just getting started in GarageBand, you can always benefit from digging deeper. "What's Inside Your Workstation?" goes in-depth to demystify fundamental issues ranging from dealing with latency to understanding 64-bit processing—starting with pipelines for moving your audio data into the box—to take your sessions to the next level.

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THE AUDIO PIPELINE

By Jason Scott Alexander

When it comes to audio technology, pros are often so consumed with learning what they need to know for practical purposes—keeping a session moving smoothly—that they never really dig deep and understand the less-tangible aspects of what makes their gear tick. This is even more true with computers, especially in that grayest area of computing: data transfer. We are aware of the many different standards, taking for granted reports that some are better than others in high-performance environments. But truly understanding the various options for moving audio—essentially data—in and out of a DAW is vital to get the most out of a system.

To learn more about what's happening under the hood, we're taking a theoretical look at the ins and outs of today's DAW environment by examining the various data-transfer protocols. Taking a down-the-wire perspective, we'll examine the entire data flow chain—from the back of the A/D converter to the computer to a storage drive and all the way back again to the final D/A stage. (This is not to be confused with front-side or patching protocols such as S/PDIF or AES/EBU digital audio signals, which are not relevant to this article.)

We'll be hitting on terms and protocols in one of two different contexts: as a method of transfer to and from a data storage device and as an audio interface connection protocol. Although there may be many possible routes and handovers in an elaborate DAW setup that comprises many storage devices and audio interfaces, it's important to realize that there are just two types of data transfers: file-based storage and retrieval between drives, and real-time transfer between interfaces. Differentiating between each protocol's benefits, even though some may be used for both purposes, is crucial to designing a system for optimum performance and can lead to better track counts, lowered system overhead and more.

PROTOCOLS AT A GLANCE

Dating back to 1979 and a company called Shugart Associates (presently Seagate in Scotts Valley, Calif.), the Small Computer System Interface, or SCSI, is the oldest and most evolved data drive-interfacing protocol still in use. Like the protocols that followed, SCSI went through numerous revisions and performance enhancements. From the original (and now retired) SCSI-1 standard of pushing 5 MB/sec down a "narrow" 8-bit path to the doubled bandwidth and strengthened reliability of SCSI-2 in 1985, 20MB/sec SCSI was the only game in town for nearly a decade. In the early 1990s, the announcement of SCSI-3 saw a collection of standards that would spawn three of the most common SCSI revisions seen today: Ultra2-Wide, Ultra160 and Ultra320. Ultra2-Wide, despite its inappropriate name, is a subset of

Moving Crucial Data In and Out of Your DAW

SCSI-3 and operates on a 2-byte-wide data path at a speed of 40 MHz for a maximum bandwidth of 80 MB/sec. Ultra160 uses double-clocking to achieve 160 MB/sec, while Ultra320 doubles the clock rate to 80 MHz for a maximum speed of 320 MB/sec.

Other data drive protocols would come along to give SCSI a run for its money. Parallel ATA, or PATA (also known as IDE), gained its popularity in the late 1980s and early 1990s as an economical drive format for the average PC. However, the original standard was not well-suited to support the growing size and performance needs of a newer breed of hard disks. Several companies jumped at the chance to reinvent ATA with faster transfer rates and enhanced features. Seagate broke out of the gates with Fast ATA and, soon after, Fast ATA-2. Meanwhile, Western Digital developed the Enhanced IDE (EIDE), a somewhat different ATA feature set expansion supporting higher-speed transfer modes, non-hard-disk ATAPI devices (CD-ROM drives, etc.) and dual IDE/ATA channels. Having undergone numerous revisions during the years (including UltraATA), the underlying parallel standard finally reached the limits of its capabilities.

To address these limitations, the new Serial ATA (SATA) interface was developed in 2001. Ridding the 40-pin and 68-pin ribbon cables of a parallel connection, SATA's single-conductor approach greatly reduces electrical noise interference, allowing for much higher clock speeds. Whereas UltraATA/133 (the pinnacle of ATA's development) allows for burst rate data transfers of up to 133 Mbps, SATA starts at 150 Mbps. There are working plans to ramp that speed up to 300 Mbps with a SATA II standard and eventually 600 Mbps in a third generation.

Similarly, Serial Attached SCSI (SAS) moves data in a single stream and does so much faster than parallel technology because it is not tied to a particular clock speed. Serial technology wraps many bits of data into packets and then transfers the packets at a much higher speed than parallel (up to 30 times faster) down the wire to or from the host.

Up to this point, these protocols are only for data drive devices. As the world has moved further into the digital lifestyle, manufacturers looked for ways to connect other data-intensive devices and peripherals to computers.

Enter USB, which promised a way to connect everything from slow and mid-speed peripherals such as keyboards, mice and digital cameras to the PC. In its initial form, USB 1.1, the main attractions were relatively low cost and "hot-pluggability," but its top-end speed of 12 Mbps was far too slow for most multimedia streaming—let alone professional audio—and completely useless for interfacing hard drives. The next major release was revision 2, which included a new optional high-speed mode; in it, USB 2 devices designed to take advantage of the mode could reach a defined maximum of 480 Mbps. For a variety of reasons, USB 2 never really lit up the pro audio environment.

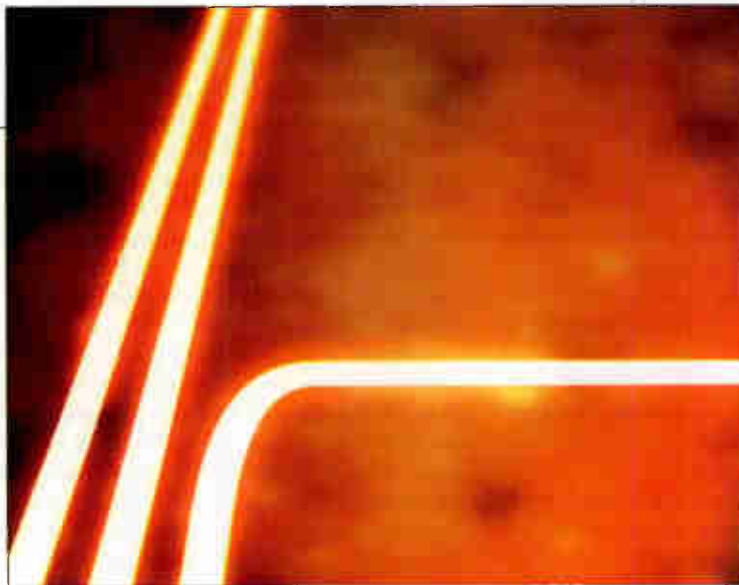
We should humbly admit that our beloved audio industry is probably near the bottom of the pecking order when researchers dream up new networking and data-transfer technologies for the market. We're often left tapping into consumer product technologies, a much more financially rewarding reservoir for frontier technology developers and manufacturers. One of the key technologies fueling this drive has been the serial I/O standard IEEE 1394—also known as FireWire (Apple), iLink (Sony) and DV (digital video; used on video camcorders).

FireWire—where'd we be without it? Posing as the be-all, end-all of our data-transferring needs, it's been hyped to death at the commercial level and heavily adopted by the pro audio community. Nearly a decade ago, FireWire-A (FW-400) hit the spot with a maximum raw data rate of 400 Mbps (50 MB/sec); it was hot-pluggable and dozens of devices could exist in a network. In 2003, FireWire-B (FW-800) hit the streets with blistering data rates set incrementally at 800 Mbps (100 MB/sec) and 1,600 Mbps/1.6 Gbps (200 MB/sec)—with architectural support for a staggering 3,200 Mbps/13.2 Gbps (400 MB/sec) in the future. Not bad for a "consumer" protocol. (For a quick pipeline spec comparison, please see the chart on page 72.)

DRIVE TIME

Drive interfaces are plentiful and finding the best option often puzzles DAW owners. With most computer systems natively supporting ATA/IDE internally and FireWire-A externally, this combo seems to present a predetermined solution—though SATA and SCSI proponents would have you believe that switching out for one of these formats is the way to go.

Due to its low cost per gigabyte, SATA will continue as the prevalent disk interface technology in desktop PCs, sub-entry servers and networked storage systems where cost is



a primary concern. In fact, the industry is replacing parallel ATA with SATA, and many years may pass before we'll get to realize its speed potential. At present, we're unable to fully tap into SATA's top-end speed on a single-drive system as current SATA drive technologies are limited to about 60- to 65MB/sec maximum sustained throughput.

Meanwhile, FireWire is entering its second-generation speed bump, though the 400Mbps FireWire-A remains the de facto standard. The interface's major selling points are convenience and flexibility in network design. With FireWire-A allowing cabling distances up to 4.5 meters in length and FireWire-B supporting distances upward of 100 meters, multiroom facilities can share drives in ways previously not possible in this price range. For the multi-operator facility, all FireWire versions offer support for up to 63 devices to be connected via a single bus, offering peer-to-peer connectivity and enabling multiple computers and FireWire devices to be connected simultaneously.

"One major advantage that FireWire has is an isochronous transfer mode," says Dave Anderson, Seagate's director of strategic planning. "This can deliver data in a more deterministic flow. A higher-data-rate device may sustain a greater average throughput, but with a media application like audio or video, it is equally important that the data arrive in a predictable manner and not in bursts."

Of the storage interfaces used today, only 1394/FireWire has this property. If you use an interface without an isochronous mode, then your system must buffer greater amounts of data to smooth out the flow between possible bursts. Even so, the interface far outperforms the drive technology currently available for it. As in the SATA scenario, current drives pin 1394's 100MB/sec maximum throughput down to about 60 MB/sec.

Despite its age, SCSI has held in there for the long haul. Still the priciest of the interfacing technologies, it continues to reign dominant in power-user systems where speed and reliability are foremost. "There's no question that SCSI is the most reliable, though not because of the interface," says Anderson. "Drives designed for server and enterprise applications meet reliability and performance criteria far above

THE AUDIO PIPELINE

those for desktop applications. If reliability is key—and especially if the workload is going to be heavy—SCSI would be the best choice.”

Its prowess for reaching top-end speeds of 320 MB/sec comes from the fact that modern SCSI operates on what's known as low-voltage differential (LVD) as opposed to so-called “single-ended” systems such as ATA/IDE. Essentially, single-ended systems are analogous to unbalanced audio cables and are susceptible to picking up noise in the same way. On the other hand, differential signal paths act much like balanced audio and are more immune to noise and high-frequency loss, allowing for higher data rates and longer cable lengths.

SCSI-based systems do have their drawbacks. Unlike FireWire devices, which are plug-and-play, SCSI requires that each device be assigned its own ID and can't typically be hot-swapped without restarting your computer. (This is more an OS issue and not directly SCSI's fault.) Also, SCSI drives have a maximum storage capacity of 146 GB, making their cost-per-GB soar compared to the 400 GB and more that you can get per ATA/SATA drive.

On the flipside, FireWire is a more com-

plex protocol, so it places a greater load on the CPU to unpack the data as it arrives. “This means that performance is more likely to vary with changing versions of the FireWire driver, or even changing versions of the OS if the OS provides part of this support,” says David Gibbons, senior director of product marketing at Digidesign. “Notwithstanding these drawbacks, we've found the performances of FireWire drives to be excellent and qualify our highest track-count numbers with FireWire and SCSI.”

Gibbons adds that considering the most common interfaces used today, his people aren't seeing differences in overall performance that are strongly related to the interface's “nominal speed.” “We are seeing some differences, but they have to do with other factors, such as driver optimization, rotational speed, seek time, OS version, packet overhead, bus contention, et cetera,” he says.

WELCOMING INPUT

In the leg data transfer from the audio interface to the computer, pro DAW users only have a choice between FireWire and PCI adapter card-based solutions. Depending on the data storage interface of choice, system overhead and data bandwidth is-

sues may dictate one over the other.

First, let's take a look at the increasingly popular all-FireWire solution. If you consider using a host system that has a single FW-400 bus (an adapter card or motherboard-based) with a single FireWire audio hard drive, plus one, two or more FireWire audio interfaces connected, then each of these devices must share the highway. Adding more drives or increasing I/O will add potential traffic.

Computers generally have a single FireWire bus. Adding a FireWire adapter gives you an entirely new bus to work with, so your internal FW-400 bus and a FW-400 adapter card on the PCI bus will give you 2x400 Mbps in bandwidth. Likewise, higher-bandwidth buses and adapters work similarly (i.e., 2x800 Mbps or 800 Mbps+400 Mbps). The PCI bandwidth in today's computers is more than enough to support multiple FW-800 buses. It is important to keep in mind that the bandwidth is only one part of the equation.

“Say you have a three-lane highway with a speed limit of 65 mph and the average car is 13 feet long,” surmises Max Gutnik, director of sales at Apogee Digital, sitting alongside his engineering partner, Kevin Vanwulpen. “If we draw a line across the highway, about

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1,320 cars per minute can cross that line. In practice, there needs to be some room between cars, and then there is the issue of cars getting on and off the highway and needing to change lanes."

The data-handling protocols will determine how this happens. Obviously, having a highway that barely fits the amount of traffic just won't do the job; you need higher bandwidth to handle the variances that will occur or you will experience gridlock.

"In the case of PCI in a PC or Mac," Gutnik continues, "it's important to know that almost everything in the system uses that bus—your

audio cards, controller chips for your hard drives, maybe your graphics cards and so forth." The more headroom you have on this bus, the better the performance. Even then, there are variances in bus speeds and chipsets that will determine the system's capabilities.

Still, PCI is much "closer" to the CPU and benefits from its direct integration to the motherboard and high speed. Although it's typically running at 33 or 66 MHz, PCI is a 32-bit or 64-bit-wide bus! It's also possible to move audio data through it with fewer stages of buffering than FireWire or USB.

"This difference makes low-latency in-

terface design easy and ensures that PCI devices can transfer their data whenever it's critical for continuity of the audio stream," says Gibbons. "You won't get clicks or pops or interruptions, even when transferring lots of data in short time periods. Doing this with live audio [from interfaces and converters] is a different challenge to working with hard drives where you can use lots of RAM to buffer up the playback or record data."

Digidesign is credited with taking this logic to extreme with its proprietary DigiLink interconnect between the company's Pro Tools|HD core cards and external audio interfaces. Gibbons was quick to point out that DigiLink is not based on FireWire or any other common computer protocol and, combined with other favorable design factors, allows Pro Tools hardware to pass audio from input to output without intervention from the CPU within the time period of just a few samples. This compares to a minimum of 32 samples and often more with host- or FireWire-based systems.

However, there are tradeoffs. "PCI can't be easily extended outside of the computer motherboard, forcing you to place your highly sensitive audio processing electronics in the electronically harsh environment inside the computer," notes Gibbons. "And, of course, you lose the ability to hot-plug."

IN PRACTICE

Theory is fine, but what's the magical combination of speed and efficiency to create an ideal data-transfer interface? There isn't one. The diversity of users' needs often dictates system interfacing choices more than the underlying technological efficiencies.


The reason many prefer SCSI for their disk interfaces and PCI audio adapter cards over FireWire likely stems from the fact that SCSI is closed: It's used only for drives and disc burners. FireWire, on the other hand, is open to a wide variance of peripherals and devices and is therefore subject to dramatic fluctuations in bandwidth. If FireWire is used in a consistent and limited environment where the bandwidth is adequate, it will be just as reliable as SCSI, as long as peripherals are not added or removed from the chain. "In general, the FireWire bus cannot provide lower latency than the PCI or PCI-e bus," says Gutnik. "Consequently, PCI will always be a faster protocol than FireWire." Implementing RAID (Redundant Array of Independent Disks) configurations has become a favored solution for tapping into the unused bandwidth of SCSI and ATA using multiple drives.

I haven't brought up Fibre Channel in these comparisons, and I'm sure I hear one

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or two of you screaming because I left it out. Though it isn't too expensive from a drive perspective, Fibre Channel simply isn't a protocol but an interconnect technol-

ogy ideally suited for highly reliable SAN topologies. Offering up to 2Gbps serial data transfer architecture using SCSI, IP and other protocols—unless the application calls for

multiple users sharing access to a common library of data (common in video post and broadcast)—Fibre Channel can seem far more complex than is necessary.

PIPELINE PROTOCOLS: COMPARING THE SPECS

	SCSI-3 ULTRA2- WIDE (LVD)	SCSI-3 ULTRA320 (LVD)	SAS	ATA-133	SATA	USB 2	FW-400	FW-800	FIBRE CHANNEL
Max. Theoretical Bandwidth	640 Mbps (80 MB/s)	2.56 Gbps (320 MB/s)	2.4 Gbps (300 MB/s) (x2, all SAS is dual-port)	1 Gbps (133 MB/s)	>1.2 Gbps (150 MB/s)		400 Mbps (50 MB/s)	800 Mbps (100 MB/s)	4.25 Gbps = 530 MB/s (x2, all FC is dual-port)
Peer-to-Peer	no	no	yes	no	no	no	yes	yes	yes
Max. # Devices	16	16	unlimited	2	1	127	63	63	unlimited
Plug and Play	yes	yes	yes	no	yes	yes	yes	yes	yes
Hot Swap	yes	yes	yes	no	yes	yes	yes	yes	yes
Internal/External	both	both	both	int	int	ext	ext	ext	both
Max. Cable Distance	25m *	25m *	10m	1m	1m	5m	4.5m	100m	> 30km in practice
Asynchronous	yes	yes	yes	yes	yes	yes	yes	yes	yes
Isochronous	no	no	no	no	no	yes	yes	yes	no

* with two or fewer devices; ≤ 12M with three or more devices

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NEW MATH

These protocols are always evolving. FireWire has two major speed revisions ahead, including the prospects of new encoding/compression schemes and simultaneous transmit and receive. Meanwhile, SATA and SAS are still in their infancy, and the move to 64-bit computing shows promise for a whole world of "better, faster" protocols.

"Interface wise, the audio industry has produced a few new standards for inter-connection including SuperMAC/HyperMAC from Sony, and in the world of live sound, Ethersound and CobraNet," notes Gibbons. "Some of these may be applicable to studio production situations, too."

On the storage front, there is a trend toward providing network-attached storage (NAS), which means that drives simply plug into your Ethernet hub without a server. Gibbons points out that although these drives are currently more expensive than their FireWire counterparts, the arrival of Gigabit Ethernet makes this an interesting direction. Similarly, Flash drives, which have previously been hamstrung by the length of rewrite cycles, are steadily increasing in performance. "I have high hopes for very compact, high-capacity, high-track-count [Flash] devices in the near future that are applicable for pro audio," Gibbons forecasts.

Gutnik anticipates several technologies being there in parallel, citing the most potential for FireWire in the near term. He notes that of the many different types of FireWire implementations currently on the market, proprietary systems with custom drivers dominate. Apogee, he says, is committed to working with the industry to build "class-compliant" FireWire solutions, meaning that they are designed to adhere to an industry-standard protocol for FireWire-based audio only.

"A class-compliant standardized protocol will have huge benefits for everyone in the industry," claims Gutnik. "Just imagine if MIDI used a different protocol for each manufacturer. Only devices made by that particular manufacturer would work together. This is how FireWire is today. You cannot, for example, connect a Digidesign 002 to a MOTU 2408 and a Rosetta 800 via FireWire. But once the class-compliant route is adopted, everyone will adhere to a single specification and FireWire will be as universal as MIDI is today."

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Jason Scott Alexander is an Ottawa, Canada-based A&R executive, producer, remixer and freelance writer specializing in music technology, convergent media and entertainment technology law.

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THE RESOLUTION PROJECT

By KK Proffitt

In the past few years, one of the most hotly debated topics on pro audio Internet forums has been high-resolution audio and its effect (or lack of) on everything from audio sales to listeners' physical and mental health. Conspicuously absent has been a verifiable resolution comparison method accessible by end-users. And while those who have access to expensive, higher-resolution audio equipment generally agree that "high-rez" audio is important for archiving, many say that "the masses" or "the iPod generation" either cannot hear the difference in quality between 192kHz/24-bit audio and low bit-rate MP3 files, or they simply do not care. Meanwhile, those who do not have access to expensive, higher-resolution audio equipment argue that the capture medium is irrelevant if the artistic merit is lacking.

Enter Generator LLC, a consulting firm dedicated to product creation and development. Founder and producer John Calder has a background in major-label audio engineering, combined with experience as a product specialist, advertising writer, marketing director and product creator. He also witnessed format war debates first-hand when he was the marketing director at Minnetonka Audio Software Inc., creating the discWelder DVD-authoring product line. Minnetonka is well-known for its software encoding products for DTS, AC-3 and MLP, so Calder was in an excellent position to observe the need for a tool that would let end-users compare audio captures at various resolutions with different distribution formats. The tool for the job was a DVD-A disc called *The Resolution Project*.

ANATOMY OF A PROJECT

The challenge facing *The Resolution Project* was to record two musical styles that were particularly appropriate for high-resolution and surround delivery—jazz and classical—so that several resolutions could be captured simultaneously while holding other variables constant, including microphones and microphone placement, converters and recording media. The raw material had to be engineered into several different formats that could be presented using one medium. The end-user would then be able to monitor all resolutions and formats in one sitting, in the same environment, with the same converters and monitoring system—all with very little time lapse between chosen segments. Having random access to audio segments was also a prime factor in choosing the design for *The Resolution Project's* delivery format.

Calder chose the Mary Louise Knutson Trio (Knutson, piano; Gordon Johnson, acoustic bass; and Phil Hey, drums) to perform Knutson's jazz composition "Merle the Pearl" (Meridian Jazz) at the Dakota Jazz Club and Restaurant in Minneapolis. The group played on the club's corner stage, which has curtains, in front of a live audience. A fairly "live"

venue, the club's seating includes a balcony around two sides; the band addressed the audience diagonally.

The Artaria String Quartet (Ray Shows, violin; Nancy Oliveros, violin; Annalee Wolf, viola; and Thomas Rosenberg, cello) performed "Presto" (Opus 20/4) by Franz Josef Haydn at the Church of St. John the Evangelist in St. Paul. The church, a larger venue than the Dakota Jazz Club, sounded "nicely dry and woody," according to Calder. The quartet performed without an audience.

NAVIGATING A CAREFULLY CHOSEN SIGNAL PATH

Five DPA 4052 omni microphones in a horizontal array captured the acoustic space. Left and right microphones were 30 degrees from the center axis, with left surround and right surround mics configured 135 degrees from center. Left and right microphones were used for capturing left/front and right/front surround format signals, as well as left and right stereo. Only five discrete channels (L/R/C/Ls/Rs) were recorded. According to Calder, "An LFE channel was not recorded, eliminating bass-management inconsistency."

For the jazz trio, the array was positioned six feet from the front of the stage and 12 feet from the floor; for the string quartet, the array was 18 feet from the front of the ensemble and 13 feet high. Using the DPA hangers, the 4052s were angled 30 degrees down off the horizontal axis. Bruce Myers of DPA Microphones elaborates, "It is always good practice to aim your omni mics for best high-frequency results. This is a simple fact of physics. Generally, and all [other] things being equal, an omni-patterned mic will maintain its omnidirectionality as long as the wavelength is greater than the size of the microphone diaphragm. Our omni mics with 16mm [0.63-inch] diaphragms will show in octave-to-octave polar plots that they begin to become directional by 15 kHz.

"[With the 4052,] I knew we were offering our very best, highest-resolution, small-diameter omni model. Higher-resolution formats are all about achieving the greatest level of detail possible. After all, in recording you can only get as close to the music as the mic capsule. If you don't get it right at the capsule, there is nothing you can put in-line to fix it."

Great River Electronics' MP-2NVs microphone preamplifiers were also chosen. According to Great River's Dan Kennedy, "We used the MP-2NVs because, frankly, that's all I had available. I think the [string] quartet would have benefited from the MP-2MH, it being cleaner and a bit better in the

Putting Audio

Formats to the Test

high-frequency detail department, but I like the combination of the DPA mics and the NV for the jazz set. It really feels live, not clinical." The MP-2NV circuitry is similar to that of the Neve 1073 channel amplifier, while the MP-2MH is noted for its noise rejection due to its transformer-coupled input.

Monster Cable provided cabling and power conditioning with Monster Microphone Cables Series 500 and the Monster Power PowerCenter Pro 3500. Monster Cable's Tim Pryde says, "The Monster Microphone Cables utilize our patented Time Correct Windings, [which allow] all of the audio frequencies [highs/mids/low] to travel and arrive at the destination point at the same time." According to Pryde, the PowerCenter Pro 3500 cleans RF and EMI noise from the signal so that the noise floor will interfere less with the articulation and detail in the recorded audio.

Calder simultaneously recorded five channels of PCM audio at three different audio resolutions: 16-bit/44.1 kHz, 24-bit/96 kHz and 24-bit/192 kHz. Five Great River MP-2NVs were routed to three Genex Audio GX9048s. Genex's Kevin Brown says that the 9048s offered many appropriate features for the task, including "embedded design, small form factor [and our] converters are built into the unit, which really helps in a complex setup such as this." The GX9048 is capable of recording 48 channels of 24-bit/192 kHz or 48 channels of DSD in a single 4U rackmount box. For *The Resolution Project*, the GX9048s were fitted with Kingston hot-swappable hard drives formatted as FAT32. The recorder was placed in PCM mode to record standard .WAV files.

EDITING AND FILE COMPRESSION

After recording both performances on April 21, 2005, Calder removed the Kingston drives and transferred their contents to his workstation for editing with Nuendo 3. No digital format transcoding, sample-rate decimation or dithering was done to arrive at the various resolutions, with the exception of data-compressed formats such as MP3, WMA and AAC.

Each selection was individually edited for length; listeners will note that the fades from digital audio black to the noise floor have differing slopes. The character of the noise floor provides one point for critical analysis when the DVD-A is played in a suitably quiet monitoring environment.

Nuendo was chosen as the editing platform due to its floating-point processing. "The system is 32-bit floating point, making it ideal for optimizing dynamic range and noise floor," says Fadi Hayek at Yamaha (which bought Steinberg last year). "Second, Nuendo can record up to 384kHz sampling rate. This, of course, is dependent on whether your A-to-Ds and D-to-As are capable of the resolution. All editing in Nuendo is based on the selected resolution. However,



Miking the Mary Louise Knutson Trio. Mics are highlighted.

mixing always defaults to 384 kHz, meaning that you could automate at a resolution of 384,000 pulses per second. This makes for some really smooth-sounding crossfades." Calder also liked Nuendo's built-in format conversion for MP3 and WMA file compression.

CODECS AND AUTHORIZING

Dolby's Meridian Lossless Packing (MLP) enabled extra space for high-resolution tracks on the DVD-A, while MPEG 1 Audio Layer 3 (MP3), Windows Media Audio (WMA) and Dolby's (MPEG 4) Advanced Audio Coding (AAC) were used to demonstrate lossy compression artifacts. All lossy formats were encoded at 64 kbits/second.

Calder explains, "The three data-compressed formats [MP3, WMA and AAC] were encoded from the 16-bit/44.1kHz stereo selections in exactly the same popular method utilized to convert CD tracks for playback on portable digital audio players, then transcoded back into 16/44.1 resolution. DVD-A does not allow lossy data-compressed formats. There is nearly zero signal degradation when transcoding from compressed into uncompressed formats, so the listening experience remains completely valid for all audio resolutions."

Calder used Apple's iTunes to convert audio to AAC. For MLP compression, Minnetonka Audio's SurCode MLP was employed. MP3 and WMA files were generated using Nuendo's codecs. For the presentation platform, Calder chose to author DVD-A with Minnetonka Audio's disc Welder Chrome II. SACD (DSD) was excluded due to incompatibility of the proprietary format with DVD-A. Disc structure includes both audio performances grouped in two lists of eight formats: MP3 stereo, WMA stereo, AAC stereo, 16/44.1kHz stereo (CD), 24-bit/96kHz stereo, 24-bit/192kHz stereo, 16-bit/44.1kHz surround and 24-bit/96kHz surround (MLP).

EARLY REACTIONS

Individual perceptions about *The Resolution Project's* content placed the most significance on the surround selection's enveloping atmosphere. Great River's Kennedy says, "I really like the jazz cut and the feeling of flying over the scene. It's a little spooky when someone else is talking and eating in your head—shades of Pink Floyd."

Others remarked on the differences between resolutions. John Schur from Minnetonka Audio Software says, "I thought

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WHEN I'M SIXTY FOUR (BIT)

By Ron Franklin

fish get to swim, birds get to fly, computers get to run with bigger, faster processors. Laws of nature? Well, apparently some kind of law, because ever since it became possible to do MIDI sequencing on a Commodore 64 back in the '80s, we've seen software and hardware tools for music and audio production playing a steady game of one-upmanship. As hardware designers gave us the capability to do more computations per second and access more memory, the software programmers quickly found ways to satisfy our creative lust to push the envelope, gobble those cycles up and ask for more!

Now we are entering the era of 64-bit computing in a big way, as chip vendors and operating systems support computing using digital words that are 64 bits long. What does it all mean for creative freedom and the eternal quest for more tracks, more processing plug-ins and unlimited numbers of mixer channels? We set out to answer these questions and more, asking some of the companies that are pioneering the latest revolution in computing. But first, a little background.

WHEN NUMBERS GET SERIOUS

In the simplest analysis, it comes down to how big a number you can represent with a single digital word. We know that binary digits or bits (ones and zeros) are strung together to create bytes or digital words of varying lengths. It's simple binary math: The largest number you can represent with a given word length is pretty straightforward to calculate and goes something like this:

$$\begin{aligned}2^8 &= 256 \\2^{16} &= 65,536 \\2^{20} &= 1,048,576 \\2^{24} &= 16,777,216 \\2^{32} &= 4,294,967,296 \\2^{64} &= 18,446,744,073,729,551,616\end{aligned}$$

Anyone who has used a sampler or recorded digital audio knows that the more bits you use to represent an audio sample, the more dynamic range you can represent. Dynamic range is proportional to word length, and frequency response is proportional to the sampling frequency. (As seen in the Nyquist theorem, simply stated, you have to sample at a rate at least twice the desired highest analog frequency component to avoid aliasing.) For digital audio, word length translates to dynamic range like this:

$$\begin{aligned}16\text{-bit} &= 96 \text{ dB} \\24\text{-bit} &= 144 \text{ dB} \\32\text{-bit} &= 192 \text{ dB} \\64\text{-bit} &= 384 \text{ dB}\end{aligned}$$

Audio Technology Taps Into Enhanced Computing Power

As the range of human dynamic perception is approximately 120 dB from silence to the threshold of pain, why would we possibly need a dynamic range more than that offered by 24-bit? Isn't 64-bit just overkill? Not really. When digital processing for audio occurs, the math involved can produce some very large values as coefficients are computed for processing digital audio signals. The enemies in this case are overflow, truncation and rounding errors that can creep in when the intermediate values to be stored are bigger than the registers available to store them. Thus, one of the great benefits of 64-bit internal processing is that a high degree of audio precision can be maintained through successive rounds of computation. In short, you can maintain truer fidelity even when a lot of audio processing is going on because you can finally do the math!

Another benefit of 64-bit processing is that there is significantly larger direct-addressable memory space than 32-bit designs. In fact, a 64-bit architecture expands total addressable memory space from 4 gigabytes to more than 18 billion GB (more than 18 Exabytes). Only 2 to 3 GB of cache memory are directly addressable on 32-bit Windows systems, while 64-bit systems can access up to a Terabyte of cache memory. This means that large data sets (tracks, plug-ins, samples, etc.) can be loaded entirely into memory, reducing the need for slower disk access. In many of the new 64-bit chip designs, an improved chip architecture can handle parallel processing tasks more effectively as improved 64-bit processors perform more instructions per clock cycle and have the ability to process these instructions in parallel. Finally, increased bus and I/O bandwidth allow for faster and wider data throughput. Simply put, you can do a lot more and do it faster and with more precision than ever before in the history of computing.

IT'S IN THE CHIPS

All of this is a definite plus given the fact that high-resolution audio formats with higher sampling rates and bit depths are becoming more and more the norm for professional pro-

duction work. According to Texas Instruments' worldwide DSP marketing manager Gerald Andrews, "Digital audio has been on a migration path to higher sampling rates over the past few years. Note the increase of products that tout the 192kHz sampling frequency. This move means audio signals are sampled at rates much higher than they traditionally have been. At the same time, the audio processing occurring at very low frequencies allows for more realistic bass—lows that are felt more than heard. This processing of low-frequency, high-sample-rate audio signals really drives the need for 64-bit audio."

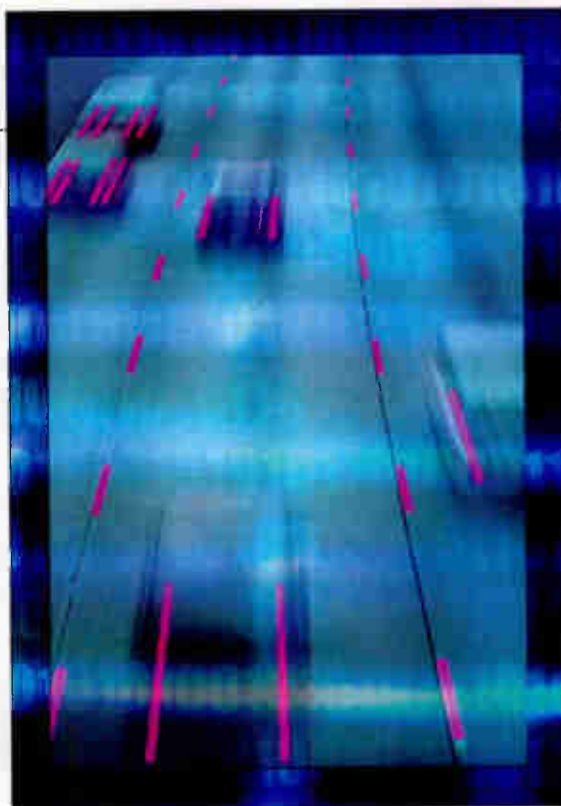
Texas Instruments has been working in the 64-bit arena for some time, says Andrews. "For more than five years, TI has offered native support for IEEE 754 Double-Precision [64-bit] computing in our floating-point DSPs. This support can be found in the C671x, C672x, DA6xx and DA7xx families of processors today. Naturally, in addition to the DSPs, we've also had support for the 64-bit floating-point math in our development tools."

The two top companies making general-purpose CPU processors are Intel and Advanced Micro Devices (AMD). AMD was out of the gate first, but both have announced and are now shipping 64-bit designs.

Denise Latscha, senior product marketing engineer at Intel, notes that the company offers 64-bit computing support in Pentium processors across its market performance segments. "All of the Intel Xeon and Intel Itanium processors shipping today support 64-bit computing for the workstation and server markets." She adds that the Intel EM64T (Intel Extended Memory 64 Technology) is a key technology that helps bring 64-bit computing to digital media. Many of its benefits can be applied to 64-bit computing in general:

- It supports the WinXP Pro x64 OS and access to more than 4GB RAM.
- More operations can be processed in RAM, resulting in less data caching to/from your hard drive, enabling faster performance. This also helps applications do more in real time, which is critical for complex audio filter algorithms and large data sets.
- For high-end audio, 64-bit computing helps enable a deep sonic palette and more lifelike and interesting compositions—more tracks, more simultaneous plug-ins and virtual instruments.
- This enables fewer multiple passes and longer sequences when layering 3-D or film/video for special effects creation.
- Increased headroom for processing HD video, enabling improvements in both workflow speed and quality.

Intel has been rolling out its 64-bit technology by working directly with companies that are upgrading the capabilities of their systems to handle the new processors. One example



of such collaboration is Intel's work with Cakewalk. According to Ron Kuper, Cakewalk VP of engineering, "With 64-bit computing, processors are getting a quantum jump in performance, and we're using it to give SONAR users more power, flexibility and creative potential." Kuper says that 64-bit technology accelerates the performance of SONAR X64 Technology Preview by up to 30 percent, "for noticeably more tracks, more effects, more synths—deeper and more interesting songs and mixes."

Apple's 64-bit G5 processor was one of the earliest 64-bit designs to find common use in the personal computer market. But issues surrounding the AIM (Apple, IBM, Motorola) Alliance's ability to respond quickly enough to future demands for processor speed improvements and lower power consumption led Apple to surprise its users this year by announcing a move to 64-bit Intel processors. According to industry sources, the Mac OS, which is based on BSD Unix, has a high level of hardware abstraction that is making the transition relatively painless and will allow Apple to begin shipping new Macs based on the Intel architecture in the middle of 2006. Developers working with early transition systems based on a 3.6GHz Intel Pentium 4 processor say the performance with Mac OS is already impressive.

We also caught up with AMD director of digital media and entertainment Charlie Boswell to explore how that company approaches 64-bit design and how this development affects the music and audio content creation world. "Our Opteron processors use the balanced AMD64 Direct Connect Architecture," he says. "The processors directly connect to memory, I/O and other processor cores, yielding a very fast architecture that's balanced so the data traffic doesn't need to slow down. When loading audio tracks or plug-ins, audio creators don't suffer the same bottlenecks as in a slower per-

forming architecture." Boswell points out that a balanced architecture allows the support of more plug-ins, more tracks and is more robust. You can run the processor closer to full capacity without running into performance issues that can produce audio problems.

Boswell contrasts AMD's architecture to what he sees as limitations in some competing designs: "[Some] other processors have a front-side bus where the two processors connect together and I/O and memory share the same wires. That means there are latencies introduced when you load the system." He makes the analogy that sharing I/O and

memory between the two processors is similar to L.A. traffic on a Friday afternoon: You may be in a speedy Maserati, but you're restricted on how fast you can go by the rest of the traffic on the freeway.

Given the impressive performance of the new CPU processors, will audio companies still find a use for specialized DSP hardware to accelerate audio processing? Texas Instruments' Andrews still sees a great deal of utility for the DSP in the pro audio world. "I think that there should always be an opportunity for DSP hardware in the audio world," he says. "In addition to having some advantages

in DSP latency performance versus the CPU, plug-in developers face less piracy issues when working on specialized hardware. Also, due to advances in FireWire and USB technologies, specialized DSP hardware can be developed to work with laptops, allowing customers to bring workstation-level performance to an average laptop in a convenient, portable package."

Andrews sees the advantages of 64-bit DSP extending beyond the high-end pro workstation and into the consumer market. "One example where we see a benefit from this technology is in the home theater market, where bass management is important. As customers become more aware of these capabilities, 64-bit floating point will be leveraged into more and more audio applications."

WHAT ABOUT THE AUDIO?

On the audio manufacturing side, developers are beginning to take advantage of 64-bit's enhanced computing capabilities. Yamaha has been on the leading edge of audio technology for quite some time. *Mix* spoke to Athan Billias, director of marketing technology products, regarding upcoming 64-bit support for Yamaha. He says that the company's collaboration with Steinberg (Yamaha purchased Steinberg earlier this year) and its own networking products will be the first places the influence of 64-bit architectures can be seen. Billias added that Steinberg software products already support 64-bit architecture, and at the end of August, Yamaha will release a 64-bit streaming driver for mLAN.

The advantages will be quite tangible for end-users. "The biggest advantage of 64-bit architecture is the ability to support extremely large sample libraries," Billias says. He goes on to note that "Steinberg and Yamaha have always been focused on supporting cross-platform capabilities and all major operating systems, so 64-bit operating systems are part of our overall strategy. The benefit of dual-processor chips [supported in the August release of Cubase SX3.1 and Nuendo 3.1] may have the most dramatic effect on the DAW end-user experience."

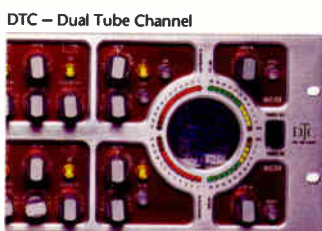
Cakewalk made its x64-bit product debut earlier this year at Winter NAMM, where the company announced SONAR x64, touting it as "the first truly native 64-bit host DAW, along with the availability of a free x64 technology preview." According to Cakewalk's Steve Thomas, more announcements will come at this month's AES. "We're unveiling SONAR 5 Producer Edition, including both native 64-bit and 32-bit versions of our flagship DAW in the same box," he says. "We're also releasing a white paper authored by Cakewalk CTO Ron Kuper titled *Benefits of Modern CPU Architec-*

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World Radio History

tures for Digital Audio Applications.

Improved performance will enhance creativity, says Thomas. "Users will experience overall performance gains in the 20 to 30 percent range; more RAM for use with samplers, virtual instruments and processors [access of up to 128 GB of physical RAM] and 64-bit double-precision-processing providing increased dynamic range and sonic clarity over current 32-bit floating-point and 48-bit fixed-point-based systems." Thomas explained that SONAR's 64-bit mix engine is accessible even on 32-bit computers; knowing that 64-bit and 32-bit platforms

must coexist in the market for some time to come, Cakewalk will ship both 64-bit and 32-bit versions of SONAR 5 together in the same box. Thomas adds that support for the migration extends even further: "To assist customers making the transition to x64 systems, we are unveiling our new BitBridge™ technology, which allows existing 32-bit VST effects and instruments in SONAR's 64-bit environment."

YOU WANT OS WITH THOSE CHIPS?

Chip development isn't the only driving factor; operating systems are following in stride.

Microsoft's Windows XP Professional x64 Edition touts the same advantages noted earlier in this article. And scheduled for release in 2006, Windows Vista operating system (once code-named Longhorn) should provide many new features to the world's most popular operating system, not the least of which is full 64-bit processor support.

On the Mac side, the upcoming move to Intel chips should bring big changes; in the meantime, Apple offers machines and operating systems that support 64-bit. The new Power Mac G5 line operates with two 64-bit G5 processors reaching top speeds of 2.7 GHz. Mac OS X "Tiger" adds a full 64-bit operating system to Apple's machines. According to Apple, a key compatibility feature for Tiger is software distribution with what Apple terms "fat binaries." This lets applications contain 32- and 64-bit binaries within a single file. According to Apple's Website, "Using fat binaries, network administrators distribute a single version of an application to all users, regardless of their system capabilities. Once installed on a user's system, the fat binary automatically selects the appropriate code for the system without user intervention. This greatly simplifies administration, installation and distribution of applications."

YOUR ROCKET IS READY

The transition from ubiquitous 32-bit processing to the world of a 64-bit processor in every PC and a 64-bit OS coursing through the new silicon will take some time. As with all technology transitions, there are a lot of moving parts out there—device drivers, software apps, hardware peripherals, communications buses and more—that have to be rendered 64-bit-friendly. For some time to come, 32-bit and 64-bit will live a (hopefully) peaceful coexistence in a hybrid world. To the extent that the manufacturers have done their homework and engineered a bit-migration strategy into their offerings, it should be a fairly smooth ride.

Once you haul that Maserati of creativity mentioned earlier away from the traffic and onto the open road of fully compliant hardware, software apps and operating systems, you'll come closer to the Holy Grail of creating at the speed of thought. Now the question is, can your creative impulses keep up with the rocket placed at your disposal? And are you ready for it?



Ron Franklin is a frequent contributor to Mix and is the director of media products for Taravi Inc. He can be reached at ron@ronfranklin.net.



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Aurora 8 and Aurora 16 are now available at select pro audio shops. For more information about Aurora and a list of stocking retailers, visit the Aurora website at www.lynxaurora.com.



AURORA



TAKING (DAW) CONTROL

By Mel Lambert

audio engineers are one demanding group. As workstations become more sophisticated, our requirements for control surfaces have grown. When early systems offered low track/channel counts, we were okay with onscreen, GUI-based mixing and simple EQ/dynamics sections. Then, as the native power of PCs and Macs exploded, and third-party plug-ins became the order of the day, mice and video display units gave way to fader trays bedecked with linear and rotary controls. MIDI provided external control of multifunction DAWs from a conventional-looking mixing surface (and is still featured in many of today's solutions). MIDI Machine Control (MMC) was available to map transport buttons and jog wheels from hardware to software functions.

But we soon reached a crossroads. Only so much data can be extracted from a controller, parsed and overlaid onto a transport layer for passage to the DAW engine. On top of that, data needs to be passed back to the surface to show that the function has been activated and move controls to follow automation data. What we needed was enhanced bandwidth and protocols that could accommodate these complex needs.

A breakthrough occurred in late 1996 when Digidesign and Mackie co-developed, respectively, the HUI (Human User Interface) protocol and controller, which uses multiple MIDI-type connections to carry commands between hardware controllers and Pro Tools. Using a series of standardized instructions for fader and knob positions, plus switch/button closures, the HUI protocol enabled more precise control of Pro Tools mixing, routing, editing and DSP functions. Plug-in command was also accommodated via a four-parameter section and page tables that switched control to different functions using button row/column maps of menu commands, pull-downs and window-opening sequences. Unlike 7-bit MIDI commands, which only provide 128-step resolution, HUI is based on 10-bit/1,024 discrete values using a slick MIDI controller implementation; it also operates at high bandwidth via USB and, most recently, FireWire ports.

The HUI MIDI Mapping Protocol was offered to any firm that wanted to implement it—and is still used today by many hardware manufacturers—to control Pro Tools and other DAWs that can be set to follow such commands. HUI supports a spectrum of parameters, ranging from fader level and touch-sense to pan, aux send and solo controls, plus plug-in selection and adjustment; the protocol also supports a maximum of 12-segment audio level metering and four-character track designations. One drawback of HUI is that it requires a dedicated MIDI In/Out connection per eight channels of control. As total bandwidth is shared

On the Verge of A Seamless Work Environment

between all ports, slowdown is inevitable.

One of the most interesting implementations of HUI control is the Solid State Logic AWS 900 Analogue Workstation System, which combines a 24-channel analog front end and mixing section with flexible monitoring and a Pro Tools or DAW command area. The preamp, EQ and dynamics sections come into their own during basic recording and overdubs, while the servo faders will control either DAW mix levels or, if you prefer to remix in the analog domain, fixed-level bus outputs. For the latter mode, SSL now offers a new AWSomation automation system based on its G/K Series Ultimatum. (Interestingly, the company also offers HUI-based control from its high-end C200 digital production console.)

Harrison's recently released IKISdirect enables HUI control over Ethernet via its IKIS console automation platform, which was designed to implement new console control surfaces and automate control of other workstations. A custom software module runs on the host CPU, extending IKIS' database to the host and synchronizing the appropriate channels in a Pro Tools session, for example. The firm also offers direct control of Merging Technologies' Pyramix via the latter's newly developed Oasis protocol over the same Ethernet network as IKIS-driven worksurfaces; Steinberg Nuendo will interface in a similar fashion.

Meanwhile, Mackie and Emagic co-developed a dedicated protocol for Logic workstations (now owned by Apple). Logic Control migrated into Mackie Control Universal, with the company electing to offer hardware controllers that, with the addition of removable Lexan overlays to relabel on-surface control, would successfully work with a wide range of DAWs, including Apple Final Cut Pro and Soundtrack Pro, Steinberg Cubase and Nuendo, Cakewalk SONAR, MOTU Digital Performer, Sony Vegas and others. Extras included a two-line backlit LCD to show parameters such as track name, I/O routing, plug-ins, EQ and dynamics setting, among other features.

Mackie Control and HUI were among the first widely supported, comprehensive protocols and have become more or less *de facto* common standards—enabling DAW

and controller manufacturers to support one another without continually re-inventing the wheel. However, some of the more innovative workstation manufacturers also offer SDKs (software developer toolkits) that allow control surface developers to more comprehensively support a DAW than what might be possible via an open-architecture protocol.

For example, Cakewalk offers a control surface SDK for its SONAR 4 workstation that allows third-party developers to design custom control surface modules. SONAR ships with a Cakewalk generic surface that can be programmed to work with any MIDI-based controller, and includes presets for control surfaces such as the JLCooper FaderMaster, Kenton Control Freak, Peavey PC1600 and Yamaha PhatBoy. Tascam US-428, CM Labs MotorMix, Mackie Control Universal, Cakewalk/Peavey StudioMix and Radical Technologies SAC-2K also are supported, together with Tascam FW-1884, FW-1082 and DM-24; Frontier Designs TranzPort; Roland SI-24; and others.

Tascam joined the fray with a series of affordable HUI- and Mackie Control-based worksurfaces connected via USB and/or FireWire ports. However, the firm quickly spotted that DAW plug-ins that are reliant on unique GUIs seldom share a common set of parameters, and that there are wide variations in the way workstations support Mackie Control and HUI.

Tascam advises that the Mackie Control protocol is also a variable feast; the more popular DAWs will probably perform as designated by an overlay, but full consistency might not be achieved by other applications. This theory could explain why Tascam's FW Series controllers feature three implementations of Mackie Control: a generic version, a version for Cubase SX/Nuendo and one for Cubase LE. Similarly, the Tascam US-2400 controller ships with four variations for Steinberg, SONAR, Digital Performer and Logic Series DAWs.

Digidesign developed an Ethernet-based control protocol for Pro Tools; ProControl unlocked more horsepower by using a wider and faster communication layer

Simplified Control

- **Who:** Rick Reynolds
- **What:** WK Audio ID Controller with Steinberg Nuendo
- **Where:** Venue Companies, Navarre, Fla.

Venue Companies provides audio services for telecommunication clients—music on-hold and voice messaging—and record production.

In April, the facility added a WK ID Controller for Steinberg Nuendo 3. "The combination has a very shallow learning curve," owner Rick Reynolds confides. "For our first project, Sounding Rick's *Unstoppable*, produced by Kasim Sulton—who in the past has played bass with Todd Rundgren and Meat Loaf—we mixed 13 songs in a remarkably short period of time. Because Kasim was on his way to Europe to act as Meat Loaf's musical director, we only had three-and-a-half days to mix an entire album.

"Thanks to the ID Controller's intuitive design, Kasim, my engineer Paul Williams and I quickly learned our way around the worksurface. Particularly helpful was the dedicated jog wheel, which provided lightning-fast access to edit functions.

"Kasim was very pleased with the ability to use the mix controller to dial in Nuendo EQ and plug-in settings. Automation was a breeze with the ID; imagine being able to automate several faders at once during one pass. On some mixes, we had two sets of hands automating faders, mutes, pans and even VST plug-ins. That would have been impossible with a mouse!

"Since many of the tracks were recorded over a period of 10 months, there were parts/ideas that had been forgotten. With some songs having 53 tracks—including 16 tracks of guitar—you could say this was a complicated project. By using the Group function, we were able to immediately locate any track within two moves. This was a real time-saver."



Fast Control

- **Who:** Tal Herzberg
- **What:** SSL AWS 900 Analogue Workstation System
- **Where:** Studio H, Henson Recording Studios, Los Angeles

A recent partnership between four-time Grammy-nominated engineer/producer Tal Herzberg and Henson Recording Studios resulted in Herzberg's new AWS 900 forming the centerpiece of the newly refurbished Studio H, which has recently been used by the Rolling Stones, Mariah Carey and Chingy.

"The AWS 900 is the ultimate small-scale mixer," Herzberg says. "I like the look and feel of a conventional worksurface. This board sounds, looks, feels and functions like an SSL and has a great build quality. It may not be K Series, but it's pretty damn close; I call the AWS 900 a 'baby K'."

"My budget [\$90k] gave me the option of choosing between the AWS 900 and a 32-fader Digidesign ICON control surface," Herzberg continues. "I spent a few sessions on each board and finally decided to go for the SSL. My main reasons had to do with the need for 24 high-quality preamps and equalizers in the studio [which are found in the AWS 900 and not in an ICON], as well as the fact that I still prefer analog summing.

"The Total Recall and new AWSomation automation package are way cool and extremely useful. I love mixing on the AWS 900—using the channel faders to control both Pro Tools' mixing functions [virtual mixer] and to handle 24 analog playback outputs from Pro Tools' audio interfaces. But for me, the standout feature is the fast access to Pro Tools plug-ins from the AWS 900 via the screen and control surface. That unique combination of assignable knobs and faders on the convention GUI is very powerful."



between the application and worksurface. The result was increased simultaneous channels, enhanced metering options and reduced latency. The networkable surface could also be extended to 48 channels, two joysticks and meters. A second Ethernet-based controller, Control|24, was co-developed with Focusrite and added analog preamps, a sub-mixer and a comprehensive monitor section.

The DigiNET protocol developed for ProControl and Control|24 was expanded to support the new ICON Integrated Console by offering more bandwidth and flexibility. By using extra packet space in the Ethernet world, more controls can be addressed simultaneously, allowing each channel strip to independently operate with sample-accurate metering. The expanded protocol also allows a worksurface to access any Pro Tools edit command or menu item. A major breakthrough for the ICON was the ability to access more than one plug-in at a time; with D-Control, users can modify under automation one plug-in per channel. (D-Command has fewer controls and, therefore, cannot address plug-ins on a channel-by-channel basis.)

In hardware terms, ICON also set a benchmark for control surface evolution. Custom faders allow users to separate the surface from the on-screen GUI and operate directly with the Pro Tools Mix Engine. It is now possible to work with hidden tracks and freely assign them across the surface as required—independently of screen settings.

As DAW engines started offering even more processing power, the size of multichannel editors and virtual mixers accessible in software became even more sophisticated. And on the other side of the street, digital console manufacturers were realizing that, for added flexibility, it makes more sense to control their proprietary DSP engines from expandable surfaces by using networkable protocols. In this way, multiple worksurfaces could be linked to not only their respective hardware-focused engine, but also third-party DAW engines. Talk about fully integrated workflow!

NETWORK-SAVVY CONTROL PROTOCOLS

There are now at least three well-documented, network-savvy protocols. Euphonix developed EuCon as a networkable, open-control protocol for System 5 consoles; the new System 5-MC combines the familiar S5 channel strips with the MC as a control interface for any EuCon-compliant workstation such as Steinberg

Flexible Control

- **Who:** Nathaniel Kunkel
- **What:** Digidesign ICON Integrated Console
- **Where:** Studio Without Walls, Los Angeles

"I first saw ICON at the Berlin AES Convention [May 2004] and knew straight-away it was exactly what I needed," says Emmy-winning producer/engineer Nathaniel Kunkel about outfitting his transportable project facility. "I purchased the 150th ICON from Digidesign and have been using it for nine months. It was the least-expensive way to get to where I wanted to be.

"Previously, I was using a [Sony] DMX-R100 digital console to track to and mix from my Pro Tools|HD2 system, but I wanted more channels. I opted for a 16-fader ICON and a center section, which, with re-assignment, would be perfect for my needs in a transportable package.

"I also wanted to access all my plug-in settings from hardware and not a GUI. With ICON, that became a reality. I had used a [Digidesign] ProControl, but, to be honest, I just didn't get it! It was okay for vocal rides, but not much else; [for me,] it just got in the way. But with ICON, the control surface is so well-laid-out that I instantly got it. I never imagined that I could buy a system that would increase my workflow as much as ICON has, and the new automation upgrades really make it a musical mixing surface."

The rig was recently used to mix *Morrissey Live From Earls Court* in stereo and 5.1, B.B. King's latest release and a Sting DVD soundtrack in stereo and 5.1.



Post Control

- **Who:** Roger Savage
- **What:** Three Smart AV Elite Series Controllers with Merging Technologies Pyramix
- **Where:** Soundfirm dubbing and post stages

Soundfirm, Australia's largest post-production facility, recently ordered the first trio of DAW controllers to be shipped by Smart AV Consoles; the Pyramix-based systems will be installed at facilities in Melbourne, Sydney and Beijing.

"We took delivery of an E48 48-channel console in early August," says Roger Savage, Soundfirm's owner/CEO. "An E72 and an E96 system will be added later this year," adds the two-time BAFTA winner and Oscar-nominated re-recording engineer. "I was impressed by the controller's ARC technology, which will make sorting out editorial tracks a whole lot easier.

"Here in Australia, our dub stages are normally single-operator, which means that there's lots of functions to be taken care of during a busy mix. Smart AV's ergonomic strength really comes into focus when you're trying to manage a multitude of tracks; it is very easy to locate the controls you are after without accessing multiple layers.

"Currently, most of our film and post projects are edited in Pro Tools, so we will run those as playback sources and use the console's Pyramix Version 5 DAW as the master recorder.

"The Smart AV Elite is a very powerful control surface. It might look like the deck of the Star Ship Enterprise, but it gets the job done. The routing control and monitor section are pretty powerful, but its usefulness depends on the DAW it connects to; after all, a Ferrari body with a VW engine is a useless combination. But Smart AV with Pyramix is going to be formidable. This technology will revolutionize the future of mixing."



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Nuendo 3.1 and Merging Technologies Pyramix (via the latter's Oasis protocol), plus others (via HUI-format commands over an Ethernet transport layer).

EuCon is markedly different from HUI: It allows intelligent control of all workstation functions and enables high-resolution metering, EQ and pan displays, intelligent mapping of plug-ins and assigning DAW tracks anywhere on the surface. The company's dedicated MC controller, which can be used stand-alone, handles multiple Ethernet-hosting of workstation PCs or Mac computers, each running an MC driver. Its control surface provides DAW interrogation and command-level metering, as well as manages control of S5 channel strips.

Down under, Fairlight has been promoting the use of its RAPID (Remote Application Programming Interface for DREAM) protocol for a couple of years to control its QDC engines from Constellation Series worksurfaces and to attract interest from DAW manufacturers. However, Constellation already ships with a feature-rich audio editor, which now accommodates third-party VST plug-ins and is HUI- and Mackie Control Universal-compliant.

Merging Technologies has quietly made friends with a number of controller developers. Aside from Harrison, whose high-end digital consoles are now Oasis-compliant, Smart AV recently shipped the first three of its Elite Series controllers with networkable Pyramix mix engines. Not to be outdone, Merging Technologies has developed the ISIS Series of Oasis-based controllers for Pyramix and VCube video player/recorders.

UK-based AMS Neve offers control of Pro Tools and other DAWs from its Encore Plus automation using HUI protocol, in addition to networked control via Ethernet/TCP/IP of Pyramix via Oasis. Interestingly, Encore Plus now allows Pro Tools 5 session mix data to be imported into its DFC Gemini, MMC, Libra Post and other digital consoles; Pyramix import is also in the works. The advantage? Fader moves created within the native DAW can be imported as Encore Plus data, thereby allowing the DAW outputs to be set to unity gain during a final mix. Pundits claim that some workstation mix engines compromise headroom and noise performance during such exercises.

In addition to accommodating HUI and Mackie Control commands—and directly supporting a number of hardware controllers—Steinberg's remote-control SDK is being used by such controller manufacturers as Mackie, Yamaha, JCooper and Smart AV to control Nuendo and

Dubbing Control

Who: John Ross

What: Euphonix System 5-MC with Steinberg Nuendo

Where: personal post facility, Los Angeles

The centerpiece of a new personal-use post/film facility currently being completed by John Ross will be a dub stage equipped with a dual-operator Euphonix System 5-MC digital console. "The effects section will feature 48 on-surface faders," Ross explains, "while the music/dialog section will feature 32 faders. The two sections will run independently with separate MC Controllers. All mixing and processing will be handled by multiple Nuendo DAW engines.

"The System 5-MC offers all of the advantages of a well-designed control surface, with the power and flexibility of Nuendo workstations. Now I can use the power of Euphonix's control system, whose fader movements are translated inside the box into workstation moves and stored with the session. But being event-based, all of these moves will follow Nuendo sound elements during editing and reconfiguring. It's the best of both worlds.

"Important to me is the ability to not have to pay attention to the DAW screen, and for the console to behave in a way that is typical of a powerful state-of-the-art mixing console while retaining all of the benefits associated with DAW systems. I will be using three Pro Tools HDs for additional playback—simply because it's still the format many sound editors know—but will use Nuendo for all other functions. The Euphonix MC is the Rolls Royce of controllers. It is extremely powerful, built with the quality typical of high-end audio equipment and does not have the 'Fisher Price, my first mixer' feel often found in this market."

The newly completed facility will be used in December to dub Antonio Banderas' new movie.



Cubase Series DAWs. The company also implemented EuCon protocol to interface Nuendo with Euphonix controllers, and worked jointly with German manufacturer WK Audio to develop the ID Controller. The latter uses a closed-architecture protocol running on USB ports that is hard-coded for Nuendo 3 (using a specialized driver that dramatically outperforms common SDKs) and is not intended for any DAW.

Smart AV has kicked into play the new Elite Series controller with sales to a leading post/film facility that will use Pyramix via Oasis as the mix engine; also newly available is an SDK for other DAW manufacturers. Workstations supported or soon-to-be-supported by the network-ready controller include Logic 7 Pro/Express and Nuendo. SADiE and MOTU's Digital Performer are expected to follow once the SDK becomes available. The surface can also be used with various general DSP engines from Klotz, Peavey and Yamaha. Interestingly, the protocol used between the console surface and the console processor is proprietary User Datagram Protocol (UDP), which is faster and more efficient for such tasks. The protocol between the console processor and the Mac running a host

Logic DAW, for example, is MIDI over UDP/Ethernet (in reality, the Native MIDI-based protocol used by Apple). According to Smart AV, the latter is more comprehensive than either Mackie Control or HUI protocols; the return path from Logic to the Elite Controller is direct UDP using Apple Logic's control surface plug-in.

In addition to supporting Mackie Control protocol for Logic Series workstations, Soundtrack Pro and Final Cut Pro, Apple compatibility with a wide cross-section of hardware controllers must be an obvious goal. (I wouldn't be surprised if the company offers its own range of worksurfaces custom-developed for its integrated audio and video applications.) M-Audio recently introduced iControl, a portable USB-capable control surface for GarageBand 2, which Apple hopes will become a third-party developer community. The surface uses a proprietary Apple-developed protocol. (An application-specific SDK is said to be in the works.)

Yamaha, through its recent purchase of Steinberg, has a unique opportunity to develop controller products. In the past, the firm has offered MIDI-based control of basic DAWs from its digital mixers, expanding these capabilities to HUI, Mackie Control

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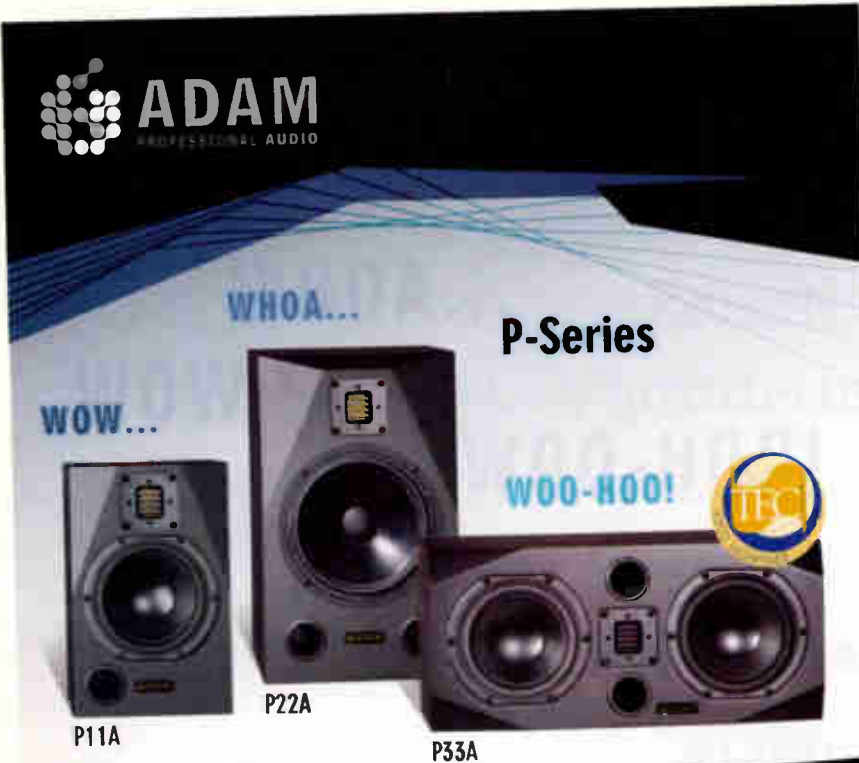
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and Nuendo from DM2000, DM1000, 02R96 and 01V96 consoles. And the DME Series processing engines are controllable via HUI and Mackie Control; the company is closely examining EuCon, Oasis and RAPID, and is considering control from Smart AV Elite controllers. An initiative with Steinberg also holds great promise: Studio Connections is described as a closer integration between software and hardware that eliminates setup/recall problems. A series of SDKs for digital consoles and Nuendo/Cubase DAWs is planned.

Looking across such a varied landscape, one can identify some immediate developments. Plain-vanilla digital consoles are a thing of the past; workstations offer more bang for the buck and enable an entire project including source media to be held within one location and recovered with complete confidence at any time in the future. It's all a matter of workflow and enhanced efficiency. The next hurdle will be to fully integrate audio with video on the same platform; a growing number of videographers and audio professionals are looking to handle picture and sound editing from the same surface, with access to new and fully connected tools.

In other words, the future is not a matter of software vs. hardware, but integrating each aspect in a seamless workflow environment. As we move toward open architecture protocols, the next big debate is sure to be over proprietary vs. nonproprietary solutions. Either way, we will all eventually be playing in the same sand box.

My sincere thanks to Gannon Kashiwa, Digidesign market manager, professional products; James "Woody" Woodburn, senior recording product manager at Mackie; and Jim Bailey, Tascam's U.S. product manager for providing extensive background for this article and enviable patience with my probing questions. Also: Athan Billias, Yamaha's director of marketing, technology products; Euphonix's Martin Kloiber, CTO, and Andrew Wild, VP of marketing; Niall Feldman, SSL's director of marketing; Matthias Korfhage, WK Audio's management director; David Ives, Harrison by GLW's engineering manager; Simon Daniels, AMS Neve's product marketing manager; Lars Baumann, Steinberg's senior product manager Nuendo; Apple Corporation's Christine Wilhelmy; and Cakewalk's Steve Thomas. ■

Mel Lambert has been intimately involved with the production and broadcast industries for more years than he cares to remember.

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FINDING ORDER IN CHAOS

Trends in Digital Asset Management

It's a dominant theme of our times: The deluge of incoming data threatens to overwhelm. Going digital hasn't helped: A double-edged sword, it has just provided the means to more quickly ingest even more information. Of course, an asset is only an asset if you know you have it, you know where to find it and it's in a form you can use.

Lots of people are working on digital asset management solutions, from the major computer companies to solo programmers in niche markets. And while some common attributes of data management are necessary to almost anyone, to be really effective, a system needs to be personalized to its users; hence, the plethora of home-grown systems. The problem that's rearing there is incompatibility—the terrifying specter of having to convert, at some point, all of an entity's data to yet another system.

Today, open-architecture systems are coming into favor, with modular components that make them cost-effective. Here, *Mix* touches base with some companies offering digital asset management systems for music, film and radio.

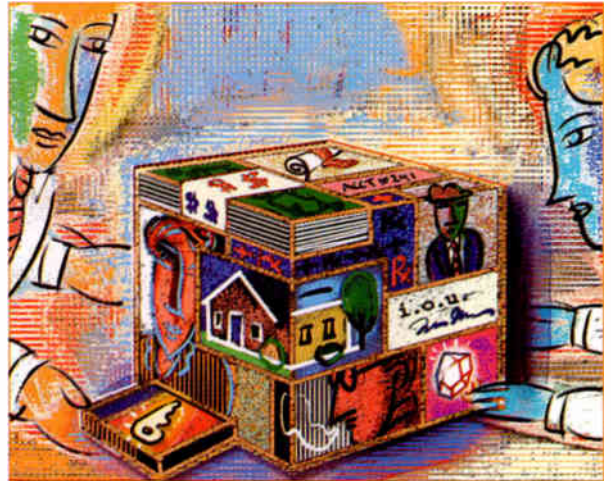
GETTING A HANDLE ON MUSIC AND SOUND EFFECTS

Entertainment production facilities for film, television, radio and advertising have a voracious appetite for sounds and music. Los Angeles-based mSoft Inc. (www.msoftinc.com) offers custom solutions that are in use by such facilities as CBS, the WB Network, Pacific Ocean Post, Electronic Arts and Saatchi & Saatchi advertising.

"We're a browser-based, Intranet media-management system," says Doug Perkins, mSoft's VP of sales and marketing. "Our systems use Internet TCP/IP standards to provide a secure local system within a facility or across multiple facilities. A producer sitting at his desk, for example, who needs to find music for his spot uses his browser to access a server IP address in the machine room. He can audition in real time and transfer files to his work environment in the format required.

"Usually," Perkins continues, "a large music and sound effects user gives us lists of the CD libraries they're using. We determine how big a system they'll require, and we generally provide a system 25 percent larger than that to allow for future library updates. Then we install servers, backed up by Level 5 RAID (Random Array of Independent Disks). We currently have about 15 terabytes of digitized music and sound effects libraries, from the big companies and also boutique houses. We provide [our clients] with digitized versions of whatever CD libraries they're licensed to use, including the metadata—the search text—as well as the audio files. After that, we update them every month via hard drive with new music. If they have a sound design library of their own with a commonly used text database like Excel or Filemaker Pro, we can import that, as well."

A basic premise of mSoft's systems is that the company is



platform-independent. "It works with Mac, PC, Unix, SGI, et cetera, with virtually any DAW," explains Perkins. "If they're using Pro Tools, they can download to sessions or timecode locations. Within the system, they make projects—lists of effects and music that they want to use in a session—that they can batch transfer to their Pro Tools session, Avid audio drive folder, Final Cut Pro, et cetera."

The password-protected mSoft systems recognize edits, read edit lists and generate timesaving automatic cue sheets. (mSoft is currently working to provide cue sheets that the performance rights organizations ASCAP and BMI will accept.) Recently introduced is mSoft MusicDirector, an innovative music search product that circumvents metadata inaccuracies, language barriers and standardization issues by using a sample track to do an actual audio search rather than a metadata search for similar music.

mSoft sells complete systems and subscriptions that Perkins calls "similar to the cable TV model," where the local hardware system is leased, with software and content updates provided. The company has also branched out into video libraries. "The ultimate goal," says Perkins, "is to have a media 'Library of Congress' containing everything a company might need to use and reuse in a production environment: music and sound effects, voice-over recordings, video, logos, fonts—all of it. The time has come for the media management to catch up to the progress that's been made in the editing environment with the DAW."

STEM TO STERN PROJECT MANAGEMENT

The concept for PIX (Production Information eXchange) evolved when computer-savvy sound editor Eric Dachs was working on the movie *Panic Room*. Searching for a way to use the Internet for real-time collaboration on sound effects spot-



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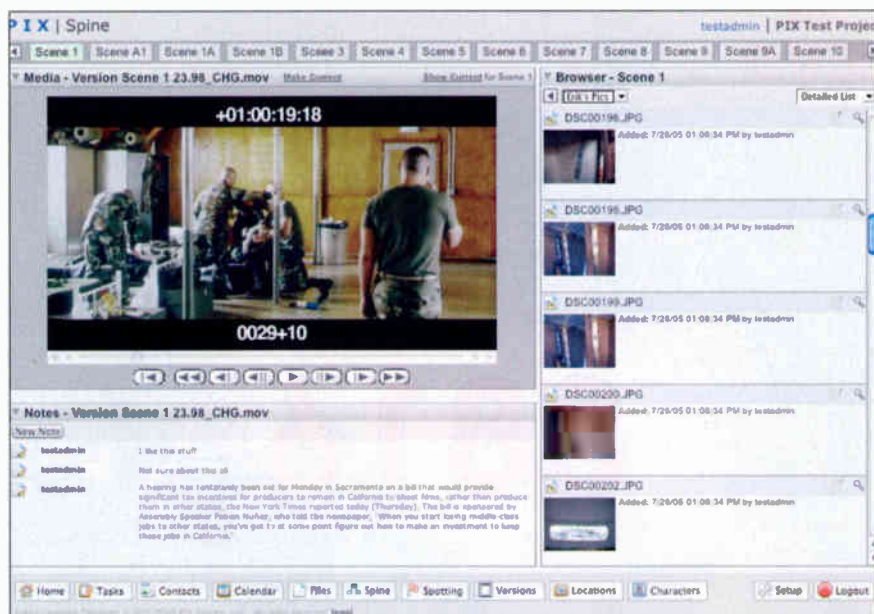
ting sessions, Dachs teamed up with fellow sound editor Larry Schalit, designer Jules Bowie, and engineers Craig Wood and Erik Bielefeldt to design what's now become a complete project-management system. PIX allows the sharing of notes, schedules and edited material, and integrates secure Web access with modular applications for screening and annotating dailies, spotting sessions, location scouting, casting, scoring and more.

At press time, PIX was in use on the film *Jarhead* (among other projects) by director Sam Mendes, editor Walter Murch and sound supervisor Pat Jackson. "Sam shoots, Walter gets the dailies, cuts a scene and puts it up on PIX," explains Schalit. "Sam gets an alert, downloads the scene to his laptop in his hotel room and can go back on the set knowing how his approach is working. Pat can spot a reel, then Walter, the sound editors, Sam—or whoever is designated in the permission system—gets a 'virtual' reel from her and can send back comments."

One of the system's features is that a timeline of edited media accumulates over the entire project as participants add to it from script to final mix. Says Dachs, "Different portions of the application can collect information from the time a film goes into development: stills from locations, music, research materials, et cetera. As the film progresses, we're building an entire active record of all of its digital assets. An age-old problem this addresses is that making a film is very segmented. Pre-production is its own environment versus production and post. Re-ingesting information that's happened upstream wastes a lot of time. We believe that a piece of information only needs to be entered once."

PIX's core is a browser-based open platform. "As sound editors, we've been the victims of workstations with closed environments," says Dachs. "PIX is an application service provider, and we have a comprehensive API. [Ed note: An application service provider, or ASP, provides access to application programs via the Internet for a fee.] If you have a particular way of organizing your sound files that works really well in your Filemaker database—depending on how it's put together—you can attach your database to the PIX framework and get information in and out."

Getting busy filmmakers to adopt new technology isn't easy. "One of the positive outcomes of having a PIX system in place throughout a production," comments Schalit, "is that we can suggest naming conventions, where, because so many people



The PIX system allows sharing of notes, schedules and edited material, with integrated secure Web access.

are independent contractors, there wasn't that infrastructure before. Also, because PIX can store comprehensive descriptions and catalog all kinds of metadata that are helpful to searching, the original file name becomes less important."

Dachs and his group see PIX as a universal production platform for film, television, advertising and videogaming. "We're trying to transition hours that are now spent on administration back into the creative area," says Dachs. "Files and metadata are part of it, but ultimately, PIX is a tool that makes it easier for people to connect with ideas and with each other."

BY SOUND EDITORS, FOR SOUND EDITORS

Started by sound editors at a post-production house in Toronto, Ontario, the Soundminer audio file management system was released commercially in January 2002. "We didn't build this with the intent to make a commercial product. We built this internally for our facility because we didn't like anything available at the time," says Soundminer's Steve Pecile.

"The way the system is built," Pecile describes, "the database travels in a file with the descriptive information in a wrapper. There are two main portions to the system. Ripper is the application that allows you to transfer commercial sound effects and music audio CDs into the most common formats, with all the database information, the waveforms and the search metadata embedded in the resulting file. Then you drag-and-drop it onto Soundminer and it

auto-builds a database for you. Soundminer is also a waveform editor and audio plug-in host: You can edit and add effects and then place the newly created sound on a specific track and time location within Pro Tools or Nuendo. With ReWire implementation, you can control your DAW and monitor through your DAW's hardware at any sample rate.

"Ripper gives the user a number of ways to name a file," continues Pecile. "Beyond the name, because there are only so many open standards for metadata, some of the metadata containers are proprietary. For example, Macintosh uses Finder Comment as a metadata container and Broadcast .WAV uses Bext. We support those and MP3 id3 tags so that you can at least see them, even if you don't have Soundminer. For example, if you were working on Pro Tools—which supports both Broadcast .WAV and Bext, as well as Finder Comment—by simply ripping with our program, you would see a full description above and beyond the name of the file. If they also had Soundminer, they would have extra containers: who composed it, who published it, what category it falls into, et cetera. You can also modify existing descriptions and store your own descriptions."

Soundminer so far is a hybrid between proprietary and open architecture; the products were developed for Macintosh OS 9 and OS X, but scheduled to debut at this month's AES show are Windows XP versions. Soundminer products range from a stand-alone Ripper/Soundminer LE "light" edition bundle, appropriate for a single editor to use, and a full Soundminer



Clone of the 88R

88D

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3 version with extensive sound design capability and other features, to a server system that expands to work with multiple clients from a central location.

The company is currently collaborating with production music companies to help replace CD delivery of their libraries with metadata-embedded digital files. "People are shooting 24-bit/96k sound," notes Pecile. "Sound effects editors are working in higher resolution. They want to be able to deliver in those formats as well, and Soundminer is capable of playing up to eight channels of 192k sound."

PRODUCTION AND WORKFLOW

With such customers as XM Satellite Radio, NPR, Voice of America and the Canadian Broadcasting Corporation, Dalet Digital Media Systems provides media-management tools to large companies, including systems—such as DaletPlus RadioSuite—that combine workstation technology with database management.

Dalet was started by computer scientists with the notion that what broadcasters needed was centrally stored media accessed via a network that could provide instant access to it in real time. "The core," comments director of product development Eric Richardson, "was the concept of a database and central storage where users share only one copy for production and playout, with browsing purposes accessed over the network. Today, that's done using standard Internet tools."

With digital files stored in servers and other places where they can't actually be seen, the primary goal of an asset-management system is to have a way to search and retrieve. Increasingly, it's also necessary to be able to repurpose those assets.

"For our clients, that means re-editing a file and putting it back on the air or the Web," continues Richardson. "For the broadcast industry, a system that works purely as an archive isn't enough. We need production tools that let users manipulate the content and keep track of it. The first element of going digital meant perfect reproduction, but the real advantage is how it impacts workflow. That's the revolution that asset management brings: the potential for changing the way people work.

"For example, at XM Radio, they have over 2 million song titles online. The same copy of a song can be playing on three different channels, all simultaneously streaming off the server. DJs can do searches and what they're looking for instantaneously comes up on their workstation. They can edit it and create a show, and it's all nondestructive, using just one copy of the media."

Although a large part of Dalet's systems involve automation, there are also numerous live applications. According to Richardson, "For XM and our other radio customers, especially on news programs, they can be editing a piece and still finishing the back end while the front end is going on the air. That's one of our most powerful concepts: While something is coming in, users can be working on it and pulling sound bytes, et cetera. The reverse is also true: While you're still finishing the editing, you can start to broadcast.

"Asset management means many things



Dalet director of product development Eric Richardson

to many people. The context for broadcast and for audio and video content producers includes not just storage, but manipulation and communication of the data," Richardson continues. "The heart of all that is a powerful database that can keep track of where everything is stored physically. When you have hundreds of users who want to be able to access the material from a roomful of servers, you need something on top of that to make the actual physical location of the file transparent to the user.

"XM, for example, couldn't exist in its current form without a system like Dalet. They provide over 100 channels, 24-hours-a-day, with very high production values. They have Pro Tools rooms, but they also have 350 desktops running the Dalet editor pulling material off the servers."

Effective file naming, of course, is a key component to any kind of digital asset management. Numerous organizations are working on standardized metadata-naming conventions, but progress has not been fast. Meanwhile, the all-too-familiar problem of getting manufacturers to agree on standards is ongoing.

"Transferring is the easy part; harder is entering metadata," Richardson admits. "What do you call it, how do you describe

it, how do you make it searchable? The Achilles heel of all this is that a system is only as good as the metadata in it. It has to be entered with a consistent vocabulary. Broadcasters and other organizations are coming up with metadata schemas and beginning to standardize the parameters.

"XM has original content and music to keep track of, so they have their own system with over 125 different data fields associated with it: things like album art, front and back scans of the CD, liner notes in both high and low resolution for the Web. All that labeling from the database is sent out to the satellite and then comes down to your car where you have the text scroll. In a way, XM is the poster child for how asset management affects so many parts of a business: what you see on the Website, your receiver, the information the DJs use to talk about the material and song reporting for the publishing industry."

Backup formats are, of course, another crucial area in which standards are still being debated. "Especially for news content, it's very important for broadcasters to be able to type in a few keywords and access their archives," Richardson asserts. "But what format do we currently have that's going to last 50 or 100 years? There's no good answer. We have practices and recommendations, but what we stress is that in the future, you are going to have to keep migrating your archived media. Today the format may be tape, tomorrow it may be optical, 20 years from now it may be something we don't even know about.

"An archive system is expensive, so it's difficult to think it may only last 20 years. Historically, things were archived to vinyl or tape, with the belief that that was it; it was done. But now there is no 'done.' But as long as you have your content in an open system database that isn't stuck in a proprietary way, it can be exported and translated and you can keep moving forward. You're going to be doing that from now on, and with a good asset-management system, the cost to move things forward will be less."

Companies are making huge investments in managing their content because they know it's a huge part of their future. Concludes Richardson, "Large broadcasters—Fox, CNN, NPR and other organizations with large audio/video libraries—are realizing that their content is a giant treasure trove that's increasing in value every day. It has to be easily searchable to exploit that value, and it also has to be able to be manipulated because the back side of an asset-management system is repurposing and commerce." ■



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WHAT'S THE HOLDUP?

Understanding and Removing Computer-Based Latency

In the stone age of computer music (the 1970s), latency was measured in minutes, hours or days. Computer musicians entered their compositions on punch cards or QWERTY keyboards and then went out for coffee or perhaps got a good night's sleep while the CPU computed the audio file.

By the late '90s, latency (the time lag between when you, the human, would like to hear something and when you actually hear it) was whittled down to less than a second. But that was still way too long. Latency was a serious, nagging issue for anyone who wanted to use a computer for audio recording and mixing, much less for real-time effects processing.

Since then, manufacturers have made giant strides in developing lightning-fast ways to handle computer-based audio. For example, Steinberg's ASIO and Apple's Core Audio provide very low-latency audio I/O. (If you're still using MME on a Windows system, don't even bother reading the rest of this article. Go out and buy an ASIO interface.) The fact that the computer's CPU speed has increased by a factor of 10 in the past decade has also helped. Today, latency isn't a problem—unless it's a problem. When it's a problem, there are solutions you can deploy. But to find the optimum solution, you need to understand the nature of the problem.

In this article, I look at some scenarios in which latency can become audible, explore the technical issues involved and discuss some strategies to deal with it.

THAT WAS THEN, THIS IS NOW

We're used to thinking of today's computers as being extremely fast, but "old-fashioned" analog audio is much faster. In an analog system, audio signals travel—for all practical purposes—at the speed of light. In contrast, in a digital audio system, audio signals are represented by streams or packets of numbers. Moving the numbers from place to place takes time; processing them takes still more time.

We know that in a computer audio system, latency is caused by the time it takes for the system to move audio data from place to place, alter it in some way or both. A typical audio process—for instance, reading a track from the hard drive, passing it through a reverb, mixing it with other tracks and sending it to the audio interface for monitoring—occurs in several stages, and each stage introduces some latency. George Radai of M-Audio compares latency to the noise floor in an audio system: Each component may introduce only a little noise, but the noise build-up is cumulative. With latency, the time lag introduced by any one stage may not be perceptible, but when several stages follow one another in a chain, the system's total latency may become not only perceptible, but maddening.

Digital audio is not usually handled one byte or sample word at a time. Instead, it's handled in chunks or packets. At



the beginning of the process, for instance, the A/D converter turns the signal from a mic or analog bus into digital audio. Typically, the audio interface fills a buffer with data and then sends a signal called an interrupt request to the computer's operating system to request that it pick up the buffer's contents. Once the OS has done so, the interface begins filling the buffer again. The actual situation may be somewhat more complex than this simplified scenario, but that's the essence of what happens.

For purposes of discussion, let's assume that the interface is sampling an incoming audio signal at a 96kHz rate with 24-bit resolution. Let's also assume that the buffer is large enough to hold 1,024 sample words of data (3k bytes) for each monaural audio stream that is being digitized. At that rate, the first sample word arriving in the buffer will have to sit in the buffer for a minimum of $\frac{1}{96}$ second (a little more than 10 ms) before being passed on to the OS.

The musician will most often be listening to previously recorded tracks while laying down a new one, so if the musician's timing is perfect, he or she will be playing the new track 10 ms after the DAW played it. The newly recorded material will arrive in the DAW after another 10 ms, resulting in 20 ms of latency. If the DAW simply lays down the new track the way a multitrack tape machine would, then the new track will be 20 ms late.

Twenty milliseconds of latency would be very audible, but today's DAWs compensate for this time lag so that you don't hear it. The DAW "knows" the size of the interface's buffer, so it advances the newly recorded audio data by the necessary



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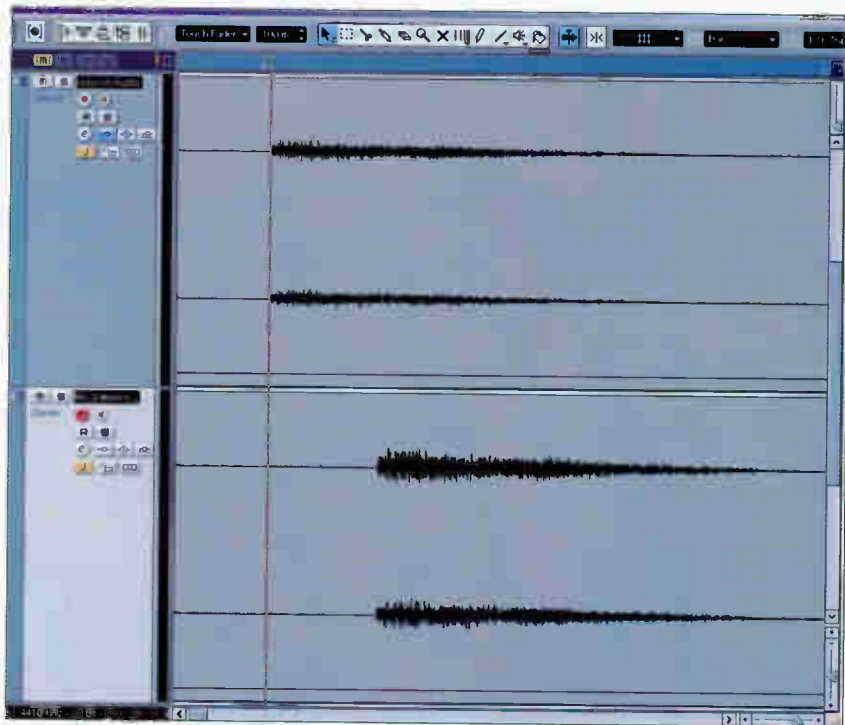
WHAT'S THE HOLDUP?

amount when placing it in a track. Thus, the track will be perfectly synchronized with other tracks that were being monitored while the recording was being made. Problem solved.

WHAT'S IN THE CANS?

A more serious issue can arise when musicians want to hear what they are singing or playing through the headphones during the recording process. If this live signal is entering the computer, being mixed with the other tracks and then sent back to the computer's output for monitoring, then the live signal will be delayed twice: once going into the computer and again on its way out. This in-to-out latency can be perceptible and distracting to the musician.

Two easy solutions are available; the third solution is more expensive. First, many audio interfaces are equipped with zero latency through monitoring. This is an analog bus that loops directly from the interface's input to its output without being digitized or passed through the computer. Once you've set up this routing in your interface's control panel applet, the musician will be able to monitor the backing tracks and get his or her performance in sync.



The file on top, recorded in Steinberg Cubase SX 3, was bounced to the next track through Cycling '74 Pluggo's Dynamical compressor effect. Dynamical was set to a look-ahead time of 29.66 ms. Not unexpectedly, the bounced track's observed latency (which would be the same as the latency of the original track's live playback) matches the look-ahead time.

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If your interface doesn't have zero latency through monitoring, you can accomplish the same thing through your hardware console; a bit of repatching may be required. For instance, you may need to connect the interface to an aux or bus output on the mixer to avoid recording the entire temp mix into the new track. This solution should also work with a digital console: While there is inevitably some latency in digital mixers, it's kept very low thanks to an OS that's optimized for the job. Yamaha reports, for example, an in-to-out latency of less than 2 ms for the 02R96 Version 2.

Most computer audio interfaces allow you to set the size of the input buffer. You may be wondering, "Why can't I just reduce the buffer size to its minimum to squash the in-to-out latency?" Feel free to try it, but the smaller the buffer, the harder the CPU has to work. At a certain point (which you'll find by experimenting with your system), reducing the buffer size further introduces crackling noises. These noises crop up when the CPU literally has to drop audio bytes here and there because it can't keep up.

In that situation, the solution is to buy

a faster computer. Today, fast systems can get the I/O buffer size down to 64 samples (1.3 ms at a 48k sampling rate) without trouble. But as you add more tracks and more processing, and especially when you're running at a higher sampling rate, the CPU will have to work harder, which means you may need to increase the buffer size to prevent dropouts.

MIDI SLUDGE

It's important to keep the buffer size as small as you can without allowing the audio to break up when you're using a hardware MIDI controller to play a software synthesizer. In this scenario, there's no way to compensate for the MIDI-in-to-audio-out latency. When you press a key on the keyboard, the keyboard needs 1 ms or so to create the MIDI message and the OS may hold onto it for another couple of milliseconds before passing it on to the DAW. The DAW then passes it to the plug-in (that step will probably be very fast) and the plug-in begins filling its own buffer with audio data. Depending on the buffer's size, a few more milliseconds may pass before the plug-in sends the beginning of the synthesized note back to the DAW. The DAW then mixes it with the data stream being sent to the interface, where it waits in the interface's output buffer for a few more milliseconds before being sent to the D/A converter.

In practice, MIDI-in-to-audio-out latency can be slightly perceptible, but it's not usually a major problem. For one thing, keyboard players are used to a little latency. When a pipe organist plays in a cathedral, the latency caused by the speed of sound and the distance from the organ console to the furthest ranks of pipes can be more than $\frac{1}{4}$ second. A stage amp 20 feet from the player introduces 20 ms of latency, and no one complains.

In the days when "MIDI synthesizer" meant hardware, the bandwidth of the MIDI data stream itself could become a source of latency. Each note-on message in a MIDI cable requires 1 ms to transmit, so when a 10-note chord spread across several MIDI channels was sent down a cable, the last note would be delayed by as much as 10 ms.

With software synths, this source of latency has been eliminated. The speed with which MIDI messages can be transmitted to a plug-in instrument is far higher. This can cause problems, however, if a hardware synth is layered with a software synth. The hardware instrument might easily lag a few milliseconds behind the software, which can



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cause smearing of attack transients. In live use, however, the situation is reversed: The soft synth may be a few milliseconds late.

In the studio, the solution is simple: After recording the hardware synth's output to a new track, advance the track a bit while listening or observing the waveforms.

PLUG-IN CHURN

Software-based effects processors can be another source of latency. When the plug-in receives a packet of audio data from the DAW's mixer, it may have to spend a few milliseconds chewing on the data before sending it back to the mixer. As a result, a track that is rhythmically aligned with the rest of the music when monitored dry may lag slightly when an insert effect is applied. (See the figure on page 100.)

According to Jim Cooper of MOTU, today's third-party plug-ins (at least on the Mac) universally make their latency figures available to the host DAW. MOTU's Digital Performer automatically compensates for the latency by sending the track audio to the plug-in early so that the plug-in's output will be in sync with the rest of the tracks.

If you're using a plug-in with latency that isn't being compensated, you can do the same thing by hand: Advance the audio segments in the track a few milliseconds at a time (either by dragging the audio segments or with a track-advance parameter) until the processed sound locks in rhythmically. At this point, the effect's Bypass button will create the opposite problem: When the effect is bypassed, the track will be early. If you want to do a lot of A/B'ing of the track with and without the effect, the workaround is to duplicate the track and use the Track Mute buttons instead of the effect's Bypass button.

Advancing the track's audio data can also be a viable solution if you're using a cherished hardware effect in your mix. In this case, you'll need to compensate for the interface's out-to-in latency, which will probably remain even if you're feeding the rack processor a digital audio signal rather than going through a DA/AID conversion. If you want the hardware effect to be on a bus rather than functioning as an insert, advancing the track data won't work, but there are still workarounds. For instance, you might pass the entire mix (except the effect return) through a wet-only delay line set to a few milliseconds of delay.

In practice, plug-in latency is likely to be a problem only with extremely DSP-intensive effects such as convolution reverbs and FFT-based processing. I tested a convolution reverb (WizooVerb W2) and found that the

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output of its dry signal path was word-aligned with the input. Inevitably, the convolution process delayed the wet signal, but a few milliseconds of pre-delay in a reverb are probably not going to hurt anything.

SCREEN REDRAW WOES

The most noticeable form of latency in today's computer-based recorders is not audio latency but visual latency. When the DAW is busy handling a number of audio streams, it will quite sensibly put screen updates at the bottom of its to-do list so as not to risk audio dropouts. As a result, the meters may get jerky. Any faders being moved by automation data may jump from place to place rather than moving smoothly.

If the meter's overload indicator is dependent on the visible meter performance rather than on the actual audio level, then sluggish meters could cause you to miss a moment of clipping. If the DAW's code is well-written, that won't be a problem. But we're not quite out of the woods yet. If you're using the mouse to record automation data, then the DAW may not read the mouse position often enough when the CPU load gets heavy. The same thing might happen with a hardware control surface.

To test your own configuration for this problem, load a CPU-intensive project, record some automation moves and inspect the data for jumps. Then mute, bypass or delete a bunch of stuff so that the CPU load drastically drops, record more automation and compare the results. Within a few minutes, you'll have a handle on whether your system needs babysitting in this situation.

Jerky automation data can usually be smoothed out by hand, either with a pencil tool or by editing a few envelope breakpoints. If your studio handles a lot of tight-deadline projects, though, a better solution is to buy a faster computer.

LAST BUT NOT LEAST

Manufacturers are naturally eager to get the last ounce of performance out of computers, so CPUs are always going to be pushed to the wall. Whenever the CPU is working hard, increasing the audio I/O buffer size can become necessary to prevent glitching. It will be a few more years before audio I/O buffering drops below 1 ms and stays there. The good news is, there's no need to sit around and wait. You can lick latency right now.



Jim Aikin is a regular contributor to Electronic Musician and other music technology magazines.



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PRODUCERS TAKE ON OS X

Demystifying System Upgrades

a few months ago, I wrote a *Mix* "New York Metro" column about the Manhattan Producers Alliance (www.manhattanproducersalliance.com), a cooperative whose members announced an "OS X Project" to track down and fix their most-hated Mac OS X bugaboos. After months of what they sometimes refer to as "torture," they have two great pieces of news: OS X is actually excellent for pro audio and the group is sharing everything they discovered along the way.

"People asked, 'Did it work?' but that's not the question," says MPA founder Joe Carroll. "In the end, some of the OS X issues were trivial, but finding the information was torture—stuff that appeared deep in manuals or update documents that only the most persistent of computer geeks bother to read. The answers are always findable, but couldn't they make it easier?"

"The way this group of composers tag-teamed their way through the software interactivity issues was great," adds MPA composer Wade Tonken. "We're also open to people with questions or who want to add to the database of knowledge on our Website with fixes that they've found." The following are some problems and solutions discovered in the course of the OS X Project.

WHERE'S MY SOFTWARE PATH?

Carroll spent long hours trying to get MOTU's MachFive sampler to open as a plug-in in a newly upgraded version of Digital Performer. "I followed the procedure in the MachFive manual but couldn't get it to work," he says. "Then, MOTU tech support told me that virtual instruments now get plugged into an 'instrument track.' It turns out that this is explained in a 'read me' file, but you will only see that if you sequentially update every version of Digital Performer; in which case, you will find it in the support material for Version 4.12." Carroll eventually located relevant information in the Digital Performer 4.5 manual—on page 815.

PLUGGING IN THE PLUG-INS

"The Waves plug-ins menu surprise is a perfect example of the highs and lows experienced when switching to OS X," says MPA composer Kevin Joy. "After upgrading, your plug-ins open up your OS 9 job in OS X and—*voilà!*—the plug-ins are all plugged in. Uh, oh! Of course, the settings aren't there because the settings are now stored in a new place. What's the answer? Go back to OS 9 and open every job. Save each plug-in setting into a folder on the desktop. Go back to OS X and put those in the right place. Open the job in OS X, and go to each plug-in and pull down the correct saved setting."

PARTITION? DUAL-BOOT? SEPARATE DRIVES?

Conflicting information on where to install OS X abounds. One drive for OS 9 and one for OS X? Separate partitions on one drive? Two separate drives? "It's typical for our user to keep a small system partition in OS 9 for backup," Tonken notes. "You can make a disc image of your system at a moment when



Manhattan Producers Alliance's Joe Carroll (L) and Wade Tonken

it all works and your authorizations are in place. Should you crash or if your system corrupts, you can return to the 'all okay' state in minutes by replacing your current system with the disc image. OS X is very large, and reworking your existing computer to accommodate a 4-Gig system partition takes a lot of time. I tried using Carbon Copy to move things around, but I must have done something wrong, because when I was done, nothing worked.

"Having OS 9 and OS X on the same drive is also debatable, because each system seems to push around the other," Tonken continues. "Rebuilding the desktop each time you move to OS 9 is definitely recommended, but what does that rebuild do to OS X? Many users have experienced being stuck in OS 9 and not being able to get back to OS X without re-installing. For us, the debate is over: We definitely want OS X on a separate drive!"

TDM/MIXPLUS AND OS X

"The single-most entrenched OS 9 group are people with a serious TDM rig," says Carroll, "because the cash and pain suffered to get to that same level of efficiency on OS X is extraordinary. We're still puzzling that one out."

There are other problems and solutions covered on MPA's Website. At this point, the pioneering group has tackled its most serious OS 9/X issues, and is looking forward to working on a Logic pilot program for the upcoming XServe, a G5 rack-central server with extremely high bandwidth to support much more powerful real-time sample streaming. And, happily, they do dig OS X. "OS X is an excellent platform for audio," Carroll concludes. "This OS almost never crashes, and restart or startup is extremely fast. Increased productivity and ease of connectivity are obvious. I don't hesitate to network to another OS X computer in the studio to retrieve some files while someone is on that computer recording because they never even know I was there. Try doing that in OS 9!"

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Track Transformations

Audio Pros Bring Big-Budget Value to Small-Budget Features

By Michael Axinn

When George Lucas famously postulated that sound was 50 percent of the movie-going experience, a generation of audio professionals began to see themselves as more than just technicians. As they pulled apart production sound and put it back together, designers and editors employed ambience, ADR, plug-ins, recorded effects and Foley to underscore story points and further the filmmaking process.

Sadly, someone forgot to tell the budget people about the “half-the-movie” deal. Sound may be widely acknowledged as an essential filmmaking component, but most film executives have trouble understanding why there should be six or more sound editors when picture departments only have one. Only on big-budget features—which account for a mere eight percent of the film market—will production companies hire a minimum of one editor each for Foley, ADR, dialog, backgrounds, hard effects and design.

On projects where budgets do not allow for that level of staffing, clear communication with the director and composer, a production mixer willing to go the extra mile and the supervising sound editor's experience can be the difference between leaden soundtracks that indie films often end up with and pure gold. With schedules pared down to four or five weeks, short or nonexistent predubs, ProControl final mixes and a maximum



Production mixer Lori Davi worked on the Foley footsteps for indie film *November*.

of two or three editors, somehow, some way, these supervisors bring clarity, craft and nuance to the work of our best indie directors.

LESSONS FROM BIG-BUDGET FEATURES

Glenn Morgan of Soundelux has become something of a specialist in the low-budget arena. His recent credits, among more than 100, include *Monster's Ball*, *Reefer Madness (Mix)*, April 2005), *Open Water* and—don't laugh—*Jackass*. These films may be “financially challenged,” as he wryly puts it, but their success is a function of the filmmakers' ability to make the best use of minimal resources and the extent to which they allow sound to play a crucial role. “The key is being able to identify the important moments of a film,” Morgan says. “You have to know the project, and listen and communicate with the filmmakers really well.”

On big features, of course, everything gets covered. “The director will give you the palette to make it the greatest-sounding thing possible,” he

says. “You're talking about budgets that are over \$1 million. You have the time and the resources.”

But on lower-budget projects, where distribution is uncertain and there isn't much mix time in the schedule, choosing what to cover—decisions often made by the sound supervisor—can mean the difference between a festival sale and a quick disappearance. One of the biggest mistakes an inexperienced supervisor will make is to try and cover everything and then run out of time. “Having the experience from those \$1 million-plus-budget movies allows me to look at a film and pick the things that are important,” says Morgan.

Another supervising sound editor who brings big-budget experience to small-budget features is Skywalker Sound's Frank Eulner. “We all know what we can do and what could be done if there was time,” he says. “With these low-budget jobs, it's the ‘Art of What Not to Do.’”

With 50-odd feature credits under his belt, working with directors such as M. Night Shyamalan (*The Village*) and Phillip Kaufman (*Quills*, *Twisted*), Eulner has witnessed and taken part in the decision-making process on numerous

—CONTINUED ON PAGE 115



Composer Marco D'Ambrosio (*Swimming With Sharks*, *Haiku Tunnel*, *Vampire Hunter D*, *Jojo*)

Jingle Rebound

A Changing Market Yields Innovative New Facilities

By Gary Eskow

By the late 1990s, changes in technology, the financial markets and consumer taste, combined with a round of bitter labor negotiations, created a vastly altered landscape in the music for advertising marketplace, particularly in New York City's greater metropolitan area. Gloom and doom were everywhere, and many longtime jingle and post houses decried the cheapening of their product and work migrating to the hinterlands.

As is generally the case in a fundamentally healthy capitalist environment, however, new opportunities arose, and a round of eager, talented suppliers found their way into the Manhattan music scene, including Human, Pulse and Tonefarmer.

HUMAN

Based in New York, with branches in L.A. and Europe, Human (www.humanworldwide.com) was created by guitarist/composer Andy Bloch and his partners Morgan Visconti, Gareth Williams and Marc Altschuler. In the mid-1970s, Bloch was a hard-working classical guitar student at the Mannes College of Music (part of New York City's New School University) who moonlighted with a fusion band. These days, he seems not unlike the quiet youngster who traded Fernando Sor licks with the rest of us in-between solfège classes.

But things have changed for Bloch. He's now a 14-year advertising music vet who cut his teeth on a GI Joe toy spot when music houses were scooping up cash. But Bloch still remembers the early days and those toy spots as the most pressure-packed of his career.

After spending several years as a freelancer, Bloch was plucked for a high-visibility staff position at JSM, one of Manhattan's top houses at the time. JSM owner John Silberman, who started out in the business as an in-house advertising writer, knew how to craft high-impact audio. He also knew the value of style, and his rooms (designed by John Storyk)

combined acoustics and accoutrements in a package that was an elixir to his client base. "JSM had four rooms with SSL consoles," says Bloch, "and the place looked like something out of *Architectural Digest*. John's vision was to create a creative community and supply them with the tools and inspiration to help them turn out their best work.

"[Silberman] certainly had his heart in the right place, but the timing—at least when I was there—was a bit off," Bloch continues. "The industry had just suffered through a SAG strike and it killed a lot of his business, and a lot of momentum was lost. The ad industry learned how to get the job done a lot cheaper, and JSM had a huge overhead. Ironically, JSM ended up being more of an incubator than a creative juggernaut. So many great people passed through and moved on to start their own shops!"

Bloch, who stayed at JSM until 1999, when he started Human with a pair of JSM composers, Williams and Visconti (son of producer Tony Visconti), acknowledges his mentor's influence. "The JSM experience was instrumental in establishing the ethos of Human. We really learned what is important in this business and how it can all come apart if one isn't careful!"

Bloch started out cutting 2-inch tape and working on an old Neve board, but he understands that the studio business he grew up in is gone. What has replaced it and what changes does he envision coming to the spot industry in the near future? "Anyone can have a rocking home studio for \$30,000 to \$40,000," he says, "and that includes the great mics and preamps we all love. As far as advertising music production, we face the same problems that the rest of the music production industry is dealing with: Budgets are tighter and everybody and their editor is a musician. Record companies are trying to



Guitarist/composer Andrew Bloch of Human

monetize their artists and back catalogs via commercials.

"The technology has spawned a new way of creating—and listening—to music. Traditional music-making and consumption is on its last legs. The computer is so powerful now that it has really become the new instrument of the 21st century. It provides content and algorithms for compositions that enable real amateurs to pass as serious composers. As the industry continues down this path, it will be open season for people who want a shot at scoring for ads.

"Some think that music libraries are the future," he continues. "The music library concept is as old as the hills and easier to actualize than ever—but it's still library music! The serious filmmakers and creatives generally want to work with a composer and explore options. It's a process, not a mail-order business.

"As much as we love to go all out and do a 60-piece date—they usually take place in Europe or South Africa—we're very much into buying gear here at Human. We are all on Mac G5s, and I use Cubase SX as my front end. Everyone else uses Logic with Pro Tools[HD]. We're also big Gigasampler users.

"We're not deep into exotic mics, but I've found that at the \$800 or so price point, you have a great range of killer microphones to choose from. I love my Studio Projects T3, for example. If we need to do a really nice, live recording session, we'll just book Clinton or Avatar and do an old-school session, although

we always mix our own stuff. The amount of revisions required these days dictate that we take whatever live recording we do and tweak it back at the ranch. It's also possible to get a good mix without knowing the first thing about mixing, thanks to great mastering programs that are on the market. The Sony Oxford Inflater is a great example of an 'insta-mix' plug-in: Drop it in and—bam!—the mix sounds great, especially coming over a small TV speaker system.

"As far as future plans, we're looking at all aspects of music production: ads, films, videogames, songs/artist production, even ring tones. Right now, ad music is a vital endeavor and there's no cultural stigma attached to it. The best people are breaking down the doors trying to get a piece, in part because it may be more adventurous and hip than most commercial music. Nobody wants corny unless it's used ironically!

PULSE MUSIC

Musicians and producers who have enjoyed success in commercial music have become increasingly attracted to the advertising industry. Just ask Joel Kipnis, aka J.K. Kipnis carries a hefty job description at Pulse (www.pulsemusic.com): president/CEO/writer/producer.

Prior to opening his own commercial music house about a year ago, Kipnis played guitar and produced records. A Paris native, he has worked with Freddie Jackson, Johnny Kemp and Jennifer Love Hewitt, not to mention Herbie Hancock, who heard *What's the Word*, Kipnis' debut album, and asked him to co-produce and play on The Headhunters reunion album. During the past several years Kipnis has produced a number of albums, including a soon-to-be-released offering from former Fugees member John Forté.

As successful as he has been, Kipnis knows the record business' vagaries. He also understands the cache that his resume carries and is using it to leverage the visibility of Pulse Music, which straddles the music for advertising and record worlds.

"My involvement is largely with records," says Kipnis, "but I have also been directly involved with spot production. We've gone from doing things that were perceived as jingles to producing much hipper spots. Pulse writers have made records with everyone from Christina Aguilera to the rock band Lit. These guys have made huge pop and soul records, and their presence provides an exciting atmosphere that carries over to the commercial work that we do.

"For example, Supaflyers have worked with Sting and Mary J. Blige, and Adam Anders has worked with the Backstreet Boys and is currently working on the new Nick Lachey record. Put all these guys together under one roof, and you get an approach to making commercials that is not at all coming from an ad perspective. And that's healthy.

"The advertising agencies these days are much more interested in having something authentic on their spots," he adds. "In fact, we have new artists that we're producing, and agencies are often intrigued by the possibility of having someone on their commercial who may become big in the near future. Asi [an artist Pulse is producing for Warner Bros.] and Gio, another artist we're working with, are people who have a special sound that hasn't come out yet. So what we're finding is that the audio part of the ad business has changed in some important ways, primarily in that creatives aren't interested in cranking out product; they want to know where a sound is coming from and what it is."

Pulse Music has seven rooms, whose aural aesthetic combines vintage equipment and almost every software application under the sun. "We use lots of Neve and API stuff for the front end, along with Pultec and Manley gear," Kipnis explains. "From there, we work on dual-processor G5s, Logic 7 and the latest version of Pro Tools. Plug-ins are fine, but nothing compares with the signal path that comes with a vintage tube mic taken through a Neve or Pultec compressor.

"Our favorite mic pre's are the API 512C and Neve's 1084 and 1073. I love the API 550A EQ and the Neve 1081, as well as the 1084. We've also been using Wunder Audio's PEQ-1 mic pre/EQ module, and I like it a lot. We love Pultecs! The Neve 33609JD is also great, and we put our Distressor to use all the time, along with the Manley Vari-mu stereo compressor. We put that across the stereo bus all the time. We're also big fans of the Chandler LTD-1 mic pre and EQ package, and the Manley Vox Box.

"As far as software goes, our favorite EQ is the Sony Oxford with the GML option. The new Apogee AD-16X converter sounds great. For monitors, the ADAM S3As are outstanding; we also use Dynaudio M3s as our large pair.

"We're all big fans of everything that Native Instruments releases—the whole package is great. We use Absynth quite a bit. The synths in Logic are very good, and we're big fans of Spectrasonics' new drum module, Stylus RMX.

"I'm really excited about the way the wind is blowing in audio post right now and with music in general," he concludes. "The common person is more excited about what music is and how it's made, and that should pave the way for a generation of great new artists. The methods of music-making have gotten so advanced that almost anyone can make a beat and put up a song, and I think with these technical advances, the hunger for outstanding music has also grown."

TONEFARMER

One thing's for sure: Jingle houses have cooler names now than they did back when the typical production company's moniker was something like "Al Smith Music."

Founded in 2001 by Raymond Loewy (composer/sound designer) and Tiffany Warin (president/executive producer), tonefarmer (www.tonefarmer.net) is another creative music house run by a former JSM composer. Loewy, who hails from Rochester, N.Y., graduated from Duke University in 1989 and immediately started working in the music industry. Warin spent a dozen years as an advertising agency producer and account manager. A trio of composer/sound designers (David Della Santa, Joe Spallina and James Harned) and studio manager/assistant composer/engineer Casey Smith round out the staff.

Loewy says that the advertising industry has pulled itself out of the malaise caused by the dotcom bust and 9/11. "The amount of work produced continues to grow, even if the avenues of communication have started to change a bit," he observes. "While mainstream broadcast 'spots' are still a major fixture on the advertising landscape, more and more attention is given to alternative media, particularly broadband and Internet marketing. These avenues can often provide shops such as ours with greater creative latitude and less-constricting schedules and deadlines.

"However, their budgets are often significantly smaller than those of traditional broadcast ads, while the amount of content required can greatly exceed what's necessary for shorter-form television and radio spots. Therefore, these types of jobs get extra careful consideration before being taken on and committed to. We've had a blast working on some of these packages, however, for clients that include Sharp, United Technologies and PBS.

"The single most significant development in our business over the past several years has been the continued and growing prominence of artist-licensed music," he

continues. "As the record industry has faltered, major and independent record labels have gotten increasingly savvy to the tremendous amount of money advertisers are willing to spend to license a track. Advertisers, in turn, have grown fascinated with the possibilities of marrying their marketing messages to recognizable existing music. From fully canonized artists such as U2, the Rolling Stones and Led Zeppelin, down to impossibly obscure and/or forgotten acts like Trio, Mr. Scruff and Terry Jacks, nothing seems to escape TV advertising's reach these days. Sometimes this option makes sense for the advertiser. Volkswagen, Reebok and Cadillac have used existing tracks to great overall effect in their advertising, some with recognizable anthems, others with alternative and lesser-known artists.

"With much television advertising today, however, it seems as if the ownership of a recognizable song—any recognizable song—is used to prop up an otherwise unremarkable spot. In the worst cases, the chosen song or track makes no sense whatsoever and can actually work against the spot's overall message. But all of this hardly matters, and the relationship between corporate marketers and record labels will most likely continue to expand.

"Many music houses have updated their services to include song and publishing searches—and even artist/label representation—with varying degrees of success, he adds. "We have done the occasional 'music search,' but as of this date, we do not offer these kinds of things as an official service. At tonefarmer, we're interested in the creation of original music and noises, and we feel that there will always be a need for thoughtful, original music scoring and sound design."

With regard to equipment, all tonefarmer writers work on the same basic setup. Each composer suite is equipped with Logic running through Pro Tools. A fine assortment of microphones and outboard gear (Telefunken, Neumann, AKG, Manley, Focusrite, API, Giltronics, Apogee, etc.) complement the process. All sorts of other music-generating equipment—including a battery of vintage and modern guitars, basses, synths, keyboards, amps, drums and a 1986 Yamaha C7 concert grand piano—are also in-house.

Tonefarmer is located high above Chelsea in an ex-sewing machine factory that was built in 1911. The 4,000-square-foot loft's original 2001 buildout comprised three composing suites, all tied into a 400-square-foot live room. In June 2005, phase 2 of

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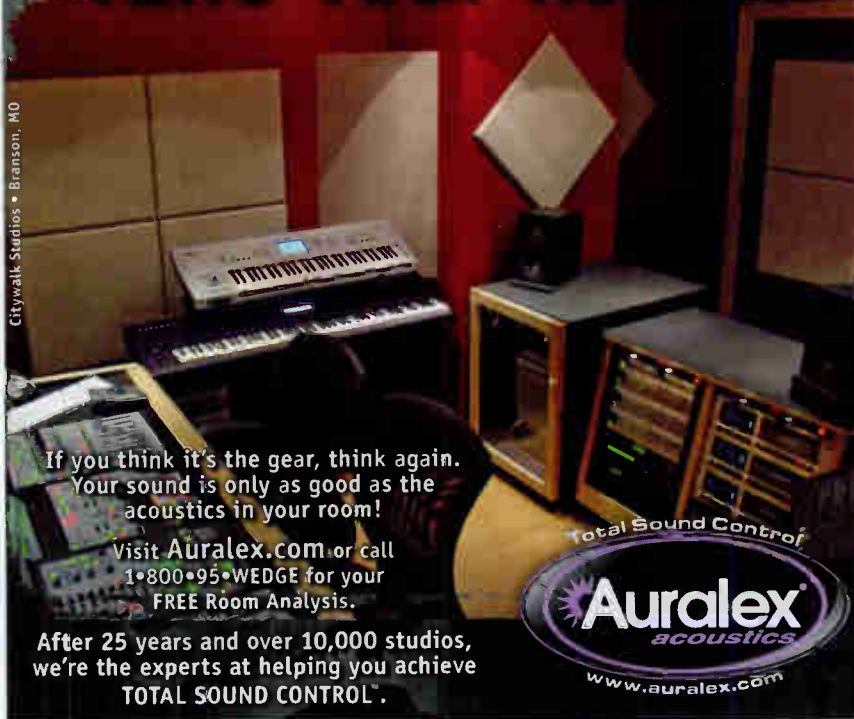
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Mitch Gallagher, EQ magazine

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construction brought an additional composer suite and an all-purpose "dub chapel," which also now acts as a machine room.

"Our main goals remain as they have since we started: to provide an intimate, chill and, most of all, dedicated creative resource for our clients," Loewy says. "Our success in an extremely crowded marketplace so far has been extremely gratifying. But success in our business can sometimes be the worst thing to happen to a young company and so we're keeping an eye on controlling and managing the growth of the company. One of our explicit goals is *not* to become a 25-composer behemoth with outposts in Oslo and Shanghai.

"We really dig the musical point-of-view and family vibe that being a boutique allows and pride ourselves on not simply taking on as much work as we can get. When we commit ourselves to working on a particular job, our clients know that their project will ultimately be handled by one of tonefarmer's four principal composers, not 'writer #34' or a group of six freelancers. This method of operation impedes us from taking on the volume of work that many of the other larger shops accept, but it also allows us to be streamlined and affords us the peace of mind that comes with knowing we'll have enough time to create the best noises we possibly can come up with." ■

Track Transformations

—FROM PAGE 110

occasions. It takes confidence to decide on focusing on one area, leaving another mostly untouched. "A very important thing is having a director who understands what you're going to contribute to the film and how you're going to do it when you spot the film," Eulner says.

COMMUNICATING WITH THE COMPOSER

The director's spotting session is also a good time to find out how much music is coming and where it's going to be placed. "If music's carrying the ball, I'm staying out of it," says Eulner. "I'll do very little and move onto a scene where music is not being used and fill it out with effects and Foley."

Morgan adds, "I always ask to come to the composer's spotting session so I have an idea what they're thinking and what they're going to attempt, so there isn't this massive crash on the dub stage." That classic moment where composer and sound designer butt heads about whose brilliant work gets to play off in the big fight scene is a less-likely

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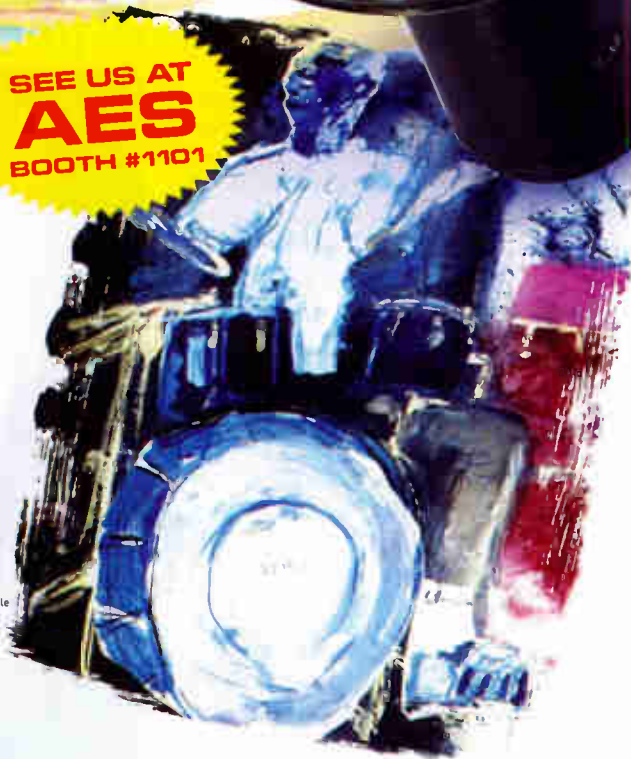
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World Radio History

occurrence on small features, where these decisions are made early on. For this reason, communication and collaboration between designer and composer can be superior on small-budget features.

Composer Marco D'Ambrosio has been a well-kept secret on features such as *Swimming With Sharks*, *Haiku Tunnel*, *Vampire Hunter D* and the Japanese anime series *Jojo*. But that may change with his recent invitation to the 2005 Sundance Composer's labs. D'Ambrosio always requests sound design tracks far in advance of the mix to anticipate complex blending decisions and facilitate a collaboration that is rare in the big-budget game. "I'll get a bounce and load that into my workstation when I'm writing," he says. "If I've got cues that are starting to be fleshed out and approved, I give the editors temp passes so they can cut in and work their sounds against that."

Working with veteran sound designer Tom Myers (*Jersey Girl*, *Revenge of the Sith* and numerous Pixar projects), D'Ambrosio even went so far as to alter his compositions to accommodate sound design. "We'd always talk about, you know, 'Tom's going to do something tonal here so I'll just be heavy on the percussion,'" D'Ambrosio says. "And then it might be the other way around, where Tom's just kind of hitting effects really hard but something needs to carry the track from the beginning of the scene, and that's where I'll have more of a sustain or a melodic thing going. You sort of pick the domain of where you're going to be hanging out in the audio spectrum."

D'Ambrosio's experience points to the particular intimacy created on independent projects. "If you and the sound designer are on the same team, so to speak, then there are less issues involved," he says. "You're not duplicating efforts, and there's less tension and confusion. You want to make best use of your time before the mix stage, which is typically where the dollars are flying the fastest."

EVERY PART OF THE ANIMAL

Saving time and money can end up being a big part of the supervisor's job; another way to keep those dollars grounded is by hiring editors who can wear a number of hats. "My sound designer is also my effects editor and my backgrounds editor," says Morgan. "My dialog editor will also cut the ADR. The Foley tends to fall by default to whoever has the available time. There are some very talented people in their own individual disciplines. The challenge is to find a crew that is able to do cross-platform."

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Multitasking editors is especially important when considering the relationship between effects and dialog: Dialog editors save time for the effects department by using *every part of the animal*, so to speak, including effects that were recorded in production. "My dialog editor will communicate with the effects editor and let them know what is working and what isn't so that we don't have to double-cut things," Morgan says.

This labor-saving device can sometimes yield elements that work better than what an effects department might have recorded had there been time. In *Monster's Ball*, one of the biggest sound moments comes when the husband (played by Sean Combs) is executed by electrocution. "The chair is very unsettling because it's a natural sound and does a lot of bouncing and rattling and wronging," Morgan says. "Believe it or not, a lot of that is production. We can all associate with what a wood chair sounds like, and to hear the wood chair go out of control is haunting. We were really lucky to actually come across a sound that was going to have that effect."

The sound supervisor doesn't usually have any say in this, but a motivated

production mixer can bequeath a host of goodies to his/her counterparts in post, the exact origin of which may remain a mystery. Lori Dovi is a favorite production mixer on upcoming indie releases such as *November* by Greg Harrison; *Hush Times*, starring Christian Bale; and the Quentin Tarantino-backed *Daltry Calhoun*. While many sound supervisors gripe about the quality of production effects (PFX) and room tones from production, they sometimes lose sight of the kind of days these mixers work. "Our ears get very fatigued after 12 hours," admits Dovi.

So after a day of asking the director to go one more time because a line got stepped on or begging a well-known actress to let you yank her blouse up because the radio mic is rubbing, the last thing any sane person should want to do is go back on the set to record something nobody even asked for. Still, it's kind of like fishing, and when you're passionate about what you do, you're going to be out there in the wee hours, angling for the big one that got away. Such an expedition by Dovi and her boom operator netted *November* an effect that ended up being used all over the track. "Tom Penny and I went out at 4 a.m.," she

recalls. "We were on the streets of [L.A.'s] South Central. It was a summer night and the crickets were just going nuts. We just tight-miked one cricket with a Neumann KMR81 shotgun; it was amazing."

FOLEY OR WHAT?

Dovi also talks about an experience from *Daltry Calhoun* that may come as a surprise to sound editors. "I'm sure post sound will never figure this out because it was done so well," she says. "The actors were on this huge long lens way down on this field. We had no shot in hell of ever getting it, but we had a monitor so we could watch, and there's my boom operator miking the grass or the gravel while he's walking and just keeping the same timing. I'm pretty sure they used it. We never said it was anything other than what it was."

The question of Foley, which can be quite an expense in post, is actually fairly complicated. Conventional wisdom—or that of the producer anyway—would tell you that Foley is dispensable, especially on projects that are mostly dialog-based.

"They tend to [assume] that dialog-driven movies don't have a whole lot of Foley," says Morgan. "Well, I have to tell you that with

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independent films, it is a prerequisite that those producers deliver a Foley-filled M&E for the foreigners. Everything that's happening during those words has to be 100 percent replaced. With action films, you can hide behind sound effects and not worry about replacing it because it is what it is."

Having recently supervised sound on Finn Taylor's *Darwin Days*, where the foreign distribution was pre-sold, Eulner needed to balance that requirement against his mandate to cut costs. "The Foley was spotted, then I went through and tossed things out that I didn't think we needed. If someone walked by in the foreground, they got footsteps; if someone walked by in the background, they didn't."

With regard to production, the low-budget post team may return the favor by rescuing elements that the mixer had given up for lost, saving the time and expense of ADR, which indie recordists regard as an affront to their skills and integrity. "What blows my mind are things that I thought would never work," says Dovi. "And that's to the credit in post sound of the time that they took to piece that one particular thing, whether it's dialog or somebody banging something on a line."

Finding alternate takes or a piece of a word to patch up that line can be labor-intensive for editors, as well as a matter of pride when the alternative is noise in the track. The way Eulner sees it, "You always end up putting more time in than you're being paid for, but you're doing it to make it satisfying for yourself, even though the director would be happy."

Trust and communication can become crucial guideposts when the filmmakers suddenly see new potential in a film that was shot on a shoestring and look to sound to make it bigger. Morgan offers a textbook example: "*Open Water* was intended to be more like a *National Geographic* documentary," he says. "When Lion's Gate purchased the film, they wanted to take it to a completely different audience and make it big."

It took a few tries before Morgan came up with the formula. "First we tried to make the ocean very complicated and we started to do water laps and surrounds, and we just realized we were mucking it up because it didn't support the images. We needed to go back to the original concept that this is just out in the ocean and is vast. What sells vastness but wind? So we started creating wind tracks that would really put us out there."

Having set the stage, it was now time to bring on the main characters. "The movie

was about sharks," says Morgan. "Our instinct and charge was to really give you that sense that there is something there, and since you don't see it, how do you know it's there? We recorded tracks of fire hoses moving through the water."

LIBRARIES AND MIX STAGES

In most cases, the next best thing would have been a library recording. In this area, a big outfit such as Skywalker or Soundelux may have a distinct advantage. Skywalker's Eulner says, "A complete library is very important for these low-budget jobs. We have so many things in the library, there's not much you would have to record."

In recent years, the big houses have seriously begun to compete for these low-budget projects, and a library is more than just a selling point. We're not just talking about the canned stuff you get with the commercial libraries, but a legacy of recordings that spans a generation of world-renowned sound designers—all at the disposal of the indie project. As Morgan says, "I'm not concerned about being limited with a library."

One final factor is mix capability. Mix days can quickly eat up a budget and,

therefore, need to be used wisely. For an indie project, there are several approaches.

On *Darwin Days*, Eulner opted for a seven-day final, with two days for fixes. "We didn't do any premixing," he recalls.

That can work, but it puts a tremendous importance on the sound editor's understanding of what a mixer requires to work efficiently. "I tried to keep all my sessions to 46 tracks and keep them laid out very mixer-friendly," says Eulner, "so there's not hard effects in with backgrounds. Most of it is balanced in Pro Tools in a room where I've already listened to the whole reel and gave it an overall balance. So there's not things that are way out of line when you play through it."

If production tracks are noisy and the dialog is hard to understand, then premixing may be in order. A ProControl or workstation premix may be enough, depending on what plug-ins or noise-reduction programs are available. Big mix boards allow for more options when you need to throw everything you can at the

production sound to make it work.

Such was the case with *Open Water*:

"The initial notion was that it was a small film and we needed to go in a ProControl environment," Morgan recalls. "But when they saw that we needed to go bigger, we raised the stakes and actually went and mixed on a Harrison board."



One factor that can trump all decisions about room and gear is personnel. Sometimes, in spite of a small budget, you can get an A-list mixer to jump in between bigger projects. On *Darwin Days*, for example, both Chris Boyes and Michael Semanick manned the mix board. "We had an A crew," says Eulner. "Eric Foreman was the assistant who helped out with spotting Foley, helping to get music specs down and picture department situations. A small crew will put in the extra effort and understand what really has to get done; some of that comes with experience." Not to mention two mixers with four Academy Awards between them. On an indie feature, with no money for sound, that truly is bang for the buck. ■



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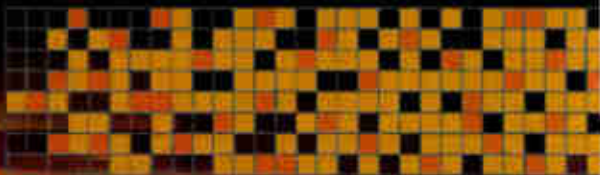
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Mark Knopfler



Text and Photos by Steve Jennings

Mark Knopfler recently finished up a summer tour supporting his latest release, *Shangri-La*. Helping out Knopfler onstage was Richard Bennett (guitar), Guy Fletcher (organ/piano), Matt Rollins (organ/piano), Glenn Worf (bass) and Chad Cromwell (drums)—all of whom have played with Knopfler since 1996. Midway through the tour at Berkeley, Calif.'s Greek Theatre, *Mix* caught up with Knopfler's front-of-house engineer, Robert Collins, who has worked with the artist since the early '80s—first as system engineer and later at FOH.

Sound was provided by Concert Sound for the European dates (including an EAW 760 rig) and Audio Analysts for the North America dates. In the U.S., Knopfler and band were heard through a JBL VerTec array with up to 20 VT4889s per side. "We normally have 12 on the main hang and eight on the side hang," Collins explains, "with six VT4880 subs per side, three VT4887s per side, ground-stacked,

and two VT4887s for front-fill. These all run from Lake processors and Crown MA5002 amps." Systems engineer and "right-hand man" Dave Dixon round out the crew.

Collins uses an Audio-Technica 4055 on Knopfler's vocals. "I found it suited Mark better, and ended up using A-Ts on all the band vocals," he says. "My FOH console is the DiGiCo D5, running about 60 inputs and the normal outputs: left, right, front-fill, delays. We were also digitally recording every night onto AMD 64 using Nuendo. The interface with the D5 via MADI was a dream. I use a TC M6000 digital reverb processor, a great unit, and a Summit TLA 100 on Mark's vocal, which I like as a quick grab by my side. Everything else is done with the D5."



FOH engineer Robert Collins

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News



The Celtic Woman tour crew are, from left, Máiread Nesbitt, Deidre Shannan, front-of-house engineer Colin Boland, monitor engineer Andreas Linde-Buchner, Órla Fallon, Lisa Kelly and Chloë Agnew

PBS' Celtic Woman tour includes performances by five Irish solo vocalists headed by former *Riverdance* musical director David Downes. Destination venues include sheds, theaters and open-air amphitheaters. The Masque Sound—equipped tour typically uses six Nexo GEO-T4805, two T2815 downfills per side in the main hang and two CD18 subs per side amplified by Camco power amps. At FOH and monitor world are Yamaha PM1Ds. The all-crew in-ear setup uses DPA 4065 headsets for most performers...The WOMAD Festival at the Rivermead (Reading, Berks, UK) used either Heritage Series or XL3 Midas consoles. Says APR production manager Dieter Van Denzel, "We rarely have time for soundchecks, and there are a lot of visiting engineers who need to jump on a desk and be ready to instantly mix. Midas gives us the familiarity, reliability and essential audio quality..." Scorpio Sound (West Bridgwater, MA) purchased seven Lake Contour digital speaker processors. Says engineer George Wehrin, who used the system at Boston's KISS Concert 2005, "I was able to walk around the side of my array, shut off what I didn't want to hear, look at SmartLive on my tablet and tune my side arrays with no guessing. [It] made our job that much more efficient."

San Francisco Hosts Chet Helms Memorial Show

On July 29, 2005, numerous musicians performed at San Francisco's Great American Music Hall to honor the late Chet Helms; the show kicked off the memorial auction, whose proceeds went to the Chet Helms Memorial Fund and Hearing Education and Awareness for Rockers (H.E.A.R.).

Helming the gig was GAMH senior sound tech Lee Brenkman and UltraSound co-founder Howard Danchik. Also on-hand were monitor engineer Will Cotter, Slim's/GAMH staff tech Alex Bendahan and engineer Stacy Parrish. The in-house rig included a 40-channel Soundcraft K2, 32-channel Soundcraft Delta monitor, JBL/UREI graphics, Drawmer gates and dbx compressors; P.A. was a JBL Array Series. Meyer UPM powered monitor wedges were brought "just in case." Danchik brought in his laptop and SIA Smart software, as well as a slew of mics. Brenkman says, "The only [mixing] 'technique' was Howard's and my years of experience mixing live shows in general and with many of these musicians in particular."



PHOTO: DAVE VAN

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On the Road

Widespread Panic

Widespread Panic's tour is carrying a complete rig provided by Eighth Day Sound. *Mix* caught up with FOH engineer Chris Rabold about the tour and recording the shows for download (within 48 hours post-show) off the band's site, www.live.widespreadpanic.com.

You've changed from using a Midas board to a DiGiCo D5 Live. Has there been any difference?

The most noticeable difference is the added sense of depth. There are 60-something inputs coming from the stage, plus six lines of shell-mounted triggers to open the gates on Todd Nance's kit. Throw in effects and we're up around 80. Separation is of utmost importance. The D5 really allows you to place sounds within the mix.

What kind of P.A. are you using?

We are carrying 24 V-DOSC, six dV-DOSC, six Q7s for frontfill, 12 Q1s for side coverage and 12 B2s. Power is via Lab Gruppen. The system is set up and maintained by systems engineer CW Alkire with John "The Technican" Switzer and Pat Lavalle flying the P.A. Having the sub lows running in unison with the rest of the array is a make-or-break aspect of a show.

How are you recording each show?

We run Peak on my Mac G4 Powerbook fed from a MOTU HD96; the Peak files are stored on a Glyph FireWire drive. We take a 48k/24-bit AES feed from the desk and run it into an Apogee Big Ben. This takes care of the format conversion and re-clocks everything to its internal word clock. The CD burners and DAT recorder take S/PDIF feeds, while the Masterlink and MOTU HD96 input via AES. When the show is over, I burn a DVD-R of the two show files from Peak. These files are .AIFF files—data only. I send the DVD overnight to the company that manages the site. They convert the show to MP3 and flac formats.

Now Playing

Kings of Leon

Sound Company: Brittonia Row (Europe), Concert Production (U.S.)

FOH Engineer/Console: Brent Rawlings/Midas Heritage 3000

Monitor Engineer/Console: Brandon Dempsey/Midas XL3

P.A./Amps: V-DOSC, ARCS, dV-DOSC, V-DOSC subs/JBL SR118 subs

Monitors: Electro-Voice wedges

Outboard Gear: Drawmer gates, dbx compression, BSS 901 de-esser

Microphones: Shure Beta 91, Beta 52, Beta 58s, SM81s, SM56; Sennheiser 408s, 409.

My Chemical Romance

Sound Company: Rat Sound

FOH Engineer/Console: Dave Rupsch (also production manager)/Midas XL4 with sidecar, Midas Verona console

Monitor Engineer/Console: Andy Ebert/Yamaha PM5DRH

P.A./Amps: 18 L-Acoustics V-DOSC, nine dV-DOSC, 12 ARCS; 16 Rat Sound subs/Crown, Crest

Monitors: 10 Rat Sound L Wedge, 2x4 Mix Triamp Rack, Rat Trap Triamped Top, Microsub, 1x4 Mix Triamp Rack

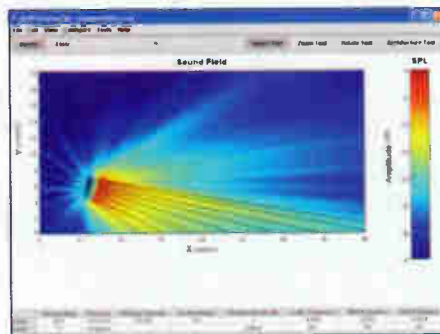
Outboard Gear: XTA DP226; BSS FCS 960 EQ, DPR-404, 901 multiband compressors;



dbx 162SL tube compressors; Viewsonic tablet PC; Drawmer DS201; dbx 160X; Yamaha SPX990; TC Electronic D2, M2000; Lexicon PCM80; Eventide 3000
Microphones: Shure SM91, Beta 52, Beta 98, SM57, SM81, KSM 137; Sennheiser e604, 421

Meyer Takes Patent for MAPP Online

Meyer Sound (Berkeley, Calif.) has received its 33rd U.S. patent for the company's MAPP Online acoustical prediction software. MAPP Online is an Internet-enabled client-server system that allows modeling software running on Meyer's server to provide a computational back end to GUI software running on a user's computer. Designed for use by sound system designers and consultants, the system uses a Java applet and is free of charge for qualified users.



According to the company's Website, "The MAPP Online system generates accurate predictions of the performance of Meyer Sound loudspeakers in a given configuration within a venue." To use the system, the user defines a venue's attributes and a choice and configuration of loudspeakers. The parameter data is then communicated to Meyer's server via Internet, drawing on a database of loudspeaker profiles to calculate the results. The server returns a color image to the user's computer to show the loudspeakers' expected coverage and frequency at any spot in the venue.

For more information or white papers on this technology, go to Meyer's Website at www.meyersound.com/news/2005/mapp_patent/.

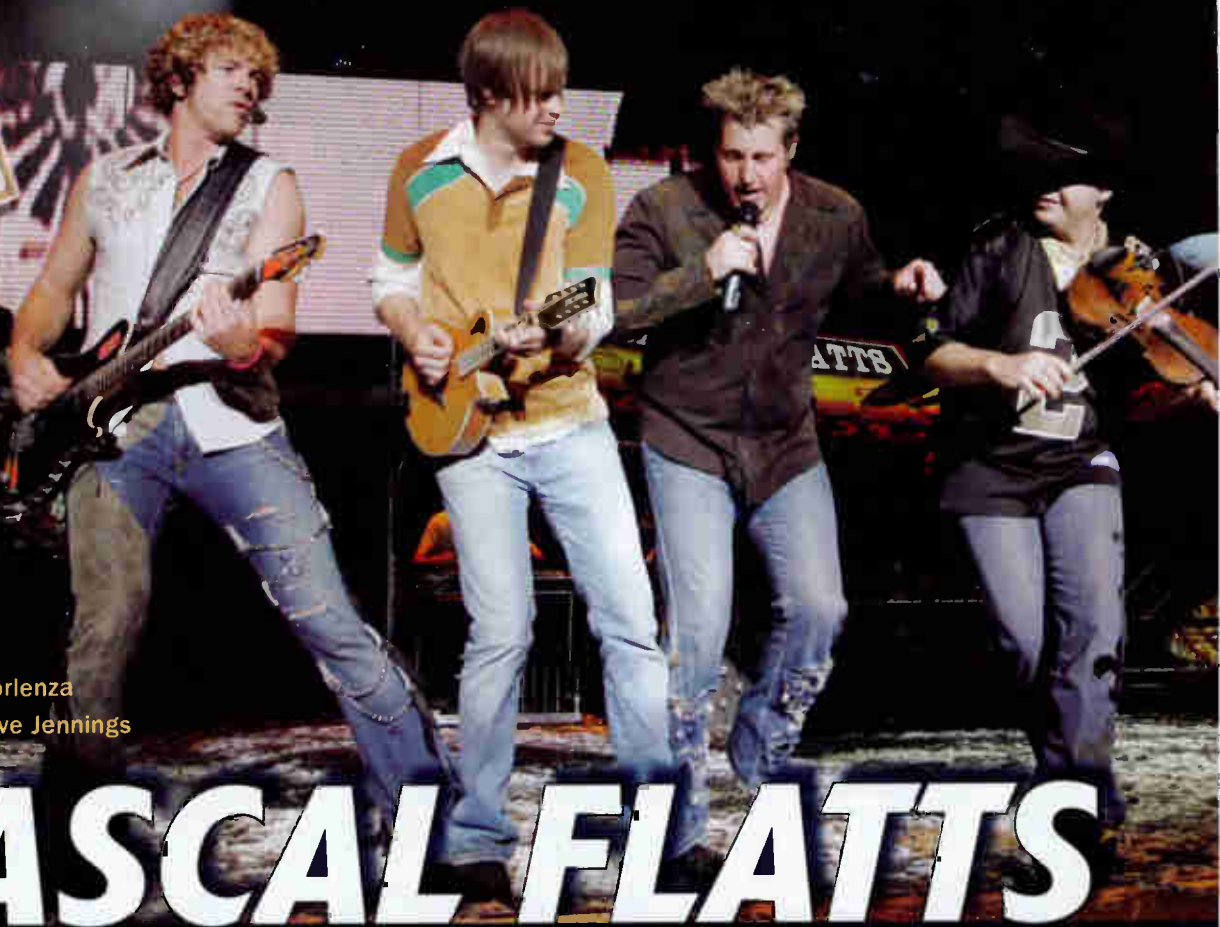


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Text by Jeff Forlenza
Photos by Steve Jennings

RASCAL FLATTS

The good looks and sweet harmonies of Rascal Flatts (vocalist Gary LeVox; Jay DeMarcus, bass/piano; and Joe Don Rooney, guitar) has helped the band top the country and pop charts, selling more than 7 million CDs since 2000. The band hit the road in

early June and wound their way across the U.S. before hitting a slew of county fair dates in August and September. *Mix* caught up with the tour at the Chronicle Pavilion (Concord, Calif.) in early July. Sound is provided by Sound Image (Escondido, Calif.).



At FOH, production assistants cover the D5 alongside FOH engineer Garber; all three bands (including the two openers) are mixed on the D5. "The headroom is so much greater and cleaner," Garber says of the all-digital console. "Just having a small front-of-house package is one of the most important benefits."

Garber relies on the board's onboard processing and presets, but is still busy adjusting and "riding" the graphical user interface's faders. Garber uses dbx tube channel strips to warm up each of the main members' vocals. "It's a vocal band, so I build the mix around the vocals," Garber says. "I spread out the mix with stereo panning, just as the musicians are positioned onstage. I go for a powerful dynamic mix: I range from 98 to 108 dBa. But sometimes the crowd is screaming at 120 and I can't compete. The P.A. just disappears."

Pictured from left: front-of-house engineer Jon Jon Garber at the DiGiCo D5; back row from left: Son Nishimura, P.A. system engineer; Jeremy Overall, A1 stage tech; Landon Storey, P.A. system engineer; and Brian Denny, A2 stage tech. Not pictured: production manager Chris Alderman



Bassist/vocalist/pianist Jay DeMarcus' bass goes through two Ampeg 8x10 cabinets, which is then taken direct to a passive Director box.



Gary LeVox sings through a wireless Sennheiser 545 mic picked up by a Sennheiser G2 system.



Howard Duck,
Keyboards



Don Rooney,
Vocals/Guitar

DeMarcus and Rooney sing through AKG 420L headset mics with Sennheiser G2 wireless systems. Shure wireless mics are used on acoustic guitars and mandolins, while dobro and banjo are sent through a Sennheiser wireless mic straight to the board. Fiddle is captured by a Sennheiser wireless and then goes through a Trace Eliot preamp into the console. Drums get Sennheiser Evolution G2 mics; Neumann KM184s cover hi-hats and overheads. Drummer John Riley and keyboardist Howard Duck sing backup through Sennheiser 855 wired microphones.



Sound Image provided the P.A.: JBL VerTec 4889 line arrays and 4880 sub cabinets (stage left/right and underneath the drum kit); proprietary Sound Image 1160 enclosures for front-fills; QSC Powerlight 6.0 and 9.0 amps; and BSS crossovers.

"We use the amphitheater's delays wherever we go," Garber continues, "but our main P.A. system throws all the way to the back of the lawn seats." Garber and system engineer Landon Storey walked the lawn of the Chronicle Pavilion to check the delays.



Monitor engineer Stuart Delk is working on a Yamaha PM5000, managing 23 wireless channels from the eight musicians onstage (including the three featured artists and a five-piece band). "It gets complicated with all the wireless instruments coming from the stage and the stereo mixes going to wireless in-ear monitors onstage," Delk says. "I've been working with Professional Wireless Systems and they have really helped with all my wireless systems. They make a helical antenna I've been using, and it makes my system sound like it's hard-wired."

Delk provides eight stereo mixes to the players from the board and uses limited pieces of outboard gear, including dbx 160 compressors, a TC Electronic M-One and a Yamaha SPX-990 reverb. "I prefer to keep things simple," Delk says. "Sometimes you can over-tweak and kill the vibe that the band is trying to create onstage. I just use compression on kick and snare; a little reverb on vocals."

Everyone onstage is wearing in-ear monitors, including Delk for talkback communication. Most of the bandmembers wear Ultimate Ears custom-fitted wireless in-ear monitors. Delk and two members of the backup band wear Sennheiser wireless in-ears.

PHOTOS: CAMBRA HARKEY



TEXICANS MUY CALIENTE

Los Lonely Boys at Los Angeles' Greek Theater

By Maureen Droney

Long before they were headliners, Los Lonely Boys were show-stealers. It's that trio thing—think Cream, The Police, Jimi Hendrix. When the musicians are hot, there's nothing like a three-piece: no distractions, no fluff and nothing to hide behind. Los Lonely Boys are three brothers who can really play; add in their distinctive sibling vocal harmonies, a balmy late-July night at the Greek (*Pollstar's* Best Small Outdoor Venue in 2004), a sold-out crowd, a good front-of-house mix and the sum of the equation is a show worth going to.

At soundcheck, however, a great show wasn't a given. The Greek Theater, situated in a posh neighborhood near Griffith Park, has ironclad SPL restrictions. At 4 p.m., trouble was brewing at FOH, where, with the band onstage and the P.A. turned off, measurements were already more than the 98dB A-weighted limit. [Note: A-weighting reflects the response of the human ear and its sensitivity to certain frequencies.—Eds.]

It was only FOH mixer Jon Schimke's third night behind the board for the band, but Schimke, a laid-back vet, was taking things in stride. So was Brandon Operchuck, the tech in charge of SPL monitoring for Schubert Systems Group, provider of the JBL VerTec line array system deployed for the Greek's summer season.

Schimke, who's also handling production management for the one-truck/two-bus tour, works for Sound Image, Los Lonely Boys' sound provider, as does

Front-of-house mixer, Sound Image's Jon Schimke



PHOTO: MAUREEN DRONEY

system tech Rob McGrillis. Rounding out the crew are monitor mixer Bobby Filarowicz, the band's longtime guitar tech Ish Flores and drum tech Chip Carter.

"This is one of the easier places we're playing in," Schimke comments. "Some of the others have limits like 95, 96—even 92 [dB]. So this is a bonus. Plus, once the show starts, they'll be singing harder than they are now. That helps avoid any feedback issues."

Operchuck, who mans the Lake Contour and Mesa systems containing the brickwall limiting that kicks in if it gets too loud, points out that the crowd will absorb a lot of volume, and he and Schimke go back to listening to the P.A. The VerTec system comprises, per side, 11 VT 4889 full-size and four VT4888 mid-size flown boxes, six double-18 VT4880 stacked cabinets and four flown VT4887s used as delay cabinets. It's powered by Crown I-Tech Series amplifiers controlled by IQ networking software. In addition, a custom Schubert interface to the IQ runs on Ethernet cables to all of the amps, enabling control of their EQ and compression from FOH. The

Monitor engineer Bobby Filarowicz



PHOTO: MAUREEN DRONEY

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Meyer Sound TEC Award Nominations

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MSL-3 Loudspeaker
- 1986 SIM® Source Independent Measurement*
CP-10 Equalizer
- 1987 MS 1000 Amplifier
- 1990 HD-1 Studio Monitor*
- 1992 VX-1 Equalizer
DS-2 Subwoofer
SIM II Audio Analyzer
- 1993 MSL-2A Loudspeaker
- 1994 MSL-5 Loudspeaker
- 1995 HD-2 Studio Monitor
- 1996 MTS-4 Loudspeaker
- 1997 CQ-1/CQ-2 Loudspeaker
- 1998 MSL-6 Loudspeaker
SB-1 Loudspeaker
HM-1S Studio Monitor
- 1999 PSW-6 Cardioid Subwoofer*
- 2000 UPM-1P Loudspeaker*
- 2001 X-10 Studio Monitor
- 2002 M3D Loudspeaker
- 2004 MILO® Loudspeaker*
- 2005 MILO 120 Loudspeaker

*TEC category winner



system, which took approximately five days for initial tuning at the beginning of the season, is periodically retuned throughout the summer by Schubert owner Dirk Schubert. His tuning is done in the I-Techs via the IQ system, with the Lakes used as the “daily interface” for guest engineers to fine-tune.

Traveling with the band are Yamaha PM5D-RH house and monitor consoles provided by Sound Image. Although both Filarowicz and Schimke prefer analog desks, they agree that for a band with frequently changing opening acts (at the Greek, the opener was the 10-piece Ozomatli), a digital board was definitely the way to go.

“We’ve been using digital desks quite a bit,” offers Filarowicz, who’s manned the group’s monitors for more than a year. “We were out with Santana for six weeks with a [Yamaha] 1D, then we took a 5D on the Brotherhood tour where we had large opening acts: Ozomatli and Calexico. I like the way it works. It sounds good, and it’s the only thing that made sense for speedy changeovers and enough flexibility. We took it again on this tour, where Ozo will do six dates with us, then Big Head Todd, Shelby Lynne, Robert Randolph Band and then Ozo comes back.”

The tour is toting Sound Image monitors—an all-wedge system powered by QSC amps—with no in-ears to be found. Drummer Ringo Garza gets three mixes: a top, a sub and one for his Buttshaker “thumper.” Both lead guitarist Henry Garza and 6-string bassist brother JoJo use three wedges each—double 12-inches in the middle and a single 15-inch on each side—so Filarowicz can “separate vocals and instruments without running out of power. Henry’s main vocal is in

both mixes,” Filarowicz explains, “but JoJo and Ringo’s vocals are just in the center mix, and mostly the instruments are in the 15s. That gives me more separation and more volume.”

On the clean, no-frills black stage, the bass rig stands out. Fronted with silver mesh, it’s, well, massive: four custom-loaded SWR Megagoliath cabinets driven by three SWR amplifiers, fed by an SWR 750 Series amp head used as a preamp and packed with eight Tone Tubby 10-inch hempcore speakers (made by San Francisco’s A Brown Sound).

Guitarist Garza also uses Tone Tubbys. His setup includes two cabinets with four of the 12-inchers, two Fender Twin amps and two JCM 2000 Dial Superleads, along with a small Fender reverb “tank.”

Filarowicz keeps it simple, filling just 24 inputs on his PM5D. Almost all mics are Audio-Technica. Bass takes AT4050 condensers; guitars also use a pair of 4050s, with an A-T 25 on one of the Fenders for a “little more low-end presence,” and a 4040 side-address condenser on the other for “just slightly different colors from the mics for different EQ realms,” Filarowicz comments.

Vocal mics are wireless AE5400 cardioid condensers, which use a studio-style 4050 element in a handheld body. “The brothers have been harmonizing since they were kids, and the three-part vocals are amazing,” says Filarowicz. “The 5400s do a great job of conveying everything that they’re trying to do vocally.”

A-T AE3000s cover snare top and the two floor toms, with an AT35 on the rack tom. Hi-hat, ride cymbal and snare under get A-T AE5100s; overheads use 4050s. Two mics cover the bass drum: an A-T 2500 dual-element and Shure Beta 52, “strictly for his thumper,” notes Filarowicz, “which is picky about how it reacts.”

Filarowicz listens over the fray on two large floor wedges set behind his seat. “My monitors are the same double-12 wedges that Henry and JoJo have,” he says. “I use a pair so I have [electrical] load reference. I can hear what the amp is actually putting out when I cue up each of our mixes.

“We’re not quiet,” he continues with a laugh. “Depending on the venue and the circumstances, getting my mixes to keep up with the band can be a challenge. They have a chemistry they

believe they’d lose with in-ears. But Ringo, for example, wants his mix to sound like it does on studio headphones—on wedges. So I’m definitely mixing, especially riding the vocal harmonies, all night.”

By the time Ozomatli had shaken out the P.A., the seats were packed. It was Los Lonely Boys’ showtime and Schimke had it together. “It’s a great band,” he observes, “so it’s pretty easy. They’ve been playing together so long; they do a lot of it up onstage themselves. I just have to watch for guitar solos and who’s singing.”

Asked if it was difficult to work with a different P.A. every night, Schimke answers, “It doesn’t matter to me. I tune it up the same every day by listening to the same CDs, trying to make it as similar as I can. The guys from the Greek spent a lot of time tuning the system today; when I turned on the CD, it sounded great.

“I have a [Klark-Teknik DN 3600] EQ in-line that I rely on, but, basically, I will always try how they’ve set the system up first. Sometimes it’s great. A lot of guys will just flatten it out right away when they come in, but I think you might as well at least listen to what’s set up already. If it’s not right, you can always flatten it out and go from there.”

Schimke’s other must-have is a Klark-Teknik RTA DN6000 spectrum analyzer, which he uses to check on “any frequencies that are getting out of hand. If we were carrying, I’d also bring gates and compressors,” he notes, “but, in this case, I’m using the onboard processing. I’m gating the kick drum mics and the rack and two floor toms, and I’m compressing the bass and the vocals. They sing pretty hard so the compressors come in handy.”

What accounted for the dB difference between soundcheck and show—besides, of course, bodies in seats? “Ish, the guitar tech, brought the levels on the rigs down a little bit,” confides Schimke. “He’s been with the band a long time, and after we had a discussion, he talked to them. He’s really the one who made it happen tonight! And, of course, the bodies helped.”

“They did the right thing for the show,” adds Operchuck. “Bands have to understand that they need to work within the parameters of our system. It can be tough sometimes for an artist to understand that their guitar amp can affect 6,000 people. But a moderate level onstage will give the audience the best-quality show. In this case, they worked with us and ended with a great show. The audience really got their money’s worth.” ■

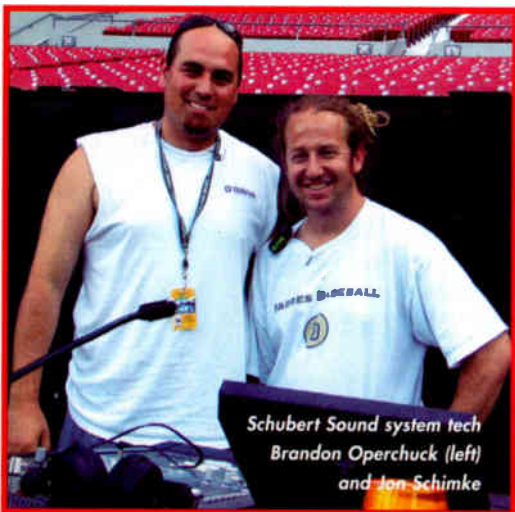


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Bedside Manners

Dealing With Customers and Avoiding Beginners' Mistakes

Assuming that some of you will be reading this at AES, I'll go easy on the traditional geek stuff. Schleppling though miles of aisles of gear can be mind-numbing without having to read a treatise on resistor codes or sources where you can buy the really good solder flux.

Last month's "Tech's Files" dealt with the leaves, trees and forest of getting gear fixed. Since writing that column, I've been haunted by the other facets of this topic, such as tips for management, bedside manner for technicians and the art of doing business at the entry level. So, here we go.

For those who are just starting out, a major challenge is learning the geek equivalent of pre-production. The art of mapping out a project—so that its realization is within the estimate and on time—is key to good customer relations and positive word-of-mouth advertising. This holds true no matter what level of service you are providing.

CREATING THE ESTIMATE

Initially, I jumped into projects, often without exploring all the "gotcha" issues such as project cost and customer requirements. It's one thing to make a mistake and have to personally "eat" the labor cost, but employees have a way of magnifying planning errors. This needs to only happen once, which is enough to provide the data to make a better estimate on the next project.

When my company did many project studio installations (circa 1990), I estimated job costs based on the number of patch points—\$2,500 per Bantam patchbay wired end to end. Patchbays are an investment; mine are 15 years old, have seen several control incarnations and are still doing their job.

Creating my modular patchbays (wired to multi-pin connectors) took about a week. Some of the actual cabling was fabricated in-house, minimizing the on-site installation time. In this case, modular patchbays in 8-channel groups simplified handling customer's changes without rewiring the actual patchbay.

Before doing any work, customers were required to pay an up-front estimate fee. I then translated all of their wiring needs into a patchbay template. Providing a visual aid greatly simplified the explanation of what was being done—an example of bedside manners. This is the tricky part of this business: the trade-off between giving customers what they want vs. what they need.

I was a real stickler for patchbay layout because everyone was always upgrading their multitracks—



analog or MDM—so I always left room in the bay for the possibility of eight more tracks, more outboard gear and even a mixer upgrade. Things haven't changed much: Now, it's converters instead of multitracks.

Once I knew the number of patchbays, I could easily estimate the price. My accountant at the time suggested that the deposit be close to the actual job cost so that the balance would be the profit. This is good advice.

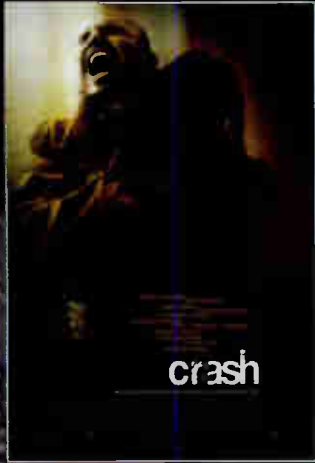
GRACE NOTES

Prior to leaving New York City, I had a three-tiered rate structure: standard, fast and "New York minute" repairs. At the time, being able to do the work when requested was key to having business—the difference between same-day service and a two-week turnaround being burn-in time. In New York City, I could play cowboy, telling customers to bring it back if the fix didn't stick.

Things changed when I moved to the Twin Cities, overnight shipping being one of the factors. I hung up my cowboy boots, too. Now, gear stays here longer to make sure it stays fixed. I feel lucky that customers are willing to wait for my services. My turnaround has only recently begun to improve thanks to Logan, my new assistant. Finding and keeping good people is a challenge. No matter how humble our entrepreneurial beginnings, we all must expand to survive.

MASTER MIX

I once asked a mastering engineer if any incoming projects needed to be remixed before being mastered. His response was that it was better to do the best



Mark Isham **M-POWERED**

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—Mark Isham, composer, "Crash"



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possible job with the material at hand rather than suggest a remix for fear that the work would go elsewhere.

I recently mastered a project for a young local engineer who went out of his way to keep costs down to the point of not charging for all of his time. The goal was to reserve money for mastering. Unfortunately, he never explained this to the inexperienced band, who didn't really recognize or appreciate his generosity.

The engineer did a fine job, lucking out because the band's arrangements were sparse. Still, I was surprised that the material came in with no notes and no reference material. I took a conservative approach to the job and a back seat in terms of customer relations, never thinking to ask for the bandleader's number. Then we waited for the band's response.

About six weeks later, the band decided that the CD wasn't loud enough, so out came the peak limiter and up came the level about 5 dB—while trying to preserve the engineer's good work. This reminded me of how much emphasis I put on interactivity and feedback. I should have been hounding the band, asking lots of questions, etc., and they would have known up front what they were paying for and why.

GEEK PRE-PRO

I'm often asked to just fix what is broken, only to discover systemic problems. Detailing the options *in writing* is like pre-production for having the actual conversation. Taking the time to explain how much work needs to be done and

the most cost-effective way to do it gives the customer the option to save money. That said, some customers prefer to do the job in chunks during several visits. They pay more in the long run but less up front.

I once hired freelancers in addition to my regular staff and purchased two desoldering stations for a job replacing every switch on an MCI 600 Series console. It cost more money up front, but was more cost-effective and efficient than paying me alone, at my rate, over several months of house calls.

THE LESSON

No matter what the task, my estimates are always high to protect the customer and myself. That's not to say I'm hard-nosed about it, but more often than not, attempting to accommodate someone never quite works out the way you thought. It is much better to know the cost up front and to occasionally pay less than the estimate.

Even with my experience, things can get complicated. For example, a year ago, an engineering student initially called for advice about a motor drive amplifier problem on a Fostex G24, a 1-inch analog 24-track recorder. Once hitting a brick wall, he drove for several hours, arriving early enough with the hope of taking it home the same day. I quickly fixed the motor drive problem, but then he mentioned all the bad channels.

Long story short: The service manual didn't match the audio electronics and

two months passed before the correct documentation was available. At that point, I could only give an estimate on parts and labor. In this case, if various channels have input, metering and repro issues, then *all* of the channels should be treated for all symptoms. This meant ordering a pile of capacitors, which I did without asking the customer.

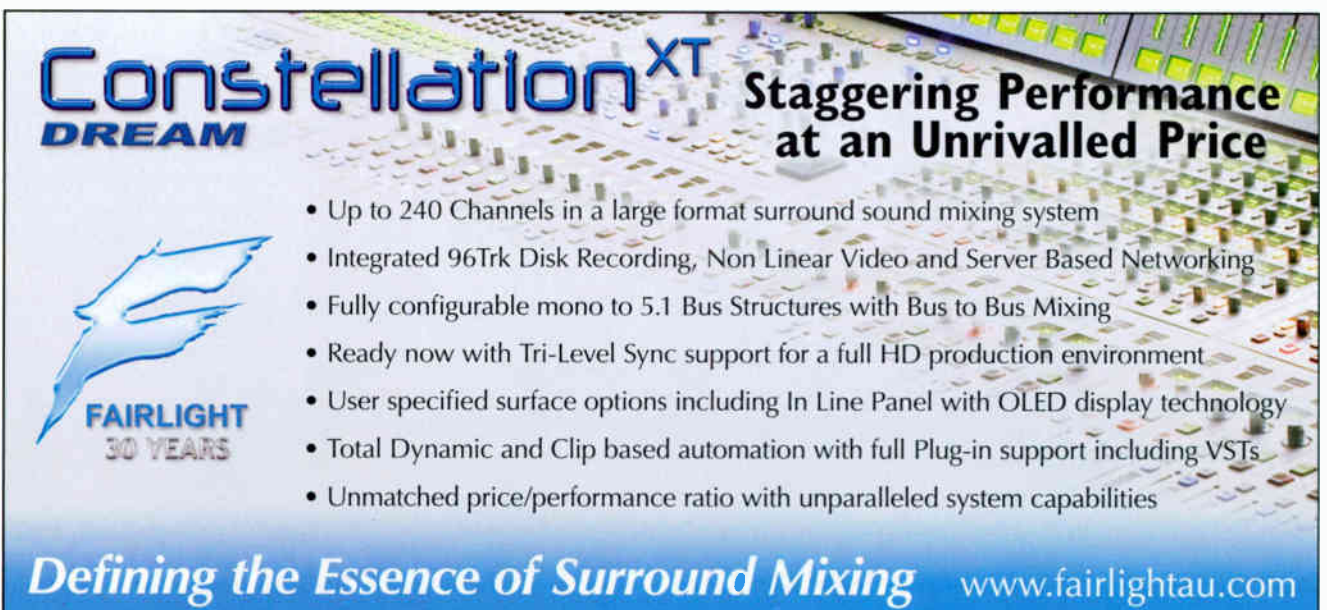
Before you tell me how stupid that decision was, remember that the plan was for me to diagnose and the customer to do the work. Still, the sticker shock had us discussing whether anything was going to happen on the day the customer arrived to do the work. I was willing to eat the parts and have him walk rather than have Mister Grumpy for an assistant. In the end, we split the difference: I fixed half the channels (while he watched) and he took half the parts.

THE MORAL OF THE STORY

Challenged though I may be at times, learning how to communicate has greatly improved my ability to do business. For some, this is an instinctive skill; for me, it's taken some time.

Being an employer for the first time in 11 years reminds me that I know a few things about troubleshooting and customer relations. I learned a lot the hard way. Hopefully, by exploring some of my mistakes (and fixes), you can avoid a few potholes. ■

Visit Eddie online at www.tangible-tech-nology.com.



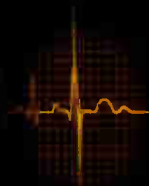
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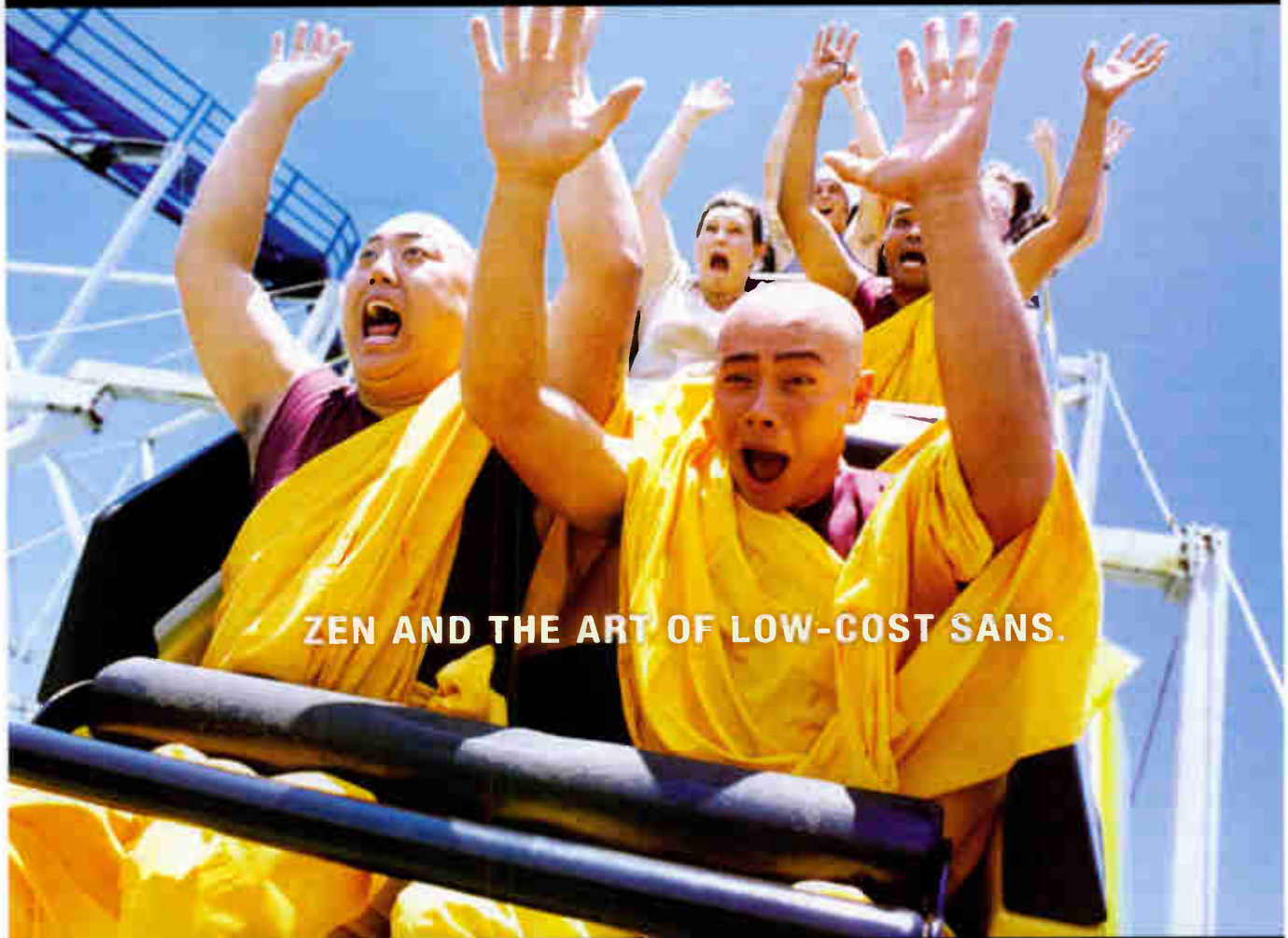
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Apogee Electronics at 20

Still Advancing the State of Digital Audio

Pro audio has always had its share of boutique companies, many dealing with high-end analog products. In a world where technology is constantly changing, the survival of a small company specializing in digital products is unusual. However, Apogee Electronics is not your usual company.

The company began in 1985 with a conversation among three industry veterans: Bruce Jackson (now with Lake Technology), a top live sound engineer noted for his years of mixing Bruce Springsteen, Swiss digital designer Christof Heidelberger (now founder/CTO of BridgeCo) and Betty Bennett, then president of Soundcraft USA.

"At that time, CDs were just coming out and people were complaining about the way digital sounded—too clinical and metallic. It didn't sound warm," recalls Bennett, who now heads Apogee. "Bruce, Christof and I were talking about what the problem might be and realized it was the anti-aliasing filters. So Bruce and Christof started working on it."

With the idea of marketing replacement anti-aliasing filters designed and manufactured by Heidelberger, Jackson and Bennett, they founded Apogee Electronics in December of 1985.

A year later, Apogee made its debut at the 1986 AES show in L.A. In a small, out-of-the-way booth, Jackson demonstrated the effect of Apogee's 914 Series low-dispersion, linear phase active lowpass filters retrofitted into a few channels of a Sony PCM-3324 24-track digital machine. Using an oscilloscope, Jackson ran square waves into the deck. The waves that were routed through Apogee's anti-aliasing filters looked like square waves; the waves coming from the 3324's stock filters looked like watermelons. Clearly, something was very wrong with digital and very right with the 914s.

However, the filters weren't exactly an instant success. "At first, we tried selling

the filters on a strictly technical level and that didn't work because the people who understood it weren't in charge of the budget," Bennett says. "Then we marketed it to the artists, who could hear the improvement and rapidly authorized the purchases. And it wasn't cheap: It was about \$5,000 for the filters to do a 3324. And the installation was complex—you had to desolder the original filters to install ours. You have to be pretty careful about going into somebody's expensive machine, but we had a list of excellent techs we could refer people to."

Apogee later expanded its list of recorders supported by its filter upgrades to include Mitsubishi and Otari ProDigi decks (both companies eventually OEM'ed the Apogee filters, installing them at the factory), as well as DAT machines and Sony's PCM-F1 family of processors.

The upgrade market was fine, but there were a lot of customers who wanted a simpler solution for improving digital sound and something they could use wherever they wanted. So in 1991, Apogee released the

AD500 and DA1000, its first outboard A/D and D/A converters. At the time, outboard converters for the pro market were hardly common, and as with the launch of the filters, Apogee was again involved in convincing the market on the benefit of its products.

"We've always used education to try to help people understand what we were doing," says Bennett. "Better filters, converters, digital (UV22) and low-jitter clocks will make digital gear sound better, but we had to be really good at educating people to help them understand the benefits of replacing their converters. Otherwise, why would someone buy something that they already had built into their existing equipment?"

One distinctive part of Apogee gear is its look. "The idea for making purple gear came from Bruce," Bennett recalls. "He has a good eye for design, and we wanted to distinguish



Apogee made its debut with the 944 filters.

ourselves from the all-black rack gear that everybody had at that point. Since then, there's been a lot of purple stuff." These days, some companies spend weeks on finalizing a logo, but that wasn't the Apogee way: "The logo was designed by a Clair Bros. lighting designer," Bennett adds. "One night at dinner, he drew it on a napkin and that was it."

Not every Apogee effort was a huge success, such as marketing a line of tapes for Alesis ADATs and a brief foray into software, although MasterTools and SessionTools were successful. Apogee refocused on hardware and began to license their software to other companies. In hardware, the hits kept coming, garnering an impressive string of 11 TEC Awards for its 944 filters, AD-500 stereo A/D converter, UV-1000 mastering processor, AD-1000 ADC, FC-8 digital format converter, AD-8000 (Apogee's first multichannel converter), Big Ben digital clock, and PSX-100, Trak 2, AD16 and Mini-Me converters.

But with all its success, Apogee remains a small, tightly knit group of 25 employees, and Bennett likes to keep the company in perspective. "We've been very fortunate," she says. "I've seen many companies come and go over the years—either disappearing or being bought. Staying independent has been good for us. Once you go public, your focus shifts slightly and you find yourself doing things that might not be good for the overall health of the company, like coming out with lesser products just to keep the stock price up. Apogee has the luxury of releasing products that we think will make a difference, regardless of shareholder pressures. Thankfully, we continue to do well in this regard. We have great people here and share the proceeds with them, because it's the people at Apogee who make the company."

For more information, visit Apogee at AES at booth #526 or online at www.apogeedigital.com.



Apogee co-founder Betty Bennett

Sony Music Studios Mastering

Wlado Meller



Kanye West



John Legend



System Of A Down



Shakira

Dave Kutch



Outkast



Ginuwine



Rod Stewart



Jaheim



Vic Anesini



Eminem



Elvis



Luther Vandross

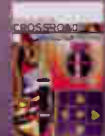


Val Emmich

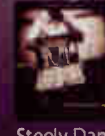
Darcy Proper



The Eagles



Eric Clapton



Steely Dan



Renee Fleming



James Cruz



Natasha Bedingfield



Three 6 Mafia



Mary Mary



Lyfe

Mark Wilder



Bob Dylan



Beyonce



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Shakira



Joe Palmaccio



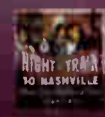
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G3



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Sony Music Studios



Fairlight at 30

The Revolution Continues

Maybe it stems from its Australian roots, but during the past 30 years, Fairlight has always forged its own path as a technology leader.

The company was founded in December 1975 by electronics designer Kim Ryrie and his boyhood friend, Peter Vogel. Frustrated by the limitations of analog synthesis, they were interested in using the newly available microprocessors to create digitally controlled synthesizers. After some months with little progress, the pair met Tony Furse, who had developed a light pen-controlled digital synth using dual 8-bit pathways and Motorola 6800 chips. Combining Furse's technology with their digital synthesis approach resulted in the Qasar M8, a bulky 8-voice system that didn't sound very good and went nowhere.

Back to the drawing board, Ryrie and Vogel developed the CMI (Computer Musical Instrument). The CMI was based on two 6800 processors and provided digital synthesis with a 6-octave keyboard, 8-note polyphony, two 8-inch floppy disk drives (one for the operating system, the other for archiving/library storage of sounds) and a whopping 208 KB of RAM. The system offered onscreen displays of waveforms, which could be modified via Fourier synthesis or simple light pen redrawing of the waveform. The CMI also offered sampling, with the ability to pitch-shift sounds or make modifications via the CMI processor. An onboard sequencer stored note velocity information, and up to eight 8-bit audio outs were available for routing to a mixer or multitrack. Unlike the Qasar M8, the CMI sounded great and was way ahead of its time. It was officially launched in 1979, with the first two units going to Peter Gabriel and Stevie Wonder.

The CMI (and its later generations) garnered worldwide acclaim and expanded its capabilities with higher-resolution

sampling, advanced sequencing and SMPTE sync. "My first experience with a Fairlight was in 1978 as a student when the Sydney Conservatory of Music bought CMI serial number 2," recalls current Fairlight COO John Lancken. "I watched the company rise in prominence, especially through the '80s, when early adopters like Peter Gabriel, Stevie Wonder, Herbie Hancock and others got involved with the company. It was also popular live, even though it was mainly a large computer instrument."

But with the advent of MIDI and a slew of low-cost samplers in the '80s, the luster of a full-blown \$150,000 Fairlight music system began to fade and the company looked to new markets. "I joined the company—for the first time [Lancken left Fairlight in 2001]—in 1991 as it was moving away from music and into disk recording/editing for post-production with the MFX Series," Lancken says. "The company succeeded with that for the next 10 years. Our first business in Hollywood was with Todd-AO and the company grew substantially."



Fairlight COO John Lancken, today

In the early 2000s, commercial pressures and other world events reduced the pack of DAW manufacturers from more than 25 to a handful, forcing Fairlight through a series of difficult years. Events turned sour in April 2003, when Fairlight was forced into receivership. "The problems the company faced had nothing to do with the quality of products but with management—overestimating the returns of the market and building a structure that was unsustainable, poor cash flow, et cetera," says Lancken. Just a few months later, he returned to assume leadership of the once-troubled company, but this time under the new name Fairlight.au (the "au" is for Australia), with new financing and a renewed commitment to meet the needs of the worldwide commercial audio



Early days in the Fairlight R&D lab with (L-R) John Lancken, Peter Vogel and (a barefoot) Kim Ryrie

production marketplace.

"Audio people aren't always the best business people," Lancken says. "The turnaround in 2003 came from finding a formula that worked with the business." However, the new Fairlight wasn't simply a case of throwing money at a problem. The company had a series of cutting-edge products that put Fairlight back into a leadership role. Powered by its QDC platform and the innovative Binnacle control of the DREAM Series interfaces, Fairlight launched the Fairlight Station^{PLUS} and the DREAM Constellation large-format digital console, which included high-end automation; an integrated suite of low-latency, third-party plug-ins; nonlinear video; and an integrated 96-track DAW. Just a year ago, these were followed by the Constellation XT, which brought a new price/performance category to large-format digital consoles.

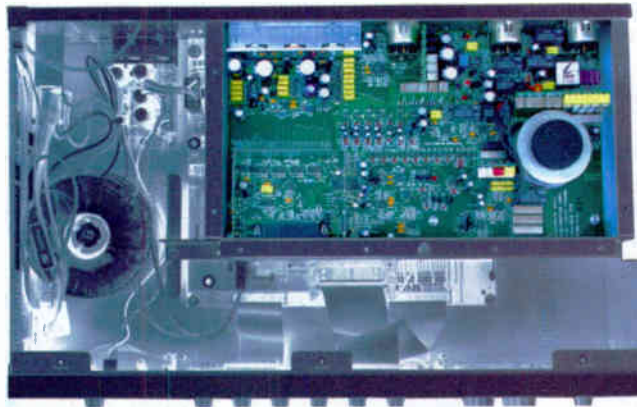
Another key factor in the turnaround? "The heart of the company is development and R&D, our biggest investment," Lancken explains. "We're putting something like 40 percent of our turnover back into R&D. We've launched five new products in the past two years, proving we can respond quickly to the market."

So what's on the horizon for Fairlight .au? "We have some great technology and intellectual properties," he continues. "Technology moves at high speed and we can move with it. Over 30 years, Fairlight has invented things that no one else had, and there's more coming, including The Anthem console, which we're debuting at AES. It symbolizes a round trip for the company that's gone from music into disk recording/editing and now back into music." ■

digital head



analogue heart



Silence is golden: At the start of the signal flow, a specially custom-wound choke is employed to ensure optimum rejection of common mode noise with zero colouration of the signal.

Isolation is key: Every effort is made to ensure that the analogue signal remains unaffected by digital signals within the Liquid Channel. The analogue and conversion circuits are isolated within a steel shell, while the digital section of the conversion circuitry is further enclosed within a second coated steel shell. To improve isolation still further, each of the circuits is powered by its own discrete power supply.

Flexibility: To physically mirror the impedance of the pre-amp being emulated, The Liquid Channel features a unique matrix of resistors and capacitors.

Before any digital processing occurs within The Liquid Channel, meticulous attention is paid to the quality of the analogue signal as it flows through the most elaborate and powerful analogue pre-amp ever designed.

This matrix switches between different combinations in order to match the input impedance of the original.

Precision: The analogue pre-amp features fully switched gain to allow total and precise recall of gain settings to the nearest dB. A special circuit is employed

utilising a zero-crossing detector to prevent zipper noise as you switch through gain settings.

With or without: To allow matching of both transformer-based and transformer-less designs, the Liquid Channel passes the analogue signal

through its own custom-wound Liquid transformer or through a discrete Class A pre-amp (specifically designed so as not to impart any colouration on the sound).

Transparent conversion: The Liquid Channel features the finest A-D and D-A converters (AKM 5394 and 4395 chips) running at 192kHz, 24bit and boasting class-leading performance specifications (123 dB dynamic range).

And finally: The signal is then ready to be processed through the dynamic convolution section which features a number of the world's most powerful SHARC chips. 688 million samples are required for 1 second of emulation at 192kHz. Here begins the other half of the story (with its total recall happy ending).



To hear what the Pros are saying, see what's in the box or learn more about Liquid Technology, visit www.focusrite.com/liquid or write us at Focusrite@AmericanMusicAndSound.com

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Dolby Laboratories at 40

Defining Standards in Audio and Beyond

Without a doubt, the best-known name in audio is Dolby. It seems to be everywhere, from automobile sound, boom boxes and DVDs to broadcast programming and cinema marquees.

Company founder Ray Dolby has lived and breathed audio since his earliest years. While in high school, he worked at Ampex, first doing mundane chores such as copying alignment tapes for the company's new 200A tape recorder, and later signed on full-time as part of the team that developed the first pro video recorder.

After earning his B.S. in Electrical Engineering from Stanford in 1957, he did postgraduate work at Cambridge, receiving a Ph.D. in Physics in 1961, followed by two more years of advanced studies. Dolby then spent two years working for UNESCO in India, during which time he considered ways of applying his thesis findings (on means of improving X-rays for clearer images) to noise-reduction methods for audio.

THE EARLY DAYS

In 1965, he started Dolby Laboratories to develop systems for reducing the background noise inherent in tape recording. The company's first product was the A301, which debuted in 1966 and provided one channel of A-type noise reduction. This sophisticated audio compression/expansion system dramatically reduced background hiss inherent in pro recorders without discernible side effects.

The effect of Dolby noise reduction on the audio community—consumer and pro—was profound. It opened the possibilities of narrow-gauge/low-speed recording on formats such as cassette tape and pro video recorders; home VCRs would follow later. But on the pro audio side, Dolby noise reduction helped fuel the fire of a multitrack recording revolution.

The demand for Dolby noise reduction led the company to develop licensing agreements with manufacturers of consumer products beginning in 1968. This formation of Dolby's licensing division was a stroke of financial genius. Today, Dolby maintains licensing liaison offices throughout the world, and licensing—

both from partnering with content makers and providing solutions to licensees—represents about 70 percent of the company's revenue.

BIG SOUND, BIG SCREEN

The 1950s brought occasional film releases using four tracks of stereo sound on magnetically striped film stock—mostly for limited first-run engagements in larger cities. Unfortunately, these stereo film releases were rare, as mag-stripped prints were fragile and expensive and distributors had to maintain inventories of mono and stereo prints.

Everything changed in 1976 with *A Star Is Born*, the first film released with a Dolby Stereo optical soundtrack with surround. The format used phase matrixing to store four channels (L/R/C/S) onto a 2-channel format, which, in this case, was two closely spaced optical tracks on a standard 35mm film. The beauty of the system was compatibility: A 35mm Dolby Stereo film could be played anywhere, whether in a non-Dolby mono drive-in or in a theater upgraded with Dolby cinema decoders and a 4-channel playback system. And, with no appreciable cost increase in manufacturing stereo prints, film studios were receptive to the idea.

In 1977, the success of blockbusters such as *Star Wars* and *Close Encounters of the Third Kind* helped push exhibitors into upgrading to the new format. The tens of thousands of Dolby Stereo tracks encoded onto Beta/VHS HiFi video releases laid the groundwork for a revolution in home theater, fueled by the arrival of Dolby Pro Logic-equipped multichannel components in the years to come.

Unveiled in 1986, Dolby SR (Spectral Recording) combined both the fixed- and sliding-band technologies invented for the earlier noise-reduction systems. The result was expanded analog dynamic range performance that rivaled the best pro digital recorders, which extended the life of analog recorders. Dolby SR also ushered in a new state-of-the-art analog optical film soundtrack, which is used on the vast majority of releases—including those that also have digital soundtracks—for backup and compatibility.

Dolby began getting involved with



Ray Dolby, circa 1966, working on a Model A301 noise-reduction unit

digital bit-rate reduction in 1984 with the debut of its first digital coding system, Dolby AC-1, which was adopted by a number of direct satellite broadcast and cable distribution systems. This system was followed by the Dolby AC-2 in 1989, used in the Dolby Fax system, allowing high-quality, point-to-point transfers via ISDN lines for file transfers between distant studio facilities.

"Along the same time, digital sound on film came out, so the first implementation for Dolby Digital AC-3 was multichannel film in 1992," says Tom Daily, Dolby's marketing director, professional division. "We took that and evolved it for broadcast and DVD in the early '90s. Dolby Digital continued to evolve with improvements, most recently with Dolby Digital Plus, which adds more channels and supports more data rates—higher and lower."

THE FUTURE AND BEYOND

With the popularity of DVDs and surround sound for films, broadcast, cable, games and new formats, Dolby's future looks bright. "One thing we've been working on over the past five or 10 years—and will continue to develop," adds Daily, "are tools for content-creation authoring and video formats and tools for audio production in those areas. Especially with formats like HD DVD and Blu-ray coming out, we want to give authors all the tools and capabilities they need to add value to these formats."

And that future is here. For a sneak peek at Dolby Media Producer, Dolby's new software suite for content creation, see page 150 or visit Dolby online at www.dolby.com. ■

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Ampex Sel-Sync, 1955

When the Roots of Multitrack Took Hold

These days, it would have made pro audio headlines and been the talk of the AES show. The development of Sel-Sync™ (Selective Synchronous) recording by Ampex a half-century ago eventually turned the recording world upside down, yet it was a quiet step with little fanfare.

There's no doubt that the impetus for multitracking came from solid-body electric guitar inventor Les Paul, who, lacking a means to play harmony parts and duets with himself, modified a tape deck with an extra head and a switch to defeat the erase function and began doing sound-on-sound recording as early as 1949. However, the technique was risky: One bad pass and the recording was ruined, and each additional pass added noise and distortion.

"The 8-track [concept] came along in 1953," Paul recalls. "While filming, I was taking a rest and looking up at the sky. My manager asked what I was dreaming about. I said that recording using sound-on-sound was crazy. There's a better way: Stack the heads on top of the other—1-2-3-4-5-6-7-8—and align them so we could do self-sync with all the heads in-line. When I told my manager, 'I think it will change the world,' he told me I should do something about it.

"I went to California to see Westrex, who said it wouldn't work," he continues. "So we went up to San Francisco to see Ampex. They called a big meeting and they said they could do it. All we have to do is hire about seven people to start the procedure, which was in 1953. It took about two years, during which they also made a number of refinements, such as a master oscillator and remoting it to the console."

However the process wasn't so easy, according to Ross Snyder, Ampex manager of special products from 1952 to 1960. These days, this distinguished AES Fellow is retired and often produces oral history recordings for the AES history committee, but back then, Snyder's domain was "custom shop"-type products for the company.

Snyder also developed the concept for Sel-Sync. "I was alone in my office at 860 Charter Street in Redwood City [Calif.] and thinking about how godawful sound-on-sound recordings became after

15 or 16 layers down," Snyder says. "You exaggerate the frequency response, you bring up the hum and noise, you increase the distortion—the whole thing is just a mess. There were many people doing those things, not just Les Paul, although Les was perhaps the best at doing it."

The Sel-Sync process that enabled overdub multitracking required several systems to function as one. "There was nothing new about the idea that a record head could function perfectly well—or rather well—as a pickup head," Snyder adds. "But to do that job you needed to get them in perfect alignment, so that when you played back, you were in synchronism. You needed a separate erase so you could preserve what was already recorded and use a new track for the next pass. But to get them in synchronism, you also had to solve the problem of switching very low-level/high-impedance circuitry. You've got to handle those things very carefully with considerable skill to avoid noise and hum.

"The whole thing did not look to me as though it were possible, but I inquired with the engineers in the mod lab, and one by one—especially one very bright, delightful person by the name of Mort Fujii—said, 'We could do that.'" The first Sel-Sync machine was the 1-inch 8-track sold to Paul for \$10,000—a princely sum that could have bought two nice homes back in 1955. The system combined a separate rack of record electronics with a heavy-duty instrumentation recorder transport, the latter chosen because it was proven to pull 1-inch tape, which led to some later complications.

"They sent me a 30/60 ips machine!" Paul exclaims. "We set the thing up and Mary [Ford] asked, 'Isn't that thing going awfully fast?' I wasn't sure, so I stuck a piece of paper into the tape pack and counted off to verify the speed." Sure enough, the Ampex team—who had never built a 1-inch multitrack—didn't remove the instrumentation capstan, so the deck ran at 30/60 ips instead of 15/30, and as the electronics were compensated for the higher speeds, the entire system was air-freighted back to Ampex and then returned to Paul's studio in New Jersey, where it still continues to work. "I'm sure



Les Paul (holding a Fostex cassette multitrack) poses with his original Ampex 8-track, which was given the name "Octopus" by comedian W.C. Fields.

we lost money on that," Snyder recalls.

Ironically, Ampex hardly made a fuss about the new technology. "It was partly because of me," Snyder explains. "I did not consider it an important or major new feature. I thought the market would be confined to a few dozen at the absolute most. After all, how many people are doing professional recording by way of overdubbing? Not many, but those who did needed it badly. Also, our attorney advised me that the concept was 'obvious' engineering and probably not patentable. The only thing Ampex ever did with it was trademark the [Sel-Sync] name."

Snyder does have one lament: "I often wished that Les would have made a greater success with the machine; he never had a hit again. By 1955/'56/'57, when Les was using the new machine, rock 'n' roll had taken over and he was not a rock artist. I would like to say we made five or six of his hits possible, but that wouldn't be true—they were all done earlier using sound-on-sound."

So 50 years later, how does the "father of multitracking" feel about his impact on music? "I'm terribly proud, but I'm very humble about it," says Paul. "If it wasn't for Bell Labs, I wouldn't have been singing into their telephone, and if there wasn't an Edison, there wouldn't be a phonograph. If I didn't have those things to play with, like the telephone receiver I put underneath the strings of my guitar and plugged into the grid of my mother's radio, it wouldn't have happened. I was just lucky enough to have others that had done so much who deserve so much credit."

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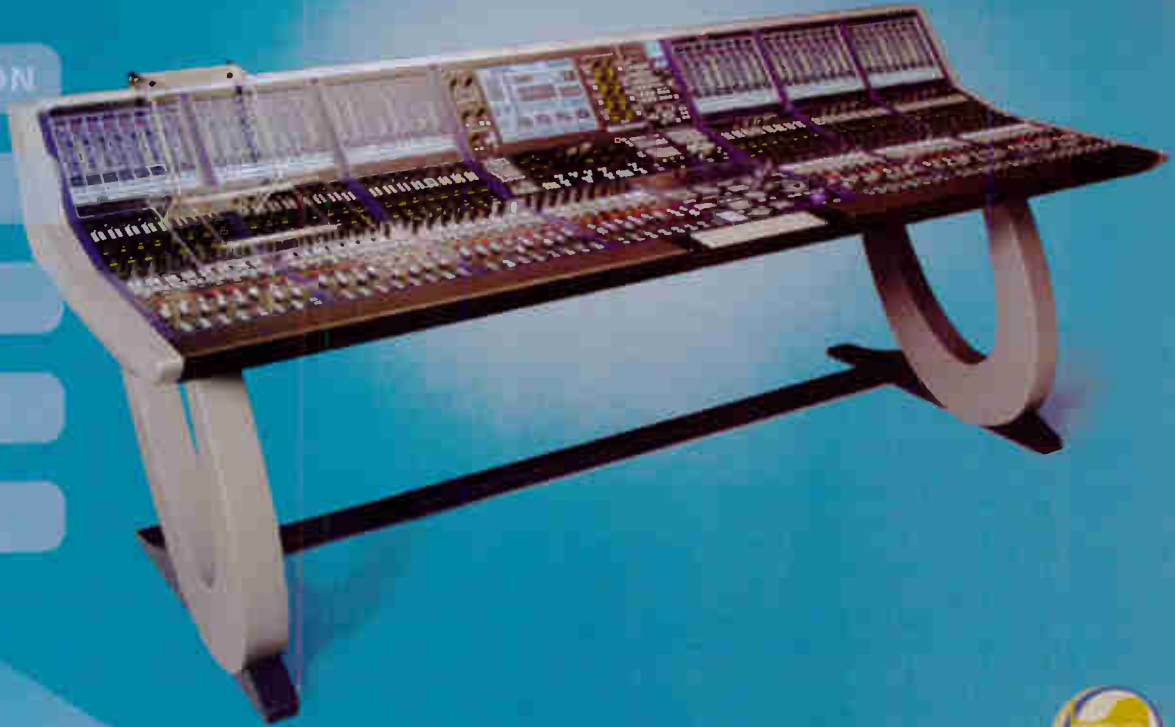
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World Radio History



AES New York, October 7th-10th, 2005, Stand 964

Innovation and Integrity

Sixty Years of Sennheiser

Today, the Sennheiser name is associated with high-quality pro and consumer audio products, but the company stems from modest beginnings. In 1915, post-war Germany was in shambles, and Dr. Fritz Sennheiser and seven other employees of the Institute for Radio Frequency Engineering and Electroacoustics at Hannover Technical University were left with virtually nothing. German scientists were then prohibited from doing research in radio technology, so Sennheiser used his savings to create a business making millivoltmeters for Siemens.

"Then we had a stroke of luck," the 93-year-old Sennheiser recalls. "Siemens asked if we could make microphones for them." After building mics for Siemens, the team began designing its own mic and in 1947 debuted the MD 2, a dynamic mic that found favor with radio stations. The company grew and expanded into other products, such as amps, intercoms, transformers, headphone capsules and the 1953 MD 21 mic, which is still in production. Based on a lab model developed in 1949, the company's 1956 MD 82 was the first shotgun mic. A move into wireless mic production followed a year later.

By 1958, the company had 450 employees and made the wise decision to change its name from the original "Labor W" (Laboratorium Wennebostel) to Sennheiser Electronic. During the 1950s, the company's sales grew tenfold, but Sennheiser always returned to the community, splitting his time between running the company and teaching at Hannover Technical University—a tradition continued by his son (and current chairman of the company's supervisory board), Prof. Dr. Jörg Sennheiser.

The innovations continued, with the 1960 MD-421 dynamic studio mic (which sold more than 500,000 units and is still a studio favorite today) and in 1964,

the first RF condenser shotgun mic. In 1968 came the HD 414 (the first open-air headphones), a definite hit that in 10 years provided more than half of the company's sales, establishing Sennheiser as a leader in the consumer market. In the '70s, the company merged its headphones with infrared technology, creating interference-free wireless headsets for home, tour guide and assistive listening systems. The '80s brought a major expansion into ultra-reliable UHF wireless mic systems that made Sennheiser a first choice on London and Broadway stages.

In 1982, managing the company was transferred from father to son, but this did not change Sennheiser Electronic's role as a technology leader. The company has received numerous accolades in this regard, including a 1987 award from the Academy of Motion Picture Arts & Sciences for the industry-standard MKH 816 shotgun mic and a 1996 Emmy for developments in RF wireless. However, doing things differently has also played a vital role in the company's

success. In 1984, Sennheiser was the first medium-sized company in Europe to use modern surface-mount technology. Today, while other companies turn to low-cost third-world manufacturing, Sennheiser has plants in Germany, Ireland and Stateside in Albuquerque, N.M.

"To protect against currency fluctuations," says Jörg Sennheiser of the U.S. plan, "we pursued a strategy that might be described as 'natural hedging.' We compensate for fluctuations by attempting to have the same expenditure in dollars as we have income in dollars."

In 1991, Sennheiser purchased a financially troubled Neumann, a change that provided the best of both worlds: Neumann could access modern electronics manufacturing, while the "old-world"



Dr. Fritz Sennheiser, today



This fun '60s ad showed a baker making fresh MD-421s. More than 500,000 have been sold.

processes—such as capsule hand-assembly—would be done under clean room conditions. Other companies might have been tempted to buy Neumann and then cash in via cheap products with a famous name—a familiar scenario—but Sennheiser is committed to maintaining Neumann's reputation for excellence.

The Sennheiser/Neumann relationship continues. The two collaborated on the KK105S wireless mic that combines Neumann's famed KMS105 capsule with Sennheiser's SKM 5000 UHF wireless rig. More recently, loudspeaker manufacturer Klein + Hummel joined the Sennheiser Group.

Sennheiser is successful, but business integrity remains a priority. Jörg Sennheiser once refused a lucrative deal to produce some 200,000 weatherproof mic capsules when he realized they were to be used as land mine triggers. But this has always been the company way, a policy dating back to the early days of Labor W, when Fritz Sennheiser invested his savings to create jobs for his co-workers. Marketing and sales president Rolf Meyer is sure that this attitude will continue. "With his philosophy of always giving his engineers space to carry out research and make discoveries, Prof. Dr. Fritz Sennheiser made a decisive mark on the company. Therefore, we look forward to even more pioneering developments from Sennheiser." ■

think inside the box



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Solid State Logic C300 Digital Console

DAW Control, DSP and Mixing Flexibility for Audio Post

Two years ago, Solid State Logic unveiled the C100 and C200—two scalable digital consoles designed for broadcast and production applications. At AES, SSL will show the next entry in its successful C Series, a fully configurable, multi-operator board for film mixing and large-scale video post installations.

The C300 mixer takes some of the series' familiar concepts—such as up to 512 inputs from a single Centuri centralized DSP and I/O core—and adds to the package with HUI emulation control of up to four DAWs simultaneously, 64 PEC/Direct switches, 8-channel monitor insert points supporting 7.1 mixing, 128x8 monitor matrix, support of up to four sets of monitor speakers and a 32x16 re-record matrix. The latter is especially useful for creating simultaneous mixes—say, in creating a final and an M&E mix (for later foreign dubs) in the same pass.

"The C300 definitely has some elements of the 100 and 200 in it, but it wasn't a case of 100 + 200 = 300," explains SSL product manager Andrew Clark. "We wanted the 300 to take some significant steps forward, and its DSP engine is one part of that because its presentation of resources is quite different to match it to post-production work methods, although the hardware is the same and its level of integration with workstations is a generation ahead of our other consoles."

The C300 can handle mid-level post or be scaled up to a full-blown, 128-fader, three-operator system with 512 inputs to mix, so it can also handle large film mixes. In that configuration, each operator's ability to have access to different workstations—for music, dialog and effects—offers a very powerful productivity tool.

Conversely, the console could also be small. "The control surface and DSP are completely independent, so you could have a 16-fader surface handling 500 inputs and 80 output buses," Clark adds. "One of the advantages of the C Series is that users can scale a system to their initial needs and later expand in terms of the physical control surface and the resources available to the user."

In developing the C300, SSL spent a lot of time talking to customers and listening

to their needs; these days, one major factor driving the market is efficiency. "Specifically, the final mix time is the most pressured with the least spare time available," says Clark. "One of the key needs of a post console is its ability to be quickly reconfigured, so when the session changes, the operators don't have to perform a large-scale reconfiguration to get to where they need to be."

One aspect shared among the C Series consoles is the Centuri core, a central unit that accepts up to eight DSP cards and is linked to the control surface. However, the C300 presents Centuri resources as an assignable pool of processing resources, such as filters, EQ, dynamics, insert points and channel delay—all with automatic latency compensation. One nice touch is Dynamic Resource Allocation™, which optimizes DSP usage—instantly replacing a 2-band EQ with a 4-band whenever more than two bands are switched into a circuit. The other aspect of the Centuri core is I/O, with slots for eight cards in a choice of AES, MADI, analog line and mic preamp connections.

The Master Channel is a hardware panel offering "one-knob-per-function" access to controls such as EQ, dynamics and aux flow parameters, with a familiar look and feel that's particularly important to first-time users. If desired, an additional panel can be fitted into any channel bay, providing multiple access points. One option is a motorized X/Y joystick controller that can be mapped to any two processing parameters.

The overall impression of the C300 is that it was built for speed: High-resolution TFT screens above each fader set display routing, processing and metering, which are combined with a master touchscreen for monitoring and machine control of the built-in synchronizer with four serial control ports. Its TimeFreeze™ automation enables slow-motion operation with no need for external time code, and channels can be easily linked to create stems up to 7.1.



"An important aspect is the C300's integration into the production environment," notes Clark. "Digital workstations are a major part of every stage in the post-production process. At the mixing stage, DAWs may simply act as playback decks, but often, there's a lot of hybrid interaction between the workstation and the console. The C300 gives users the opportunity to have everything in one place, with the console surface acting as a controller of the workstation."

"For some projects, mixing completely inside the box may be acceptable; the console surface provides the interface to the workstation's DSP and mixing. Other times, you're mostly mixing stems, with premixes coming to the console from the workstation. On some stems, you may need to get inside the component elements within a stem; here, workstation control allows these to be manipulated and remixed before they are mixed and fed as stems into the console. This also offers the advantage of rewriting the automation information inside the workstation—a powerful way of integrating the workstation with the console."

The C300 makes its AES debut this month, but this is no unveiling of a "dream car" or prototype. The C300 is in production, with the first installs slated for December.

For more information about the C300, visit www.solid-state-logic.com or AES booth #801. ■

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World Radio History

Dolby Media Producer

A Software Tool Suite for Pro Encoding/Decoding

These days, the market is barraged by consumer formats for audio, video, broadcast, Netcast, streaming, downloads, content-on-demand and more. Meanwhile, the production process has morphed from consoles, recorders and hardware racks to networked facilities equipped for file sharing (within and outside the studio walls). Keeping up with the pace requires smarter products that adapt to the new world of digital cinema, HDTV, HD DVD, Blu-ray and advanced audio formats.

With a solid track record in developing delivery-format standards, Dolby was ideally poised to create Dolby Media Producer, its first professional encoder/decoder software suite. "We've always been on the hardware side, so this is a big step for us," says Steve Venezia, Dolby's DVD/DTV broadcast support manager. "Facilities are becoming more centralized and more networked. They want to move files around, let big projects crunch overnight and do more work offline. At the same time, budgets are squeezed, requiring faster output and improved quality at both higher and lower data rates. Everybody wants to be more efficient."

At AES, Dolby will debut its Dolby Media Producer suite of HD and DVD creation tools. The suite includes Dolby Media Encoder, Dolby Media Decoder and Dolby Media Tools, a set of utility tools. After studying the market, Dolby saw that most of the encoding work was done in Mac-based facilities, so the suite—at least the initial offering—is designed for Mac OS X (optimized for Tiger). Rather than design the software as plug-ins for specific DAWs, the programs operate independently as stand-alone applications.

Each program will be available separately or as a suite, so users can buy exactly what they need. For example, a multiroom facility might require one encoder, three decoders and one toolkit. "The encoder can be run locally on a G5 or be in a back room on an Apple server and fed by multiple users," Venezia explains. "For example, if you finished conforming your movie in Pro Tools and exported your master files as broadcast .WAV files, you can open up the



The Decoder allows decoding/monitoring of Dolby Digital Plus, Dolby Digital, TrueHD and MLP Lossless formats.

Dolby encoder software where you import the files and tell it whether you want a Dolby TrueHD, Dolby Digital Plus, Dolby Digital or MLP Lossless file. You then set up your metadata for your selected format and submit the job to the encoder queue to be processed. Any room that submits jobs can log onto the server via a Web browser and see the order and status of its job."

The decoder is essentially a software version of Dolby's DP564 reference hardware decoder for listening in any form that the consumer might use, including downmixing to two channels, decoding a downmix to Dolby Pro Logic/Pro Logic II or taking a 5.1 mix and outputting a Dolby Headphone mix. The decoder supports Core Audio or ASIO I/O formats for use with FireWire I/O devices or Pro Tools I/O.

One of the decoder's key features is supporting playback to picture. "A concern we hear all the time is the ability to quality control encoded files synchronized with picture," says Venezia. "The decoder allows synchronized playback of encoded files, as well as source files. When you select a file for decoding, you can view all the metadata settings, the sample rate, data rate, file type and channel configurations, starting with a basic display, plus an additional window for getting deeper into the metadata. These are unique functions of this decoder. We're pushing to support the QC process here."

The utility software is perhaps the suite's most powerful productivity tool. "It's ideal for metadata updating, where you've already created a file and just need to change or correct something in the metadata without having to re-encode the whole project," Venezia says. "These are efficiency tools: Instead of tying up a room for two hours for re-encoding, you simply go in a back room and make a metadata

update. Also included are utilities such as file trimming, useful when trying to match a file with 30 seconds of black on the head and one with 15 seconds of black. Users can concatenate material for assembling pre-encoded files together. This is handy when you already have encoded files created to go on a shiny disc and you need to repurpose them for video-on-demand, which need a new front-end logo. It also lets users restripe timecode when new continuous timecode is necessary."

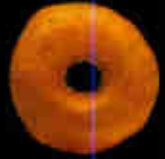
One advantage of the software approach is its ease in adapting to new formats and standards. "In terms of MLP Lossless, for video applications such as Blu-ray and HD DVD," Venezia says, "we offer the next generation of MLP Lossless—Dolby TrueHD—which increases the number of channels and expands the metadata for film applications. A professional software platform allows us to easily add support for new formats like Dolby TrueHD. The four codecs the new software suite supports are Dolby Digital, Dolby Digital Plus, MLP Lossless and Dolby TrueHD."

"We've also built in some project-management capabilities, so you can manage project information in logs that track the overall project and sub-projects," says Venezia. "The main project might be 'movie x,' but the client also needs versions for Blu-ray, HD DVD and standard DVD, so you might need a Dolby TrueHD encode, a Dolby Digital encode and a Dolby Digital Plus encode. If 'movie y' needs a Spanish-language version, you can access any relevant metadata from the English encode. You can manage this information in a project folder that tells who did what step and when, and all this information can be stored on the server, something that isn't possible with a hardware encoder."

For more info, visit www.dolby.com. ■

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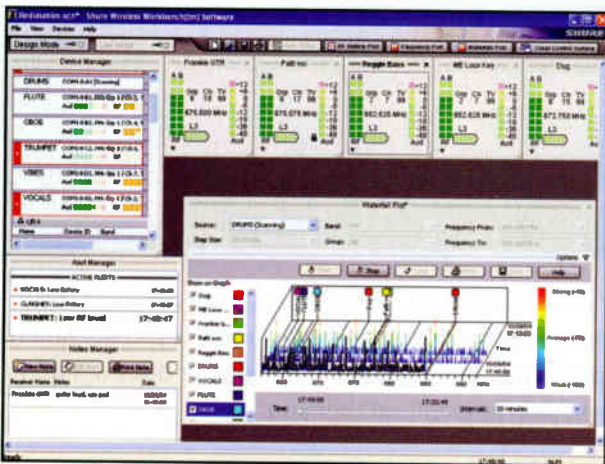
World Radio History

Shure UHF-R Wireless System

Pushing Bandwidth Boundaries

When you consider wireless technology, these are the good old days. Unlike other segments of audio, where the word “vintage” is spoken with reverence, new wireless systems offer better performance with greater reliability and more freedom from interference and dropouts than units that are even a few years old. Besides, that “classic” VHF system taking up room in your closet isn’t of much use: Since the FCC re-allocated those frequencies, all you’ll get out of that guitar rig is static.

Finding a great system today is no big deal. However, with wireless systems that are increasingly easier to use and more affordable, one main concern is finding some clear sky in the crowded frequency spectrum in which to operate. With that in mind, Shure developed UHF-R™, the company’s new flagship wireless system for live performance.



New functions in Windows-based Wireless Workbench Version 4 include full remote monitoring and control.

Making its AES debut this month, UHF-R offers fast, automated setup; real-time system tweaking over network control; and 2,400 selectable frequencies over a wide 60MHz bandwidth, providing up to 40 simultaneous compatible systems per band. “One of the challenges faced by our engineering team was to meet or exceed the performance of our high-end wireless products, but also stretch the tuning range of the product,” says UHF-R project

manager Michael Carnahan.

UHF-R’s extended bandwidth comes as a result of Track Tuning, a filtering system similar to the one used to create the almost-1,000MHz bandwidth employed by VHF and UHF television signals to increase signal isolation from intermodulation distortion. UHF-R operates by using a narrow, moveable filter within its 60MHz bandwidth. As the user selects different frequencies within the band, the filter shifts to attenuate any possible interference that may be created by frequency intermodulation outside the filter range.

“That’s one of the main advantages of our Track Tuning filtering technology,” Carnahan says. “With Track Tuning, when you center on a particular frequency, you’re less likely to pick up interference.”

UHF-R is designed to work within three UHF 60MHz-wide frequency ranges: H4 (518 to 578 MHz), J5 (578 to 638 MHz) and L3 (638 to 698 MHz), with the ability to operate up to 40 systems in each band or up to 108 systems using all three bands. (In Europe, where wireless allocations are different, UHF-R operates in bands up to 75MHz wide.)

“We built in some scanning features to sort a set of usable frequencies in a given band,” Carnahan says. “Users get an optimum curve telling what channels are usable based on other wireless devices in the area, TV channels, et cetera. We’re trying to take the setup process and make it as efficient as possible.”

Among UHF-R’s standard features are Flash memory for storing six 60-channel custom groups; automated infrared transmitter setup with custom group upload; Audio Reference Companding; built-in USB and Ethernet connectivity;



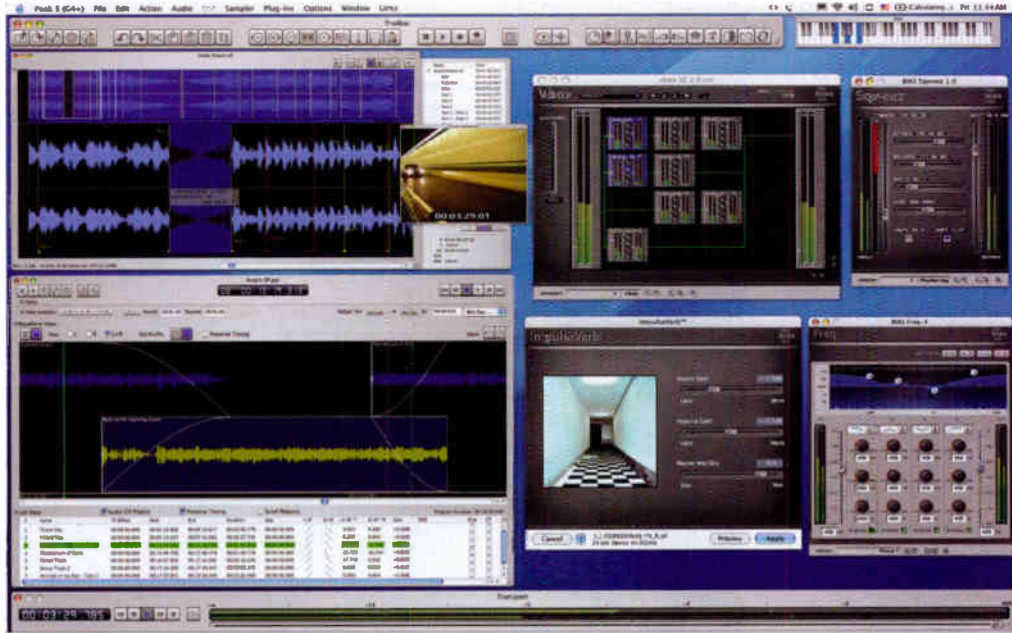
AMX/Crestron compatibility; bit-mapped LCD on all transmitters; and eight hours of operation on two AA cells. The compact UR1 bodypack transmitter can be used with any Shure headworn or lavalier mic (or optional instrument cable), and the UR2 handheld can be ordered with a choice of SM58/86/87 or Beta 58/87A/87C interchangeable capsules. Options include antenna splitters, antenna/power distribution, an in-line antenna amplifier and various passive and active antennas.

With UHF-R, Shure has updated its Wireless Workbench™ software (which can be downloaded at www.shure.com). Now at Version 4, this Windows-based application simplifies management of networked wireless systems, with access to all system parameters—either globally or to individual units—in the system. New functions in V. 4 include full remote monitoring and control of network, the creation of custom groups, infrared sync setup, and Frequency-Compatibility Calculator and Auto-Frequency-Selection Wizards. The latter scans the RF environment, accessing the networked hardware to recommend usable frequencies. The Wireless Workbench’s frequency-compatible wizards consider various makes and models of hardware (including PSM monitors) and create a blend of optimal frequencies to use, “allowing customers to address frequency coordination issues by themselves,” says Carnahan.

“In basic terms, UHF-R allows us to stretch the available bandwidth and maintain solid RF performance,” concludes Carnahan. “I’m excited to see how the tools we’ve built into it really take the guesswork out of wireless setup and coordination.”

For more information, contact Shure at 847/800-2000 or visit www.shure.com. ■

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Ableton Live 5 Performance-Oriented DAW

New and Enhanced Features Stretch Boundaries of Production

Converts to Ableton Live (and they are legion) are used to seeing updates that burst at the seams with new features. Live 5 is no exception. I could have filled the entire space allotted to this review by cutting and pasting the new features' brief descriptions from the Ableton Website. But I couldn't resist trying out the latest enhancements and making music with them.

DAW AS ANOTHER INSTRUMENT

For those of you whose noses have been buried in Pro Tools for the past decade, here's a quick overview. Live doesn't just blur the distinctions between a DAW and a musical instrument—it erases them. After loading numerous loops and one-shot samples, you can trigger them—individually or in groups—in real time and in perfect sync using MIDI or a QWERTY keyboard. You can capture your improvised performance as a conventional multitrack arrangement. Then—and this is new—you can drop MIDI-triggerable markers into the timeline and interact with the arrangement while it plays.

Live 5 provides or supports just about every software widget you can think of: plug-in synths and effects, very smooth audio time-stretching, ReWire, envelope-based automation at both the clip and track level, an intelligent browser and so on. Its user interface is extremely clean and usable. Newcomers will welcome the tutorials, which pop up in a separate window with hyperlinks.

Live 5's limitations are not major, but are worth noting. The MIDI editing is less powerful than in old-line sequencers; there's no groove quantization, for instance. Live 5 has no audio editing to speak of, and the only two factory-supplied synths are basic sample players. (Ableton's justly praised Operator FM synth is \$149 extra.) The lack of audio editing is mitigated by the power of clip envelopes with which you can notch out unwanted sounds and sculpt crossfades. After adding an EQ to a loop, you can also envelope the EQ parameters.

Here are some new features: automatic plug-in delay compensation, a track delay parameter, a search utility in the browser,



Live's feature-packed user interface. Two new effects, Beat Repeat and Saturator, are at the lower right.

support for Mackie Control-compatible mixer surfaces and three separate envelopes in the Simpler sample player. Multiple clips can now be edited at once, tracks can be resized in Session View and MP3s can be loaded into clips; the latter is perfect for DJs with large song libraries. Live 5 makes a good guess about the tempo of the imported song, and a quick manual adjustment will bring it into line with the project's beats. A new time-stretch mode called Complex makes song mixes sound very smooth when the tempo is bumped up or down.

WELCOME TO THE CLIP JOINT

Ableton's new Live 5 Clip file format includes the audio or MIDI in a clip and all of the associated parameters, effects processing and envelopes. Got something you like that doesn't work in the current project? Drag it to the browser where it will be tucked away on the hard drive, ready for import into another song.

With Device Groups, you can group a soft synth with the current track effects and save the whole thing as a synth preset. The browser has been linked to the Clip view

to handle loading and saving of device groups.

Live 5's Track Freeze function intelligently handles clips. Although you can't change the parameters of a clip that has a frozen track, you can still stop and start any of the track's clips. Transferring the song to a slow laptop for use onstage and to a computer in which some plug-ins have not been installed is a breeze. The frozen effects don't eat up CPU cycles, and you can still improvise an arrangement. One difference is that when you trigger clips in a frozen track, the effect tail (such as reverb decay) stops when the clip is stopped rather than continuing.

Live 5 comes with a large assortment of clips in various styles. I really liked the electronic MIDI beats, but you may have other favorites. This sound library is not automatically installed, and the instructions on how to install it by hand are hidden in the manual. (Look on page 46.) When installed, the library is stored in folders with names such as Bass and Pad, and not organized by style. According to the manual, extra Live packs will be available



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on the Ableton Website, but none were visible when I checked.

MESSIN' AROUND

The new phaser and flanger effects have envelope followers, opening up some sound design possibilities. The Saturator (distortion) has selectable curves and several parameters to fine-tune the part of the frequency spectrum that will be crunched.

The Beat Repeat effect is not that easy to describe or use. It samples chunks from the track's audio stream and repeats them

in a rhythmically controlled manner, which makes it a wonderful source of subtle or drastic variations for looped beats. You can set the size of the sampled chunks, the position in the beat where the sampling will take place, the probability that the effect will activate on any given beat, the amount of pitch decay and more. At the output, you can choose to blend the effect's output with the source signal, listen only to the effect's output or switch between the two automatically. The latter mode is good for making quasi-random changes in a beat and for stuttering fills. (For a short

example of Beat Repeat in action, check out this month's Online Extras at www.mixonline.com.)

Normally, I prefer to play my own MIDI parts, but Live 5's new arpeggiator is interesting enough that I'm sure I'll let it lend a hand once in a while. It lacks high-end features such as user-programmable patterns, but you can program a velocity diminuendo, run an arpeggio a specified number of times, and then automatically stop and perform key signature-dependent transpositions.

THE LIVING IS EASY

I used Live 5 to sketch out several projects and found it consistently solid and cooperative. The third-party plug-ins that I tried—both synths (Camel Audio Cameleon 5000, Native Instruments Battery 2, Cakewalk Z3TA+ Steinberg XpHraze) and effects (iZotope Trash, Antares Filter and Wizoo WizooVerb2)—worked without a hitch.

Live 5 lets you stretch the boundaries of production as experienced in more common DAWs. For example, I was able to isolate specific drum hits within a sampled beat and drag them into Impulse for MIDI sequencing. I also imported a piece of classical music that was played rubato and had Live 5 sync up to it rather than removing the rubato and making the music rigid.

The only thing that could dissuade me from seriously considering Live 5 as my primary DAW is that its time ruler won't change time signatures at specific points in the middle of a piece. For film composers and prog rockers, the lack of multiple time signatures may be a turn-off. Live 5 will happily play in multiple time signatures—even several of them at once—because clips can be any length. But if you switch from 5/4 to 7/4, the time ruler won't show where the bar lines are.

STRAIGHT LIVE

Using Live 5 is a real pleasure, and the new features take it over the top in terms of power. Thinking of Live as purely a program for DJs no longer holds water: It's effectively a full-function DAW. Live 5 is feature-packed and the manual somewhat terse, so there is a learning curve. But if you spend a little time clicking and dragging things and listening to the results, you'll probably be as excited as I am about it.

Price: \$499.95.

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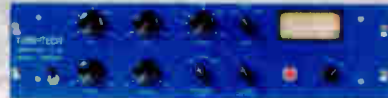
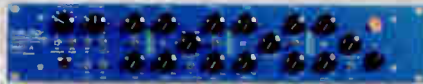


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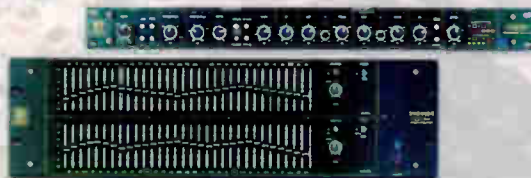


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DPA 4006-TL Microphone

Classic Omni Reissued Sans Transformer

I'm a biased, happy camper with my original 21-year-old pair of B&K 4006s, still in constant use here (and still available, by the way). They've saved the day on more than a few occasions. Still, it was quite a thrill to get a new matched pair of 4006-TL microphones from DPA for review with sequential serial numbers.

The 4006-TL is a small-diaphragm (16mm) phantom-powered, front-address omnidirectional mic, with a stated frequency response of 15 to 20k Hz (TL version). With its black stealth-like body and silver capsule, the 4006-TL ships in a padded black plastic carrying case with a standard DPA mic clip, a foam windscreen and three different diffusers for various applications.

THE REAL SKINNY

Seven different frequency responses and directional characteristics can be created acoustically—without any electronic phase shift, noise or distortion—by changing the grids or mounting an element over the capsule. The stock silver diffuser grid that comes mounted on the mic (DI0251) is recommended for standard spaced omni stereo recordings of large ensembles. For more intimate and upclose recordings, use the silver trapezoid (DI0254) diffuser; when creating distant/diffuse field recordings, try the black grid (DI0297).

Additionally, optional nose cones (UA0777) are available for completely flat omnidirectional work. Rounding out the accessories are three sizes of ball-shaped acoustic pressure equalizers (in kit form as the APE-L6). Used for both spatial and spectral equalization, these passive acoustic processors use diffractions on the ball's surface to modify the sound field around the microphone's diaphragm.

Another notable feature is the -20dB pad, a tiny push on/off switch discretely hidden inside the male XLR connector at the end.

REAL-WORLD USE

In my initial testing recording solo acoustic guitar (a vintage Gibson LC 1933) using the pair as spaced omnis with the near-field

trapezoid diffusers, the 4006-TLs provided imaging and detail that was almost three-dimensional in character. Transients, plectrum sounds and harmonics were clearer than I've heard before, and the stereo soundstage was rock-solid, letting me drop the vocal track right in the middle. In mixing, the final guitar tracks did not need EQ.

A movie soundtrack shoot using the 4006-TLs for room tone and overhead pickup of harpsichord and solo violin proved just as wonderful as the guitar session—it was almost too easy! As much as I prefer cardioids for tight, close-in recordings, omnis can still work in this application. Mainly, there's no proximity effect for intimate sounds, enabling close-miking of vocals and acoustic instruments without the low-end bump. In addition, the 4006-TLs seem to have an extra-fine degree of detail, especially on the harpsichord—no doubt due to the lack of an output transformer and improved electronics.

For large choral and orchestral work, the distant/diffuser grids yielded a sought-after sound, giving me a smooth blend of an adult choir and orchestra in a moderately reverberant church. With the 4006-TLs as my main spaced omni pair and an ORTF cardioid pair on the choir, I had to do very little touchup/soloist miking. The overall blend was smooth, silky and powerful, retaining all of the ensemble's clarity and detail: deep bass from the men, unflinching tracking of the soaring sopranos and more of that almost three-dimensional instrumental pickup.

The 4006-TL's low end seems clearer and tighter than on the original's. The mics were deadly on an African percussion ensemble, effortlessly handling an 18-inch tribal drum—which no one thought would be recordable—with depth and clarity. (I wish I had more time to test some pipe organs!)

UPGRADE THE OLD OR EMBRACE THE NEW

With the clever inline pad switch, front-end diffuser options and transformerless preamp design upgrade, the 4006-TLs are smart, welcome improvements to the same



essential microphone design that folks have trusted and used for more than 20 years. Just as the original 4006s raised the bar for serious recording back in the early 1980s, the 4006-TL takes it up more than a notch, making it a worthy upgrade from the original or as a new purchase.

At press time, DPA is offering a transformerless upgrade for original 4006 users. For \$499 USD, existing owners can have their beloved 4006s updated to the TL version.

While losing none of the original's best features, DPA made subtle changes for the better, giving anyone who's ever needed a microphone like this even more reason to consider the upgrade—or a pair of new 4006-TLs. I'll bet you get another 20 years out of them.

Price: \$1,799 each; matched pairs add \$180 per pair. The mic also comes in a stereo kit (model 3506) with all accessories, a stereo bar and a hard-sided locking Samsonite briefcase. All are phase-matched and come with an individually serialized calibration chart, showing frequency response, noise and sensitivity specs.

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Joe Hannigan runs Weston Sound & Video in Philadelphia.



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World Radio History

Waves APA32 Audio Processing Accelerator

Dedicated DSP for Thirsty Plug-Ins

I love the quality and power that Waves plug-ins—such as the LinMB Linear Phase Multiband dynamics processor, LinEQ Linear Phase Equalizer and IR1 Convolution Reverb—provide. The downside is that these monster plugs consume a whale-sized portion of my computer's CPU resources; just a few instantiations leave my dual 867MHz G4 nearly beached. The Waves APA32 Audio Processing Accelerator offers an elegant solution to this problem.

DESCRIPTION IN A "NETSHELL"

At the heart of the APA32 is Waves' Netshell technology, which incorporates Ethernet-based hardware and software, letting the APA32 power Waves' plug-ins running on a host computer. Each of the two Netshell hardware products can connect directly to your computer's Ethernet port using a supplied "crossed" Ethernet cable.

I reviewed the APA32 (\$1,600), a 1U rackmountable box suitable for use in machine rooms. Also offered is the APA44-M (\$2,400), a quiet, portable and more powerful half-rack unit (for which a rackmount adaptor kit is available). You can mix and match, connecting up to eight units to an Ethernet switch (not a hub) using standard Ethernet cables. Waves recommends connecting APA units using a dedicated 1,000Mbps Ethernet adaptor in the host computer to avoid network conflicts and bandwidth shortfall. A stack of APA units can be shared by two or more Netshell-enabled host computers on the same network, although a single APA box cannot be shared by multiple computers.

The Netshell system and APA32 can't power host-based Waves Version 5 plug-ins; they can only power Netshell-enabled versions. (Fourteen Netshell plugs are available.) APA32 users who don't already own V. 5 plugs must download V. 5.2 installers for all of the plug-ins or bundles they wish to buy; existing Waves V. 5 users must also download the installers to get duplicate Netshell-compatible versions of the host-based Waves plugs they already own. This is an update process only and does not require additional purchase or reauthorizations. After installation, Netshell plugs appear in your DAW's plug-in menu with a "Net" suffix

appended to their otherwise familiar names.

The APA32 and V. 5.2 Netshell are Mac- and PC-compatible. Visit Waves' Website for minimum system requirements and compatible DAWs. I used my dual 867MHz G4 with 1.8GB RAM for this review using one APA32; a faster machine is needed to run several APA boxes at once.

HARD AND SOFT

The APA32 is a simple-looking box, featuring front and rear power switches, a power receptacle for the detachable AC cord and an Ethernet port. Connect the Ethernet port on the APA32 to that on your computer, power up and go!

The Netshell Monitor, an included software utility, provides useful feedback on Netshell's performance (consumption of CPU resources, memory and network bandwidth), and lets you view and set the system's inherent latency (which most modern DAWs automatically compensate for). Netshell intelligently manages system overhead in a multiple-APA setup, loading newly instantiated Netshell plugs on the APA with the most available CPU resources.

Netshell plugs look and behave just like their host-based counterparts and can be used simultaneously with them (or with any other brand plugs). I could save Netshell-enabled plug-in settings as both AudioUnits presets and as clippings in Digital Performer V. 4.6. However, I couldn't open presets for a Netshell plug (e.g., TransX Multi Net) in its corresponding host-based Waves plug (TransX Multi). I also discovered that you can't copy and paste parameter settings from a Netshell plug-in to its corresponding host-based Waves plug or vice versa.

I could apply LinEQ Broadband to 19 tracks at once before the APA32's CPU was maxed out and wouldn't let me instantiate any more Netshell plugs. Alternatively, I could apply Morphoder Net to a dozen tracks or open eight instances of either LinMB Net or IR-1 Net or five instances of



SoundShifter Pitch Net before hitting the wall. Maxing out the APA32's CPU also incurred an additional 7- to 20-percent load on my G4's CPU, depending on the number of Netshell plugs instantiated and due to the resulting network traffic management imposed on the Mac by the APA32.

Digital Performer 4.6 automatically compensated for Netshell's latency, and the small-form Netshell Monitor always floated in front of all of Digital Performer's other windows so that it was conveniently visible. The Netshell submenu of plug-ins appeared just below the Waves submenu in Digital Performer's mixer insert drop-down menu.

The APA32 is noisy and belongs in a machine room: Its built-in fan constantly ran. I measured 52dB SPL (A-weighted) one foot above the fan with my Radio Shack sound level meter. Thankfully, the supplied Ethernet cable is plenty long—roughly 32.5 feet—to accommodate the APA32's remote placement. (Waves' APA44-M, which is reportedly nearly silent, is available for studio use.)

NET GAIN

Having the ability to open so many powerful Waves plugs at once on a project is a truly liberating experience and opens a lot of possibilities, particularly when mixing. At \$1,600 list, the APA32 is reasonably priced. And for early adopters, it's a downright steal, because for a limited time, the APA32 comes with IR1-L Convolution Reverb Light Net and Q-Clone Net plug-ins for free.

Waves, 865/909-9200, www.waves.com. ■

Mix contributing editor Michael Cooper is the owner of Michael Cooper Recording, located in beautiful Sisters, Ore.

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DTS Pro Series Surround Encoder

Multiformat Codec Software for 5.1/6.1 Production

Since Pro Tools 6 arrived, there's been a scarcity of DTS surround software products for the Mac. Back in the old days of Pro Tools 5, you could do a DTS encode within Pro Tools by using Kind of Loud's DTS encoder, but that product never made the jump to Pro Tools 6. Not to worry—DTS now has a product that has come to Mac users' rescue. The DTS Pro Series Surround Encoder is a stand-alone application that works on Mac OS X and Windows XP and will encode files from 16-bit/44.1 up to 24-bit/96 kHz.

The software comes in two versions: SE works on a single platform using a dongle for verification, and NE is a network version for those who need to encode on various platforms throughout a facility. I reviewed SE on a single-processor 1.25GHz Mac G4 running OS 10.3.7 "Panther." (For system compatibility on Mac and PC, visit www.dtsonline.com.) Installation was a breeze, only requiring a free USB port to hold the DTS dongle.

LET'S OPEN IT UP

The encoder is a suite of products that provide DTS Digital Surround for 5.1-channel encodes, DTS-ES 6.1 discrete (with a discrete rear center channel) and DTS 96/24 to encode 5.1 discrete audio channels for DVD-Video. Available sample rates include 44.1 or 88.2 kHz for CD encoding, and either 48k or 96k for DVD. There are also three bit rates available, including 754 kbps, 1.5 Mbps or 1.235 Mbps. The bit rate is dependent on the rate at which you're encoding and how much bandwidth you have to spend, with some being pre-determined. For instance, you must use the 1.5Mbps rate when encoding at 96 kHz.

PERFORMING THE CRUNCH

Encoding couldn't be easier, although there were a few oddities on the Mac version that I tested. You start the Packer by simply double-clicking on its icon. Next, adjust your sampling rate accordingly. In my case, I chose to encode at 44.1/16-bit and burn the encoded file onto a CD to be decoded by a Pioneer Elite DV-45A DVD player with the DTS Decoder. Name the file, choose the proper sampling rate and then click

on the first of the six files you need to encode (L/C/R, etc.). This is where the clunkiness comes in.

The Packer brings up a Java-based browser that looks like Windows from 10 years ago, not at all like the Mac browser. It took me some searching to figure out that I needed to go to the first level of the browser and choose Volumes to access the hard drive where my bounced files were. Once the files are in their slots, you can choose to simply Pack them for encoding at a later date or Pack and Encode, which will automatically bring up the encoder interface. Packing takes about 30 seconds for a five-minute song.

Splitting the process into two operations is unique to this product; DTS encoders from Minnetonka and Kind of Loud did it as one operation. According to DTS, breaking the process into two operations eliminated some file timing issues that the company ran into with the new product. Company representatives described it as "putting a wrapper" around the files—getting it ready for the encode. It is an extra step, but not cumbersome.

The packed file carries an .agm suffix and is the file you use for the encoder. As stated above, if you choose Pack and Encode, the encoder interface will open itself and you're ready to go. The .agm file and file name show up in their proper windows on their own, so the only thing left to do is hit the Encode button. Once the button is hit, a smaller window appears with your session data, such as the file length, bit rate, dial norm setting and sampling rate. Hit the OK button, and another quirky thing happens: You get a message that states that the encoder can't determine whether you have enough drive space, suggests the amount needed and expects you to know that you have the space to continue or abort the process to check for space. This is a nice warning to have included, but it would be better if the program figures it out on its own and sends an error message only if there isn't enough room.

The encode takes a bit longer than the packing process, but is still very quick. After the encode, you're left with a stereo



The DTS Pro Series Encoder is a stand-alone app for Mac OS X and Windows XP.

.WAV file that you can burn onto a CD for playback in any DVD player.

THE EARS AGREE

Despite some quirks that might unnerve some Mac users at first, the DTS interface works very well. Tucking separate files into their respective slots is simple, and the interface gives you plenty of chances to match everything up correctly. The one suggestion I would make is to quit Pro Tools altogether before using this program and run the encoder solo on the desktop. I found that Pro Tools has a tendency to crash and act erratically after a Pack and Encode was performed if both apps are running.

How does it sound? When I A/B'd against the original surround mix, the decode process' outcome is astoundingly accurate. You do lose a bit of the low-level stuff like reverb tails, resulting in a mix that sounds a bit dryer, but everything else is very close.

The DTS Pro Series Surround encoder makes it easy to send surround mixes for approval and gives users the ability to put a full 74 minutes of surround mixes onto a Red Book CD. In addition, the high-resolution encodes for DVD are there if you need them. DTS got it right for this \$1,200 product, with great sound, features and price all in a single package.

DTS, 818/706-3525, www.dtsonline.com.

Kevin Becka is Mix's technical editor.

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SPL MixDream Summing System

16x2 Class-A Mixer With Dynamics Processing

Sound Performance Lab (SPL), known for its unique vision of analog signal processing gear, has released the 16-channel MixDream Model 2384. With its advanced design and novel insertion and signal routing features, MixDream separates itself from other summing units by refining the process with more user options, maximum control and two built-in stereo processors: a stereo expander and peak limiter.

MixDream, a 2U, 16-channel x2 system, uses Class-A, electronically balanced, differential input amplifiers running on a ± 30 -volt supply. All switching is done using Matsushita SDS/NAIS gold-plated, gas-filled and vacuum-sealed relays. Each input channel has a switchable insert, and multiple MixDreams can be linked together for more inputs or for 6-channel surround sound applications. No amplifier chips (ICs) are used; rather, SPL's op amp modules enable the MixDream to deliver 127dB dynamic range and 96dB S/N with all channels on. The entire signal path is DC-coupled with no electrolytic capacitors used except in the internal linear power supply.

SUMMING IT UP

MixDream offers odd-numbered channels to be bused to the left side and even-numbered channels to the right. All connections to these channels, channel insert send and returns, direct outs, and master inserts and expansion I/O use D-Sub (DB25s) connectors following the Tascam standard pin-out.

Each channel insert toggle switch has three positions: Off (no insert), On (insert path active) and No Mix, where the channel is lifted from the stereo summing bus and routed to its own direct out. In addition to muting that channel to the mix, No Mix allows for routing channel audio to a processor and back into your DAW for re-recording/mixing. The No Mix position is also good for routing click tracks, SMPTE and production sound (such as dialog) to separate destinations. When fully integrated into your studio's patchbay, MixDream acts as a clean DAW analog buffer amp and I/O router, saving time and patching when specialized session needs arise.

Each channel's signal present LED (-30dB level) indicates input signal when the insert



switch is Off; when On, it indicates that signal is coming back on the insert return. It's a simple idea, yet a clever way to verify that an outboard signal chain is working. Two more LEDs indicate an active insert (orange) and No Mix mode (red). The global Inserts On/Off switch activates all 16 channel inserts together for checking (or troubleshooting) all inserted gear on the mix. MixDream has mono switches for channel pairs 1 through 2, 3 through 4 and 5 through 6, forcing them to the center of the stereo bus.

Summed stereo audio goes direct to the master insert control section, where an Elma rotary switch controls the master insert send level from -6 dB to +4 dB. There is plenty of level here—as much as +28 dB—if you like to overdrive a tube compressor for “that sound.” Two -30dB signal present LEDs light up when level comes back from the inserted unit; In/Out hard-relay bypass is provided for quick A/Bs.

The Stereo Expander uses another Elma 6-position rotary switch that controls the amount of a phase shuffler-type effect that widens the image of stereo material, taking left and right signals and adding them back to the opposite side in reverse phase. This is a cool effect that I found fairly mono-compatible. I wish it was also available, switchable or patchable to any stereo pair of channels rather than just to the whole mix.

The Stereo Peak Limiter uses a diode/transistor combination and only reduces peaks. It worked well at minimal settings to prevent any A/D converter following the unit from clipping, but you should avoid heavier settings as transients will be rounded off. There is no way to adjust its action, and only a pair of LEDs indicate gain reduction.

The main and monitor outputs are the same, but are presented on two sets of rear panel XLR connectors controlled by a single rotary switch. A switch gives the option

of using Lundahl LL1539 transformers. I preferred the sound of the Lundahls; following processors or A/D converters may require additional isolation.

IN THE MIX

All of my music mixes benefit greatly when summed in analog—I became a true believer the very first time I mixed separate outputs from a DAW on a large API console. After carefully testing all 16 channels with a -18dB reference tone from a Pro Tools|MIXPlus system, I found that all channels contributed exactly the same level to the summing bus—within an astonishing ± 0.2 dB.

The beauty of this unit is evident in that stereo localization and imaging are more solid with spatial cues locked in place. There is less smearing, and the increased clarity of low-level information—such as room ambience, reverb tails and subtle effects—is noticeable. Subtle mix moves made in the DAW are more audible, and I liked MixDream's uncolored transparent sound—you cannot overload this unit.

WHAT'S THE BUZZ?

Careful Class-A circuit design, an extremely high headroom and a low noise floor pay off big when it comes to summing analog signals—and the SPL MixDream offers all this and more. So far, I've used three different summing systems with DAWs and I've noticed the biggest sonic improvement yet while using the MixDream. If you're joining the fast-growing analog summing crowd, you'll be well-represented using the MixDream. Price: \$3,795.

SPL-USA, 866/4-SPLUSA, www.spl-usa.com. ■

Barry Rudolph is an L.A.-based recording engineer. Visit his Website at www.barryrudolph.com.

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SOUNDTOYS ECHOBOY VERSION 1.2 Echo/Delay Plug-In

EchoBoy from SoundToys (formerly Wave Mechanics) is an ingenious echo/delay plug-in for Mac OS X and Pro Tools HTDM/TDM/RTAS/AudioSuite. With its imaginative and musical design, comprehensive parameters/options and editable Style section, EchoBoy emulates new and classic echo units, creating just about every conceivable type of delay effect.

EchoBoy has four modes: Single Echo, with a single delay value and up to two outputs; Dual Echo offers two delay times and two outputs; Ping-Pong is similar to Dual with two delay times and outputs, except that one delay (Ping) feeds the other (Pong); and Rhythm Echo for creating a rhythmic sequence of delays using up to 16 taps from a single delay line. Rhythm Echo's GUI has a grid of up to four measures long (4/4 time) that shows each tap's delay time, level, panning, repeats and number of sequence recycles. Besides a page of main parameters for each mode, Tweak submenus allow mode-specific fine-tuning.

Delay times are entered by keystrokes or up/down delay adjust buttons, with times expressed in milliseconds or as musical note subdivisions (sixteenth, eighth, quarter, half-note); you can also have dotted or triplet notes. Master tempo is set (in bpm or milliseconds) by typing in values, tapping or by following session MIDI tempo. A Groove knob sets the delay output's groove anywhere between shuffle and swing; a Feel control shifts the onset of the first echo between Rushin' (ahead of the beat) or Draggin' (behind the beat).

Adjusting the relative timing and feel of echo and its repeats can affect how the echoes mesh with the music and the feeling it imparts on the song. EchoBoy is the first processor to offer precise control over timing/feel and the sound character of both the echo and the way the repeat echoes devolve in fidelity.

There are 30 specific Styles that change the quality of the echoes. These range from pristine Master Tape echo, to harder-sounding Digital Delay echo, to Tube echo—where saturated echoes get thinner with each repeat—to the low-fi repeats of Telephone. There are more than 300 factory presets, each with a style that's editable in its Tweak submenu.

On a lead vocal track, I used EchoBoy in Dual mode with each output panned left/right and each having slightly different delay times. I adjusted the Feel knob to the Draggin' side so that the eighth-note delay echoes were late. The Accent controls let me make the even repeats (2, 4, 6, 8, etc.) hotter than the odd-numbered repeats. I then used the Width control to distance the lead singer's main track from the delay. For a low-fi effect, I used the Tel-Ray Style, turned the Saturation control down, added high frequencies and increased Wobble to add a wowing varispeed to the echo.

At \$495, EchoBoy is a sure winner and a must-have for anyone's plug-in list. If you can dream it up, EchoBoy can do it with style.

SoundToys, 802/951-9700, www.soundtoys.com.

—Barry Rudolph

A DESIGNS REDDI Single-Channel Tube DI

Great DIs are like expensive cars. You can go through life without driving one, but once you do, you'll never want to go back. At \$750 retail, A Designs' REDDI is in the high end of direct input devices and has made me a believer, as well as other audio pros who used it during this review.

REDDI weighs a hefty 10 pounds and is 14.5 inches long. The vented all-steel case provides cooling for the tube and power supply. On the inside are top-quality components, including a beefy toroidal power transformer, custom-wound output transformers and a 6N1-P tube. An optional rack adapter can handle up to two REDDIs.

The front panel has a Neutrik Combo XLR/¼-inch input, an XLR output, power switch and level control. A piercing blue LED indicates that the unit's on. One of REDDI's best features is that it offers 16 dB of gain for easily matching any source to your console's mic input, especially notoriously hot active basses or weaker passive ones. The rear panel has a ground lift switch and an IEC AC connector. One downside is the lack of a thru jack so that you can also connect the input to an amp.



A Designs claims there is no room for this, but on a box in this price range and size, it's an expected feature. (A Designs recommends the use of any cable or switcher box for this application.)

REDDI's first outing was on an active bass. The bass player's head turned as

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soon as he heard his instrument in the 'phones. REDDI was an instant hit both in and out of the control room. The tone it provides is rich and full with plenty of low-end punch and high-frequency definition (up to 60 kHz, according to A Designs). Next, it was used with a Wurlitzer electric piano. Wurlitzers have limited bandwidth but REDDI delivered, making the Wurly sound great. Even when playing hard, there wasn't a hint of overloading REDDI. Because of its combo input and level control, REDDI is versatile enough to take a dynamic mic input and give it the neo-classic REDDI warmth and tone. This is a nice feature and almost makes up for the loss of a thru input.

REDDI's warm, punchy tone, solid construction and level control make it a versatile studio tool that will make engineers and bass players drool with audio glee.

A Designs, 818/716-4153, www.adesignsaudio.com.

—Kevin Becka

DISCRETE DRUMS SERIES FOUR The Heavy Mental Drum Library

There are at least a bazillion drum libraries on the market (pop, rock, hip hop, R&B, techno, industrial—you name it), but so far, the genre of drum collections catering to the metal connoisseur has been pretty limited.

Discrete Drums has launched The Heavy Mental Drum Library. Produced by Rick DiFonzo, it's available in three formats: 16-bit stereo and 24-bit multitrack, both in universal .WAV format on CD-ROMs for loading into virtually any—or any virtual—system and a \$119 DVD with 1.8 GB of 24-bit samples as 27 kits formatted for EXS-24, Kontakt, GigaStudio, MachFive, HALion, Reason, SampleTank and Battery.

The 16-bit stereo set is \$189 and has two CD-ROMs of tracks and two audition discs in standard audio CD format to quickly find something to your liking. The mega \$349 pro bundle has 14 CD-ROMs and two audition CDs—almost 9 GB of full performances, solos and individual hits. It includes 13 tracks (kick, snare, hi-hat, stereo toms, stereo overheads, stereo close room, stereo big room and stereo "gak"). (Pro Tools edition offers Pro Tools sessions, Live sets and SampleTank kits on DVD for \$329.) The latter is a nasty, rude-sounding track recorded using an excessively cheap (and overcompressed) distance mic for effect.

Loading the 48kHz multitrack files into Pro Tools was a snap. Just have a quick

listen on the audition CDs, find what you like and start working. The cuts feature popular session drummer Tony Morra and were cut at Sound Kitchen's Big Boy room (just outside Nashville in nearby Franklin, Tenn.). The quality of the performances and audio throughout is impeccable—except for the intentionally bad gak tracks, which, like any spice, has its use in some dishes and not in others. I appreciated accessing 13 separate channels on each project, and for more variation, alternate endings are provided with each project, along with a collection of miscellaneous crashes, count-offs and extra endings for use anywhere. Also, all of the drums are dry-miked and can be combined with the distance mic tracks or with outboard reverb to your taste.

Is this collection for you? Some of the track names—such as "Neuronic Whip," "Nail Gun" and "Brain Matter"—should give you a clue, but if you need powerful, mind-numbing backbeats or crushing double-kick grooves, you might have the answer. Or, go to the company's Website and download a demo sample for yourself.

Discrete Drums, 484/582-0727, www.discretedrums.com.

—George Petersen

SYNTHOGY IVORY Sampled Grand Piano Library

The sampled grand in Kurzweil's original 1984 K250 keyboard was the best from that era. Tapping the formidable horsepower and the disk streaming available in modern computers, the 32GB Ivory takes off like a jet from where the K250 left off.

Currently only available for the Mac (a PC version is coming soon), Ivory contains three complete grand pianos: a powerful Bösendorfer 290 Imperial, a 9-foot German Steinway D with lots of personality and a Yamaha C7 with its characteristically resonant low end. Each was sampled with four to

eight velocity layers, plus several release samples taken at different times, soft-pedal samples and key noise. The pianos are beautifully recorded, miked fairly close for maximum versatility.

In addition to the presets, Ivory provides all the control you need over its performance characteristics. You can select soundboard models with different amounts of resonance and then adjust the level that sounds when you press the sustain pedal.

You can select stretch or equal-tempered tuning; tune or transpose the instrument; select player/audience pan perspective; and adjust the stereo width, dynamic range, key noise level, overall timbre, release time and velocity response. The software includes a surprisingly well-programmed ambience processor with none of the typical problems in "free-verbs." An effects screen provides access to basic reverb parameters, chorus, and low- and high-shelving EQs.

Minimum requirement is a 450MHz G4 450 with 512 MB of RAM. I ran it on a dual 1GHz PowerMac G4 with 1.5 GB of RAM under OS 10.3.4, inside Apple Logic 7, MOTU Digital Performer 4.12 and Pro Tools 6.3.2. On the review machine, a full 8-layer Bösendorfer took up roughly 630 MB of RAM over what the host sequencer required, although lower-memory versions of the pianos are available.

Ivory has a very effective note-stealing algorithm: You can set the polyphony limit as high as 160 stereo voices, but I never noticed notes being cut off at the default 24-voice setting.

Features aside, the transitions between samples are absolutely seamless, and the velocity response is impeccable. Ivory feels/sounds like you're playing a real piano. At a retail of \$349, it's a bargain.

Synthogy, dist. by Ilio, 818/707-7222, www.ilio.com, www.synthogy.com.

—Nick Batzdorf ■



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"With 64-bit computing, processors are getting a quantum jump in performance, and we've used it to give SONAR 5 users more power, flexibility and creative potential. Intel's support has been extraordinary. They have supplied Cakewalk with prototype systems for development, helped us get the latest drivers and helped us with getting our software tools configured properly. They've been a great partner, especially when it came to getting the message out about the power of 64-bit computing. 64-bit technology accelerates the performance of SONAR 5 by 20% to 30% on a single core computer.

The benchmarks are not in yet on Intel Multicore processors, but we are expecting even greater results. SONAR has been optimized for multiprocessing for a few years now, and our most demanding users are seeing huge performance gains when SONAR is run on dual or quad CPU systems.

What does that mean to musicians? 64-bit pushes the envelope of what you can do with software-based samplers through access to 128 GB of RAM. Instead of orchestrating a solo violin, you can orchestrate a whole string section. And the processing benefits will translate into noticeably more tracks, more effects, more synths- and deeper and more interesting songs and mixes."

- Ron Kuper, VP Engineering at Cakewalk

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FOUNDED IN 1977 BY DAVID SCHWARTZ AND PENNY RIKER

Welcome to AES!

The 119th Audio Engineering Society Convention returns to New York City, and this year's show will leave no technophile lacking for cool stuff to check out.

A few items on your AES "must-see" list might include consoles making their U.S. debuts, such as the Fairlight Constellation-Anthem and Solid State Logic C300. However, not everything at AES is a big-ticket attention-grabber, and the show will offer plenty of less-glitzzy products in that "why-didn't-I-think-of-this-first" category, like HHB's FlashMic, which builds a solid-state digital recorder into a Sennheiser mic handle.

To keep *Mix* readers informed of some of the latest new technologies, we present our 28th annual "AES New Products Guide." Packed with specifications and tech information on hundreds of recent offerings from hundreds of pro audio manufacturers, this guide focuses on products that were introduced (or shipping for the first time) in the months prior to AES.

The product information in this guide was supplied by the manufacturers. Specs, prices and availability may change, so readers should contact companies directly for more information; phone numbers and Website URLs are provided for your convenience. And if you can't make it to AES in person, don't worry—we'll provide complete coverage of the show highlights next month.

See you at AES!

George Petersen
 Editorial Director

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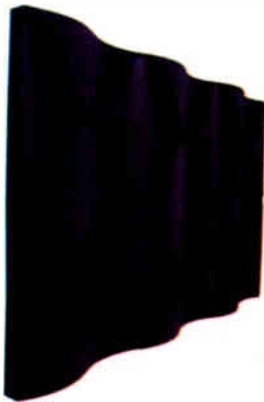
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AC POWER PRODUCTS

FURMAN SOUND AR-15: The AR-15 delivers stable AC power to protect sensitive electronics from damage caused by power irregularities, such as sags, brown-outs or overvoltages. It transforms input voltages from 97 to 141 VAC to a constant 120 VAC ($\pm 5V$), and uniquely filters AC power, reducing line noise and ensuring optimum performance. The AR-15 has a total of nine outlets and includes all the features of Furman's SMP+ technology. Retail: \$649.95. AES booth: #533.

FURMAN SOUND POWER FACTOR PRO R: The Power Factor Pro R is a rackmount power conditioner with nine outlets that enables amplifiers and subwoofers to reach higher levels of performance. It stores up to 45 amps of current for the most extreme power demands in home theater and both live and recorded music. It also includes SMP+ technology, which filters AC power and protects sensitive electronics from impurities and surges. Price: \$349.95. AES booth: #533. 707/763-1010
www.furmansound.com

ACOUSTICAL MATERIALS



AURALEX PARTSCIENCE AUDIOTILE

Designed by Russ Berger for Auralex Acoustics, pArtScience AudioTile redefines the aesthetics of acoustical absorption. Tesselated forms present unlimited design possibilities for a sophisticated, custom appearance that is precisely tailored to the desired acoustical performance. Varying thickness built into each component delivers excellent broadband absorption, while the design patterns allow a unique means of blending absorption, diffusion and reflection for the optimum acoustical balance. Auralex's proprietary Studiofoam formula provides superior durability and Class-B flame retardancy. Price: \$119. AES booth: #150.



AURALEX PARTSCIENCE SPACEARRAY

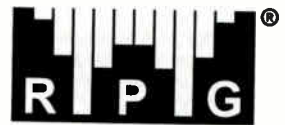
Designed by Russ Berger for Auralex Acoustics, the pArtScience SpaceArray combines excellent hemispherical acoustical diffusion with a top-quality wood finish. Based on a quasi-random series that provides superior performance without visual patterning, the SpaceArray is ideal for control rooms, auditoriums, performance venues, listening rooms, home theaters and worship spaces. Strong and light weight, the beautiful 24x24-inch solid wood panels install easily and can be used in a variety of placement options. Price: \$399. AES booth: #150. 317/842-2600
www.auralex.com

BAG END E-TRAP: Now in production, Bag End's revolutionary, tunable electronic bass E-Trap is a first-of-its-kind electronic feedback control system incorporated in a powered subwoofer that creates the same dynamics as a passive bass trap. This is an active feedback coloration control solution that adds dampening to the low-frequency acoustic mode and smoothes out the magnitude of frequency response in a room, thus eliminating the need for passive acoustic materials. Price: \$998. AES booth: #643. 847/382-4550
www.bagend.com

INTELLIGENT ACOUSTICS: Founded by a team of industry veterans, Intelligent Acoustics offers an affordable single-source solution for customers seeking help with design and acoustical treatment of interior spaces. In addition to marketing products from Illbruck, Kinetics and RPG, the company is launching an innovative range of acoustical doors (some with exotic woods), gobos (moveable floor-standing baffles), clouds and variable acoustical panels for studios and other acoustically critical environments. AES booth: #560.

973/263-3950
www.iacoustics.com

REALTRAPS MONDOTRAPs: MondoTraps broadband acoustic panels feature very high absorption down to the lowest frequencies. Only slightly longer than MiniTraps, MondoTraps are effective to below 40 Hz. MondoTraps can be installed permanently or mounted on optional stands (\$80). This is our most powerful bass trap and will greatly improve your ability to record and mix accurately in any room. For product details, tutorials and videos about room acoustics, please see our Website. Price: \$299 each. AES booth: #1038. 866/RealTraps
www.realtraps.com



RPG DIFFUSOR SYSTEMS, INC.



RPG INC. MODEX BROADBAND

Control rooms often exhibit poor low-frequency response with significant emphasis at modal resonances. Porous surface absorption is ineffective because the air motion it requires is essentially zero when near room boundaries. The Modex™ Broadband was developed to offer broadband absorption effective from 50 to 5k Hz in a thickness of only four inches. Every now and then, a new technology comes along that changes everything. Now you can absorb more bass in less space! Price: \$999 USD. AES booth: #1062. 301/249-0044
www.rpginc.com/proaudio

ZAINEA ROUNDFFUSOR1: Roundffusor1 has a main body and two lateral drivers for wall/ceiling mounting. It works simultaneously in two ways: as a clean MF/HF diffuser and as a self-controlled LF, acting like a complex Helmholtz resonator. The listener is simply immersed in the sound without any coloration. Additionally, the sweet spot expands so that almost every

person in the room senses the same mix. Applications include recording/broadcast studios, churches, home theater, cinemas, film mix/dubbing stages, mastering and serious listening rooms. Price: 85 Euros. 30/210-2027191 (Greece) www.zainea.com

CABLES & CONNECTIVITY

ACCUSOUND SILVER STUDIO PRO CABLES: Accusound cables offer discriminating musicians and studios world-class cables for a real-world price. Sonic excellence is achieved by combining high-quality materials, construction and knowledge. Our Accusound Silver Studio Pro microphone, instrument and patch cables combine the warmth of copper with the speed and accuracy of silver to produce a winning sound combination. Features: twin silver-plated copper conductors, a 95-percent silver-plated annealed copper-braid shield and ultra-flexible wear-resistant jacket. 508/894-0004 www.accusoundproaudio.com

AVIOM 6416I INPUT MODULE: The 6416i Input Module is a two-rackspace analog input module compatible with all Pro64 digital audio network products. It converts 16 line-level analog audio channels into uncompressed, full-bandwidth, 24-bit digital data transmitted via Aviom's proprietary A-Net Pro64 protocol. Each channel has a 4-position gain setting, signal level LEDs and individual channel on/off switches. All audio inputs use balanced XLR connectors. The 6416i also includes Virtual Data Cable connectivity for GPIO, MIDI and RS-232. AES booth: #1154.

AVIOM 6416M MIC INPUT MODULE: The 6416m Mic Input Module is a three-rackspace, mic level module with 16 high-quality mic preamps with 24-bit A/D converters. The 6416m can be controlled remotely using an optional Pro64 Mic Control Surface. The 6416m can be used to create a digital snake or as part of a distributed audio network. Each channel has phantom power, phase invert, highpass filter, gain control and LED metering. DB-25 multipin connectors are used for auxiliary input and direct outputs. AES booth: #1154.

AVIOM 6416O OUTPUT MODULE: The 6416o Output Module is a 16-channel, two-rackspace D/A converter that's compatible with all Pro64 digital audio network products. The 6416o can be used to create a digital snake or as part of a distributed audio network. All rear panel audio outputs use balanced XLR connectors. The 6416o also includes Virtual Data Cable connectivity for GPIO, MIDI and RS-232. AES booth: #1154. 610/738-9005 www.aviom.com

GEFEN EXT-DVI RS-232 EXTENDER: The DVI RS-232 Extender sends high-definition video with RS-232 control over two economical Cat-5 cables. Distances up to 150 feet are guaranteed to perform beautifully, giving you a reliable method of all-digital extension while streamlining your installation cabling needs. Price: \$599. AES booth: #355.

GEFEN DVI SUPER BOOSTER: Extending HD digital video via DVI beyond its specified 15-foot distance limitation using a DVI copper cable simply will not replicate the highest resolutions perfectly. In fact, sparkles or other objectionable distractions of the video often appear, which indicate that the signal has been degraded. But add a DVI Super Booster to that same cable, and it can extend pristine HD resolutions up to 1,080p or 1,920x1,200 up to 150 feet. It operates just like the DVI Booster, but comes with an optional power supply that guarantees performance up to 150 feet. Price: \$199. AES booth: #355. 818/884-6294 www.gefen.com

GEPCO X-BAND MIC CABLES: Gepco's X-Band mic cables are extra-flexible, high-bandwidth cables ideal for use in critical recording facilities or live sound venues. Gepco's X-Band cables are sonically transparent, low noise and highly durable. Each oxygen-free copper conductor is insulated with a unique low-k constant, foam polypropylene dielectric that lowers the capacitance and extends the cable's bandwidth. AES booth: #559.

GEPCO CT504HDX CAT-5E CABLE: The CT504HDX heavy-duty tactical Category-5e cable is ideal for portable or remote patching of Ethernet networks or digital audio/video formats using Cat-5e-type cable. The CT504HDX features solid conductors for longer runs and was created to meet the increased demand of audio/video pros who need a rugged, reliable, portable and flexible cable solution. AES booth: #559. 800/966-0069 www.gepco.com

NEUTRIK OPTICALCON: Neutrik created the OpticalCon to increase the reliability and maximize the uptime for fiber-optic connection systems. The new system is based on a standard optical LC-Duplex connection. However, OpticalCon improves this original design to ensure a safe and rugged connection. It enables up to four copper wires to run power or data signals. A special SMPTE version has been optimized for broadcast applications, providing an additional ground-shell contact. Price: Starting at \$800. AES booth: #536. 732/901-9488 www.neutrikusa.com

STUDIO NETWORK SOLUTIONS 9.6-TERABYTE SAN: A major upgrade to Studio Network Solutions' globalSAN™ X-24, the system now offer 60 percent more storage capacity and two additional software licenses. Priced at \$29,999 (about \$0.40/gigabyte), the X-24 is now a 9.6-Terabyte, eight-user SAN with dual RAID controllers and redundant power supplies in a 5U enclosure. The X-24 is easy to install, setup and use. There are no metadata servers to purchase or maintain and no Fibre Channel switches to configure. AES booth: #563. 314/733-0551 www.studionetworksolutions.com



SOURCE ELEMENTS SOURCE-CONNECT SCVFN22: Collaborate remotely with incredible real-time, broadcast-quality audio directly within Pro Tools—and now over your private network. Source-Connect VPN leverages the full potential of existing networks, utilizing your leased and privately owned lines. A complement to Source-Connect, the VPN upgrade provides an additional layer of network control. Together, they allow private, direct-to-timeline recording with real-time audio using only your Internet connection—from you to anywhere in the world. Price: \$495. AES booth: #1237. 312/706-5555 www.source-elements.com

STUDIO PROJECTS HYBRID LITZ SOLID-CORE CABLES: In Litz construction, each conductor strand is individually insulated. In most cables, this is not the case, and without insulation, the signal can randomly jump conductors in an uncontrolled manner. Phase and time-domain distortion results, which is difficult to measure but can be detected by the ear. Finer Litz conductors tend to favor highs; heavier conductors are better for mids and bass. Our cables use a specific combination of heavy and fine gauges for the most realistic balance throughout the frequency extremes. Combined with a Quad Balanced configuration for maximum noise rejection, our cables offer a wide bandwidth, natural sound. Price: \$59. AES booth: #545. 310/323-9050 www.studioprojects.com/cable.html

WHIRLWIND MUSIC ES2: ES2 is the next generation in Whirlwind's series of digital audio/networking products. ES2 accepts any two of the same 8-channel I/O cards used in the original E-Snake for a total of 16 channels. I/O cards include mic/line, transformer mic and AES/EBU. Whirlwind's E-Snake Control software provides complete remote control of inputs and allows administration of channel assignments, routing, etc. 585/663-8820 www.whirlwindusa.com

CD/DVD DUPLICATORS/RECORDERS

MF DIGITAL BAXTER: MF Digital's Baxter is a truly multi-functional desktop digital assistant and can facilitate automated audio/video/data duplication, PC hard disk backup and perform MP3/WMA ripping. Baxter redefines CD/DVD duplication by putting this power right on your desktop. Baxter will quickly become your indispensable digital assistant. 631/249-9393 www.mfdigital.com/baxter.html

COMPUTER SOFTWARE

ABLETON LIVE 5: Live is the only solution designed for each stage of the musical process, from creation to production to performance. In the creative stage, Live is transparent, intuitive and responsive, capturing inspiration and encouraging the flow of musical ideas. During production, Live provides all of the professional tools and studio compatibility required to complete and perfect projects. Onstage, Live delivers the expressive control and stability that innumerable performing artists have come to rely on. MSRP: \$499. AES booth: #2D11.

Dist. by M-Audio
626/633-9055
www.ableton.com

ARTURIA BRASS: Brass is a virtual instrument that faithfully reproduces the trumpet, saxophone and trombone in real time. Brass is based on a new kind of physical modeling technology that allows the user to play with maximum expressivity. It has been created in collaboration with IRCAM, the world-renowned institute based in Paris, to bring this groundbreaking technology to us. Price: 279 Euros. AES booth: #1129. 33/4-38 02 05 55 (France)
www.arturia.com



CAKEWALK SONAR 5 PRODUCER EDITION: Version 5 adds an arsenal of responsive instruments, more effects and powerful editing tools, including Roland V-Vocal™ VariPhrase technology and Pure Space™ convolution reverb. These features are complemented by a 64-bit, double-precision, floating-point mix engine that sets new standards for digital mixing through dramatic increases in dynamic range, even on 32-bit computers. In addition, SONAR 5 introduces groundbreaking advances in RAM and native processing power on systems running Windows XP X64 Edition. Price: \$799. AES booth: #826.
617/423-9004
www.cakewalk.com

CENTRANCE CE1505 UNIVERSAL DRIVER: Centrance's Universal Driver supports simultaneous use of several FireWire ASIO/MIDI devices under Windows and allows the user to see all available devices as one extended multichannel audio interface. Price: \$79.95. AES booth: #677.
847/581-0500
www.centrance.com

FXPANSION AUDIO: FXpansion Audio new products: GURU, BFD, BFD XFL, BFD 88K, BFD Deluxe Collection, VST-RTAS Adapter, VST-AU Adapter. FXpansion is an award-winning developer of innovative, cutting-edge drum/rhythm software and plug-in adapter solutions. Based in London, established 1999. AES booth: #1106.

Dist. by eBlitz Audio Labs
805/258-1465
www.fxpansion.com

GEFEN 2X1 DVI KVM SWITCHER: This connects two cross-platform computers to one keyboard, video display and mouse (KVM) workstation. It also lets users share peripherals between laptops and desktop computers. Stereo audio, high-speed USB 2 and DVI video in resolutions up to 1,920x1,200 are output for each computer. The Switcher also provides a button on the front that gives access to computer data in just seconds. An optional RMT remote can access computers from a distance if needed. Price: \$199. AES booth: #355.
818/884-6294
www.gefen.com

GLYPH GT SERIES: Glyph Technologies provides digital audio delivery systems and storage sub-systems for audio and video production environments. The GT Series storage products incorporate sound-absorbing metal to reduce noise and Glyph's Integrity™ FireWire hot-swap interface. All are covered by a three-year warranty and carry an additional Overnight Advance Replacement policy in the first year. AES booth: #1204.
607/275-0345
www.glyphtech.com

ILIO IVORY 1.5: Three glorious grand pianos in one PC/Mac sample-based virtual instrument: Bosendorfer 290, Steinway D and Yamaha C7. Version 1.5 enhancement: PC and Mac formats all in one box. New PC formats: VST and RTAS; extended library with two additional velocity layers; more than 38 GB of samples; and proprietary noise reduction for improved fidelity. Upgrades available. Price: \$349.

ILIO ORIGINS: Origins is an exhaustive collection of authentic, atmospheric historical sounds by Dirk Campbell, the creator of World Winds. Origins' vivid, dramatic samples promise to add sonic and musical interest to historical and archaeological productions, film scores (especially fantasy, sci-fi and horror), world music soundtracks, left-field rock and pop, creative remixes and any recordings that require imaginative sound design and innovative textures. Price: \$349.

ILIO S.A.G.E. XPANDERS: Stark Raving Beats, Ethno Techno, Skippy's Noizbox and Skippy's Big Bad Beats are all customized expansion collections for Spectrasonics' Stylus RMX. Each Ilio S.A.G.E. Xpander comes with the complete groove collection, a special bonus Ilio section and a library of new Stylus RMX multi-patches that allow more flexibility than ever using Spectrasonics S.A.G.E. technology. Each Xpander is completely different from the next and will further broaden the potential of Stylus RMX. Price: \$99 each.
818/707-7222
www.ilio.com

MACKIE ONYX 1200F FIREWIRE INTERFACE: This multiple I/O, 24-bit/192kHz FireWire computer audio/MIDI interface for Mac or PC features 12 premium Onyx preamps, a control room section with talkback and four headphone mixes with amplified outputs. Besides individual outputs, an onboard DSP-based mixing engine can provide custom zero-latency mixes to various pairs of outputs without going through the DAW software. Included is Mackie's Traktion 2 recording/editing software and the Final Mix plug-in to round out the package. AES booth: #255.
425/487-4333
www.mackie.com

MAGGOT SOFTWARE CONFORMALIZER: Film and TV sound post tool for conforming audio data to match changed picture cuts. Conformalizer compares EDLs cutlists and change notes and conforms Pro Tools sessions or any tab-separated timecode data (such as effects lists or ADR databases). It can also load two QuickTime movies to compare changes and verify accuracy of the compare process. Absolutely essential for anyone working with VFX-heavy film or TV projects.
64/21-237-3181 (New Zealand)
www.maggot.co.nz



MOTU DIGITAL PERFORMER 4.6: Digital Performer™ lets you record, edit, arrange, mix, process and master MIDI and audio tracks simultaneously to produce musical recordings, soundtracks for film and television and other audio production tasks. Version 4.6 adds many new features, including pitch automation, the Pattern Gate™ plug-in, V-Racks™ virtual plug-in rack, AAF file interchange, film/video scoring enhancements, audio click, bounce-to-QuickTime movie and much more. AES booth: #354.
617/576-2760
www.motu.com

MSOFT MUSICDIRECTOR: New for AES is MusicDirector, a revolutionary audio comparison search where users find music by how it sounds, not a text search restricted by a database. Other new features include tracking the past use of media and creating "accurate-to-the-second" music cue sheets by reading an Avid EDL file, etc. mSoft will also show the new Vision-Clip, a video file-management module for its popular music and SFX server system. AES booth: #249.
800/489-9314
www.mssoftinc.com

SONIC STUDIO SOUNDBLADE CD: SoundBlade CD is a fully host-based, OS X-native mastering/premastering application, offering integrated CD burning and

10 Years...

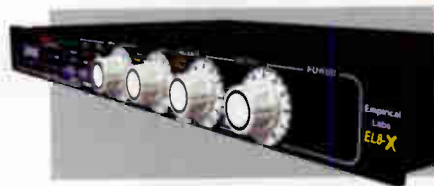


Empirical Labs INC.

10,000 Distressors!

So here we are 10 years later, appearing in the magazine that gave us our first product review. In 1996, George Petersen went out on a limb to feature a review of a product he thought had a chance - the Distressor. Ten years and 10,000 units later, all of us at Empirical Labs are grateful for people like George who took a risk early on when no one had ever heard of us. We continue to strive to create more high-quality whacky products that bring a smile and make your work more enjoyable. And to our thousands of appreciative customers, we will continue to take pleasure in providing you with customer service second to none.

The Distressor - Our flagship product and much more than a compressor. With vintage compressor emulation and a classic "knee" sound all its own, the Distressor has a place in every studios and live sound rig.



DISTRESSOR EL8X

The FATSO - Simulating analog tape, the EL7 Fatso offers many of the "musical non-linearities" exhibited by the older tube, class A discrete, and magnetic tape mediums. The FATSO will keep you warm on a cold, digital night!



F.A.T.S.O. EL7

The Lil FrEQ - Instead of daisy chaining EQ's and frequency processors, we tried to cram most of what an Engineer needs into one single-height box, while offering the highest performance of any design we know of.



Lil FrEQ ELQ



Empirical Labs
INC.

Visit Empirical Labs on the web at www.empiricallabs.com.

WAVE
DISTRIBUTION

We'd like to thank Mix and its readership for nominating our new Lil FrEQ for a TEC Award. Please stop by our AES Booth #436 and say hello! - Dave Derr, President

complete PQ handling from the folks who created desktop mastering. Our source/destination editing model and cut/copy/paste editing with improved fade tool makes quick and intuitive work of any editing chore. Other features include drag-and-drop files from iTunes or any .AIFF, .WAV, BWF or SD2 source; built-in automatic, high-quality sample rate conversion; psychoacoustically optimized shaped triangular redithering; and VST plug-in support. Price: \$1,495. AES booth: #272.
409/792-9552
www.sonicstudio.com

SOUNDMINER XP 1: At AES, Soundminer will demo Soundminer XP 1, which will ship sometime after AES, offering both single-user and server connectivity options. Distilled from the company's respected Macintosh product, the XP version offers PC users an intuitive, familiar interface, expansive user customization, speed and quick editorial control. AES booth: #564.
416/644-1066
www.soundminer.com

SPECTRAL COMPUTER RM-7000, RM-5000: Spectral Computers, a leading manufacturer of computers specifically designed for the audio community, announces a new line of high-powered Windows-based computer systems—two standard systems and a custom-build option—each optimized for audio and qualified by leading software manufacturers. Spectral Computers are designed to deliver a level of performance and reliability far beyond that offered by the consumer products so often found in studio and production environments.
818/981-3101
www.spectralcomputers.com

SPECTRASONICS STYLUS RMX 1.5: Stylus RMX Real-Time Groove Module is a virtual instrument plug-in for PC/Mac. Version 1.5 offers hundreds of new patches and several new features, including an embedded "Help System" electronic users manual; a real-time Chaos stutter effect; browsing via genres/categories; a new version of the S.A.G.E. Converter with drag-and-drop batch conversion of REX file libraries and conversion support for ILLIO's Groove Control libraries; native support for Digidesign's Windows RTAS format; and much more. Registered Stylus RMX users can get a free download upgrade from the Website or via DVD-ROM for \$5. Price: \$299.
818/955-8481
www.spectrasonics.net

DIGITAL CONVERTERS

CRANE SONG EGRET: This 8-channel D/A converter with a stereo mixer has level, cue send, and pan, solo and mute control on each channel. Egret has a master level control, master cue send control and headphone out. Each channel has a TRS insert and direct balanced outputs. The DACs support up to 192k with bypassable sample rate converters on each channel. The converters can be used independently at different sample rates. Expected release: winter 2005. AES booth: #865.
715/398-3627
www.cranesong.com



LAVRY STEREO DA: The Stereo DA features a built-in, digitally controlled attenuator, crystal-based jitter reduction and sample rate converter, high-drive headphone amplifier and stereo/mono switch.
206/842-3552
www.lavryengineering.com

LYNX LT-ADAT EXPANSION CARD: This full-function ADAT interface provides up to 16 channels of high-performance ADAT Lightpipe I/O in a Lynx Aurora 8 or 16. At 48 kHz, LT-ADAT's I/O channel capacity is 16. Higher sample rates are supported via S/MUX. Channel routing is controlled from Aurora via Lynx AES16, MIDI or infrared devices. The LT-ADAT clock can be slaved to Aurora or Lightpipe optical signal, with Aurora's SynchroLock technology providing high levels of jitter immunity. Retail: \$249. AES booth: #842.
949/515-8265
www.lynxstudio.com

SONIC STUDIO TD-302 FIREWIRE INTERFACE: This portable, ultra-fidelity FireWire audio interface provides not only an intimate connection between Sonic Studio's OS X applications for improved fidelity and transparency, but also acts as a best-of-breed Core Audio interface for all your audio production needs. The Model 302 includes stereo analog and digital I/O, plus DSP-based effects, routing, real-time headphone and line-level monitoring, and FreeFlight. Price: \$3,495. AES booth: #272.
409/792-9552
www.sonicstudio.com

DISK-BASED RECORDERS/EDITORS

DIGITAL GROOVE PRODUCTIONS GMDOPT-U: Nuendo, Pro Tools, Sequoia users: The Groove Machine™ Dual-Opteron Ultra Audio/Video Workstation offers all the power you need for tracking, mixing, mastering, soft synths and plug-ins. It features dual-processor, 64-bit power, 1.6GHz FSB, 8 GB of RAM, 1 terabyte of storage, twin PCI-X buses and 16x PCI-Express video (two SLI capable). Future-proof design, massive track count capability in a whisper-quiet, four-rackspace case. Certified, solid performance and reliability, all designed and hand-built by seasoned audio pros. Price: \$4,995.
513/325-5329
www.dawstore.com

E-MU 1616M LAPTOP DIGITAL AUDIO SYSTEM: Equipped with mastering-grade 24-bit/192kHz converters, E-mu's 1616M Laptop Digital Audio System is the most powerful and portable notebook audio system ever created. It features hardware-accelerated effects (more than 600), zero-latency hardware mixing/monitoring and an ultra-portable MicroDock. Also standard are twin ultralow-noise mic/line/h-

Z preamps, four 1/4-inch balanced ins, six 1/4-inch balanced outs, three stereo 1/8-inch speaker outs, turntable in, two stereo headphone outs, 24/192 ADAT I/O, 24/192 S/PDIF and two MIDI I/Os. Price: \$699.99. AES Booth: #818.

E-MU 1616 LAPTOP DIGITAL AUDIO SYSTEM: E-mu's 1616 Laptop Digital Audio System is the most powerful and portable notebook audio system ever created, featuring premium 24/192 converters, hardware-accelerated effects (more than 600), zero-latency hardware mixing/monitoring and an ultra-portable MicroDock. There are two ultralow-noise mic/line/h-Z preamps, four 1/4-inch balanced ins, six 1/4-inch balanced outs, three stereo 1/8-inch speaker outs, turntable in, two stereo headphone outs, 24/192 ADAT I/O, 24/192 S/PDIF and two MIDI I/Os. Price: \$499.99. AES Booth #818.
831/438-1921
www.emu.com

IZ TECHNOLOGY RADAR V: IZ Technology's RADAR V line of dedicated hard disk recording products feature new Adrenaline Plus recording engine technology. Major features include 24-track recording at 192 kHz and dual-disk recording on SCSI, Serial ATA or Parallel ATA drives in FAT32 Native Broadcast .WAV file format for direct disk transfer to DAWs. Additional features include Gigabit Ethernet, FileFlat instant file consolidation feature and up to 2TB recording capacity. AES booth: #845.
800/776-1356
www.izcorp.com

KORG D3200 DIGITAL RECORDING STUDIO: New Click-Point and Knob Matrix combine with 320x240 tilt-up LCD for intuitive navigation. Features: interactive "Session Drums" for fast, programming-free rhythm track creation; 12-track simultaneous recording (44.1/48 kHz, 16/24-bit); up to 32 playback tracks; scene and dynamic automated mixing; 11 simultaneous effects; 4-band parametric EQs (peak or shelving); 12 balanced TRS and eight XLR (with individual phantom) inputs; high-quality preamps; internal CD-RW and HD; S/PDIF I/O; USB 2 to computer; MIDI; MTC (all frame rates); and MMC. Price: \$1,799.
631/390-6500
www.korg.com/d3200

M-AUDIO MICROTRACK 24/96: This rugged, high-fidelity, mobile 2-channel unit records .WAV and MP3 files to CompactFlash or Microdrives from balanced line inputs or built-in mic preamps with phantom power for studio mics. It connects to a PC or Mac via USB. Users simply drag-and-drop recordings for immediate editing or Web posting. The unit can recharge its lithium-ion battery via the computer's USB connection or a USB power adapter. MicroTrack offers better-than-DAT-quality mobile recording that's convenient and cost-effective. Price: \$499.95.
626/633-9050
www.m-audio.com

NAGRA ARES-M: Nagra ARES-M is an ultra-miniature (5x2x8-inch), mono/stereo, solid-state recorder with automatic record start and built-in editing. It operates for more than 10 hours on two AA batteries, and

features MPEG compression and PCM linear recording with built-in or external microphones. Price: \$975. AES booth: #426. 615/726-5191 www.nagraaudio.com

TASCAM HD-P2 PORTABLE RECORDER: This pro solution for live, on-location stereo applications records at up to 192kHz/24-bit resolution for audiophile quality to Compact Flash media, locked to the built-in SMPTE timecode input. The Broadcast .WAV audio files are instantly available through the built-in FireWire port. Features include XLR mic inputs with phantom power and analog peak limiter, unbalanced stereo RCA I/O, S/PDIF digital I/O, headphone out, built-in mono mic and FireWire interface. AES booth: #865. 323/726-0303 www.tascam.com

LOUDSPEAKERS



JBL VERTEC DP SERIES

JBL Professional is now offering the networked versions of its VerTec DP Series. These integrated audio systems are compatible with HiQnet System Architect Software™, and feature JBL DrivePack technology with remote control and monitoring capabilities. Developed with Crown International, these high-performance power modules with integral digital signal processing couple seamlessly with VerTec loudspeakers,

providing a new level of functionality for system users. Products include the VT4888DP-AN, VT4882DP-AN, VT4888DP-CN and VT4882DP-CN. Price: \$8,699. 818/894-8850 www.jblpro.com

ADAM Audio System 110: ADAM's System 110 combines the diminutive S1A monitor with its popular Sub-10 subwoofer offering a 25 to 35k Hz frequency response. A bass-management section in the sub adjusts the crossover point for almost any listening environment. The subwoofer ensures deep low-end reproduction, while the S1A satellite adds ADAM's signature A.R.T. folded-ribbon driver, yielding a smooth, clear top end complemented by tight, accurate mids and low-mids from its 6-inch Hexacone driver. Price: \$3,850 street. AES booth: #1100.

ADAM AUDIO S4V-A MARK II: Priced the same as the original S4V-A, the Mark II mid-field model has a bigger bass driver (12-inch instead of 11-inch) than the older model and replaces the folded-ribbon mid-range unit with a 6-inch Hexacone driver. In addition, the HF and MF power amps have been increased from 150W to 250W, and the bass amp has been increased from 300W to 500W. Price: \$8,250/pair. AES booth: #1100. 805/413-1133 www.adam-audio.com

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www.firstcom.com

ATC LOUDSPEAKERS SCM110ASL: The SCM110ASL Pro is an active three-way system suitable for reference monitoring in medium- to large-sized rooms. Designed as far-field loudspeakers that are also compact, the SCM110ASL features dual 234mm Super Linear bass drivers and ATC's unique midrange soft-dome driver. The active design ensures optimum matching of eight MOSFET amp blocks to the drivers, providing plenty of transient headroom. AES booth: #861.

ATC LOUDSPEAKERS PA65ASL: ATC goes live! The PA65ASL is an active three-way system suitable for live sound reinforcement in medium-sized rooms, with a 234mm Super Linear bass driver and ATC's unique SM75-150S soft-dome midrange driver. The active design ensures optimum matching of six MOSFET amp blocks to the drivers, providing plenty of transient headroom and maximum SPLs of up to 112 dB. An LF contour control provides five bass-boost settings and a flat reference response. Price: \$7,500 per speaker. AES booth: #861.

702/365-5155

www.transaudiogroup.com/atc.shtml



BAG END/MODULAR SOUND P-D18E-AD: The Bag End P-D18E-AD is a self-powered, low-profile speaker system containing two 18-inch subwoofers in a cabinet that's only 15 inches high. Powered by the internal 1,000W Minima One amplifier, the P-D18E-AD displays the same acoustic properties of its more conventionally shaped brother, the D18E, with a frequency response from 8 Hz to 95 Hz, ± 3 dB. The P-D18E-AD is 38x15x30 inches (WxHxD). Price: \$3,220. AES booth: #643.

847/382-4550

www.bagend.com

COMMUNITY IBOX HP: The new IBOX HP installation series from Community offers a flexible approach to implementing arrays, clusters and distributed systems. These premium-quality, large-format loudspeakers and high-power subs are ideal for sound reinforcement in stadiums, houses of worship, nightclubs and live sound venues. A variety of convenient dispersion patterns are available. AES booth: #508.

610/876-3400

www.loudspeakers.net

E-MU PM5 PRECISION MONITOR: E-mu's PM5 Precision Monitors feature a custom 40W/40W bi-amplified power section and world-class drivers to deliver hyperaccurate audio in a compact design. The PM5 also offers Current Mirroring Technology to ensure consistent peak performance and lower distortion, as well as overload protection circuitry to prevent damage to drivers. Price: \$349.99. AES booth: #818.

831/438-1921

www.emu.com

FOCAL SM6 SERIES: The Solo 6 has a new 6-inch "W" sandwich cone driver (low mass/high rigidity), in which the woofer acts as a perfect piston, providing maximum acceleration and no low-end distortion. The Twin 6 uses two woofers with a left/right positional switch to keep the imaging tight. Both models are complemented by Focal's unique inverse-dome 40kHz response beryllium tweeter and feature a bass-reflex design delivering Focal's legendary sound quality at a modest budget. AES booth: #436.

Dist. by Wave Distribution

973/728-2425

www.wavedistribution.com

GENELEC 7050B: This 8-inch active subwoofer in an Laminar Spiral Enclosure features a 5.1 input panel and LF extension to 25 Hz. The 7050B is ideal for use with the Genelec 8020A 4-inch bi-amp monitor in stereo or surround applications, or the 8030A 5-inch bi-amp monitor in stereo applications where wide-bandwidth, high-quality critical monitoring is required. Price: \$1,095. AES booth: #3D07.

508/652-0900

www.genelecusa.com

GRIFFIN AUDIO G1, G2A: Griffin Audio will display its line of pro studio loudspeakers at AES, including the G1 studio reference monitors through the newest G2A active mid-field speakers. Griffin is currently expanding its subwoofer offerings to complement its line. Customers include Barber Shop Studios, The Studio at The Palms, Dark Dimensions, Harry Connick Productions and 2 Hard Records. AES booth: #345.

914/248-7680

www.griffinaudiousa.com

ISP TECHNOLOGIES GSL12 "MONGOOSE": The ISP Technologies Mongoose speakers are a three-way active ground-stack line array. The half-line configuration comprises four 12-inch speakers, one horn-loaded compression midrange and two high-frequency drivers within two boxes, with a built-in 5-channel, 1,700W RMS amplifier/electronic crossover. This can be expanded to a full line configuration by adding a second set of boxes to form eight elements. High-quality components are used to achieve exceptional fidelity and output. Price: \$30,000.

248/673-7790

www.isptechnologies.com/GSL12.htm

JBL LSR4300: JBL Professional unveils its LSR4300 Series studio monitors, which feature stunning sound and networked intelligence. Each speaker incorporates an onboard analyzer that measures and automatically corrects response to compensate for problems in the mix environment. The result is more accurate mixes in any room. See them in booth #226 or demo room 3D03.

818/894-8850

www.jblpro.com

KLEIN + HUMMEL MONITOR MANAGEMENT SYSTEM: Klein + Hummel's PRO M 1012 Monitor Management System is a completely configurable surround

loudspeaker-management system that includes full-featured bass management, multiple programmable downmix configurations, 12-channel volume control and multiple other features. Price: \$5,950. AES booth: #227.

860/434-9190

www.klein-hummel.com



LIPINSKI SOUND L-707/L-505 MONITORS: PAR Excellence Award winners: "The level of detail...is simply jaw-dropping. *Mix* magazine's Joe Hannigan: "Best reproduction I've ever had in 40 years of putting together stereo systems!" *Pro Audio Review*, Bob Katz: "If more engineers were using monitors like these, there might be a lot less abuse inflicted on poor defenseless audio." Arri Digital, Alan Silverman: "I have plenty of gear that makes my job easier, but the L-707s have made me a better engineer." Price: \$2,295. AES booth: #1043.

301/229-4360

www.lipinskisound.com

M&K SOUND MPS-1611P: Finally, a small powered speaker good enough to be an M&K. With 100W on the bottom and 50W on the top, the MPS-1611P is timbre-matched to the renowned MPS-2510PK, and comes in a smaller and less-expensive package. The new speaker may be used in a traditional satellite/subwoofer configuration or, by removing the port plug, as a stand-alone "full-range" speaker. Price: \$1,199.

818/701-7010

www.mkprofessional.com

MACKIE S400 SERIES: Mackie unveils a series of EAW-designed, passive, flyable sound reinforcement speakers in a Tetrad design, with four 8-inch woofers surrounding a horn/compression driver with a 70x70-degree pattern. The ported plywood cabinet features flying and pole-mount hardware, and its tight pattern creates a near-point source effect. AES booth: #255.

425/487-4333

www.mackie.com

MARTIN PROFESSIONAL MACH C-RANGE SUBS: The CW Series 115, 118, 215 and 218 subwoofers are designed to fit unobtrusively into any install, with the same flying hardware as C-Range top boxes. All feature reflex-loaded compact cabinet designs with deep, fast bass; improved excursion control and linearity; recessed NLA Speakons and barrier strip terminals; easy installation through recessed handles and multiple flying points; and highly durable cabinets in Baltic plywood with SafeCoat coating for optimal cabinet strength. Price: \$999.

954/858-1800

www.martinpro.com

NHTPRO M-20: NHTPro will soon replace its former flagship A-20 powered studio monitor with the newly designed, single-channel M-20 system, featuring an updated cabinet and companion single-channel/single-rackspace, 250-watt control amplifier. The NHT M-20 is designed for both pro and project studios immersed in multichannel environments. The M-20 single-channel design replaces both the popular 2-channel A-20 (L/R) and companion C-20 (center/surround) models. AES booth: #1058.

NHTPRO M80Xd: NHTPro will soon ship a new tracking monitor specifically designed to provide a powerful and accurate speaker with substantial output and transparent sonics. The M80Xd, scheduled to ship in Q3 '05, is the first tracking monitor to feature DEQX-calibrated DSP speaker correction. With this process, all listeners, including those sitting far off-axis, will enjoy ruler-flat response and even dispersion. AES booth: #1058.

NHTPRO M60Xd: The M60Xd DEQX-calibrated DSP speaker-corrected monitor referred by Don Bassey is at once unusual and a feat of design ingenuity. The baffle is flat and wide across the tweeter to ensure even high-frequency response, but it is considerably narrower around the woofer to eliminate reflections. Further, as there are no parallel surfaces, the design reduces internal standing waves and back reflections. AES booth: #1058.
800/648-9993
www.nhtpro.com

QUESTED S10: The three-way active reflex-designed S10 is the newest and largest fullrange monitor in Quested's S Series; other models include the S6, S7, S8 and SB10. Drive units are a 10-inch cone bass, 3-inch soft-dome mid and 1 1/8-inch HF soft-dome. The three integrated Class-A/B amplifiers, designed by Terry Clarke and manufactured by Quested's sister company, MC² Audio, are capable of providing a total of 690 watts RMS. Price: \$2,000. AES booth: #645.

QUESTED SB10: Quested's SB10 subwoofer complements all the fullrange models in its S Series, with a 10-inch long-throw driver fitted in a tuned cabinet. The SB10 breaks with tradition in that the matched 215W RMS amplifier and 2-channel variable filter section of the SB10 controller are housed in a separate single-rackspace unit. Two advantages to this approach: The electronics do not suffer from intense LF vibrations and adjustments can be made accurately from the listening position. Price: \$2,000. AES booth: #645.
44/1404-41500 (UK)
www.quested.com

RENKUS-HEINZ DCC SERIES: DCC Series digitally controlled column loudspeakers use advanced technology to provide intelligible speech and musical sound in highly reverberant environments. Their slender "thin-stick" vertical profile mounts flat to the wall and blends easily with architecture. The integrated technology provides a powerful new solution for consultants, contractors and architects requiring precisely controlled acoustic energy for both intelligible and musical sound. AES booth: #326.

RENKUS-HEINZ CF/CFX SERIES: The CF/CFX Series of high-value/high-performance loudspeakers is aimed at both portable and installed applications. The self-powered CF Series incorporates the company's new PF-1 Intelligent digital amplifier, while the CFX Series is designed for use with external processors and amplifiers. The CF/CFX Series brings the benefits of Renkus-Heinz innovations to a lower price point, using the finest components and materials within simpler cabinet designs. AES booth: #326.
949/588-9997
www.renkus-heinz.com

SLS LS6593: The LS6593 compact line array design provides different options for vertical dispersion, allowing versatile system configuration for many applications. The LS6593S/LS6593A is based on a woofer line array mounted on a front panel with a coaxially positioned ribbon tweeter array. Comprising six 5.25-inch drivers, the woofer's straight line array has an extremely controlled vertical dispersion, while the tweeter's 9x3-inch proprietary ribbon planar drivers have internally articulated driver elements, allowing wider vertical dispersion. Price: \$1,195. AES booth: #730.
417/883-4549
www.slsaudio.com

TANNOY REVEAL 5A ACTIVE STUDIO MONITOR: The new Reveal 5A studio monitor provides tight, punchy and controlled bass response with a clean and open midrange for superb vocal intelligibility. A new soft-dome high-frequency unit extends response to beyond 30 kHz, ensuring increased tonal accuracy of individual instruments. The new Reveal 5A provides greater bandwidth, significantly lower distortion, smoother responses, more accurate phase control and higher sensitivity levels in a smaller package. Price: \$399 each. AES booth: #3D12.

TANNOY PRECISION 8D ACTIVE STUDIO MONITOR: The Precision 8D incorporates the Tannoy Dual Concentric™ driver and WideBand™ technology, delivering a new standard for near-field reference monitoring. Precision 8D Active provides superior bandwidth, low distortion, smooth response, accurate phase control, high sensitivity levels and input source flexibility. A calibrated EQ facility for mid/near/close-field monitoring, MF and HF trim shelving controls, analog and digital input trim facilities allow setting user requirements for all listening environments. Price: \$1,029 each. AES booth: #3D12.
519/745-1158
www.tannoy.com

WHARFEDALE PRO TITAN T12P: Designed for live sound applications, this 12-inch, two-way powered loudspeaker features a molded polyethylene enclosure, 250W+100W bi-amp power with mic/line input mixing and 13 M8 rigging points for safe flown applications. Price: \$449.
508/850-3950
www.wharfedaleprou.com

MICROPHONE PREAMPLIFIERS

A DESIGNS AUDIO MP1A: Single-channel tube preamp with Jensen input transformer, custom output transformer. New features include special vibration-resistant tube socket and dual two-pole tone switches for four unique tones in one box. Also features line input, phase reverse, phantom power and pad switches. Price: \$1,975.

A DESIGNS AUDIO MP2A: This dual-channel tube preamp features Jensen input transformers, custom output transformers, special vibration-resistant tube socket and two two-pole tone switches for four unique tones in one box. Also standard is a line input and switches for phase reverse, phantom power and pad.

A DESIGNS AUDIO PACIFICA: The Pacifica is an all-new, solid-state, dual-mono mic preamp based on the famous sound of the Quad Eight consoles. Using large transformers and high-quality parts, it features XLR mic and 1/4-inch line inputs, phantom power and phase reverse switches.
702/365-5155
www.transaudiogroup.com/a_designs.shtml

AEA DUAL-MONO RIBBON MIC PREAMP

AEA unveils a high-gain, dual-mono ribbon mic (no phantom) preamp for those who need their sound louder, with 84 dB of quiet gain with mic and instrument inputs. Outputs are +4dBu balanced and -10dBu unbalanced. The continuously variable output level, 6dB/step preamp gain, phase and highpass controls on each channel are complemented by operating and overload-level LED metering. This compact, half-rackspace package powers from a 9- to 12-volt AC or DC external supply. AES booth: #649.
800/798-9127
www.ribbonmics.com

GML 2032: The latest 2032 single-channel microphone preamp and EQ has the same preamp as George Massenburg's renowned 830x Series preamps and a 4-band mono version of the venerable 8200 EQ. It has all the GML quality and transparent sound as its predecessors in a new affordable package. Price includes internal power supply. MSRP: \$3,000. AES booth: #858.
615/515-6656
www.georgemassenburg.com

JOEMEEK ONEQ: The oneQ is a single-channel mic pre/optical compressor/de-esser/enhancer. Its feature-rich topology incorporates a number of new and innovative features, such as an Iron switch, which inserts a transformer into the signal path of the mic pre, and digital outputs (AES/EBU, S/PDIF, optical and coaxial) for interfacing with DAWs, etc. Inputs are available for mic, line (balanced and unbalanced) and instrument. The large, oval VU meter provides easy monitoring of input level, output level or gain reduction. Price: \$799.99. AES booth: #545.

JOEMEER TWINQ: Offering everything you ever wanted in a dual studio channel, the twinQ starts with high-quality Burr-Brown ICs for the preamp and adding a musical EQ section and an optical compressor for that signature "Meek" sound and an Iron switch that switches the IC front end to a transformer—completely changing the topology of the circuit. It also includes 24-bit, 96k A/D converters. With sonic quality rivaling mic pre's priced thousands more, twinQ sets a new standard for dual channels. Price: \$999.99. AES booth: #545. 310/323-9050 www.joemeek.com



LAVRY 2A2D2 MIC PRE: The 2A2D2 is a cost-effective—yet high-quality—"all-in-one" solution containing all of the standard features (plus AcousticBit-Correction) found in the Lavry Blue converters and microphone preamp. 206/842-3552 www.lavryengineering.com



LIPINSKI SOUND L-408 AND L-409 MIC PRE: These preamps have a four-way gain adjustment with two different input transformers, each having a switchable turn ratio, giving endless flexibility to create a desired sound. According to *Pro Audio Review*, "The L-409 is reminiscent of a vintage Class-A mic preamp...somewhere between an API and a Neve 1081." And, "The L-408 is one of the finest clean-sounding mic preamps that I've ever encountered. The resolution and detail of the pre's are amazing, especially in the bottom end." Price: \$1,095. AES booth: #1043. 301/229-4360 www.lipinskisound.com

LITTLE LABS LMNO PRE: Little Labs is excited to introduce a new and unique microphone preamplifier at the 119th AES convention. The Little Labs limited-edition Lmno pre is not just another great-sounding mic preamp, but a stellar-sounding mic preamp with some highly unique features, including low-frequency resonance adjust, infinitely variable phase adjustment, fully differential discrete circuit topology, output transformer saturation control and much more. Price: \$1,200. AES booth: #1142. 323/851-6860 www.littlelabs.com

M-AUDIO FAST TRACK PRO 2: Offering the recording flexibility of Fast Track USB with more features, Fast Track Pro 2 has mic/line inputs with phantom power, outboard effects inserts, balanced/unbalanced ana-

log outs, S/PDIF digital I/O, MIDI I/O and more. Fast Track Pro also has near-zero latency direct hardware monitoring and low-latency ASIO software monitoring, plus an A/B source switch and dual-output pairs for DJ-style cueing. It's compatible with most PC/Mac music software. USB connection and bus power, along with Mac OS X class-compliance, make setup a breeze. Price: \$299.95. 626/633-9050 www.m-audio.com

MILLENNIA MEDIA HV-3D/R: The HV-3D/R is a remote-controllable, 8-channel microphone preamp. Based on the world-standard HV-3 mic pre, the HV-3D/R can be controlled by any Windows XP computer using standard Ethernet protocol. Up to three outputs per channel are available with the analog output option. There are format-specific digital output and console interface options available. Price: \$4,995. AES booth: #922.

MILLENNIA MEDIA HV-3C A2D: The HV-3C A2D is an optional 2-channel A/D converter for the HV-3C mic preamp. It offers 24-bit PCM performance with sample rates up to 192 kHz. DSD at up to 2x is also available simultaneously. This feature allows you to compare conversion methods using the identical source. Price: \$1,295. AES booth: #922. 530/647-0750 www.mil-media.com

RANE CORPORATION NM 1: The NM 1 network mic preamp is a versatile, single-channel CobraNet I/O box. The NM 1 presents matchless features in a compact, reliable, easy-to-install and easy-to-maintain package. It has a single studio-grade mic input with +48-volt phantom power and a single amplifier output for connection to an external loudspeaker. The mic signal can be transmitted over CobraNet, and the amplifier input can be driven by any CobraNet audio channel. Price: \$1,689. AES booth: #743. 425/355-6000 www.rane.com/nm1.html

RESOAUDIOTRONICS RESOPRE 273: The ResoPre273 2-channel mic pre is a vintage re-creation based on the 1073 circuit, with modern features and functionality. Built on classic design methodology and an emphasis on authentic performance, while increasing functionality through improved components and advanced remote-control capability. With a Pro Tools system, the Reso273 operates as a Digi pre. It can be controlled via MIDI, HUI or RS-422. Price: \$1,995. AES booth: #761. Dist. by AXI 877/440-2717

RUPERT NEVE DESIGNS PORTICO 5032: The Portico™ 5032 single-channel mic pre/EQ has an independent transformer-coupled input. It includes a full-featured mic pre that is identical to that found on the 5012, with the addition of a flexible 3-band EQ in the Mr. Rupert Neve tradition. The 5032 is equipped with high- and low-frequency shelving curves. It also has a parametric mid-band covering 80 to 8k Hz in two ranges. AES booth: #841. 512/847-3013 www.rupertneve.com

STUDIO PROJECTS VTB-1: The ultimate in low-cost mic preamp technology, the Studio Projects VTB-1 is a totally discrete circuit incorporating true Class-A/B switching. Unique to the VTB-1 is the Tube Drive, a variable drive to a 12AX7 that lets users blend as little or as much of the Tube Drive as they want. Features include phantom power, phase reverse, detented pot input gain, ¼-inch DI input, HP filter, TRS insert, mic/line switch, switchable 50/200Ω impedance and more. AES booth: #545.

STUDIO PROJECTS SP828: The single-rackspace SP828 8-channel mic preamp/8x2 mixer incorporates the latest Burr-Brown ICs. Each channel offers phantom power, phase reverse, mic/line switch and level/pan/solo controls, and ¼-inch TRS direct recorder send. The output section has stereo L/R and headphone outs and a summed mono output. Expansion I/O jacks allow cascading several units for up to 32 inputs, with 32 inputs bused to the L/R and 32 direct outs for remote recording. Price: \$799.99. AES booth: #545. 310/323-9050 www.studioprojects.com

TOFT AUDIO DESIGNS ATC-2: The ATC-2 is a direct descendent of the Trident 808 designs created by Malcolm Toft. Features include two high-quality mic preamps with phantom power, DI input; line input; classic FET compressors with variable attack, release and ratio; musical 4-band EQ with selectable HF/LF shelving frequencies; two sweepable mids; and 50Hz LP filter. The compressors can operate individually or as a stereo pair. Balanced XLR mic/line inputs and balanced XLR and TRS for line input/output. Price: \$1,299. AES booth: #545.

TOFT AUDIO EC-1: A complete recording channel in one rack, the EC-1 is a high-quality mic preamp with selectable phantom power, phase reverse, front panel instrument input and selectable line input. Its musical 4-band sweep EQ can be switched pre/post-compressor. Features include classic FET compressor with variable attack, release and ratio; and VU metering of gain reduction and output level. Price: \$799. AES booth: #545. 310/323-9050 www.toftaudio.com

TRANSISTOR AUDIO MODEL 702: Housed in a single rackspace, the Model 702 is a Class-A, 2-channel mic preamp with a discrete bi-polar transistor design using a Jensen input transformer and both DC and AC negative feedback. All transistors operate in the common emitter mode. Maximum gain is 65 dB. Maximum input is +20 dBm. Maximum output is +22 dBm. Also available is the model 704, a 4-channel version. 818/831-0515 www.transistoraudio.com

TRUE SYSTEMS P-SOLO: A single-channel mic preamplifier from True Systems that uses the same renowned preamplifier technology of the True Systems Precision 8 and the True Systems P2 analog units. Price: \$749. AES booth: #227. Dist. by Neumann USA 860/434-9190 www.neumannusa.com

UNIVERSAL AUDIO LA-610: The LA-610 brings Universal Audio's legendary "all-tube" sound into a modern channel strip format by combining the 610 Mic Pre/EQ/DI and the classic Teletronix LA-2A-style T4 Opto-Compressor in a single 2U rack, and at a groundbreaking price. The 610 tube preamp/EQ is based on the legendary console modules developed by recording giant Bill Putnam in the '60s. Countless classics have been recorded using these preamps, noted for their musical character and warmth. Price: \$1,749. AES booth: #266. 831/466-3737 www.uaudio.com

WUNDER AUDIO PAF0UR: The new PAF0UR is the rackmount 4-channel mic preamp version of the PEQ1. The PAF0UR is a fully Class-A discrete 1970s-style mic pre using the exact mic pre circuit as the PEQ1. The design employs proprietary, custom-designed mic and output transformers. It is no secret that the huge sound is due to the makeup of the Mu-Metal transformers. They are the exact ones that the old Zeppelin desk used. AES booth: #672.

WUNDER AUDIO PEQ1 "REV A": The PEQ1R "Rev A" preamp/EQ represents the latest evolution in the PEQ1 line. The revisions include smoother highs and bigger lows in the EQ section with a lifted 20k "air band." We also beefed up the output while reducing IM distortion. The huge transformers have extremely low-turn ratios, eliminating the need for a pad. These transformers also include Cobalt in the Mu-Metal

for a smooth sound with virtually no phase shift. AES booth: #672. 512/338-6777 www.wunderaudio.com

MICROPHONE PRODUCTS

RØDE[®]

MICROPHONES



RØDE NT6

New at AES is the RØDE NT6, featuring a small independently positioned capsule head and remote balanced output preamp connected via a custom

3-meter, Kevlar[™]-reinforced low-loss cable. 310/328-7456 www.rodemic.com

AKG HS 271 HEADSET MIC: The HSD 271 combines a studio-quality, shock-mounted dynamic mic with the TEC Award-winning K 271 Studio closed-back circumaural headphones. AKG innovations make these ideal for on-air broadcasting, recording, monitoring, intercom and other pro applications. Features include a mic boom arm with 270 degrees of vertical and horizontal rotation that can be placed on the right or left without modifying the headset. Intelligent muting automatically silences the mic when the arm is moved up. AES booth: #226.

615/620-3800 www.akgusa.com

AUDIO-TECHNICA AT2041SP: Ideal for project/home studios, Audio-Technica's new AT2041SP 20 Series Studio Pack comprises the versatile AT2020 side-address condenser (for vocal and instrument applications) and the AT2021 small-diaphragm condenser, a natural for acoustic instruments, overheads, hi-hat and piano. Audio-Technica's stringent quality/consistency standards set both microphones apart from other mics in their class. Each offers a wide dynamic range and handles high SPLs with ease. A pivoting stand mount, microphone clip and protective pouches are included. Price: \$249. AES booth: #608. 330/686-2600 www.audio-technica.com

Portico[™]

ANALOGUE BUILDING BLOCKS

RUPERT NEVE DESIGNS



The 5012 Dual Microphone Pre-amplifier

The 5012 Mic Pre uses Rupert's new essential-transformer input and single-sided transformer-coupled circuitry. The 5012 also features a swept high pass filter and a "Silk" circuit that yields the rich warmth and presence of Mr. Neve's renowned audio designs.

The 5042 Two-Channel "True Tape" Emulation and Line Driver

Two-channel True Tape Emulation. For remarkable simulation of true tape sound, providing the nostalgic rounding and compression that offsets the harshness of poor digital recordings.

The 5032 Single Channel MIC PRE and EQUALIZER

The ideal "Starter Pack" providing the much sought-after signature quality in a compact package. The Microphone section is identical to that of the RND 5012 and is followed by a 3 band Equalizer with steep Shelving high and low bands and a wide ranging mid band.

WWW.RUPERTNEVE.COM

TEL: 512-847-3013

World Radio History

AVENSON AUDIO TVM: This handheld tube mic will be "very smooth, very open," according to designer Brad Avenson. The capsule is a 3/4-inch cardioid-only design coupled to an amplifier with a hand-selected, military surplus, subminiature triode for exceptionally low noise and high durability. The grille's three-layer design avoids foam altogether to preserve clarity, but still limits plosives, wind noise and other ills of live performance. Because this is a tube mic, a roadworthy outboard power supply is included, with 16-gauge steel chassis and enough power to supply two mics at once. Price: \$1,000. AES booth: #1151. 512/826-3862 www.avensonaudio.com

BRAUNER PHANTOM AE: The Phantom AE is Brauner's new high-quality, single-pattern FET microphone. This limited black with gold lettering edition comes with a certificate of authenticity and microphone cable. AES booth: #857. 702/365-5155 www.braunerusa.com

CHARTEROAK ACOUSTICS SA538B: The SA538B microphone is a variation on the company's flagship product, the SA538. The SA538B employs the side-terminated S-2 capsule-type and, as a result, provides extended bass response and extremely smooth treble response. This mic is excellent for vocal recording. Each microphone is hand-assembled and tested in our studio with a seven-day burn-in. The mic ships in a lockable flight case with power supply, appropriate cables and shock-mount.

CHARTEROAK ACOUSTICS S600: This cardioid tube condenser is sold in sequentially numbered pairs with a dual power supply, two shock-mounts and cables. The S600 employs a 1-inch, side-terminated S-3 capsule and is excellent when used as a stereo overhead pair on drums in small rooms. The result is non-sibilant cymbals while picking up all of the transient peaks of the snare and toms. The S600's extended bass response makes it excellent for recording bass guitar, while its particularly smooth treble response is perfect for recording bright electric guitars. Each mic is hand-assembled and tested in our studio with a seven-day burn-in period. The mics ship in a lockable flight case. 860/698-9794 www.charteroakacoustics.com

CROWLEY & TRIPP RIBBON MICROPHONES: Studio Vocalist, Soundstage Image and Proscenium are newly designed, U.S.-made ribbon mics. The Vocalist (\$1,395) has a 30 to 15k Hz bandwidth, 126dB SPL handling and a bass response tailored for full low/midrange sounds. The \$1,395 Soundstage Image offers an uncolored sound for broadcast, soundstage and orchestral. Proscenium (\$1,485) is useful for classical recording and has a warm sound reminiscent of vintage ribbon models. 508/231-4515 www.soundwavereasearch.com

DPA 4006-TL: A transformerless version of the classic 4006, the Model 4006-TL provides optimal neutrality, accuracy and extremely low distortion even at very high SPLs, with total transparency and natural-sound-

ing clarity. The transformerless design increases the sensitivity and provides an extended low-frequency handling capability (10 to 20k Hz). Price: \$1,799. AES booth: #148. 303/823-8878 www.dpamicrophones.com

ENHANCED AUDIO M600: Rather than suspending the microphone in elastics, this revolutionary microphone mount clamps the mic within two low-resonant aluminum rings, precision-drilled and tapped at three points. At each of the three points, an adjustable mounting screw is inserted; attached to the screw is a technopolymer plastic (Delrin) thrust pad. When contact has been established, the microphone is protected from disturbance caused by structural and ground-borne external vibrations, resulting in an audibly tighter and extended bass response, cleaner treble and improved detail. Price: \$325. AES booth: #859. 702/365-5155 www.enhancedaudio.ie

ELECTRO-VOICE BLUE SERIES CARDINAL: The Electro-Voice Blue Cardinal is a cardioid condenser designed to capture the detail of voice and instrument in live sound or studio applications. Employing Class-A, discrete ultralow-noise amplifier circuitry, the Cardinal's smooth and detailed performance is sure to please even the most discerning artists and engineers. Features include pressure-gradient cardioid condenser, Class-A discrete ultralow-noise circuitry, unique double swivel-mounted design for ideal positioning, innovative visual design and a cherry wood mic housing. Great for voice or instruments. Price: \$269.

ELECTRO-VOICE BLUE SERIES RAVEN: The Electro-Voice Blue Raven is a stylish dynamic microphone designed to capture the character of live and studio vocals; it's also the perfect microphone for live and studio instruments. The Raven incorporates the collaborative design work from the top industry microphone engineers to provide unparalleled performance in a stunning package. This dynamic mic with studio detail and clarity features a cardioid pattern with excellent off-axis rejection and a unique double swivel-mounted design for ideal positioning. Price: \$199. 952/884-4051 www.electrovoice.com

HELL SOUND PR40: Our highest-performance LD dynamic microphone, the PR40 puts Bob Hell's best cardioid capsule loaded in a studio-capable, end-fire package. Very smooth midrange and extended bottom end. Also available is the PR30, with an internally shock-mounted Hell LD dynamic capsule floated on an internal rubber shockmount system for improved mechanical isolation. You haven't heard dynamics like these before! AES booth: #851.

HELL SOUND PR20: This handheld, large-diaphragm dynamic microphone is the very first Hell LD dynamic, and sonically outperforms nearly all dynamic mics. It features the smoothness of a ribbon and a top end that is surprisingly good. AES booth: #851. 702/365-5155 www.transaudiogroup.com/hell.shtm

HHB FLASHMIC: Combining 1 GB of Flash memory with a Sennheiser omni condenser capsule, the FlashMic DRM85 is the world's first pro digital recording mic. The self-contained unit records instantly with a single button-push and its 48kHz/16-bit .WAV linear or MPEG 1 Layer 2-encoded files can then be transferred at up to 90x real time via USB to Mac or PC. The unit records up to six hours on two AA batteries and will ship in January 2006. AES booth: #227. Dist. by Sennheiser USA 860/434-9190 www.hhb.co.uk

HOLOPHONE H2-PRO: The H2-PRO surround sound mic is the only patented device specifically designed for capturing discrete 5.1, 6.1 and 7.1 channels of surround sound for all professional audio applications. All surround sound recordings from the H2-PRO are discrete and in real time, thus easy to bring into any broadcast or studio environment to manipulate, mix and/or encode into any/all of the standard consumer playback formats—Dolby, DTS and Circle Surround. AES booth: #654. 416/362-7790 www.holophone.com

JOEMEER JM47A: The new version of the JM47 is even better than before. The JM47A cardioid large-diaphragm condenser mic combines a FET device for the preamplifier circuit with a transformer-balanced output. The capsule uses a "center-electrode" design with dynamic feedback at the capacitor element. The diaphragm is gold-sputtered micro-fine Mylar, with a machined brass body, highpass filter and pad switches. Price: \$299.99. AES booth: #545.

JOEMEER JM37: This large-diaphragm, cardioid condenser uses FET devices for both preamplifier and output stages for pleasing audio qualities. The capsule is manufactured in the "concentric electrode" design, providing smooth extended frequency response. The large 1.035-inch diaphragm is gold-sputtered micro-fine Mylar with a machined brass body. You'll find that the JM37 is an excellent choice for male and female vocals, as well as acoustic guitar and other instruments. Price: \$299.99. AES booth: #545.

JOEMEER JM37-DP: This dual-pattern (omni and cardioid) large-diaphragm condenser mic uses FET devices for both preamplifier and output stages, and a "center-electrode" capsule design for smooth, extended frequency response. Its 1.035-inch dual-diaphragms are gold-sputtered, micro-fine Mylar in a machined brass body. An excellent choice for male and female lead vocals, the JM37-DP also excels at recording choir, orchestral and other acoustic instruments. Price: \$399.99. AES booth: #545. 310/323-9050 www.joemeer.com

MXL 604: The MXL 604 dual-capsule instrument miking system is a pressure-gradient condenser microphone with an interchangeable omnidirectional capsule. The microphone features a -10dB attenuation switch, along with selectable LF roll-off capability. The 604 has a satin silver finish and includes a mic clip, windscreens and wood storage box. Price: \$179.95. AES booth: #527.

MXL 2010 MULTIPATTERN MIC: Featuring Class-A FET circuitry, the new 2010 is a pressure-gradient condenser microphone with a large 25mm (1-inch) gold-sputtered diaphragm. Polar patterns include omni, cardioid and figure-8. The MXL 2010 features a -10dB attenuation switch and selectable LF roll-off. It includes a shockmount and carrying case. Price: \$199.95. AES booth: #527. 310/333-0606 www.mxlms.com

PEARL OM 16: The Pearl OM 16 is a small omnidirectional condenser mic. The transformerless circuit achieves a very flat frequency response but with a boost from 5 to 12 kHz of 2.5 to 3 dB (at 8 kHz). The OM 16 sounds very natural and uncolored, which makes it an excellent choice for capturing musical instruments and vocal performances. Price: \$575. AES booth: #446. Dist. by Independent Audio 207/773-2424 www.independentaudio.com

RØDE VIDEOMIC II: At AES, RØDE will introduce one of the most exciting new microphones to be released in the past decade. With the unprecedented success of the VideoMic, RØDE releases VideoMic II, an on-camera stereo microphone that rivals the performance of many high-end stereo shotguns. 310/328-7456 www.rodemic.com

ROYER R-122V TUBE RIBBON MIC: After years of development and testing, Royer unveils its first vacuum tube ribbon mic at AES. Based on the same ribbon transducer technology as the acclaimed R-121 and R-122, the R-122V uses a triode-driven circuit to raise the mic's sensitivity to -29 dB. The mic is finished in 18-carat gold and features a dedicated power supply and cable set with military-grade locking-type XLR connectors, Jensen output transformer and proprietary toroidal mic transformer. AES booth: #869. 818/847-0121 www.royerlabs.com

sanken
The world's most original
microphone maker.



SANKEN CO-100K

Sanken's CO-100K superwide-range omnidirectional mic is the world's first 100kHz mic designed specifically for professional high-resolution recording. Applications

include recording music with a wide dynamic range, especially acoustic instruments, and capturing a new world of detail in recording sound effects. Its compact size and unobtrusive appearance also makes it ideal for orchestral and other live recording environments. 323/845-1171 www.plus24.net

SE ELECTRONICS SE RIBBON: The SE Ribbon is a hand-crafted precision microphone yielding all the warmth of a fine vintage microphone and an extended high-frequency response due to our special design. The microphone is supplied with an elegant shockmount and comes in an aluminum flight case. Price: \$749. AES booth: #568.

SE ELECTRONICS TITAN: Finally, an affordable 1-inch titanium-diaphragm mic. Titan features clear highs and tight lows, a transformerless active balanced output, eight selectable polar patterns, 100Hz filter and 10dB pad. Frequency response is 20 to 20k Hz; Equivalent Noise Level is 18 dB (A-weighted), 128 max SPL for 0.5-percent THD @ 1 kHz; impedance is <200 ohms. 48V phantom power required. Price: \$1,499. AES booth: #568. 617/623-5581 www.seelectronics.com/titan.html

SOUNDELUX E67: Soundelux restores the sound and performance of the '60s era German tube 67 in the all-new E67. For less than you would pay for a vintage original—with replacement parts and readily available new-old-stock tubes—the E67 embodies all of the most important characteristics of the original, while offering consistency, reliability and long-term serviceability that's a requirement for today. With the addition of a "normal/bright" switch, the E67 adds even more flexibility needed by today's recordists. AES booth: #854.

SOUNDELUX E251C: The E251C is a more affordable, cardioid-only version of the renowned Elux251, using the same capsule as the Elux. By using a lower-cost body assembly, removing the pattern selection switch and providing an imported shockmount, we pass significant savings on, enabling more people to have a top-of-the-line, world-class vocal mic. Maintaining all the clarity and tone of the original, the E251C is an ideal mic for vocals and many other applications. AES booth: #854. 702/365-5155 www.soundeluxmics.com

SOUNDFIELD ST350: The new portable ST350 offers SoundField's unique 3-D technology in a miniaturized package that's powered by either AC or battery. Dispensing with the compromises associated with portable recording, the ST350 system comprises a lightweight multicapsule microphone and fully featured compact mic pre/control unit that generates surround and stereo simultaneously at balanced line-levels. AES booth: #848. 702/365-5155 www.soundfield.com

T.H.E. AUDIO KS-1: T.H.E. has combined its finest electronics with a smooth-sounding, 16mm true

condenser capsule. The result is a product tailored for live stage vocals. The KS-1—with its solid feel and mass; smooth, clean output; and competitive price point—sets the standard for all of the new (wired) vocal systems currently in use. Price: \$429. AES booth: #1028.

T.H.E. AUDIO KR-50: Our KR-50 capsule is a new addition to our modular line based on the KA-04 mic body. Using the same technology as our "flat and open" cardioid 25mm capsule series (KR-25A), we have made an omnidirectional capsule that adds a great new audio palette to your studio. Price: \$598. AES booth: #1028.

T.H.E. AUDIO CR-5 AND CR-6: T.H.E. is now offering a unibody (non-modular) series of cardioid and omnidirectional mics that are economically priced yet packed with features. Using our patented electronics and a new capsule design, we offer these small, true condensers to studio owners, musicians and recordists everywhere. High-speed, smooth-sounding and (hand-) built to last, our CR Series offers tools that will add a new level of enjoyment to your recording and playing. Price: \$348. AES booth: #1028. 860/821-5414 www.theaudio.com

MIXING CONSOLES

ALLEN & HEATH GR2: A new 1U rack or deskmount 9-input, 4-output, analog zone mixer for demanding but budget-conscious installations in a diverse range of modern architectural applications, including live entertainment, paging, background music, conferences and presentations. The GR2 offers the installer a host of front panel preset switches and trimmers to meet each special requirement with a tamper-proof cover plate. Connectors are XLR/RCA and screw terminal, and there are extensive remote-control capabilities using standard Cat-5 cable. AES booth: #237.

ALLEN & HEATH ILIVE: Developed for live sound applications, iLive's "ground-up" design is based on the IDR-64, a rackmounting modular mix engine controlled via an Ethernet network that provides 64 channels into 32 mixes that are assignable as auxes, groups, matrix and main outputs. iLive-112, iLive-144 and iLive-176 control surfaces feature motorized faders in four banks with up to 176 control strips, featuring channel controls such as EQ, compressor, limiter and de-esser on rotary encoders with LED indicators. AES booth: #237. 800/431-2609 www.allen-heath.com

AMS NEVE 88D: The 88D music production console brings the legendary Neve sound to contemporary music production with power, control, flexibility and integration. A powerful 1,000 track, 96kHz DSP engine combines with Neve preamps, 8.1 monitoring of multiple sources and Encore Plus automation. Pro Tools, Pyram and Nuendo are integrated for total control of the mix environment. Hi-def I/O and 40-bit floating-point processing provide the ultimate digital mix.

Classic EQ and dynamics plug-ins ensure that the 88D retains the true character of the classic Neve sound. 44/1282-457011 (UK)
www.ams-neve.com.

CADAC D16 DIGITAL MIX MATRIX: The D16 provides a fully featured, 16x16 audio matrix designed as a stand-alone audio processor (for smaller-scale performances, fixed installations and broadcast/recording applications) or as an expansion mixer for existing consoles. It has 16 line-level analog I/Os, with each channel providing 4-band parametric EQ, high/lowpass filters, compression and gating dynamics control, plus adjustable level routing to 16 output mixes. The system can be controlled locally from the D16 front panel or via Cadac's SAM software. 44/1582 404202 (UK)
www.cadac-sound.com

DIGICO MINI-DIGIRACK: The MINI-DIGIRack was designed to give even more flexibility to the D1 and D5 Live systems. The 4U-high and 19-inch rackmount MINI-DIGIRack can be fitted with a MADI or optical interface, and has two power supplies with separate mains connectors and switches. There is a newly designed back plane that allows any slot to be either input or output for analog connections, or both in and out for digital connections such as AES/EBU. AES booth: #719.
310/326-5266
www.digico.org

DIGICO D1 LIVE 48MINI-DR AND 56MINI-FM: The D1 Live 48Mini-DR and D1 Live 56Mini-FM packages use the new compact MINI-DIGIRack to further expand the D1 Live system range. In these systems, the stage rack is located onstage and the Mini-DIGIRack provides eight mic/line in, eight line out and four (eight channels) AES I/O at the control surface location. With room for four I/O cards total, this still allows the user space to add another card for their particular needs. AES booth: #719.
310/326-5266
www.digico.org

DIGIDESIGN D-COMMAND™: The D-Command™ medium-format console environment work surface packs ICON-exclusive Pro Tools functionality into a medium-format console. As with the flagship large-format ICON D-Control console, D-Command uses Pro Tools |HD Accel as its DSP mix engine and Pro Tools |HD interfaces and peripherals for system I/O. It offers hands-on control over every aspect of a Pro Tools project, including recording, editing, mixing and processing—with integrated video—from a relatively small, but expandable, work surface. AES booth: #336.
650/731-6300
www.digidesign.com

FAIRLIGHT CONSTELLATION-ANTHEM: Constellation-Anthem joins the DREAM family, and is designed specifically for today's audio media creators in production and mixing. Anthem can be instantly configured in four separate modes (Split, Classic In-line, In-line Plus and Constellation) to offer a recording and mixing surface that is totally intuitive and familiar to those who enjoy traditional analog-style music consoles but wish to employ the power of digital technology.

Features include built-in touchscreen TFT and in-line panels. AES booth: #243.
61/2997-51777 (Australia)
www.fairlightau.com

GLYPH TECHNOLOGIES GPM-216: The GPM-216 is a collaborative audio system that lets each musician create his/her individual monitor mix onstage or in the studio. AES booth: #1204.
607/275-0345
www.glyphtech.com

INNOVASON DIO CORE: Dio Core is the first modular 64-channel EtherSound-enabled stage box compatible with InnovaSon I/O modules using InnovaSon's recently released Dio ES multichannel audio interface module. Dio Core can be used with InnovaSon Sy80 and Sy48 digital live mixing consoles and/or as a remote I/O box for other EtherSound-enabled devices. Dio Core features up to 64 I/Os: digitally processed bus and direct outputs for remote/stage locations; and additional Dio Core units or other EtherSound-enabled devices using standard Cat-5 EtherNet networking. AES booth: #627.
33/0297-243434 (France)
www.innovason.com

INTER-M KENSINGTON: Available in 24/32/40-channel models for live sound or theater applications, the Kensington Series bring together a renowned team of designers led by Inter-M's Miyajaki Yuichi and Audlent's Dave Dearden. Features include true LCR mixing, low-noise preamps, 4-band "British" EQ with swept mids, sweepable highpass filtering, eight aux sends with pre-fader switching, four mute groups, direct outputs and fader flip to create a dual-purpose FOH and monitor console. AES booth: #1219.
866/636-5795
www.inter-m.net

LAVRY ANALOG MIXER: This low-cost 12-input-to-stereo device provides digital level controls and the lowest distortions and noise for unprecedented transparency. 206/842-3552
www.lavryengineering.com

LAWO NOVA ROUTERS: The Nova73 HD router has a capacity of up to 8,192 mono channels with ports for MADI, ATM and AES3. Additional formats and decentralized interfaces can be provided. It features hot-pluggable configuration changes while running; 96 kHz; Dolby-E compatibility; clock-synchronous switching to video frames; and integrated signal processing. For smaller installs, the Nova17 universal matrix acts as a format converter or MADI breakout, with 384-channel capacity, integrated signal processing and freely programmable logic. AES booth: # 64.
416/292-0078
www.lawo.de

LOGITEK MOSAIC DIGITAL CONSOLE: An advanced control surface for Logitek's Audio Engine digital router, the Mosaic is modular and configurable. Designed primarily for TV and radio on-air/production, Mosaic configurations range from two to 24 faders with easy access to timers, intercom, dynamics and EQ func-

tions. Drop-in modules for faders, monitors and soft-key functions give users as few—or as many—buttons and controls as needed. AES booth: #1019.
713/664-4470
www.logitekaudio.com

PHOENIX AUDIO NICERIZER 16: Nicerizer 16 is a 2U rackmountable 16x2 summing mixer. Like its predecessor, the Nicerizer 16 can be stacked and linked in any multiple and various configurations to give high-quality, line-level, Class-A discrete buffering, summing and mixing. Additions to the Nicerizer 16 are +8dB Boost button and pan control for each channel. Price: \$4,125. AES booth: #446.
Dist. by Independent Audio
207/773-2424
www.independentaudio.com

SOUNDCRAFT MH2: The MH2 live performance console combines the sound quality and ergonomics of Soundcraft's popular MH3 and MH4 desks, but with a more compact footprint and lower price. Like its siblings, the MH2 is capable of dual-mode (FOH/monitor) operation and features eight subgroups, 10 auxiliary buses, eight VCA groups, six mute groups, LCR panning, 24 to 48 mono channel frame sizes (all plus four stereo channels), four stereo returns and an integral 11x4 matrix. AES booth: #226.
818/920-3212
www.soundcraft.com

SPL ELECTRONICS MIXDREAM XP: After introducing the MixDream analog summing and insert box last year, SPL launches the MixDream XP this year as a straight 16x2 summing box. Entirely discrete signal paths run on 60V rails in Class-A mode, reaching a dynamic range up to 124 dB. The MixDream XP is ideally suited as a pure, active DAW summing extension or to expand the MixDream with 16 further channels. AES booth: #2591.
951/272-3465
www.spl-usa.com

SSL C300 DIGITAL CONSOLE: SSL's new-generation digital console is designed for the full spectrum of film and post applications. The C300 is a compact, assignable console for fast and efficient sweetening and mix creation. The requirements of nonlinear film and TV production are fully addressed by the C300, delivering the ultimate in operational efficiency in a cost-effective, scalable solution. The C300 Master Studio System integrates DAW control using techniques successfully pioneered with the SSL AWS900 console. Priced on application. AES booth: #801.
44/1865-842300 (UK)
www.solid-state-logic.com

STUDIO TECHNOLOGIES M742 AUDIO MIXER: Designed for use in electronic news gathering (ENG) and various general audio applications. Features four mic/line inputs, four line inputs, two audio buses, two 10-segment LED level meters and monitor section. Single-rackspace mounting. Price: \$1,095. AES booth: #551.

STUDIO TECHNOLOGIES MODEL 212 ANNOUNCER'S CONSOLE: Designed to serve as the audio control center for announcers, commentators and production talent, the Model 212 incorporates the features of the Model 210 Announcer's Console, adding digital inputs and outputs. AES booth: #551.

STUDIO TECHNOLOGIES MODEL 41 INTERFACE:

Designed primarily for use in on-air television (fixed location or as part of a remote facility), the Model 41 can also be used in audio recording and post-production facilities. In addition to broadcast intercom applications, the Model 41 can be used to create high-performance stereo headphone cue systems. AES booth: #551.

847/676-9177

www.studio-tech.com

TL AUDIO M4 TUBE CONSOLE: A fully featured classic console designed to maximize today's digital production techniques while continuing to deliver that elusive sound from an illustrious era. It's offered in 16, 24 or 32-input channel versions, each with valve preamp, 8-channel ADAT and 24-bit/96kHz mix output option. Track direct channel outputs with level control. 4-band EQs with bypass. Four aux sends—selectable pre/post. Classic big valve console performance in a compact package. Priced from \$9,025. AES booth: #446.

Dist. by Independent Audio
207/773-2424

www.independentaudio.com



TRIDENT DREAM SERIES: You get to your digital mix and all that careful sampling and editing seems wasted when the more you mix in, the thinner it all gets. You need real analog like only Trident knows how, and the Trident Dream Series console is your best choice. A 16-channel console is \$10,995, a 24-channel is \$16,995 and a 32-channel is \$22,995. With prices and sonics like these, you'll think you're dreaming. 44/1474 815 300 (UK)

www.tridentaudio.co.uk

UREI 1601S: The 1601S is a 2-channel digital DJ mixer packed with unique features such as dual 32-beat, 24-bit/96kHz assignable samplers with footswitch control, highpass filters and an audio exciter. Additional amenities include 360-degree customizable phono/line switches; crossfader monitor selector; backlit headphone out with EQ; ultra-clear input and output level monitoring LEDs; full-cut high, mid- and low EQ rotary pots; send and return FX loop; and many more DJ-friendly features. AES booth: #226.

818/920-3212

www.ureidj.com

WENDT X3: This premium low-noise location mixer has all the features necessary for recording top-quality sound for film or TV. The inputs are mic/line-switchable,

and phantom power is available on all three inputs. The X3 also offers pan switches, a slate mic and a ¼-inch headphone jack, and unbalanced aux and balanced XLR mic/line-switchable outputs. Six AA batteries give you an estimated 12 to 15 hours of use.

805/494-4432

www.wendtlinc.net

YAMAHA PM1DV2: Yamaha's PM1DV2 sound reinforcement console makes its AES debut. Notable features include automatic gain adjustment for systems using shared inputs and Load Filter, which allows for more flexible file management to and from the PC/MIA data memory card. For theater applications, an enhanced Event List enables the Timecode Event List to match that found on the Yamaha PM5D console. An Insert/Delete Channel function has been added to improve the already user-friendly console setup. Price: \$86,000. AES booth: #418.

714/522-9011

www.yamaha.com

MUSIC PRODUCTS

THE BEAT SUITE: Royalty-free production music library containing classical, dance, rock and jazz. Music tracks, loops and sounds available for immediate download as MP3. Music for multimedia, computer games, online, broadcast and business. Instant preview, purchase and download, with blanket license available.

44/0191-221-2400 (UK)

www.beatsuite.com

CREAMWARE MINIMAX ASB: A quality vintage synth emulation in a dedicated hardware system, complete with authentic controls. The Minimax ASB is a 12-voice unit with 128 factory presets and 128 user presets, with stereo outs and a stereo input for processing of external signals. The Minimax ASB also has MIDI In/Out/Thru and a USB connection for host/MIDI interfacing. External power supply unit (12 VAC). Plug-in-like Windows remote-control software. Price: \$899.

CREAMWARE PROFIT-5 ASB: A quality vintage synth emulation in a dedicated hardware system, complete with authentic controls. The Profit-5 ASB is a 6-voice unit with 128 factory and 128 user presets, with stereo outs and a stereo input for processing of external signals. The Profit-5 ASB also has MIDI In/Out/Thru and a USB connection for host/MIDI interfacing. External power supply unit (12 VAC). Plug-in-like Windows/OS X remote-control software. Price: \$999. 49/2241-5958 (Germany)

www.creamware.com

E-MU XBOARD 25: E-mu's Xboard 25 professional USB/MIDI controller for PC and Mac features a full-size, 25-note, velocity-sensitive keyboard with after-touch, 16 programmable real-time controllers, Xboard Control software and E-mu's Proteus X LE Desktop Sound Module with more than 1,000 sounds. Runs on USB, battery or AC power. Price: \$199.99. AES booth: #818.

E-MU XBOARD 49: E-mu's Xboard 49 professional USB/MIDI controller for PC and Mac features a 49-note, full-size, velocity-sensitive keyboard with after-touch,

16 programmable real-time controllers, Xboard Control software and E-mu's Proteus X LE Desktop Sound Module with more than 1,000 sounds. Runs on USB, battery or AC power. Price: \$229.99. AES booth: #818.

E-MU SOUND CENTRAL'S MODERN SYMPHONIC ORCHESTRA: E-mu's Modern Symphonic Orchestra offers composers and musicians more than 10 GB of the finest orchestral samples ever collected, with all sections recorded in their onstage seated positions with close and far microphones. All presets have been programmed for E-mu's powerful Emulator X and Proteus X sound engine, delivering plug-and-play performance that lets you dial in the perfect orchestral sound every time. Price: \$399.99. AES booth: #818. 831/438-1921

www.emu.com

FIRSTCOM MUSIC MUSIQUICK LOCAL: FirstCom makes hard drive delivery easy! Get a customized hard drive with as few as 100 CDs or as many as 1,900 CDs! MusiQuick Local, our easy-to-use search engine, makes your searches a breeze. Hard drives are completely networkable and are Mac- and PC-compatible.

800/858-8880

www.firstcom.com

GARRITAN JAZZ AND BIG BAND: The first complete jazz and big band sample library/virtual instrument. A complete jazz and big band collection featuring trumpets, trombones, a comprehensive collection of sax, keyboards, guitars, winds, rhythm section and more. Variety of mutes, extended ranges, jazz effects and expressive control provide utmost playability. NI Kontakt Player: Mac and PC, VST AudioUnits, DXI and RTAS. Price: \$259. AES booth: #1254.

GARRITAN STRADIVARI SOLO VIOLIN: A technological revolution in sampling. This virtual Stradivari violin (for Kontakt 2) is the first to feature new and exclusive Sonic Morphing technology. The samples are harmonically aligned to seamlessly crossfade between different dynamic and vibrato levels without phase problems. This, combined with instrument body resonances (convolution) and advanced scripting, makes this product the most expressive and realistic-sounding virtual solo instrument ever made. Price: \$199. AES booth: #1254.

360/376-5766

www.garritan.com

HOLLYWOOD EDGE HIGH IMPACT SERIES: The High Impact Series is a 5-disc collection of more than 2,200 non-stop action sounds. These effects have the authentic feel of *Horror*, the out-of-this-world dimensions of *Science Fiction*, the full heat and shockwaves of *Fire and Explosions*, the gut-wrenching blows of *Impacts* and the realistic, destructive force of *Crashes*. No matter what impact, disaster, space voyage or ghost hunt you're planning, the High Impact Series has what you're looking for. Price: \$595.

800/292-3755

www.hollywoodedge.com

IK MULTIMEDIA MIROSLAV PHILHARMONIK: Miroslav Philharmonik workstation focused on orchestral instruments, ensembles and choirs. Philharmonik is a powerful integrated orchestral workstation combining the legendary Miroslav™ Orchestral and Choir sample collection masterpieces with a dedicated plug-in instrument specifically tailored for classical sounds and arrangements. The Orchestra & Choir Workstation features more than 1,200 sounds and 7 GB of samples; 16-part multitimbral sample-based orchestral workstation; 20 classic DSP effects (four per instrument) and three synthesis engines with STRETCH™ easy-to-use classical music-oriented parameters. For Mac OS X and Windows. AES booth: #1236. 954/846-9101 www.philharmonik.com



MOTU MX4 VERSION 2: Inspired by legendary subtractive synthesizers, MX4™ delivers fresh and vintage sounds alike. Hundreds of presets—fat basses, nasty leads, analog pads, vintage electronica—are organized by category and saved with your host application projects for recall. Tweaking sounds is fast and easy but with a depth synth programmers will appreciate. New in V. 2: more built-in effects, stereo detune for huge analog sound, anti-aliased wave tables, hundreds of new presets, pattern gate, arpeggiator, trigger sequencer and more. AES booth: #354.



MOTU SYMPHONIC INSTRUMENT: This virtual instrument plug-in has everything needed to create complete orchestral recordings. From solo instruments and small ensembles to full orchestral masterpieces, the Motu Symphonic Instrument™ provides a massive 8GB library of sounds, from world-class orchestras and musicians recorded with pristine audio fidelity. Adjust sounds quickly and intuitively using a single-window interface. A built-in convolution reverb produces stunningly realistic room ambiances—orchestra sound stages, renowned concert halls and majestic cathedrals. Compatible with all major plug-in formats for Mac OS X and Windows (VST, AudioUnits, DXI, MAS and RTAS). AES booth: #354. 617/576-2760 www.motu.com

OPEN LABS NEKO64: New 61-key version of NeKo64 features Pentium D dual-core 3GHz 64-bit processor; RunSilent™ function dynamically controls CPU speed and reduces temperature when ultra-quiet operation is required; native DDR2 800 support; universal PCI-E Slots6 PowerRush™ technology intelligently detects system load and automatically boosts performance for the most demanding tasks by increasing CPU clock speed on-the-fly; and serial ATA 3Gb/s support for next-generation hard drives that doubles current bus bandwidth for high-speed data transfers. Price: \$5,995.

OPEN LABS GENERATION 2: This 61-key version of NeKoLET includes Pentium 4 3GHz processor; RunSilent™ function to dynamically control CPU speed and reduce temperature; and PowerRush™ technology intelligently detects system load and automatically boosts performance for the most demanding tasks by increasing CPU clock speed on-the-fly. Price: \$2,995. 512/444-6222 www.openlabs.com

RADIAL ENGINEERING SGI: The SGI (Studio Guitar Interface) is a transmit/receive pair of modules that allows a guitar signal to travel across 500 feet of balanced mic cable. The SGI is a unity-gain device that features 100-percent discrete Class-A circuitry and transformer isolation to eliminate ground loops. The guitar connects to the SGI-TX, which outputs a balanced signal. At the far end of the balanced line sits the SGI-RX, which converts the balanced signal back to a hi-Z instrument level output that can connect to pedal boards and amplifiers. Retail: \$200. AES booth: #1218. 604/942-1001 www.radialeng.com

SONIC IMPLANTS COMPLETE SYMPHONIC COLLECTION: This sample library for GigaStudio 3 is extremely playable, making it the first choice for composers and producers. The Sonic Implants Complete Symphonic Collection comprises four volumes: Strings, Woodwinds, Brass and Percussion. It offers users an orchestral solution with prodigious flexibility, intuitive programming and an authentic virtual soundstage that allows for the correct respective placement of instruments and sections without the need for additional processing or panning. Price: \$2,995. 617/718-0202 www.sonicimplants.com

SONIC REALITY SONIC REFILLS FOR REASON 3: Sonic Reality has helped to take Reason to a whole new level with the release of the Sonic Refills Series of sound libraries. Each of the highly affordable volumes in this more than 20-volume collection offers amazing playable instruments that were meticulously recorded and expertly programmed. Each volume also features its own custom Combinator module to take advantage of all of Reason 3's new enhancements. Price: \$49.99. 954/846-9409 www.sonicreality.com

TAYLOR GUITARS 2005 FALL LIMITED EDITIONS: Taylor's 2005 Fall limited-edition guitars are electric/acoustic cutaways featuring Taylor's remarkable Expression

System acoustic pickup (winner of the 2004 Mix Foundation TEC Award in the Musical Instrument Technology category). This fall, Taylor's popular 300, 400, 500 and 800 Series guitars have received solid exotic tonewood upgrades of Hawaiian koa, Indian rosewood, Tropical American mahogany and Mexican cocobolo for back and sides. Tops are solid Sitka spruce, mahogany or koa, depending on the model. Price: from \$2,248 to \$4,298. 619/258-1207 www.taylorguitars.com

TRF PRODUCTIONS ADRENALIN PRODUCTION MUSIC LIBRARY: Eleven new CD releases added to the Adrenalin Production Music Library, now totaling 26 discs, all released since spring 2004. Categories contained in the Adrenalin library include urban/hip hop, rock, ambient, electronica, sports, jazz, acoustic guitar, fashion, funk and drama. The Adrenalin discs are being added to the more than 50,000 selections already contained in the TRF libraries, the largest and most extensive source of production music. 845/356-0800 www.trfmusic.com

VIENNA SYMPHONIC LIBRARY OPUS 2: This 9.3GB orchestral sample library expands the potential of Vienna's Opus 1—or the first edition—with additional articulations for most of the instruments included in Opus 1 and additional instruments such as percussion from the Pro Edition Opus 2. It also includes basic articulations of instruments taken from other Horizon Series titles, such as solo strings, epic horns, french oboe or woodwind ensembles. Formats: Giga, EXS, Hailon, Kontakt. Price: \$495. 011/431-617-63-13 (Austria) www.vsl.co.at

ZENPH STUDIOS SOFTWARE ANALYSIS: This process captures audio piano recordings (even poor-quality ones) and converts them into nuanced descriptions of the original performances—exactly replicated using modern piano technology. Zenph's software analysis determines the precise keystrokes, pedal movement and timing that went into a performance and converts it to high-definition computer data that can drive a modern reproducing piano for an exact replica of the original performance. In a studio, this note-perfect reperformance can then become a modern, high-quality recording—suitable for commercial release. AES booth: #2D04. 919/646-3844 www.zenph.com

POWER AMPLIFIERS

CREST AUDIO NX COBRANET-8 MODULE: The new Nx CobraNet-8 control module and CM Series power amps work in tandem to support Crest NexSys 4 and Peavey MediaMatrix MWare software programs for advanced control and audio routing. Nx CobraNet-8 supports all NexSys functions, DSP functions and CobraNet digital audio I/O on a single Cat-5 Ethernet cable. A four-character LED allows easy setup, control and monitoring of up to eight CobraNet audio channels. An extensive suite of DSP options—Includ-

ing delay, EQ, compression/limiting and crossover—adds to the functionality.
866/812-7378
www.crestaudio.com

LIPINSKI SOUND L-301: This "three-in-one" amplifier has three incarnations: stereo (2x300W), bridged (1x600W) and parallel (1x300W), hence the name L-301 "Three-In-One." This allows users to start surround monitoring with only three stereo amps and later upgrade to five or six amps by resetting for parallel or bridged mode mono blocks. AES booth: #1043.

LIPINSKI SOUND POWERED STANDS: The Lipinski Sound answer to powered speakers. Our tests indicate that many amplifiers built into the back of a speaker produce up to 15 percent first- and second-harmonic distortion. Lipinski Powered Stands feature the L-301 amp built into the stand rather than the speaker, enabling short speaker cable length while allowing easier amplifier setup, especially in a surround environment. AES booth: #1043.
301/229-4360
www.lipinskisound.com

MC² AUDIO E45: The E45, rated at 2,250W/channel into 4 ohms, is built in a 2U chassis and has a switch-mode power supply capable of delivering high peaks without any perceptible bass sag at very low distortion, and is kept within its safe operating area by an intelligent limiter. Power is delivered over the entire audio bandwidth, making it ideal for driving high-power P.A. systems including subwoofers, packing high power into a compact size. AES booth: #1047.
Dist. by Group One Ltd.
516/249-1399
www.g1limited.com

RANE MA 4 MULTICHANNEL AMP: The 100-watt/side, 4-channel MA 4 amplifier achieves unparalleled power density, reliability and features in a space-saving, one-rack-space chassis weighing a mere eight pounds. The universal-voltage switching power supply provides near-perfect Power Factor, reducing peak currents to a fourth as compared to non-power factor-corrected supplies. The MA 4 excels in music and paging systems, small conference rooms and speech reinforcement applications requiring multiple amplifiers. Price: \$1,399. AES booth: #743.
425/355-6000
www.rane.com/ma4.html

SIGNAL PROCESSING, HARDWARE

BRICASTI DESIGN M7 STEREO REVERB: The first in a series of products from Bricasti Design, the M7 uses the latest-generation ADI DSPs to create a world-class stereo reverb. It features dual dedicated power supplies, AES/EBU digital I/O, network control and internal 192kHz sampling to create the lush and complex overtones necessary for truly believable, encompassing reverb. See us at AES and hear how far reverb processing has truly come. AES booth: #263.
www.bricasti.com

BUZZ AUDIO RESONANCE EQUALIZER MODEL REQ-2.2: The Resonance Equalizer gets its name from using real switched inductors and capacitors as the reactive elements in the EQ, resulting in natural resonance and a simply detectable sound. The REQ-2.2 boasts four parametric bands and a unique variable transformer saturation circuit that introduces varying amounts of LF color in the form of harmonic distortion for subtle but effective lifting of lows without the usual volume increase. A passive choke-based HP filter completes the picture. Price: \$5,000. AES booth: #1148.

BUZZ AUDIO DUAL-COMPRESSOR SYSTEM MODEL DCS-2.2: Model DCS-2.2 is a high-end compressor featuring two different compressor types in one unit with one channel of hard-knee FET-based compression and one channel of softer opto-compression. Routing switches let users enable the two types individually, in series or in parallel, and a Blend control mixes between uncompressed and compressed signals, or blend between the two compressors. Other features include a switchable insert point, transformer saturation, LED metering, a sidechain frequency response tilt control and stereo linking to a second DCS. Price: \$3,000. AES booth: #1148.
644/385-2478
www.buzzaudio.com

CEDAR CAMBRIDGE VERSION 2.5: CEDAR Cambridge Version 2.5 is a significant upgrade for all CEDAR Cambridge systems. It incorporates two new processes—Auto Dehiss and Declickle 2™—and many improvements to the user interface and automation system. All existing CEDAR Cambridge systems can be upgraded. The host system upgrade is free of charge to all users, and Declickle 2 is free of charge to all registered owners of the original Declickle process. Preferential upgrades to Auto-Dehiss are also available. AES booth: #450.
207/828-0024
www.cedaraudio.com

DRAWMER S3: The S3 stereo 3-band optical compressor incorporates the very latest in Ivor Drawmer's designs. The aim from the very beginning was to create a "no technical compromise" circuit using only the highest-grade components. The S3 forms the basis of a Signature Series and offers previously unattainable control and tonality over each of the three bands, and gain control at each stage offers precise spectral balancing. AES booth: #850.

DRAWMER THREE-SUM: The Drawmer Three-Sum analog split/sum device opens up a whole new set of options, allowing the engineer to split the audio into two or three bands and apply his or her own sonic signature to each part of the audio bandwidth. AES booth: #850.
702/365-5155
www.drawmerusa.com

D.W. FEARN VT-7: D.W. Fearn will display its new VT-7 stereo vacuum tube compressor, featuring an all-tube audio path, stereo linking and the sound that has made our other products famous. We will also show the VT-2 dual-channel vacuum tube microphone preamplifier and the VT-4 vacuum tube LC

equalizer. AES booth: #864.
610/793-2526
www.dwfearn.com

ELECTRO-HARMONIX POLYPHONIC OCTAVE GENERATOR (POG): Add one octave up, two octaves up and one octave down from your original guitar signal and blend them all together—plus it works on chords! Want your guitar to sound like a 12-string? The POG can do it—or even make it sound like an 18-string. The POG also lets you detune either or both of the up octaves, and it can process any musical source. Designed to be a legendary EH classic. AES booth: #1248.
718/937-8300
www.ehx.com

EMPIRICAL LABS LIL FREQ UPDATE: The 2005 TEC Award-nominated Lil Freq dynamic equalizer model EL-Q is in full production for AES, and now features a clever 1073 Emulation mode in addition to its 4-band parametric/8-section EQ. Including an electronically balanced transformerless output and a super-fat old-school transformer output, the Lil Freq can be used for corrective EQ and/or colored EQ as situations or tastes merit. AES booth: #436.
Dist. by Wave Distribution
973/728-2425
www.wavedistribution.com

EVENTIDE H7600: The H7600 is Eventide's most powerful stereo effects processor to date. The H7600 features a 174-second sampler and refinements from the H8000 operating system, including the powerful sorting capability. The H7600 features the stereo algorithms from the flagship H8000FW and carries forward the best effects from previous generations of Eventide processors, including our entire collection of stereo post-production effects. The H7600 offers two channels of analog I/O, AES/EBU, S/PDIF and word clock I/O. Price: \$4,995. AES booth: #318.

EVENTIDE H8000FW: The H8000FW now includes FireWire for direct high-speed connection to your computer. Featuring Eventide's best 1,588 preset algorithms and the expanded analog of the H8000A, combined with the full digital complement of the H8000 and FireWire, the H8000FW offers Monolithic Tandem, allowing both processors to operate together, facilitating large complex algorithms including 5.1 reverb and effects up to 96 kHz. The H8000FW offers four channels of analog I/O, eight channels of AES/EBU, ADAT, S/PDIF, FireWire and word clock I/O. Price: \$5,995. AES booth: #318.
201/641-1200
www.eventide.com

GREAT RIVER MEQ-1NV: The new MEQ-1NV is the Great River channel strip—all-Class-A, discrete, incredibly versatile. The EQ section, an EQ-1NV (4-band, true inductor/capacitor, parametric), is routed via the insert jack on the ME-1NV (two-gain-stage, dual-meter, '70s British-style mic pre). This configuration allows a wide range of gain effects—you can hit the EQ L/C sections slightly harder for subtle harmonic possibilities or use less first-stage gain with more second-stage gain for very clean-sounding results. Retail: \$2,650. AES booth: #1136.

651/455-1846
www.greatriverelectronics.com

MARTINSOUND MARTECH MSS-01 DI: Martech Direct Inject Interface with active and passive signal paths, low-impedance output and ground lift switch. Price: \$595. AES booth: #1146.
626/281-3555
www.martinsound.com

OLD SCHOOL AUDIO I.G.M. COMPRESSOR: This new compressor features optional input and output transformers and is linkable to eight units for 7.1 surround capability. The VCA-based I.G.M. compressor is compatible with the current Old School Audio mounting frame or any API 500 Series-compatible frame. Price: \$995. AES booth: #1148.
866/235-0953
www.oldschoolaudio.com

RADIAL ENGINEERING PROD2: This high-quality, ultra-compact, stereo passive direct box features two custom-made transformers capable of handling high levels without saturation and exhibiting exceptionally linear frequency response from 20 to 18k Hz. The ProD2 features a -15dB pad for high-output sources and ground lift switch. Designed for stereo keyboards, DJ equipment and consumer audio devices, it's housed in a rugged, 14-gauge steel enclosure with a bookend-designed outer shell that prevents damage to the switches. List: \$150. AES booth: #1218.
604/942-1001

ROLL MUSIC SUPER STEREO LIMITER COMPRESSOR: The Super Stereo compressor has been designed specifically for stereo mix applications. The unit is 1RU high and has a single set of controls for true stereo application. It features a switchable highpass filter on the sidechain, along with attack and release controls, including an option to employ program-dependent release. "It has a short, clean signal path and the kind of smoothly aggressive response my customer was asking for to use on his stereo bus," says designer Jason Morse. AES booth: #1151.
612/379-3255
www.rollmusic.com

RUPERT NEVE DESIGNS PORTICO 5042 TAPE EMULATOR AND LINE DRIVER: The Portico™ 5042 provides a remarkable simulation of true tape sound through the inclusion of genuine tape drive circuitry. The 5042's 2-channel "True Tape" and line driver's tape-emulation circuit provides the nostalgic rounding and compression usually only achieved by the use of actual tape. This effectively offsets the harshness often found in digital recordings. When the Tape circuit is not engaged, the 5042 can be used as a full transformer-coupled, high-performance line amplifier. AES booth: #841.

RUPERT NEVE DESIGNS PORTICO 5043 COMPRESSOR/LIMITER DUO: The Portico 5043 is a 2-channel compressor featuring a discrete main signal path. In addition to controls for threshold, ratio, attack, release and gain make-up, the 5043 offers a choice of feed-forward or feedback control capable of yielding unobtrusive musical-sounding dynamics

and brick-wall limiting. The Portico 5043 can link both internal control lines or multiple additional 5043s, enabling one of them to serve as master. The Portico 5043 includes both line and mixing bus inputs. AES booth: #841.
512/847-3013
www.rupertneve.com

SSL XLOGIC DYNAMICS RACK: SSL's new XLogic Dynamics Rack provides up to eight SSL XL 9000 channel dynamics processors in a modular 4U X-rack format. In addition to this renowned dynamics processing, the X-rack also houses a Total Recall processor. This feature allows a complete snapshot of the dynamics settings in local memory stores. This makes the unit invaluable for live applications. This recall capability also integrates with the SSL AWS900 console, allowing saves to and from a partner DAW. Price: \$2,000 to \$7,800. AES booth: #801.
44/1865-842300 (UK)
www.solid-state-logic.com

SUMMIT FEQ-50 PASSIVE EQ: The FeQ-50 is a 4-band parametric passive EQ. Each band has six selectable frequencies and ±14 dB of sweepable cut/boost. The LF/HF bands peak/shelving-switchable; the mid bands can switch between narrow and wide bandwidths. Also included is a switchable 30Hz, 6dB/octave high-pass filter to reduce rumble. I/O includes a total of four simultaneous outputs: -10dB/+4dB vacuum tube out and -10dB/+4dB solid-state out. AES booth: #263.
775/782-8838
www.summitaudio.com

TC-HELICON VOICEPRO: TC-Helicon introduces VoicePro, the most technologically advanced voice processing unit on the market today. A combination of proprietary voice processing algorithms developed through years of human voice research and a voice-optimized compilation of essential vocal effects including classic TC algorithms, VoicePro delivers limitless vocal sounds for music, game, post and commercial audio designer/producers. Price: \$3,495. AES booth: #3D06.
818/665-4900
www.tc-helicon.com

TONELUX MODULES: New Paul Wolff-designed Tonelux modules include the CR2 control room monitor with four external stereo inputs and an internal stereo mix bus. It has an all-discrete signal path for superb sonic quality. The TB1 talkback module and TR8 bus assign modules allow for a totally modular console solution in a minimum of space. Speaking of consoles, Tonelux will introduce a complete modular console with fader automation in a compact package, designed to interface seamlessly with any DAW. AES booth: #436.
Dist. by Wave Distribution
973/728-2425
www.wavedistribution.com

WAVES APA44-M: The APA44-M is a hardware accelerator that lets users run multiples of Waves' most CPU-demanding plug-ins. The APA44-M is a half-rack unit that features nearly silent operation and is connected to the host computer via a standard Ethernet port. Up to eight units can be used together with

an Ethernet switch. The units can also be shared among several DAW workstations via a suitable V-LAN configuration, with each workstation accessing up to eight APA units. Price: \$2,400.

WAVES MAXXBC: MaxxBCL combines three of Waves' well-known audio processors in a sturdy 2U rackmount configuration: MaxxBass Enhancer, Renaissance Compressor and L2 Ultramaximizer Limiter. All processing is performed in a 48-bit end-to-end path. MaxxBass uses psychoacoustic principles to generate harmonics that add bass sound without adding bass frequencies, improving bass without requiring additional power or subwoofers. Renaissance Compressor offers classic compressor warmth, while the renowned L2 Ultramaximizer Limiter offers a dramatic increase in perceived level. Price: \$3,200.
865/909-9200
www.waves.com

WEISS DNA1: In cooperation with the Pure Notes Company, Weiss has developed a state-of-the-art digital de-noiser/de-clicker/de-crackler and K-stereo ambience regenerator unit. Estimated MSRP: \$8,900. AES booth: #847.
702/365-5155
www.weiss.ch

SIGNAL PROCESSING, SOFTWARE



URS 1970 Compressor / Limiter / Side Chain Version

URS CLASSIC CONSOLE COMPRESSOR BUNDLE

The URS Classic Console Compressor Bundle™ digitally re-creates the sound of two popular British console compressors. The URS 1970 is smooth and warm, and the URS 1980 is snappy and more aggressive. Both feature high-resolution 48-bit double-precision processing and 192k sampling. Separate compressor and brickwall limiter, internal sidechain with high- and lowpass filtering. Prices: \$899 TDM and \$449 Native RTAS AudioUnits and VST. AES booth: #336.
www.ursplugins.com

CEDAR TOOLS FOR PRO TOOLS: CEDAR Audio launches a major suite of new processes for Pro Tools, starting with Retouch™, Declip and Auto-Dehiss. These

processes, derived from the latest CEDAR Cambridge workstation, are uncompromising in their ability to rescue performances, save location shots and restore archive and library recordings. Available as Audio Suite plug-ins on the Pro Tools (PC) platform, each process is quick and simple-to-use, yet provides unparalleled results for all types of speech and music recordings. AES booth: #450.

207/828-0024

www.cedaraudio.com

DOLBY MEDIA PRODUCER: Dolby will show a software encoder/decoder designed for professional multiformat audio encoding. AES booth: #400.

415/645-5176

www.dolby.com

IK MULTIMEDIA AMPLITUDE 2: This powerful new tool puts a virtually unlimited array of guitar tones and effects at your fingertips. AmpliTube's stomp box, post effects and amp-simulation capabilities can craft everything from rich, vintage tones to unique cutting-edge sounds. For Mac and Windows, 20,000 different stomp box/amp/post effects configurations can be emulated. AES booth: #1236.

954/846-9101

www.amplitude.com

IZOPE OZONE 3: Ozone 3 combines analog modeling with 64-bit digital precision to deliver a complete suite of world-class mastering processors. Ozone 3 isn't a collection of plug-ins. It's a single powerful interface that combines all of the required mastering tools in one system. It's technically impossible to get this sound quality and resolution by chaining separate plug-ins. From tube-modeled equalizers to the pure transparency of linear phase filters, Ozone 3 provides the tools you need to deliver top-notch audio masters. Price: \$249.99.

IZOPE TRASH: The ultimate tool for selectively adding distortion to your tracks, with tons of guitar rig simulators and 85 cabinet models. Trash also offers subtler tone enhancements: tape saturation for vocals, overdrive for keyboards or a pinch of fuzz on a lead guitar. Chain pairs of distortions together or apply distortion independently to individual frequency bands. Trash is compatible with most Mac/PC hosts, supports 192 kHz and employs 64-bit for great fidelity regardless of how nasty you like your sound. Price: \$199.99.

IZOPE SPECTRON: Spectron uses spectral-domain processing to provide control over selective frequency bands. Imagine delay effects with the ability to selectively delay, feedback and modulate specific ranges of frequencies. The possibilities for exciting new sounds are limitless. Internal 64-bit processing and support of up to 192kHz audio delivers an incredibly pristine signal. Spectron works with most popular audio host environments. The only similar products on the market sell for much more. Price: \$129.99.

617/577-7799

www.izotope.com

MCDSP PROJECT STUDIO: Project Studio is the most comprehensive RTAS bundle ever, featuring award-winning EQ and compression, virtual synthesis, guitar amplification and McDSP's new convolution reverb. Everything you need to create, mix and master. Project Studio includes Revolver LE, FilterBank LE, CompressorBank LE, Chrome Tone LE, Synthesizer One LE and a pre-programmed Ilok. Five outstanding McDSP plug-ins in one unbeatable bundle. AES booth: #856.



PSP MASTERCOMP: PSP MasterComp is a high-fidelity, single-band stereo mastering compressor plug-in with a distinctive sound and extra linking features (VST, DirectX, RTAS for PC). Its double-precision (64-bit floating-point) and double-sampled (FAT, Frequency Authentication Technique) processing offers transparency even at extreme compression settings and high sample rates. It includes a wide range of controls that make it an exceptionally versatile tool for mastering compression and expansion, as well as bus processing during mixing. Price: \$249. AES booth: #764. 48/601-963173

www.PSPaudioware.com

SONY OXFORD LIMITER PLUG-IN: Designed to provide flexibility and performance for general transparent level control, program loudness maximization or heavily applied artistic effects, the Oxford Limiter employs logarithmic sidechain processing with adaptive timing functionality and "look-ahead" techniques. An Enhance function adds volume and punch to material without overloading. Sophisticated dithering with selectable and variable depth noise-shaping enables superb mastering output quality in either 24- or 16-bit modes. Price: \$530 for Pro Tools TDM; a version for LE systems is \$350. AES booth: #600.

www.sonyplugins.com

SYNCHRO ARTS VOCALIGN PRO: VocAlign PRO is a new version of Synchro Arts' unique VocAlign audio alignment software. VocAlign is the only software that automatically edits one audio signal to match the timing patterns in another audio signal. VocAlign PRO will contain a host of new improvements, including new sophisticated alignment and editing algorithms and audio preview controls that enhance the program's ease-of-use, accuracy and quality, making audio alignment tasks easier and more efficient. The new VocAlign PRO will be released first as a Pro Tools AudioSuite plug-in. Price: £395 GBP. 44/1372-81 1934 (UK)

www.synchroarts.com

UNIVERSAL AUDIO UAD-1 ULTRA PAK: The UAD-1 Ultra PAK is designed for the most demanding DAW professional who needs premium sonic quality for mixing and mastering applications and wants the largest and best-value Universal Audio plug collection in one convenient bundle. Ultra PAK includes the award-winning UAD-1 DSP card and a complete suite of 24 powered plug-ins, including painstaking circuit models of analog studio mainstays such as the 1176LN, LA-2A, Pultec EQP-1A and Fairchild 670. Price: \$1,495. AES booth: #266.

831/466-3737

www.uaudio.com

TEST EQUIPMENT

AKG WMS 40 PRO: AKG's third-generation WMS 40 PRO range includes FLEXX Diversity systems (three selectable frequencies per channel), and single (fixed-frequency) and dual systems (two transmitters and two independent channels in one receiver). Application-focused dual systems are designed for vocalists, musicians, coaches, trainers, worship leaders—anyone who needs clear communication and unrestricted movement. Compatible with previous WMS 40 generations, the WMS 40 PRO has up to nine simultaneous channels and more than 30 hours of battery life. AES booth: #226.

615/620-3800

www.akgusa.com

LECTROSONICS SM UHF BELTPACK: Not much bigger than two AA batteries, the 100mW SM Super-Minature Digital Hybrid Wireless™ beltpack transmitter packs all user controls onto an easy-to-operate control panel that includes an LCD, four membrane switches for adjusting operating frequency and modulation level, and both modulation and power indicators. The switches can also be used to set compatibility modes, allowing the SM to work with all of Lectrosonics' Digital Hybrid Wireless receivers, plus 200 Series and 100 Series analog products and IFB systems. AES booth: #942.

505/892-4501

www.lectrosonics.com

NTI TALKBOX: TalkBox is the missing link for the complete evaluation of speech intelligibility in emergency life and safety announcement systems, from the system mic to the listener's ear. TalkBox features human head-like dimensions and is based on a digital playback generator, it perfectly equalizes the STI-PA test signal and replays it at the precisely correct playback sampling rate, also minimizing systematic errors through the internal amplifier and internal precision loudspeaker. Each TalkBox is individually equalized and calibrated for precision output. Price: \$1,750.

503/684-7050

www.nt-instruments.com

SENCORE DA795 DIGIPRO DIGITAL AUDIO ANALYZER: The DigiPro digital audio analyzer quickly solves new equipment connection mysteries, troubleshoots intermittent digital audio, tracks down digital audio quality problems and analyzes digital signal content and equipment operation. Price: \$4,495. AES booth: #959.

SENCORE SP395: The SoundPro SP395 audio integrator totally analyzes sound systems and room acoustics on-the-spot, tunes audio systems and documents system performance, relieves stress at showtime by providing quick cures for show-stoppers and gives you all the audio tools you need in one unit for maximum effectiveness and convenience. Price: \$2,695. AES booth: #959. 605/339-0100 www.sencore.com

ZAXCOM TRX900: Zaxcom is proud to introduce the TRX900 wireless microphone transceiver. By incorporating an IFB receiver into the body of a traditional wireless microphone transmitter, both functions are now combined in a package smaller than most transmitters on the market. Key features include RF remote control of the bodypack and an optional six-hour, timecode-referenced audio recorder. AES booth: #742. 973/835-5000 www.zaxcom.com

WIRELESS PRODUCTS

GENNUM GW 5150: These in-ear musician monitors are designed to enhance the capabilities available to IEM users by personalizing the listening experience, controlling the dynamics and amount of ambient environment in the mix, and even tailoring the frequency response to individual taste. Featuring patent-pending ear-level microphone ambience processing, users gain full 360-degree spatial perspective, which offers the ideal solution for musicians to hear their environment or communicate without having to remove monitors from their ears. Price: \$1,495. AES booth: #272. 409/792-9552 www.sonictudio.com

QUANTUM5X SYSTEMS QT-256WP: The QT-256wp's proprietary microtransmitter technology is so small, you can hide it anywhere. The frequency-agile QT transmitters have companding pre-emphasis and provide high-quality broadcast audio. It features the latest lithium batteries that last up to 12 hours, with a power output ranging from 50 to 250 mW. It is frequency-selectable from 665 to 765 MHz in four individual blocks. The QT-256wp is made from solid industrial-grade aluminum, providing extra durability and reliability. Price: \$1,750.

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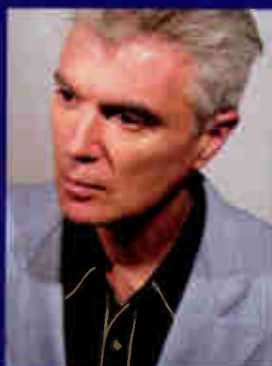
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MUSIC HISTORY COMES ALIVE ON CD BOX SETS BY COUNTRY PIONEER CHARLIE POOLE, BIG BAND LEADER COUNT BASIE AND JAM TITANS THE GRATEFUL DEAD

By Blair Jackson

It's hard to beat a really good CD box set—one that is comprehensive, aesthetically pleasing, historically illuminating and sonically successful. It is easy to get lost in a good box for weeks at a time; I just think of it as leaving the planet for long stretches to enter another time and space. With that in mind, I thought it would be fun to look into the making of three boxes that meet the above criteria and greatly add to our understanding of different idioms. The music on them spans seven decades, from the days of Edison cylinders to the introduction of 16-track. And, stylistically, the box sets encompass everything from old-time banjo music to wonderfully arranged big band tunes to trippy, improvised rock. You won't find any of these on the top of the charts—or on the charts at all—but each is spectacular in its own way and—dare I say—important.

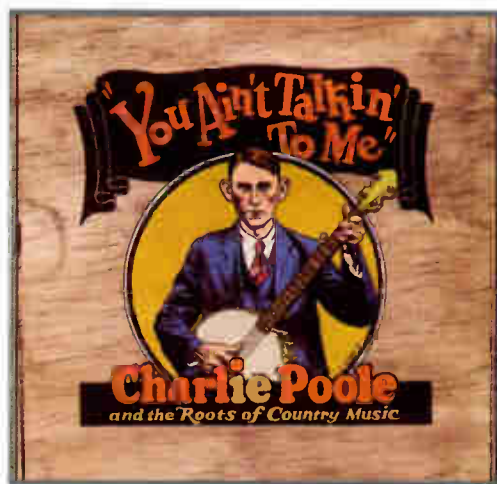
***You Ain't Talkin' to Me:* Charlie Poole and the Roots of Country Music**

Don't be distressed if you've never heard of Charlie Poole—he's never received the kind of attention that, say, Jimmie Rodgers did. Yet he was one of country music's early pioneers, a North Carolina banjo picker and old-time music star who had the first country mega-hit with "Don't Let Your Deal Go Down Blues" in 1925, selling more than 100,000 copies. Poole's career was brief (he was dead from alcoholism by 1931) but brilliant.

He embraced various regional folk styles and incorporated well-known early 20th-century novelty tunes into his repertoire to create a synthesis that influenced many artists who followed, including Earl Scruggs, the "father" of bluegrass banjo. His songs on the famous *Anthology of American Folk Music*, released in the '50s, were emulated and covered by the leading lights of that era's folk boom, too. What makes this three-CD set remarkable is that it not only offers the cream of Poole's output, but also tracks by

artists who preceded him (going all the way back to a 1905 recording) and those who copied him or closely followed in his footsteps. It's a highly entertaining and educational journey, beautifully augmented by compilation producer Hank Sapoznik's illuminating liner notes and copious historical photos.

Sapoznik, whose previous archival work includes a four-CD anthology of early Yiddish music, notes that Poole began his recording career in 1925, "right when a major technological shift had happened and they'd gone to electrical recording, which meant instead of using the horn, you were using a microphone and the vibration of the air to create the sound to



force the stylus to cut into the surface of the disc. And you have a sound that to our ears today is a more accurate and recognizable sound than had previously been possible. Beyond the body of Poole's recordings, however, I wanted to identify recordings from the Paleolithic era of recording, the end of the 19th century—primarily, Edison cylinders and early one-

—CONTINUED ON PAGE 177

TALKING HEADS IN 5.1

RIGHT BAND, RIGHT MEDIUM

By Blair Jackson

Somehow, it makes perfect sense that Talking Heads—one of the most inventive, forward-looking and influential bands of the modern rock era—would be among the vanguard of groups to truly embrace surround sound technology. Early this month, Rhino will release the eight studio albums in the Heads' catalog in a box set of DualDisc hybrid CDs, called *Brick*. One side contains a DVD-A surround mix and the original stereo mix, and the other side the stereo version plus bonus tracks (playable in a conventional CD player).

Former Heads keyboardist/guitarist/singer/arranger Jerry Harrison, a very successful producer for many years (Live, Crash Test Dummies, No Doubt, the Von Bondies), was at the helm of the elaborate 5.1 mixing project, so it was clear the project was in good hands. Ace engineer Eric "E.T." Thorgren, who had been at the board for two of those Heads albums—*Little Creatures* and *True Stories*—was the chief engineer on the remixes, ably aided by Matt Cohen, who has been working with Harrison for the past few years. The mixes were done at Harrison's cozy Sausalito Sound studio, just steps away from the San Francisco Bay and with a wonderful view of Mt. Tamalpais from the deck off Cohen's upstairs work room. It's a *really* nice place to work.

And when I go over to "The Toe," as Thorgren and company have taken to calling it, on a beautiful, sunny day in March of 2004 to hear some early mixes, it couldn't seem more inviting. Shut the door, sit in the



PHOTO: SASHA GULISH

From left: engineers Matt Cohen and Eric "E.T." Thorgren, and producer Jerry Harrison

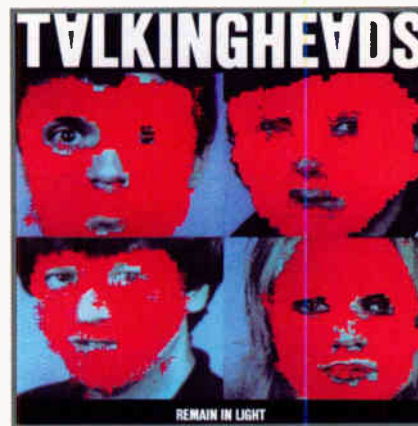
sweet spot and I'm enveloped by one amazing Talking Heads tune after another, the Blue Sky monitors pumping at "11." You've never heard "Burning Down the House" (from *Speaking in Tongues*) quite like this: the front line rocking hard, with drums and bass kicking their way out of the center, vocals cascading out of the front and rears, keyboards dancing beside me left and right. Wow, *this* is what it's all about! In surround, "The Overload" (from *Remain in Light*) sounds like some swirling, *moderne* Pink Floyd track, but feels completely new.

At that point, more than a year ago, the plan was to release just two Talking Heads albums in 5.1 and see how the market responded. "It actually began when we were putting together the deal to do the *Greatest Hits* album with Rhino," Harrison says. "I brought up, 'Well, if we're going to be doing reissues, shouldn't we be doing surround mixes, too?' Rhino was into it, and we identified these two records—*Remain in Light* and *Speaking in Tongues*—as being the most appropriate to begin with."

Fortunately, the tapes were in pretty good shape. Once they had been baked, the tapes were taken over to Penguin Recording in Pasadena, Calif., to be transferred by John Strother to Pro Tools at 192 kHz, "but when we brought it up here to mix," Thorgren notes, "we reduced it to 96 because Pro Tools works better at 96—you get more tracks and can use more plug-ins. We also did a listening test, and with that many channels of material, the difference between 96 and 192

was negligible." Sausalito Sound is equipped with a Pro Tools|HD 6.2.3 workstation, a 32-fader ProControl, scads of plug-ins, three Dangerous Audio 2-bus units and rack after rack of classic and modern outboard gear: Neve, Telefunken and Daking preamps; Universal Audio compressors; and much more. Everything is easily accessible, "set up almost like a Pro Tools plug-in; there's no patching needed," Thorgren says. "So I can say, 'Let me hear the 1176 on the bass. No, that's not right. How about the Distressor or the Neve?' And it's really easy."

However, before mixing began, there was the small matter of figuring out just what the hell was on the tapes. Track documentation was spotty and often confusing. "We'd



put up the stereo mix of the finished record and study it," Thorgren says. "Then I'd sit there and figure out who played what when. They might be marked 'Prophet 1,' 'Prophet 2,' 'Prophet line,' 'Prophet solo,' and on each track, there's all this stuff going on. Sometimes a whole track would play and it would

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PHOTO: AMY EIRA

DEAD KENNEDYS' "CALIFORNIA ÜBER ALLES"

By Heather Johnson

Oliver DiCicco's San Francisco studio, Mobius Music, was only three years old in the spring of 1980. The self-taught engineer had just moved up to 16-track—a 3M 56 2-inch tape machine with iso loop—and had a couple album projects under his belt, mainly in the avant-garde and jazz realms, which allowed him to keep the lights on via live 2-track sessions of complex but generally serene music. At the time, San Francisco was fertile ground for creative new ventures; cost of living was low (shocking, I know); and the city was smaller, livable even for artists and accepting of those who wanted to follow their own path, no matter what path they chose.

Then, in what had to resemble a visit from the Tazmanian Devil, a young band with a big local buzz called Dead Kennedys—Jello Biafra, East Bay Ray, Klaus Flouride and Ted—proceeded to turn Mobius Music and DiCicco's recording methodology upside down when they blazed through to record their full-length debut, *Fresh Fruit for Rotting Vegetables*. Its success not only heightened the Bay Area punk scene's presence, but bolstered the career of one of the most important and controversial punk bands of the genre's history.

Their biting, *über*-left-wing politics and Biafra's dark humor manifested initially on the album's first single, "California Über Alles," an attack on California's then-governor, Jerry Brown, who ran for the Democratic nomination for president in 1976 and 1980. He's now the mayor of Oakland, Calif.

"California Über Alles' was one of the few songs I wrote the music for while jamming on an instrument," says Biafra, who fronted the group until their breakup in 1986 and still runs Alternative Tentacles, the label the band formed in 1979. "I generally taught tunes to the band by voice, but I was playing around on my roommate's bass and came up with the verse riff, and the chorus just popped into my head from there. It was more influenced by Japanese Kabuki music than rock. Thus, the nasal warble of the 'California Über Alles' chorus."

The original version of "California Über Alles" was played by The Healers, a band Biafra fronted in his native Boulder, Colo. Bandmate John Greenway wrote the lyrics based on Biafra's theories about Brown. Biafra rewrote them and later used them with Dead Kennedys soon after moving to San Francisco.

"Boulder had turned into a new age yuppie hellhole long before either of those terms were used in the mainstream," Biafra says. "There were an awful lot of people who thought they were really rebellious and free-spirited, searching for gurus to tell them what to do. This scared me. I thought, 'What if this kind of apathy is going on in a mass scale and people just laid down until a dictator walked in.' It's happened in so many



countries; it's happening to our country right now. And then I thought, 'The one politician who seemed to have a grip on the power of Eastern religious thought to manipulate people's minds in mass, who also had a grip on the American political system, was Jerry Brown.'

Dead Kennedys originally recorded the song in 1979 as a D.I.Y. 7-inch (flipside: "The Man With the Dogs") at Army Street/BSU Studios, a basement 8-track facility owned by Jim Keylor. "A lot of other underground punk music was made there at the time," says Biafra. "It was hard to find an engineer who was friendly to this kind of music because a whole generation of recording engineers had been trained to make mellow, clean, Eagles-sounding recordings. But Keylor knew what we wanted.

"One of my favorite records, production-wise, was an obscure single from England called 'Sick of You' by The Users," he continues. "I showed that to Jim as kind of a guidepost for what I wanted. It didn't come out sounding like The Users, but it did come out sounding pretty damn powerful at the time, and that helped to vault the single into another dimension as far as interest went."

Dead Kennedys sold about 6,000 copies of that 7-inch through their newly formed Alternative Tentacles label. They took the single with them for a few New York City and Boston shows. The owner of Scotland-based record label Fast Product (Gang of Four, The Mekons, the Human League) caught one of their New York City shows and wanted to release the single in the UK. He did, and it promptly entered the Top 10 on what would now be considered the alternative charts. The single's success also led to a UK tour, but first they needed an album to promote. Cherry Red Records funded that project, which included a re-recorded version of "California Über Alles" and "Holiday in Cambodia," another previously released single.



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The band surveyed the close-knit San Francisco studio scene, which was populated with major players such as Fantasy, The Automatt, The Plant, Coast Recorders, Different Fur and Funky Features (which later became Russian Hill), as well as a growing community of one-man operations. Based on their modest \$8,000 budget and a good rapport with DiCicco, Dead Kennedys chose DiCicco's mid-sized Noe Valley facility, which was outfitted at the time with a 16-input Quantum console, a pair of early EPI speakers and a "limited" mic collection that included U47 and U87s, a couple of 421s and a pair of KM84s.

The band set up in the main room with only a few 4-foot-high gobos between them. (There were no iso booths at Mobius at the time.) "It was kind of like a shoebox," DiCicco recalls. "There was carpet on the floor, Fiberglas panels on the walls with burlap on them and then bare Sheetrock. It was a small room and isolation was difficult to achieve. It was probably as bare bones of a recording as you could do. It wasn't fancy, but it was going to 2-inch 16-track, so there was plenty of tape real estate to put sound on. Tape hiss wasn't a problem because the sound never stopped!"

Working at night after bassist Flouride punched out from his day job, the band spent a week on basic tracks, about another week on overdubs, another on background vocals, keyboards and horn overdubs, and a week to mix. For the band, tracking seemed to go relatively smoothly. DiCicco, however, had to "cram 10 pounds of sound into a five-pound bag. With just the drums and bass playing, you could hear things pretty well, but as soon as the guitar kicked in...Ray was like a wall of sound."

That wall of sound came from a Fender Super Reverb, a DOD Overdrive preamp and Echoplex tape delay. "Guitar would go into the Echoplex first, then into the overdrive and then into the super-reverb," Ray says. "So, actually, the echoes were distorted. As the echo's volume goes down, since it's not driving the amp as much, it cleans up. I also put the echo onto a swing time so it would be like a polyrhythm: If the hi-hat's doing eighth notes and the guitar echo is doing dotted eighth notes, they would coincide like every 12 beats."

Ray also used tricks such as overdubbing the verse riff of "Funland at the Beach" Duane Eddy-style, then molting that down in the mix; essentially, layering his guitar parts to, in the words of Biafra, "come as close as we could to capture the fire and extremities of a kick-ass live punk rock show. I was hell-bent on burning down the Hotel California!"

Meanwhile, DiCicco kept one hand on

the fire extinguisher. "When you get to the point where it's as loud as you can get, there's no more dynamic range so it never sounds any bigger. You've saturated everything—the tape, the room, your ears; it's all just loud. Biafra's concern was that it sounded wimpy, but it was wimpy because there was no dynamic other than full-on!"

Upon the advice of famed punk producer Geza X (who recorded "Holiday in Cambodia" and "Police Truck" with the band at Tewksbury Sound prior to the *Fresh Fruit* sessions), Biafra also made sure every word in his lyrics packed a wallop. X also introduced

Ray and Bruce would argue incessantly that I was being too picky about the mix. [But] as Morris the Cat once said, 'It pays to be finicky.'

—Jello Biafra

the singer to higher-quality microphones and double-tracking, which added presence and power to Biafra's distinct warble.

"At Mobius, I was using the same Neumann U47 I use now," Biafra says. "I sang a scratch vocal in the [live] room during the basics and then re-did it. By then, I was using the technique I use today, where I usually blast through maybe three or four takes in a row, and then pick and choose which lines I like the best later. Sometimes I leave a compiled single track, but on *Fresh Fruit*, it's double-tracked."

"Biafra was relatively consistent," adds Ray. "Part of the job was matching the level so that you can't tell that it's a composite. Sometimes he'd do them all in one night. We told him, 'If you do them two days later, your voice is going to be a little bit different, and if you try to make a composite, the sound quality will be a little bit different each time.'" DiCicco often didn't have an open track to comp vocals, so he would have to make notes and edit later.

DiCicco mixed the album to an Ampex 351 2-track machine—a straight-forward process due to a lack of automation and inputs, but challenging nonetheless. Guitars always had to be louder, with voice added on top. Ray usually stayed in the control room with DiCicco, while Biafra stayed in the upstairs lounge, where the speakers apparently sounded a lot like the ones he had at home,

which gave him a good measuring stick for how the tracks would sound outside the studio. "They were mounted on the wall of the room and they had this lamp cord running up to them, so who knows what was going on with the sound of them," adds DiCicco. "But for some reason, Biafra liked the sound of those speakers, so when we were mixing, he'd be up there listening to the mixes and yelling down to me through this door into the control room, and I'd hear him yelling and I'd think, 'Okay I guess that means turn something up,' and then if I didn't get it right, he'd come in and go, 'No, no, no, no.' He was pretty particular about how things were going to sound. Nothing was ever fast enough or loud enough."

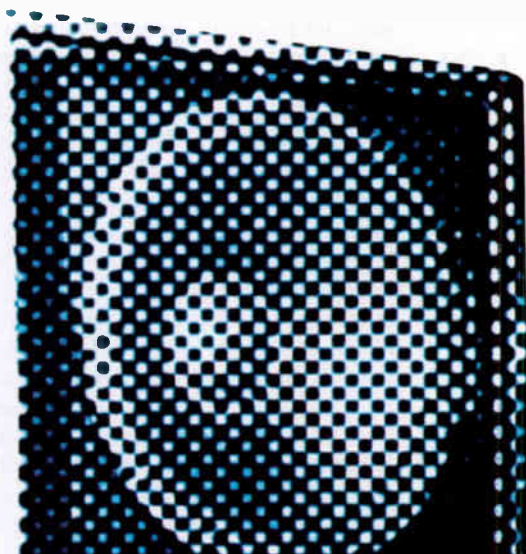
Biafra counters, "Ray and Bruce [aka Ted] would argue incessantly that I was being too picky about the mix, but in the long run, I have no regrets about that. As [9 Lives cat food spokesperson] Morris the Cat once said, 'It pays to be finicky.' People still like listening to our albums, and part of that is because somebody went the extra mile to make sure they sounded good."

Though he had final say on the mixes, Biafra didn't credit himself as producer. Originally, Ray didn't either, although he was heavily involved in the production process. No, the band deferred that honor to Norm, one of DiCicco's two cats who took a fancy to sleeping on the console. "Norm was instrumental in helping us record," Ray says with a laugh.

After *Fresh Fruit*—which some cite as Dead Kennedys' most powerful album—the band recorded *Frankenchrist* in 1985 with John Cuniberti at Hyde Street Studios, followed by their last official album as a band, *Bedtime for Democracy*. (Coincidentally, Cuniberti, who now runs The Plant Mastering in Sausalito, Calif., is remastering *Fresh Fruit for Rotting Vegetables* to be released this month along with a limited-edition DVD on Manifesto Records.) Bitter legal battles over *Frankenchrist*'s album cover art (an HR Giger landscape of, um, body parts) propelled Biafra as a very vocal advocate for free speech and a strong opponent of Tipper Gore's PMRC (Parental Music Resource Center). In the midst of these wranglings, the band disintegrated.

DiCicco promptly returned to recording jazz, new age and experimental music. Less than a year after *Fresh Fruit*'s release, he began recording a series of albums for Windham Hill, including *Winter's Solstice* and *Winter's Solstice III*, among many others. He closed his studio in 2004 after a 28-year run, and now works as a designer and visual artist, builds musical instrument sculptures

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and leads an experimental music project, Mobius Operandi Ensemble.

Of those four weeks in early 1980, DiCicco downplays his role in one of punk music's most memorable records. "I didn't really know what I was doing, but maybe it was better that way," he says. "There was a certain synergy—the band was new, the music was new, I was new—we didn't have time to be jaded about what we were doing. We didn't have time to think about what it all meant."



TALKING HEADS

FROM PAGE 171

just have two little blips on there. I was also concerned with which instruments would have reverb, what type of reverb, the sound of it, the timbre, the length. It was poorly documented."

Cohen adds, "There might be a bass drum for half the track and then it might be guitar for half the track. And then there would be whole tracks of guitar or keyboard that weren't used at all for whatever reason. On 'The Great Curve' [on *Remain in Light*], there were so many sweet lead lines that were not part of the finished recording." "We called it forensic mixing," Harrison adds. "Typically, it would take a day per song just to figure out what was on there."

Once the tracks were sorted out, the greatest challenge in doing the surround mix was "trying to maintain the integrity of the original mixes," Thorngren says. "You want it to sound like the original album as much as possible, but with more dimension, more detail." Even accomplishing that has its pitfalls, as the team learned. "We'd put something in the back [speakers] and think, 'Jeez, that's really distracting,'" Thorngren says. "And then we'd try moving something around, and a lot of times, that wouldn't work either."

"We'd have a guitar part up front and think, 'Let's move it to the back during the chorus,'" Harrison adds, "but then it would sound artificial and the front sounded too empty."

"Eventually, we found the right balance of what felt right," Thorngren says.

Their final approach to mixing the band was fairly consistent and straight-forward: Chris Frantz's drums and Tina Weymouth's bass anchored the middle; David Byrne's lead vocal and his always interesting rhythm guitar parts were up front. Thorngren notes, "I set up left and right as our buses for a phantom center and then took a determined center

send off of that channel at -6 dB. So you can go to the center, and if you shut everything off, you'd have a pretty good drums and bass and lead vocal and parts of the guitars, but you can also shut it off and still get the whole experience. Then, things that were not part of basic rhythm section might fall toward the outsides and the rears."

That doesn't mean that Harrison's keys and various vocal backups were placed *exclusively* in the rear, but that is where some of the music's more ornamental aspects fell, as did various reverb shadows and some effects. A few songs have some movement across the rears, but it's mostly quite subtle. "On *Remain in Light*," Thorngren says, "there were all sorts of sustain-y things and it's re-

It was important for the music to feel 'whole,' and if it gets too spread out or there are too many tricks, it stops feeling like the same performance.

—Jerry Harrison

ally nice to move them. Sometimes we'd find that if you moved things really slowly, you wouldn't really notice it unless you were really listening to that thing, but it created a nice effect."

"It was important for the music to feel 'whole,' and if it gets too spread out or there are too many tricks, it stops feeling like the same performance [as the original mix]," Harrison adds. "Before we started, we did a survey of other surround mixes and we found that a lot of them that sounded pretty good on first listen weren't as exciting as the original because you didn't hear it as a whole—you were conscious of how it had been spread out—and the song didn't have as much emotional impact."

Along the way, the trio employed a slew of tools to optimize the sound, from the Digidesign DNR noise-reduction plug-in used to clean up dirty tracks to Roland's Dimension D chorus, "which added a really nice, subtle color," Harrison says.

Once *Remain in Light* and *Speaking in Tongues* were completed in the late spring of 2004, Byrne popped out for a visit and was extremely impressed, and then the brass at Rhino flipped for the mixes and decided to

turn Harrison, Thorngren and Cohen loose on the rest of the Heads' catalog, which explains how work on the project stretched out for another year (interspersed with other projects they were involved in, together and separately).

When I return to Sausalito Sound in mid-summer 2005, the project is in the can and the team is eager to play me more mixes. Once again, the results are extremely impressive. I rattle off some of my favorite Talking Heads tunes: The big choral opening of "Road to Nowhere" (from *Little Creatures*) sounds like it's ringing through the vaults of some gothic cathedral; and guitar lines and percussion skitter across the rears on *Naked*'s wonderful slice of *Africana*, "(Nothing But) Flowers." The nervous, jabbing stabs of "Psycho Killer" (from *Talking Heads: 77*) lunge from the front speakers. The group's soulful but edgy reading of "Take Me to the River" (from *More Songs About Buildings and Food*) bops and jerks across the surround field, Harrison's keys squawking and singing—a perfect complement to Byrne's vocals. The tribal *Fear of Music* track, "I Zimbra," becomes a veritable orchestra of fascinating polyrhythms and interlocking parts.

With their mixing approach solidified after initial forays, translating the remaining six albums to 5.1 ended up being relatively uneventful. This isn't to say there weren't challenges and obstacles. For instance, the 1979 *Fear of Music* was recorded by a remote truck at the Heads' Manhattan loft rehearsal space and "they used all these room mics that had tons of leakage in them," Thorngren says. "It was a nightmare. On the album, a lot of stuff gets masked by the stereo, but when you start to spread it out—which was hard to do because of the leakage—a lot of abnormalities really stick out. And if there's a vocal take on the overheads and it's not the same vocal [that was used], that's trouble, too."

On the Heads' final album, *Naked* (1988), the problem was multiple clicks and pops: The original was recorded on a Mitsubishi 32-track digital, and when it was transferred to Pro Tools (at Capitol Studios), the anomalies became apparent. "For that, we mainly used a Waves X crackle plug-in and that really worked; it was a savior for us," Thorngren says. "It was a drag, but there was nothing we came across that we couldn't fix."

Other tools used on the second round of mixes included the Culture Culture valve distortion processor (by Thermionic Culture of England), "and we also bought a stereo compressor from that company called The Phoenix," Thorngren notes. "It has no transistor circuitry at all, so it's like a really early compressor. It works beautifully on drums

and it gives the bass a little more *oomph*.”

Listening to concentrated doses of the Talking Heads again, it's hard not to be impressed by their skill, imagination and selfless dedication to the group gestalt. How did the music strike Harrison after all these years? “There were a few embarrassing moments, but most of the time, it was pretty great,” he remembers. “What really comes through is the sense of inventiveness and excitement. Everyone was aware we were charting some new territory, but we weren't really sure where it was going.”

That is why the music still sounds fresh today—and better than ever in 5.1. ■

RESTORATIONS

FROM PAGE 170

sided discs. The problem there is that if you put a recording from 1903 next to one from 1930, you run the risk of giving the listener the equivalent of audio whiplash. So the matrix we used was great performance, great condition. A bunch of stuff I wanted to use I didn't end up using because the sound was impossible.”

The ideal for these sorts of projects is to locate as many metal masters (or “mothers”) as possible; then, as a last resort, go to record collectors and find the best copies possible. When Sapoznik did the Yiddish box, “of the 100 tracks we chose, I was able to locate metal parts for about 95 of them. On this one, out of 73 tracks, we could only come up with two! It was stunning to see how little remained in the vault. There are very few metal masters for all the great early blues stuff, the jazz, the early country. A lot of it just disappeared through the years, but there were also things like during World War II, there would be a scrap drive and the record companies would give them the metal parts! What's interesting is that metal parts for various ethnic styles—Hawaiian, Irish, Yiddish—exist in much greater numbers. I have no idea why.”

Searching for the optimum Poole recordings wasn't too hard: Sapoznik is well-connected and the old-time music community is tight-knit. However, finding some of the earlier Edison cylinders was more challenging. “A lot of the folks who collect the older stuff don't know anything about 78s. When I was looking for the original ‘Monkey on a String,’ I'd say [to a cylinder collector], ‘I'm doing an anthology on Charlie Poole.’ ‘Who's that?’ ‘He recorded in the '20s.’ ‘Oh, I don't listen to that modern music!’”

For the Poole set, Sapoznik enlisted the

aid of Christopher King, whose transfer and restoration work on various collections of 78s through the years has earned him tremendous respect in the record-collecting community. “When I heard what [King] did with *Down in the Basement* [a wide-ranging anthology of old 78s released in 2003], it changed how I heard these records,” Sapoznik says. “These songs had the most breathtaking presence to them. Most of the time in remastering, people tend to use too much technology because there's such an obsession with getting rid of noise. With Chris, his aesthetic reflects mine in that I prefer a hot transfer. I prefer one with more ‘noise’ in it because in that crackle—in that top part of the sound cycle—you have the overtone series of the instruments. Not only does Chris know how to make transfers, but he's also incredibly savvy: He can look at a record and decode the markings on it and tell you how early in the pressing process the record was. So he can say, ‘This is in excellent condition and it's made from an early cycle of the stamper,’ which is a good thing, because the earlier in the cycle, the crisper the cut.

“What Chris was able to do was not only locate the best-condition copies, but he kept working with different-sized styli, trial-and-error, to find something that would



Charlie Poole (sitting) with the North Carolina Ramblers, circa 1927

really work the groove wall and get the most sound out. In a tune like ‘Flop Eared Mule,’ the payoff was that we not only got a cleaner transfer than had ever been done before, but



Producer Hank Sapoznik also worked on a Yiddish music anthology.

we actually heard something that no one had ever heard before. Right before Poole is about to take his famous banjo break, you hear him say, ‘Aww-right!’ That might not sound like a huge thing, but to people who know and love this music, it's like a message in a bottle that finally showed up.”

King made his transfers to DAT and then handed those recordings to digital mastering engineer Darcy Proper “to sharpen the sound of the transfers,” Sapoznik says. Then, Andreas Meyer applied some judicious CEDAR magic to certain “difficult” tunes. “Andreas and Darcy both shared my appreciation for the overtone series, and [Meyer] used the CEDAR to its optimum effect and with incredible nuance and shading instead of putting ‘cheese’ on top of the sound—what I call pamesan remastering,” he says with a laugh.

In an era when record labels are routinely slammed in the press for their lack of vision and playing it safe, Sapoznik gives high marks to Sony Legacy for letting him put together this superlative box, which will only enjoy a niche audience. “We'd have meetings [at Sony] in these rooms with posters of Michael Jackson and Christina Aguilera, and I'd be in there saying, ‘So, what do you think? Should we use the Uncle Dave Macon track?’ It was pretty strange. But they were great every step of the way, and now we have this box that we can be proud of and hopefully speaks across the decades.”

The Poole box is in quite a few record stores, but also available (cheap!) online at www.legacyrecordings.com.

The Complete Clef/Verve Count Basie Fifties Studio Recordings

Scott Wenzel, a producer for the fantastic jazz reissue label Mosaic Records, knows a few things about 78s. As a kid growing up in Rye, N.Y., he became fascinated with the medium and would scour the nearby dump looking for records. By now, he's amassed more than 10,000 78s of every musical style, though his great love has always been jazz.



Count Basie's box set producer Scott Wenzel

With Mosaic, he's produced boxes by Louis Prima, Mildred Bailey, Harry James, Bunny Berigan and others, often using his connection in the record-collecting world. For his latest Mosaic opus, *The Complete Clef/Verve Count Basie Fifties Studio Recordings*, there was no great call to collectors or searches of dusty attics. For many years, Count Basie's 1950s Verve output has been lovingly kept in the climate-controlled confines of one of Iron Mountain's famous storage facilities. Hell, these tapes, recorded between 1952 and 1957, didn't even need baking!

The music on the eight discs is often sublime: big, brassy, swinging dance tunes; dreamy ballads; and plenty of Basie's deft, economical piano. "What happened with Count Basie is that he reinvented himself in the '50s," Wenzel says. "He had those marvelous '30s and '40s bands with people like Lester Young, [Harry] Sweets Edison, Buck Clayton and all those guys. But by the early '50s, the big bands weren't as popular as they had been, so when Basie came back—mostly from the persistence of [singer] Bill Eckstine—with his New Testament band and was so successful, it was really a resurrection of his career." Using mostly new players, a broad selection of old and new tunes, and even some new charts of songs his previous groups had made famous, Basie proved once again to be one of the most popular purveyors of big band jazz, and his group became a launching pad for a number of great players.

Norman Granz produced all of Basie's Clef and Verve recordings. "He was one of the most remarkable impresarios that jazz ever had," Wenzel comments of Granz. "In this particular period, he was all over the place. He was doing the Ella Fitzgerald songbook, he was doing all sorts of small groups with Bird [Charlie Parker]—*Bird With Strings* was one of his babies—a little bit of everything."

The bulk of the superb recordings were made at Fine Sound, located at 711 Fifth Ave. in Manhattan, the site of NBC Radio's first studios in the late '20s, and then home to World Broadcasting and, later still, MGM, which owned a share of Fine Sound. There were two large music studios, A and B, and a third smaller room (C) that was used as a film mixing and dialog recording studio. Most, if not all, of the Basie sessions would have been done in Studio B, engineered by either studio owner Bob Fine, Aaron Nathanson or Al Mien. (Alas, there are no engineer credits on the exhaustively annotated session notes for the Basie box—not unusual for that era of the "invisible" engineer!) Fine had worked with Granz on a wide variety of projects already (Bird, Billie Holiday, Bud Powell) and was an experienced hand at recording big band music, so he was likely involved in some or most of the Basie sessions.

According to Bob Eberenz, chief engineer at Fine Sound during the '50s, Studio B was a large room by today's standards, measuring 55x38x25 feet. The console was a custom RCA model with 12 inputs and two output buses, although it was mainly used for mono recordings until the late '50s. The console went through an Altec A322 compressor/line amp on its way to the distribution bus. There were two Fairchild full-track tape decks (before early 1953) or two Ampex 350 recorders, which would run simultaneously (one for backup). Monitoring was through an Altec 604. The console had no EQ or effects; however, there was an echo send and return, and the studio could be patched into one of two live chambers (equipped with a 604 and RCA unidirectional mics) located under the eaves of the building's roof. According to Fine's son, Tom, who talked some shop with his father (who died in 1982) and is still in touch with Eberenz, miking for the Basie sessions might have gone like this: RCA 44s on the brass, Telefunken U47s on woodwinds, RCA 77s on the bass and perhaps drums, and an RCA 44 on Basie's piano. "For a large band," Tom Fine says, "my father probably would have used all 12 channels on the board. He liked to mike and mix by section, letting the musicians form the balance themselves and then capturing their ensemble balance."

Whatever the specifics of the methodology, what we have are a series of exquisitely clear and dynamic recordings. A look at the tracking sheets shows how efficient Granz, the engineers and musicians were; sometimes, they would record up to seven masters in a single session. Needless to say, everything was live.

Like the Poole recordings, the first of these Basie sessions took place at a transitional

point: In this case, 78s were on the wane and 45s and 33½ LPs were starting to dominate the market. "In 1952, they were still making 78s, mostly for jukeboxes," Wenzel says, "and record players still had a 78 [setting], but the change had really been completed by then." All the recordings were in mono, save for two 1956 sessions cut at Capitol Studios in L.A.

Ellen Fitton did the transfers from original tapes to 24-bit DAT. "Then," Wenzel says, "once I got all of the takes down from the original reels and we exhausted all the tapes that existed from Basie and his band, I put them on a CD-R for reference. Then I went through my collection and others' collections and the Institute for Jazz Studies and listened to the 45s and 78s of those songs because it's well-known that Granz would sometimes issue one take on the LP and then put another take on the single. I'd have two headphones where I'd be listening to two simultaneously, checking them against each other to see if they're different." All in pursuit of the "complete" recordings.

The Basie box is available at www.mosaicrecords.com.

The Grateful Dead: *Fillmore West 1969—The Complete Recordings*

Even for a group that has already released literally hundreds of hours of live recordings, this is a milestone. This limited-edition (10,000 copies) 10-CD set must be regarded as the crowning achievement of the Dead's most adventurous musical period. These four concerts (February 27, 1969, through March 2, 1969) yielded the recordings that were used on the group's most magnificent psychedelic opus, *Live/Dead* (released in November 1969), and represent the apex of their improvisatory genius. Boasting four versions each of their late-'60s classics "Dark Star," "St. Stephen" and "The Eleven," plus favorites such as "Alliga-

Grateful Dead's box set engineer Jeffrey Norman



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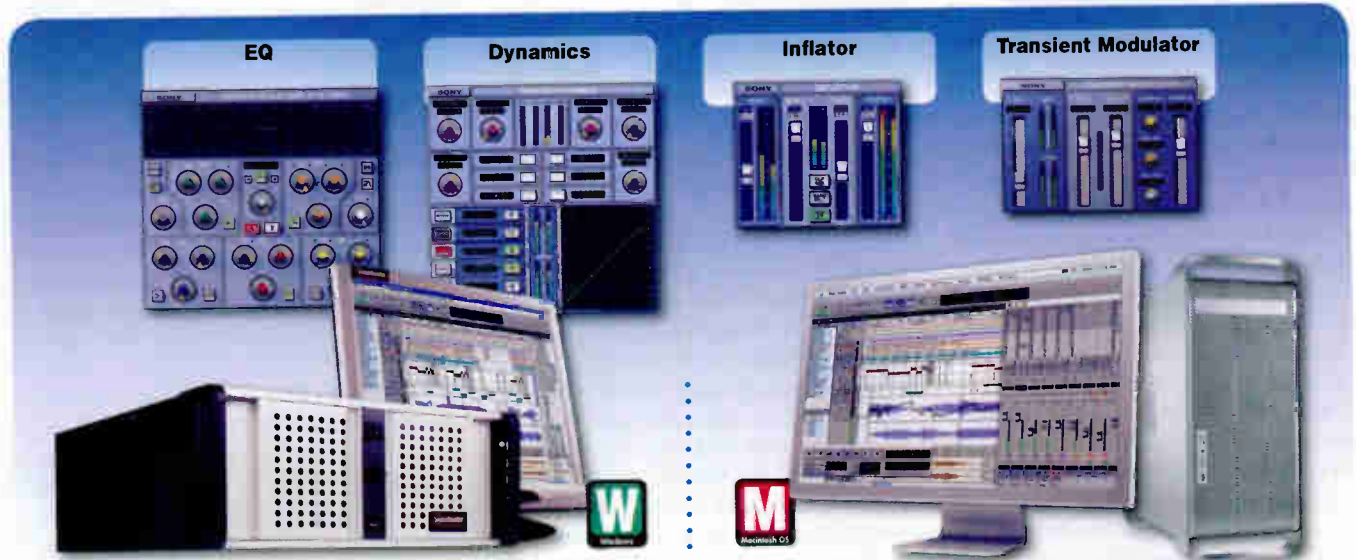


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PHOTO: MICHAEL MERRITT

The Grateful Dead jamming onstage, February 27, 1969—captured live and included in the upcoming box set

tor,” “Caution,” “Cosmic Charlie” and others, the box captures the group right before they began a slow evolution toward the country musings of *Workingman’s Dead*.

Aside from being the most jaw-droppingly intense music to come out of San Francisco in the late ‘60s, the Dead’s Fillmore West shows have some historical significance in the audio world: These were the first live 16-track recordings ever made. It helped that Ampex, which first developed the 16-track by converting a 2-inch video machine to an audio-only function, was based down the road a ways from San Francisco. Pacific Recording in San Mateo was the first local studio to take delivery of a 16-track, right when the Dead were in the thick of recording their third album, *Aoxomoxoa*, on 8-track. The Dead convinced Ampex to lease them a 16-track—the third made—to capture some of their live performances. And so Dead engineers Bob Matthews and Betty Cantor and a couple of beefy roadies maneuvered the 750-pound behemoth up the stairs of San Francisco’s Fillmore West ballroom to record the band for a live album.

“The process by which we recorded was a simple one,” Matthews recently told David Gans on the *Grateful Dead Hour* radio program. “Microphones [were] placed on the stage that [were] used for the P.A. split and [those] same microphones went directly to channels on the tape machine with no signal processing in between. No artistic decisions were made [concerning] the electronic signal.” Later, when he went to mix what became *Live/Dead* (culled from parts of two of the four concerts), he used “a fairly complex set of delays and reverbs to recreate that feeling of being in [the Fillmore].” One advantage of using the 16-track is that it allowed the use of 14-inch reels, “which at 15 ips allowed you to record continuously for an hour-and-a-half, and, of course, with the Grateful Dead [who rarely stopped between songs in those days, instead threading their songs together with long jams], that was very

important,” Matthews said.

As wonderful as *Live/Dead* sounded upon its release 36 years ago, when it came time to put together the *Fillmore West* box, there were a few sonic problems and anomalies that had to be dealt with by veteran Bay Area engineer Jeffrey Norman, who has spearheaded the audio side of the Dead’s ambitious archival release program for the past several years.

One is that the Dead’s two drummers, Bill Kreutzmann and Mickey Hart, had just two tracks each. “They put the kick and the snare on the same track, and the reasoning probably was, ‘Well, the snare is going to be the high end of the spectrum and the kick is the low end, so we can kind of deal with it that way,’” Norman says as he sits at the Neve VR console in the Dead’s Marin County studio. “And to some degree that’s true, but the blends of the two vary from night to night and there’s distortion on a lot of it. Fortunately, each of them had another overhead track that was cleaner, so I’m trying to feather those in and use the overhead to do whatever I can. I also mult that one kick/snare track into two faders and treat one like a snare and the other like a kick. Some of the vocals, particularly Jerry [Garcia’s], are distorted, too. If you listen closely to *Live/Dead*, you hear it a little bit, though I think that album sounds great.”

Early on, Norman “realized there were some things that could benefit from going over to a workstation: no tape degradation with repeated passes, selected noise reduction and the ability to move time slightly so that instruments are more time-coherent,” he says. “So I transferred it all to Pro Tools at 24-bit/96 kHz and started mixing, and I was really disappointed in how things were sounding, particularly on something like ‘Doin’ that Rag’ from February 28, 1969, where Jerry’s vocal was so distorted. What I’ve figured out is that analog-to-digital converters—even good ones—have a very difficult time accurately recording distortion and they have their own level of distortion.

“If it’s really clean, they might add things the ear doesn’t pick up,” Norman continues. “But when there’s audible distortion, they make it even worse. So I went back and talked to Steve Jarvis and rented his Genex A-to-Ds—now I’m using his D-to-As as I’m mixing—and then, for the vocals, I rented a CEDAR Cambridge, which is pretty incredible for the de-clipping. It’s eight channels of a lot of restorative elements: It’s able to analyze where a clip is or too hot a level and to interpolate on either side of that. It wasn’t quite as successful as I had hoped it would be, but it was definitely an improvement on those vocals.”

Norman also dealt with the incredible amount of bleed on many of the tracks. He pulled up singer Ron “Pigpen” McKernan’s lead vocal on “Alligator,” which revealed Garcia’s guitar nearly as loud as the lead vocal. Both of bassist Phil Lesh’s tracks have prominent drums, organ and rhythm guitar, in addition to Garcia’s axe. “Jerry’s guitar is in *everything*,” Norman says with a smile. “Fortunately, he was playing *really* well.”

Speaking more generally of his approach to mixing these tapes, Norman says, “I get a good, rough bed of everything set up and get the tones and reverbs I’m going to use, start someplace in the computer and usually the first thing I mix is the vocals because there’s so much ambience and leakage that I find it a lot easier to get the vocals in a rough position and then bring them up and down, depending on when they play. So when it’s a jam, the vocals aren’t in there; when they’re singing, they’re in there and I can tailor the other instruments around the vocals. It helps me make that weave together.”

Among the other gear Norman employed for the mix were the Neve VR’s EQs, Summit Audio compressors, Pacific Microsonics 2-track A/Ds (the Dead have long-supported HDCD) and a Fairman tube mastering compressor, a Danish box akin to a Fairchild that Norman uses on bass. He adds, “I always mix back to analog tape because it still sounds the best. I have an Ampex ATR in like-new condition—thanks to Mike Spitz—and I mix to half-inch with Dolby SR.

“Once I get past the technical things, which I guess is what I’m here for, the music is just so great; it’s spectacular,” Norman concludes. “I mean, anyone who can sustain a 25-minute jam and have it be interesting the whole time—that’s just *incredible*!”

The *Fillmore West* box, which also includes a 100-page booklet containing photos and an essay by historian Dennis McNally, doesn’t ship until mid-November, but can be ordered now through www.dead.net. ■

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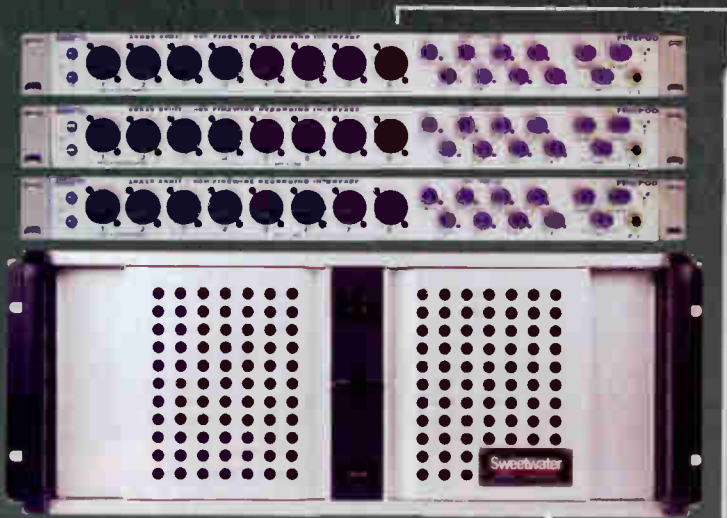
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L.A. GRAPEVINE

by Maureen Droney

Playing for Change is an extraordinarily soulful new documentary (and accompanying soundtrack CD) that offers an inspirational glimpse into the lives of a group of diverse musicians who perform on the streets and in subways across the United States.

Conceived by Grammy-winning audio engineer-turned-filmmaker Mark Johnson, and realized by Johnson, co-director/cinematographer Jonathan Walls and

PHOTO: MAUREEN DRONEY



Mark Johnson mixed part of *Playing for Change* at his studio

producer Whitney Kroenke, *Playing for Change* (www.playingforchange.com) was filmed in New York, Los Angeles and New Orleans, and has already aired on the Sundance Channel and garnered awards at two European film festivals.

Johnson counts among his engineering credits Keb' Mo', Los Lobos and Rickie Lee Jones, among others, so it's no surprise that the film sounds great. "The point of this movie was to show street musicians in their usual environments," he comments. "We wanted to capture the emotion and excitement, and to let the audience be a part of the experience rather than having it interpreted and filtered for them."

Johnson had been kicking the concept around for some time, but the project really began one day in Manhattan when he came across something particularly captivating. "I was on my way to work at

a recording studio," Johnson says, "and in the subway were two monks painted in white from head to toe. One was playing classical guitar; the other was singing in a language I couldn't understand. They were so good, my jaw dropped. There were maybe 100 people in the subway, and we all just stood there. That was the catalyst: I wanted to go out and find as much of that kind of experience as I could."

In Los Angeles, Johnson enlisted Walls, whose work he'd admired; then Kroenke came on board with financing. "Whitney loved the idea," Johnson says, "but she felt that the film needed another element. We decided to incorporate a song on which musicians from all over the country—and, ultimately, the world—who'd never met would add their own parts."

Capturing performances proved difficult and Johnson had to devise three different recording rigs. He and Walls first went on scouting expeditions, carrying a small setup. "We'd run around the city and see what we could find," Johnson relates. "I'd take a Grace Lunatec stereo battery-powered mic preamp, a Tascam stereo DAT machine with Echo Charge batteries and a couple of Schoeps mics in a backpack. I also used a laptop with Nuendo and Metric Halo, the hardware audio interface with 96k sample rates and built-in mic pre's. Everything we recorded; some of it made the movie."

At other times, Johnson, Walls, Kroenke and B camera operator/still photographer Tahitia Hicks used three cameras and a larger recording setup powered by golf cart batteries in wheeled road cases. Johnson credits audio dealer Mickey Houlihan, owner of Boulder, Colo.-based Wind Over the Earth, for help with gear and rig design. The main rig, which recorded to Sony DA78 digital multitracks, includes

—CONTINUED ON PAGE 188

NASHVILLE SKYLINE

by Rick Clark

When I think of musical chairs in the music industry, I automatically think of A&R gigs. People come and go into that position all the time. However, there usually isn't much movement in the local studio manager world. Nashville's studio managers often hang at certain facilities for long stretches, building valuable relationships. These studio faces learn clients' likes and dislikes and fine-tune the personal level of service that keeps artists, producers and engineers returning. After all, the studio business is a service business.

This is why the recent spate of turnovers of Nashville studio managers is so unusual. Here is a rundown (try to keep up): Scott Phillips, studio manager for Emerald, left when the new owners took over. He started at Blackbird this week in the same position. Milan Bogdan, former studio manager at Emerald, and Susan White, former studio manager at Sound Stage, both head to the new Masterfonics as studio manager and client services rep, respectively. Glenda Cones is the new studio manager at Ocean Way. Janet Leese left Sound Kitchen and went to Starstruck, and Sharon Corbit left Ocean Way and went to Sound Kitchen. Amy Hendon left Paragon and that position has not been filled. Now that's quite a lot to remember, but there you have it.

So if you go to Ocean Way looking for Corbit, you need to head down to the home of the Big Boy off of Seaboard Lane in Cool Springs to find her. Cones, who ran the intern department at Belmont for almost 10 years, is wonderful and she's more than familiar with Ocean Way. I'm sorry to see Hendon split Paragon, but she has moved on to the publishing world as a song-plugger, something I'm sure she will excel at doing.

Moving on, because this is the AES issue, I should point out that John McBride's super-studio, Blackbird, and its audio gear rental division are taking the highly unusual step of setting up a large booth (number 860) at the New York AES show. This comes on the heels of opening

NEW YORK METRO

by David Weiss

its fourth studio within the complex (one designed by George Massenburg) and signals McBride's intention to take his coveted gear collection national and offer it for rentals in other markets.

Blackbird Audio Rentals manager Rolff Zwiep says he is excited to show off the collection to engineers who may not be familiar with the rare and vintage pieces. "We have been adding pieces every month and I can say definitively that this is the largest inventory of gear anywhere," he says of the more than 800 vintage microphones in stock and the extensive collection of outboard equipment that ranges from current in-demand items to some of the most exotic and esoteric pieces imaginable.

"Our equipment inventory includes dozens of EMI EQs and comps," he lists, "35 Pultecs, over 100 channels of Telefunken tube preamps, Digidesign HD, API pieces in all shapes and sizes, Chandler, SPL, Helios, Apogee, Martech, Decca, 30 channels of Fairchild compression, Crane Song—among them the sought-after Spider and STC-8 compressor—Teletronix, GML, UREI, RCA OP-6 tube preamps (among other RCA vintage tube pre's), SSL, Tube-Tech, Universal Audio, Lavry and Manley Labs, as well as mics from Altec, AEA, AKG, Royer, Neumann, Korby, Telefunken, Coles, RFT, RCA, Shure and Schoeps, to name only a few."

—CONTINUED ON PAGE 188

PHOTO: RICK CLARK



Members of the revolving door of studio managers, from left: Sharon Corbit (Sound Kitchen), Milan Bogdan (Masterfonics), Scott Phillips (Blackbird), Susan White (Masterfonics), Janet Leese (Starstruck)

New York City may not be a perfect place, but it's certainly got the perfect name. The first word in its name is all about the spirit of discovery and optimism that constantly fills the people and the streets; the second word is a throwback to an Olde World location and state of mind; and the third word—well, it's a city and then some. The lifecycle that New York City's name suggests apply to almost everything; lately, that goes double for recording studios.

Rebirth is fully in effect at one of Manhattan's largest and most storied facilities, Quad Studios (www.quadstudios.com), which has been home to some of the biggest names in music since opening in 1977, including Aretha Franklin, John Lennon, Madonna, Bob Marley, Paul McCartney, Diana Ross, U2 and a ton more. Although it grew from one original room at its heart-of-Times Square location to a five-story SSL powerhouse, the same tough economics that have bedeviled many of New York City's biggest recording facilities finally convinced Quad founder Lou Gonzales that it was time to part ways with his Manhattan landmark. Now, a deal brokered by David Malekpour of Professional Audio Design has given new life to at least one new audio concern in the tower at 7th Avenue, with another one possibly completed by the time this column goes to print.

For signs of immediate change, look to Quad's former top floor, the famed 3,000-square-foot penthouse where untold sessions took place. While the incumbent SSL 9080J console remains, the facility has a new name: Tainted Blue Productions (www.taintedblue.com). Founded by the young, formerly Boston-based production team of Andrew Koss and Patrick Shaw, Tainted Blue is a sharp synthesis of analog and digital production approaches. "A lot of

PHOTO: DAVID WEISS



Patrick Shaw and Andrew Koss (center) of Tainted Blue, with studio designer Larry Swist (right)

people in the industry veer one way or another. There are analog guys that say, 'I don't like MIDI,' and MBox guys that wouldn't know how to touch a real compressor," Koss says. "It's always a fear of the other, but the coolest things happen when you put them together."

"I'd reached the point where I couldn't do anything more in the digital world," adds Shaw. "We realized that if we wanted that great live sound, we needed a great live room." Tainted Blue now has that, thanks to what is being termed an "environmental redesign"—as opposed to a total acoustic overhaul—of the well-known space. Designed by Lawrence P. Swist Designs and Evenfall Acoustics, the warm wood appointments and polycylindrical clouds help extend the reverb time to nearly a second.

The real excitement manifests itself in the control room, where Koss, Shaw and Swist collaborated to create a highly advanced production environment featuring a remarkably transparent workflow between the SSL 9080J, Apogee/Pro Tools|HD3 system and full-power hard/soft synth pod located behind the producer's desk. Smart ergonomic touches include dual Pro Tools KVM setups for the console engineer and synth pod operator, and a sliding MIDI control section from the pod that extends out to the SSL, making the room ideal for a wide variety of

—CONTINUED ON PAGE 190

IN SEARCH OF A NEW ATMOSPHERE NYC ENGINEER LAUNCHES SONOSPHERE

More than 20 years of 12-plus-hour workdays, compiled with the daily stresses of Manhattan life, can certainly take its toll on a person. Just ask engineer Bryan Martin, who *was* that guy until early this year, when he and his family moved to the more laid-back environs of Montreal. Admittedly burnt out on recording but still infected by the music bug, Martin opened Sonosphere (www.sonosphere.ca) and promptly carved himself a niche as the progressive city's only existing mastering facility. "Quality of life and dumb luck coincided," says Martin, whose wife is a Montreal native. "I'm an audio lifer, so I couldn't *not* be in audio. But I couldn't continue and make records in a computer. Now, I don't have to compromise. I can be excellent every day."

Located downtown in a converted industrial space, Sonosphere doesn't compromise in terms of acoustics. Martin hammered "every nail himself," creating a warm, acoustically correct environment within the building's massive concrete framework. Martin's Sonic Studio system is augmented by Prism Sound ADA-8 24/96 converters, a Manley Variable Mu compressor/limiter, Masselec MEA2 stereo equalizer, Weiss DS1-MK2 24/96 dynamics processor, Z-Systems routing and EQ, and a monitoring system comprising Bryston 4B amplifiers and BP20 preamps and Dynaudio Special 25s. Sonosphere can accommodate most analog and digital formats, and should begin handling 5.1 projects by the end of the year.



Owner/engineer Bryan Martin (inset) works on a Sonic Studio mastering/editing system in his Montreal studio, Sonosphere.

Aside from broadening his client base of Montreal-based and regional acts, Martin plans to design and build custom EQs and preamps for the studio—something he finally has time for now that his workdays fall closer to a reasonable eight-hour shift. "And when we build our own stuff," he adds, "again, no compromise."

BEHIND THE GLASS

CUTTING LOOSE MCLAUGHLIN TRACKS NEW CD



From left: assistant engineer Anthony Gallo, Chris Griffin, Dennis Chambers, Zakir Hussain and John McLaughlin

Guitar virtuoso John McLaughlin has been cranking away on his forthcoming CD, working at various facilities with fellow greats such as Michael Brecker, Bill Evans, Ada Rovatti and Eric Johnson. Recently, he stopped by the Cutting Room (New York City) for percussion and guitar overdubs.

Percussionist Zakir Hussain strolled in with a set of tablas, and drummer Dennis Chambers brought a kit that included six toms. Engineer Chris Griffin says that McLaughlin incorporated MIDI with his signature complex riffs. "He pulled up stock synths in Logic Audio, then used that to trigger, along with his audio," Griffin says. "He sent me MIDI through his Roland rig—then just went to town."

THE JUNIOR SENIOR MIX DANISH DUO VISITS EAST IRIS



Taking time out from mixing, from left: artist Junior, East Iris studio manager Mike Paragone, mixer David Leonard and Senior in East Iris' Studio B

Danish duo Junior Senior brought their latest batch of indie Euro dance tunes to East Iris in Nashville, where they mixed with engineer David Leonard. Leonard mixed to Pro Tools on the studio's SSL 4000 E Series console, which comes paired with a 16-channel sidecar. Shuttling rough mixes back and forth between Denmark made the process somewhat challenging, Leonard says, but fun nonetheless. Look for their album on Crunchy Frog Records (www.crunchyfrog.dk).

HOUSTON HOTSPOT MASON ROAD VISITS SUGARHILL



From left: Mason Road's Brian, Dan Workman, Sanctuary Urban A&R director Huy Nguyen, bandmember Vaughn and Steve Christensen

Music World/Sanctuary Urban, whose roster includes such artists as Jon B.; Earth, Wind & Fire; Keith Sweat; Solange Knowles; and Wu-Tang Clan, among others, chose SugarHill Studios in Houston as the spot to mix "Can't Make You Love Me," the debut single for new R&B group Mason Road. A&R director Huy Nguyen oversaw the sessions, which were mixed by SugarHill president Dan Workman and chief engineer Steve Christensen.

HYDROGYN ROCKS IT QUARTET ENTERS WIREWORLD



From left: singer Julie Westlake (seated alongside Savannah), guitarist Jeff Westlake, guitarist Jeff Baggs, producer/engineer Michael Wagener, assistant engineer Ryu Tashira

Hard rock band Hydrogyn moved into WireWorld, producer/engineer Michael Wagener's studio located on the outskirts of Nashville, to work on their new album, *Bombshell*. The drummer played all 15 songs in two days, and Wagener captured it all (and the rest of the band) using his Euphonix R-1 and a "boatload" of outboard gear.

TRACK SHEET

NORTHEAST

Producers Jason Corsaro and Ben Elliot visited the Barber Shop Studios (Lake Hopatcong, NJ) to work on the upcoming release for Christian rock band Countd...Honor Among Thieves tracked a new album at Target Studios (Elkton, MD) with engineer Randy Adler...Avatar (NYC) kept super-busy when Ross Petersen engineered Windup Records acts Megan McCauley and Dmnsoul, produced by Will Baker and Gregg Wattenberg, respectively. Producer/mixer Rich Costey overdubbed and mixed Franz Ferdinand's new album, and producer Tom Schick chose Avatar's new Kevorkian Mastering to wrap Ryan Adams' new one with engineer Fred Kevorkian...Burning Spear lit up the Magic Shop (NYC) when he tracked and mixed his new album with engineer Nino Caccavale. Producer John Goodmanson mixed bands Socratic and Rogue Wave; and Greg Fidelman overdubbed Life of Agony vocalist Keith Caputo...Laughing Dog Studios (NYC) finished working with Journey lead vocalist Steve Augeri on four songs for the band's new album. Kevin Elson produced; Bill Donnelly engineered...Threshold Music (NYC) welcomed vocalist Michael Cavanaugh, recording with engineer Kato Khandwala; Ari Hest tracked and mixed with engineer Dan McGloughlin; Nothing Rhymes With Orange recorded and mixed with Khandwala and producer Bill Aucoin...Mark Radice "turned" to Turn Wright Recorders (Delran, NJ) to track his latest with engineer Jack Wright...Sound on Sound (NYC) hosted Judy Collins with producer Steve Buckingham and engineer Alan Silverman; Blindside with producer/engineer David Bendeth; Desmond Child with engineer Victor Mancusi; Papa San with engineer Brian Stanley; and Chico Hamilton with Chris Fasulo.

MIDWEST

The soundtrack/5.1 mix for *TimeSpace, The Infinite Adventure*, a show for the Adler Planetarium and Astronomy Museum in Chicago, was produced by Mark Paternostro and Mathew Mascheri at Effigy Studios (Madison, WI)...Aberdeen Recording Studios (Aberdeen, SD) welcomed singer/songwriter Sierra Weiland and rock band Quarter to Nine; both are signed to the studio's new label, Aberdeen Originals...Catherine Schell finished her debut at Chicago Recording Company (Chicago). Mathieu Lejeune and Stefan Clark produced. Kanye West worked with engineer Chris Steinmetz on new material, while the CRC Mobile Unit traveled everywhere from Bonaroo to the Hodag Festival...Gravity Studios (Chicago) reports activity with the Secret Machines, recording/mixing with engineer Brandon Mason. Kasabian tracked a song for the upcoming film *Hooligans* with producer Jim Abbiss. Story of the Year tracked their latest with producer Steve Evetts; and Umphrey McGee tracked/mixed a double disc with Kevin Browning and engineer Manny Sanchez...Chapman Recording (Kansas City,



Ontario-based rock band Cherry Suede stopped by The Clubhouse (Rhineback, N.Y.) to record with producer/engineer Rick Slater. From left: bandmembers Randy Young and Randy Scott, Rick Slater, assistant Mukh O "OT" Turbolt and guest keyboardist Zoch Provost.

MO) hosted a session by TECH N9NE for EA Sports' *Madden NFL 2006*, engineered and co-produced by Robert Rebeck.

SOUTHEAST

Brendan O'Brien mixed tracks for Audioslave at Southern Tracks (Atlanta) with engineer Nick DiDia. DiDia also handled the 5.1 mix for The Offspring's *Greatest Hits*. Third Day returned to work on their forthcoming release with engineer Karl Egsieker...Parallel chose Catalyst Recording (Charlotte, NC) to record their sophomore release with producer Rob Tavaglione; Dave Harris mastered in Studio B...The Sound Lab (Smyrna, GA) welcomed Don P of Trillville, who was in working with engineers Jai Hutcherson and Jan Nerud. A Few Good Men mixed three good songs with Nerud; Crime Mob and Lil Scrappy worked on new projects with Hutcherson and Taj Mahal...Texas Treefort Studios (Austin) got a visit from Bob Schneider and engineer Dave McNair, who were in recording a new album, as was Charlie Sexton.

NORTHWEST

Michael Tolcher and band visited OTR Studios (Belmont, CA) to record a live session with Cookie Marenco. Marenco and Jean-Claude Reynaud mixed a project for Garrett Brennan on the Sonoma digital system...Nettleingham Audio's (Vancouver, WA) Kevin Nettleingham mastered releases for PDX artists Qwong, Brandon Moor, Rich Layton & The Troublemakers and Lisa Marie Buster.

SOUTHERN CALIFORNIA

Oasis Mastering (Studio City) engineer Eddy Schreyer wrapped up a new Sublime tribute featuring No Doubt, Jack Johnson, G. Love and Ozomatli, among others; a Golden 12-inch vinyl single was produced by Printz Board of the Black Eyed Peas. Gene Grimaldi mastered new albums for Pennywise, Dangerdoom, Exene Cervenka & The Original Sinners and Darker My Love...House of Blues Studios (Hollywood) welcomed will.i.am, who was in producing albums for Macy Gray and Sergio Mendes, with Jason Villaroman engineering. Pink worked on new material with songwriter/producers Butch Walker and Billy Mann; and Jamie Cullum mixed his follow-up with producer Stewart Levine and engineer Rik Pekkonen. ■

Send your session news to hjohnson@primediabusiness.com. High-resolution photos encouraged!

Grace 801 mic preamps, a Manley Variable Mu limiter, two Schoeps (with multiple capsules) and two B&K 4011 mics, along with Shure SM57s, a Beta 52 and SM 7, and a DPA high-voltage microphone and a lavalier.

"We'd rent a van and get as close as we could. One person would park it, and the rest of us would wheel the gear," Johnson describes. "It was treacherous! We filmed in rain and wind, and I couldn't stop musicians to ask them to change position. It was designed to be a moment in time, so it was always spontaneous. We were very careful to make the artists comfortable. I'd just listen for the loudest instrument and

PHOTO: BOB SHANAHAN



Barefoot Servants' Lee Sklar, with a portrait from his clean-shaven youth

then put the mics farthest from it."

The project was mixed at The Village Studios in West Los Angeles and at Johnson's home studio, Timeless Studio. Partly due to the exposure they received from the project, two of the featured artists have now obtained major-label recording contracts.

The soundtrack is available from Amazon.com and iTunes; the DVD is being released by the Sundance Channel. Meanwhile, work has begun on a second project: *Playing for Change International*, with footage already shot in Barcelona, Spain. Next, Johnson and friends are off to Africa to record a Zulu choir.

"With all of these people," Johnson concludes, "it's about the purest kind of playing and their conviction of their own worth. They decided that whether or not they ever had a hit song or made a lot of money, their lives were going to be filled with playing music."

Given that Lee Sklar has been a first-call bass player for more than 30 years, you might expect that at this point, not much gets him excited. After all, with more than 2,000 albums to his credit, he's toured and

recorded all over the world with top artists such as James Taylor, Jackson Browne, Linda Ronstadt, Phil Collins, Willie Nelson, Clint Black, Lyle Lovett and Veronique Sanson—to name but a few. But Sklar is an enthusiastic, optimistic type—one of the reasons he's so successful; not only is he a brilliant bass player, he's also a good hang. And these days, he's especially excited about his own band, the Barefoot Servants, and their new CD, *Barefoot Servants 2*, out on Atom Records (www.AtomRecords.com/www.barefootservants.net).

The Barefoot Servants are Sklar, singer/guitarist Jon Butcher, guitarist Ben Schultz and drummer Neal Wilkinson. And, yes, there was a *Barefoot Servants 1*, released in 1994. That disc, with its stellar playing and gritty Texas blues/rock (with Ray Brinker on drums), became a cult favorite and the band toured briefly. But lacking commercial success, busy individual careers intervened and the members went their separate ways.

The group's origin was in songs written by Butcher and Schultz. "Jon and Ben, with Ray Brinker, were getting ready to record, but

they didn't have a bass player," explains Sklar. "Michael Frondelli was producing, and he sent me a tape of their songs. I only had to listen to a couple of notes to say, 'Count me in.' It was ZZ Top meets Jimi Hendrix—right up my alley."

The first CD was released on Epic/Sony, and the Servants headed out on a tour, dubbed Bubbapalooza by Sklar, opening for .38 Special, Marshall Tucker Band, the Fabulous Thunderbirds and The Outlaws. "I enjoyed it so much," he recalls, "but we just couldn't afford to turn down other work to do any more of it."

Afterward, the Servants kept in touch. "We'd bump into each other at the NAMM show every year," Sklar says with a laugh. "Then Ben built a studio in his house, and he called me to put some bass on a project. When I walked in, it felt really comfortable. Jon came over, and we decided to go at it again and to make a record just for ourselves. Ray was involved in other things, but I've worked with Neal for years on Veronique Sanson. We asked him to play on some tracks and that felt right, too. He's British and brought that great English musical attitude."

The self-produced album had some outside help from engineering guru George Massenburg, who supplied advice and gear, and mastering engineer Stephen Marcussen. Schultz engineered; the project was recorded and mixed entirely at his home studio. Along the way, the first album's Texas boogie morphed into something they're calling "nouveau classic rock" that runs the gamut from cranked power rock 'n' roll to intimate acoustic numbers. Ultimately, Sklar says, the record is about performance.

Getting these guys together to tour will be challenging, but this past July, Butcher and Schultz kicked off the CD release, touring and playing radio stations as an acoustic duo. The fans are out there. "I was in a little hotel restaurant in the south of France when I was touring with Veronique," Sklar relates. "The maitre d' came over and said, 'Aren't you Lee Sklar?' I thought he was going to talk about Phil Collins or Veronique, but he said, 'Will there be anymore Barefoot Servants?' Now, the answer is yes." ■

E-mail your L.A. stories to Maureen drone@aol.com.

NASHVILLE SKYLINE FROM PAGE 185

McBride is one of those guys who appreciates the finest audio gear and the great recordings that come from its proper use. To spend any (and I do mean any) time with him at Blackbird is to experience a kid utterly enthralled with having the best Christmas of his life. McBride doesn't have to work at conveying his enthusiasm, and his commitment to excellence is infectious. While many studio owners (with a collection that is a mere fragment of McBride's) would never dream of letting gear like this out into the world, McBride sounds like a missionary determined to spread the joy—albeit with a rental fee attached.

"We want to give the engineers, producers and artists every color of the palette when they paint their picture," enthuses McBride. "We never want to have the studio be the weak link in the creative process. I have an addiction to gear! I just can't say no to great gear. That was sort of the point that led us to start renting it out. This is a collection I have amassed over the years, and I can't wait for folks to see it at the AES show. Of course, when you work at the studio, you have access to all this gear for your sessions, but now we have made it so we can come to you, wherever you are."


New studio manager Phillips (remember,

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he exited Emerald to take the position at Blackbird) will also be at the booth to answer questions about the studio.

Besides talking up the studio's rental business, Blackbird is also planning on drumming up new awareness of its huge multiroom facility. I will address Blackbird's major developments in a future issue of *Mix*, as there is so much that has happened there.

"We are just thrilled with the reception that we have gotten both in and outside the Nashville market," said McBride, who recently finished work on a forthcoming CD from his wife, Martina, which is slated for release this month. "This has been a dream of mine for a long time, and I constantly strive to make it better and better and find new, innovative ways of recording music and sound." ■

Send your Nashville news to mrblurge@mac.com.

NEW YORK METRO FROM PAGE 185

modern production scenarios: A producer working alone can run much of the room without having to leave their seat or enjoy easy communication and task-sharing with an engineer when one is present.

"A lot of the design philosophy came from the benefit of working in my home studio," Koss explains. "There, I had my Pro Tools rig on one side, MIDI keyboard on another, I could plug my guitar in and everything was within easy reach. But I had also been going to major studios and they wouldn't have the stuff that was really obvious to me, like a nice keyboard array or all the virtual instruments like Reason and the Spectrasonics plug-ins—stuff more on the creative side. There were so many times that I had been in the studio with a great idea and they couldn't accommodate it."

"One of the challenges of designing the new room was integrating the new world into the control room without making it look like a lot of racks have been rolled in," Swist adds. "You walk in and this doesn't feel like a foreign environment to someone who's comfortable in the analog world. But as soon as you walk back there, you're in that digital world and the analog world disappears. From an ergonomic standpoint, [the producer] can sit in front of the control room and the furniture still conforms to them—they can be in the MIDI world and still be in the analog SSL space. So if they get an idea—bang!—they can do it."

With hardware such as a TC Electronic System 6000 reverb; 32 channels of outboard preamps, including Manley,

Vintech and Grace; Studer A827 24-track; and enveloping Dynaudio M4 monitors, Tainted Blue unquestionably has the necessary tools. It will be interesting to see how things unfold for Koss and Shaw, as the largely unproven duo seek to hone their distinctive sound and provide a full-service experience for a strictly select clientele. "We don't want to be studio owners who just book it 30 days a month," Koss concludes about the newly rejuvenated landmark space. "We want to book it with people who have the same philosophy: Use it right."

Meanwhile, the four floors below the penthouse are also on the verge of undergoing their own change. As this column went to press, Gonzales was close to completing the sale of the rest of Quad Studios. If the transaction is completed, the studio will continue to operate under the Quad name and retain many key members of the staff, including operations manager Robbie Norris and studio manager David "Ros" Rosner. Gonzales will also be involved and continue to own and operate Quad Nashville.

About 10 blocks down and a few avenues over, another great space is in the process of remaking a name for itself. In its first incarnation from approximately 1974 to 1994, Skyline Studios (www.skystudnyc.com) used its acoustically and aesthetically beautiful 1,000-square-foot cedar and oak main room to record the likes of Blondie, Miles Davis, Frank Zappa, David Bowie and Mariah Carey, along with super-producer Nile Rodgers. Sold in 1995 to international session drummer Jonathan Mover and a group of Russian investors, the studio struggled with a business model based largely on luring Russia-based artists to New York City to record. In 2000, Mover replaced his Russian friends with a new partner, engineer Ron Allaire, and Skyline was Skyline again.

Five years later, with a clientele that has included Steely Dan, Avril Lavigne, David Byrne and Fuel, to name a few, Mover and Allaire are finding that although the rebirth of a New York City studio can

take time, their patience is now being rewarded. "We're able to cover a lot of string, piano and acoustic drum sessions that went to the Hit Factory and now need a big room to handle them," Mover says. "Having a large room and being able to cover a lot of those situations is a big thing for us. We also just added the Yamaha grand piano that formerly resided at the Hit Factory."

Adding to the equation are Allaire's outstanding engineering abilities and the upgraded Musgrave Neve VR 60, Pro Tools|HD3 and killer gear collection that he commands from the spacious control room. With Mover and Allaire bringing serious playing/arranging/production skills to the table, the pair believes they've honed the right balance between the full service and sound of a big facility with the boutique feel of a personal studio—perfect for a New York City market that's passionate

PHOTO: DAVID WEISS



Ron Allaire (left) and Jonathan Mover of Skyline Studios

about music but currently undecided as to what constitutes the ideal recording environment.

"We're still in a big transition period where we're building up a client base with the new people in the business," Allaire says. "The perception is that you can do records at home—and you can! But finding people that want to work at a high level, understand that they can't do everything in their bedroom and that they do need people that do their utmost to get their vision accomplished—those are the people we're looking for." ■

Send your stories from the Metro to david@dwords.com.

—FROM PAGE 26, AES—ALWAYS EXCITING STUFF actually *advertise* fleas in the beds. What's in the center of every city? A freakin' convention center. A union convention center. And a bunch of bars. Oh, yeah, and hookers. Let's not forget the non-union workers.

Man, I *love* capitalism. I mean it, I'm not being sarcastic. This whole game, this entire concept of artificial deadlines for annual mega-swap-meets that swap money for gear actually *works!*

But, as is occasionally the case, I digress. I just wanted you to know that I am in fact aware of the validity, albeit comically absurd, of the entire concept. And with that said, I return to the point.

THE POINT

One of the secret joys in life is paying huge bucks for a sun-drenched island vacation—perhaps a villa on a white-sand beach and then purposely sleeping in at least one day and missing breakfast and half a day's sun, just because you can.

It's a bit beyond the scope of this column to analyze the distorted psychological factors that make such behavior so deeply satisfying. Suffice it to say that it's the concept of decadence upon decadence, buying the right to be self-indulgent to the point of literally not making use of what you paid for on purpose, or simply implementing your ability to change your mind at the last second and choosing the path of immediate gratification.

So. At AES right now? Can't get to your favorite Mexican or Caribbean resort to sleep in? Hell, no problem. Take one-quarter of each day, turn your back on business, go find a friend or a little booth that you personally like and play. Connect. Live. Share a warm \$7 beer and a dried-out \$32 hot dog. Show them you care. Hell, show them your hair. They're sure to get a kick out of what it looks like now, remembering what it looked like then.

Sure, you might miss something, some great deal, maybe a free guitar pick or some 92.4-percent naked female licking your arm and applying fake tattoos...Oh, wait—that's NAMM. Never mind. You won't miss *anything!* The vendors need you more than you need them, and though cell phones were invented to make appointments, their primary use today is to postpone them. You have the power, you have the technology.

NO MORE JOKES. THINK ABOUT THIS.

Bob Moog just died. No one will ever again get to talk to him about how it all started. And he isn't our only recent loss, nor will

he be the last. We say we understand this, but we sure don't act like it. Your old friends are part of your history, and some of them aren't coming to any more shows.

Life is a blitz against entropy. You win until you lose. For some, it's a bit more like Tetris—you can't actually *win*, you

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just try to hang in as long as you can while everything around you gets more hectic and more difficult to manage, even as you get more mellow and wise. Then you die.

WHAT'S AES GOT TO DO WITH IT?

The AES convention has little to do with anything other than selling gear and inventing standards to create a need for replacement gear. But there is an underlying significance.

Most people at AES are there because they in some way, at some time, had an interest in music.

For those who still do, I offer this perspective. On the floor before you are the tools that you and your friends used and use to make music. *Music*, the only thing in your lives besides family and friends that will live on.


To what do you owe the existence of your career? Desire, skill and tools. That's it.

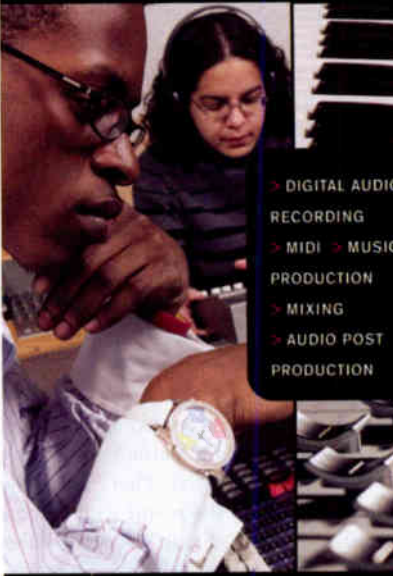

AES and NAMM represent those tools—one leg of the tripod supporting your professional life. We all use variants of these same tools. We do very different things with them (hopefully), but they are our common connection.

And so these shows are sort of the watering holes for our kind.

So check out the toys, but take a moment to look for old friends doing the same...

SSC is watching those who built our industry fall even as he feels the winds pushing at his back. Introspection is inevitable.

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—FROM PAGE 28, TO PRESERVE AND PROTECT that the animals use infrasonic sounds to communicate; Public Enemy's *Fear of a Black Planet*; and Nirvana's *Nevermind*. The only rules are that a nominated recording be at least 10 years old and that a copy of it actually exists.

A standing advisory committee—known as the National Recording Preservation Board—makes the selections and comprises members from some 17 organizations involved with music and sound recording, including NARAS, ASCAP, BMI, the RIAA, the Society for Ethnomusicology, the American Folklore Society and the Audio Engineering Society. Each organization names a committee member and an alternate, and there are five “at-large” members appointed by the Librarian of Congress, including such luminaries as Mickey Hart, Michael Feinstein and Phil Ramone.

While being included in the Registry would be an honor for any artist or producer, there's more to the Library's efforts than just singling out recordings of merit. The NSRPA also specifies that the Preservation Board study and report to the Librarian of Congress the current state of preservation techniques and practices, as well as how best to make archived materials available to researchers and educators. According to the two delegates to the board from the AES—George Massenburg and Elizabeth Cohen (the alternate)—this part of the mission is critical to the recording industry's health, looking both backward and forward, and gives the AES an important role on the board.

“The AES was approached to recommend someone to the Librarian [of Congress] who had good experience in music and engineering,” says Massenburg, who, with his extensive track record in engineering, production, design and education, certainly fits that description, “and who would be able to help with discussions on any number of levels, working with preservationists and archivists. I loved the idea that we were going to cherry-pick recordings of great cultural significance. I learned about a lot of things that I'd missed. There are some brilliant people on the board with careers in music-immersive fields. Everyone cares deeply about music and preserving it. That's the key.

“We're tracing the roots, looking back at the great thread of musical styles, how one influenced another,” he continues. “Given that perspective, you see that only a small percentage of the artists in any given genre are really inspired—their work

is transcendent and influential—while the others you view as ‘entertainers.’ The process gives us a chance to look at the really important innovators and how seminal their work was. Criticisms of the day fall away so you can see the work better in perspective. For instance, at the time he was composing, George Gershwin was thought of as being good with melodies, but he wasn't much of a symphonist.

I loved the idea that we were going to cherry-pick recordings of great cultural significance. I learned about a lot of things that I'd missed.

—George Massenburg

“Some of the early, flat acoustical discs are extraordinary work. I never knew about this before, but when electrical recording was introduced, people complained it was too cold and brittle and wanted the warmth and natural intimacy of acoustic recordings. Now what does that sound like?”

Cohen, a leading acoustical engineer with academic appointments at Stanford and UCLA, and a former AES president, helped write the original legislation. “The major contribution of the AES to the board, as regards to the registry, is to speak up for recordings that demonstrate important changes in technology,” she says. “We spoke up for Edison recordings and recordings that couldn't have been made without new mic techniques.”

For example, there was a 1951 recording by Rafael Kubelik and the Chicago Symphony Orchestra of Mussorgsky's called “Pictures at an Exhibition.” Massenburg explains, “It was a single-mic recording. They set up a [Neumann] 47 in the middle of the hall and rehearsed the orchestra really well. It was a major departure because before then, electrical recording had been all about close mics and technicians doing the balancing without much in the way of ambience. This was, ‘Let's play music in a hall and record what it sounds like.’

“We wanted to include [The Beatles'] *Sgt. Pepper's Lonely Hearts Club Band* as a turning point in modern recording: the use of technology to tell an interesting,

focused story, [one that] also stood the test of time,” Massenburg continues. “We wanted to emphasize methodologies that were unique and innovative. Of course, Les Paul had to be in there—a guy who will stop at nothing to try an idea. But we're not going to recommend a technology for its own sake. Nobody's getting a listing for Best Plug-In.”

There are countless recordings that have been lost during the years, some of them *legendary* performances that were recorded and then misplaced. Part of the mission is to ensure that doesn't happen again.

“We now have 100 years' worth of recorded sound, and our job is to make sure that that legacy is accessible to future generations,” Cohen says. “It's an act of cultural preservation: preserving that record of human creativity across time. But there are so many endangered recordings. We have an enormity of challenges: Obsolete formats are becoming harder for us to hear, hardware and the technical expertise to operate the hardware are becoming harder to obtain, the materials are deteriorating and people don't know how to handle the materials to preserve them. You can't imagine how much material has been lost due to bad labeling or boxes that corrode.

“Part of our work is to do a study on the state of audio preservation and develop a comprehensive national preservation program. We have to become intelligent advocates to management and show them why preservation is an important issue: how you store things and how to establish a data migration policy for a studio, especially in terms of metadata like session and track information. We're working with recording companies and individuals, making sure that deliverables have migration advice with them.”

“A newborn digital project is a lot more difficult to keep track of than anyone imagined,” notes Massenburg, who has also worked on this issue at the behest of NARAS and the nonprofit Council on Library and Information Resources. “In the old days, there was a master tape. With analog multitrack—even with digital multitrack—there was almost always a master with a track sheet inside and some descriptive notes on the back. But with hard disk recordings, looking at your ‘master’ tells you little. There's no established protocol to name things and no archive structure to handle it, much less preserve it. In time, certain new technologies become unreadable and evolving computer applications can't read old project files. We've been told, in confidence, that some

records have been lost. One thing we found at the major labels was that their libraries were incompatible; each of them was making it up as they went along. Many of us feel that it would be an asset to music preservation to just help libraries coordinate metadata."

"We need to develop a series of best practices for how to move the bits from point A to point B before the media decays, or the hard drive or tape drive fail, or the software collapses," Cohen advises. "Even today, if you have digital audio on Beta tapes or memory sticks, just try to read that! And we need hard disks that last a decade rather than just two years. Everything comes with error correction, but you have to know how to read it and use it. Amateurs can do this, too. We can educate individuals on how to handle their own collections. But there's a four-letter word that people have to use: 'plan.'

"There is a whole array of related technologies such as compression and lossless compression that other fields deal with, like data storage, medical imaging and supercomputing. We need to look at where things are going: nanotechnology, RAID arrays, grid computing, holographic storage—all of these are vital. I would

like to see leadership coming from audio engineers in these fields so our applications are on the radar screen of the people developing them."

Around the time you read this, the physical repository will be opening for the first time at the National Audio Visual Conservation Center in Culpeper, Va., some 70 miles from Washington, D.C. But the work is going slowly. "They're already

job, and it's just one item on the list. When we wanted to list the entire Edison collection, they declined."

And, according to Cohen, a single physical location is not necessarily enough. "We've learned enough from floods and fires that we need to mirror these repositories," she says. "Networks make that easy, but you need good practices and coordination between various archives."

The idea of preservation is no longer museums with objects under glass that have restrictions around them.

People want to be able to reach their own cultural heritage.

—Elizabeth Cohen

overtaxed, and they only get \$250,000 a year in government money," says Massenburg. "I don't think they're even halfway through the first year's list. They wanted 25 items a year and we wanted 100, so we compromised on 50. There's a radio station in New Orleans—WWOZ, jazz and heritage public radio—and we elected to list their entire archives. But that's a huge

And there's another issue, which is particularly tricky given the current state of copyright law. "The public today equates preservation with access," says Cohen, "and there's a public demand for preserved recordings. The idea of preservation is no longer museums with objects under glass that have restrictions around them. People want to be able to reach their

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own cultural heritage. It shouldn't be so far away from them that they're deprived of hearing those recordings.

"This requires greater access than is allowed by copyright restrictions. We need to determine how to handle orphaned recordings and how to deal with copyright issues over unidentifiable or unreachable sources. Sometimes there's no known originator for recordings, but they're locked up because someone may have an economic interest in them. There's a huge amount of material that could be released if we could deal with these legal issues. We're working to find a balance between the need for broader access and respecting international property rights. The intent of a lot of works was to be heard and performed, and locking it up in a way that makes it inaccessible to an audience is disrespectful."

As for getting your favorite recordings into the National Registry, there are ways to do that. "There's no limit to public nominations," says Massenburg. "Anyone can bring a nomination to Elizabeth or myself. Public nominations have a decided edge in consideration. On the other hand, you can imagine how many times people nominate a Beach Boys record. We had a preservation session at the 2003 AES in New York and passed out a form. Now you can do it online at the Library of Congress' site. The procedure changes every year, but if something doesn't make it one year, we can roll it over and nominate it the next year."

"There's great expertise in the board," says Cohen, "but there's greater expertise in the public at large. The public can be advocates for things that the board may not be aware of. If you make good arguments, then you might be persuasive. We'd love to see an increase in nominations from the AES membership and *Mix* readers. As long as it had a cultural, historical or aesthetic impact on the U.S., it can be nominated. It doesn't have to have been made in the U.S."

"We don't know what will be important in 50 years," says Massenburg. "Some obscure record might turn out to be very influential. We need everybody's support and participation to help us uncover that work."

The National Recording Registry's site is www.loc.gov/rr/record/nrpb/nrpb-nrr.html. Feel free to, as Cohen says, "Vote early and vote often."

Paul Lehrman has several thousand LPs, all of which (he hopes) are in pretty good shape.

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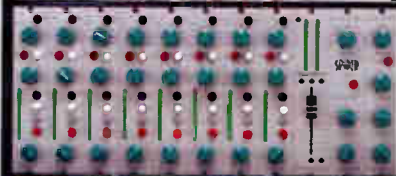
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For Extreme Native Recording

Lay down extreme track counts with this native recording powerhouse

The Apple **Power Mac G5** is capable of recording over 100 tracks simultaneously — even to the second internal serial ATA drive. Make no mistake: G5-based native systems can handle today's most demanding multitrack recording scenarios via multiple FireWire and PCI MOTU audio interface configurations. And the modest cost of these systems gives you plenty of room in your budget for the additional gear you've always dreamed of.



Massive I/O

Connect up to four MOTU FireWire interfaces — that's up to 80 inputs at 44.1 or 48kHz sample rates — on the internal FireWire bus and more via FireWire expansion cards. The MOTU **896HD** provides 8 mic/instrument inputs with preamps, individual 48V phantom power and individual front-panel trim control. Quickly adjust input levels via luxurious 10-segment front panel LEOs. The MOTU **824** and **812** interfaces provide 2 and 4 mic/instrument inputs, respectively, along with 8 quarter-inch TRS inputs each. All three models provide 8-channel optical digital I/O, along with either AES/EBU or S/PDIF digital input/output.

A new studio standard

The flagship of the KSM line — and the new must-have mic for any large multitrack studio, the Sure **KSM44** multi-pattern condenser microphone has an extended frequency response specially tailored for critical studio vocal tracking. Its ultra-thin, externally biased, large dual diaphragms provide precise articulation; extremely low self-noise (7 dBA) ensures that the KSM44 captures only the sound of the performance. Inside, the three polar patterns — Cardioid, Ommidirectional, and Bidirectional — offer greater flexibility and uniformity in a wide variety of critical recording applications.

Class A, transformerless preamplifier circuitry provides extremely fast transient response and no improved crossover distortion for linearity across the full frequency range.

transformerless preamplifier circuitry provides extremely fast transient response and no improved crossover distortion for linearity across the full frequency range.



Call the MOTU system experts.

Removable storage

The Glyph **GT103** offers many advantages for large-scale multitrack recording, including hot-swap portability and convenience.

Specifically designed recording scenarios that require multiple drives, the GT103 can be configured with three FireWire hot-swap GT Key drives of any capacity. Using Glyph's proprietary Integrity™ hot-swap technology, you can easily shuttle content to other GT Series enclosures. To keep your studio quiet, GT Keys incorporate sound-dampening composite metal technology in their frames. Includes three-year warranty, plus overnight advance replacement warranty in the first year for GT Keys.



On-demand plug-in processing.

How do you conserve precious CPU cycles for the demands of multitrack recording, but also run all of today's latest plug-ins and virtual instruments? The Muse Research **Receptor** is a dedicated hardware-based plug-in player for your favorite VST software.

With 16 channels to run virtual instruments or effects, a built-in MIDI interface and a versatile complement of digital and analog I/O, Receptor is the ideal way to run plug-ins while keeping your host computer running smoothly. Control everything from the front panel, or simply connect a monitor to the back. Visit museresearch.com to view demos by Dream Theater's Jordan Rudess and to learn about Receptor's new UniWire™

technology, which provides MIDI, audio, and remote control between Receptor and your computer via a single Ethernet cable. Receptor provides the ultimate in performance, stability, and sonic performance.



Waves distributed processing.

For large-scale multitrack recording systems, it is good practice to offload plug-in processing from your host computer. The Waves **APA-44M** delivers on-demand Waves processing to your MOTU native desktop studio via standard Ethernet. Open your existing Waves plug-ins as usual in Digital Performer via the new Waves Netshell™. But now you can run up to 6 Waves IR-1 Convolution reverbs at 44.1kHz at once, and save your CPU power. Need more Waves processing? Just add another APA-44M with the snap of an RJ45 Ethernet cable. It's that simple. For extreme processing needs, connect up to 8 units to your network. The APA-44M is equally at home connected to a laptop, desktop or both. Just transfer your Waves authorized iLok. You can even share a stack of APA-44M's among several computers across the Waves Netshell network. The APA-44M ushers in a new era of state-of-the-art, distributed-network Waves processing for your MOTU multitrack studio.



Power conditioning

A large-scale multitrack studio is an investment. Protect that investment — and get the best possible performance from it — with the Monster **Pro 2100** and **Pro 1200 PowerElements**. Much more than just a "surge protector", both devices use Monster's patented Clean Power™ filter circuitry (U.S. Pat. No. 6,473,510 B1) with separate noise isolation filtered outlets for digital, analog and high-current audio components. The result is high quality sound that's free from hums, buzzes and other power line artifacts, revealing all of the rich harmonics and tone in your recordings. Get All the Performance You Paid For™.

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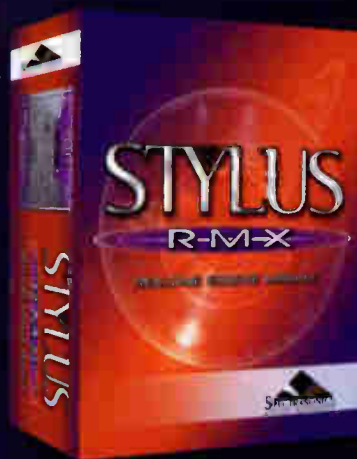
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The controller.

Digital Performer captures every nuance of your MIDI performance. The M-Audio **Keymaster Pro** is an 88-key hammer-action USB powered MIDI controller. It delivers fine-tuned response to satisfy even the most demanding players. Add four zones, a stunning set of MIDI-assignable controllers all in a compact 40 pound package, and you have the most comprehensive product of its kind!



The control room.

The PreSonus **Central Station** is the missing link between your MOTU recording interface, studio monitors, input sources and the artist. Featuring 5 sets of stereo inputs (3 analog and 2 digital with 192kHz D/A conversion), the Central Station allows you to switch between 3 different sets of studio monitor outputs while maintaining a purely passive signal path. The main audio path uses no amplifier stages including op amps, active IC's or chips. This eliminates coloration, noise and distortion, enabling you to hear your mixes more clearly and minimize ear fatigue. In addition, the Central Station features a

complete studio communication solution with built-in condenser talkback microphone, MUTE, DIM, two separate headphone outputs plus a cue output to enhance the creative process. A fast-acting 30 segment LED is also supplied for flawless visual metering of levels both in dBu and dBfs modes. Communicate with the artist via talkback. Send a headphone mix to the artist while listening to the main mix in the control room and more. The Central Station brings all of your inputs and outputs together to work in harmony to enhance the creative process and ease mixing and music production.



Mastering & restoration.

Your DP mastering and processing lab awaits you: **BIAS Peak Pro 5** delivers award winning editing and sound design tools, plus the world's very best native mastering solution for Mac OS X. With advanced playlisting. Superb final-stage processing. Disc Burning. Plus PQ subcodes, DDP export (optional add on), and other 100% Redbook-compliant features. Need even more power? Check out our Peak Pro XT 5 bundle with over \$1,000 worth of additional tools, including our acclaimed SoundSoap Pro, SoundSoap 2 (noise reduction and restoration), Squeeze-3 & 5 (linear phase multiband-compression/limiter/upward expander), Reveal (precision analysis suite), PitchCraft (super natural pitch correction/transformation), Pepli-Q (linear phase EQ matching), SuperFreq (4, 6, 8, & 10 band parametric EQ) and GateEx (advanced noise gate with downward expander) — all at an amazing price. So, when you're ready to master, Peak Pro 5 has everything you need. It's the perfect complement to DP. Or, perhaps we should say, it's the perfect finishing touch.



Call the MOTU system experts.



The faders.

Imagine the feeling of touch-sensitive, automated Penny & Giles faders under your hands, and the fine-tuned twist of a V-Pot™ between your fingers. You adjust plug-in settings, automate filter sweeps in real-time, and trim individual track levers. Your hands fly over responsive controls, perfecting your mix — free from the solitary confinement of your mouse. Mackie Control delivers all this in an expandable, compact, desktop-style design forged by the combined talents of Mackie manufacturing and the MOTU Digital Performer engineering team. Mackie **Control** brings large-console, Studio A prowess to your Digital Performer desktop studio, with a wide range of customized control features that go well beyond mixing. It's like putting your hands on DP itself.

The monitors.

The Mackie **HR Series Active Studio Monitors** are considered some of the most loved and trusted nearfield studio monitors of all time, and with good reason. These award-winning bi-amplified monitors offer a performance that rivals monitors costing two or three times their price. Name it, a stereo field that's wide, deep and incredibly detailed. Low frequencies that are no more or less than what you've recorded. High and mid-range frequencies that are clean and articulated. Plus the sweetest of sweet spots. Whether it's the 6-inch HR-624, 8-inch HR-824 or dual 6-inch 626, there's an HR Series monitor that will tell you the truth, the whole truth, and nothing but the truth.



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Sound of dial tone, number being dialed. Recorded voice: *Welcome to StudioWorks technical support. Please enter your serial number.* Numbers being entered on phone. *Thank you. Now please enter your key code.* Oh, fer chrissake. *Thank you, one moment please.*

This is Dirk at tech support. Am I speaking with Mr., uh, Grampmother?

That's P. T. Grumpmeier, you twit! I've been in your database since it was on index cards.

I'm sorry Mr., uh, Mumpgrinder. What seems to be the trouble?

What isn't? For starters, ever since you stopped using key disk copy-protection, you seem to think I have an infinite number of USB ports on my computer.

No sir, we assume you have two: One is dedicated to your Superstudio DingleDong and another one is for general use. If you need more, just add a hub. Of course, you can't plug our DingleDong into a hub since the computer won't see it.

No kidding. But I also have a damn DingleDong for my software sampler and one for my mastering plug-ins and one for my MIDI sequencer. And my controller surface, which is supposed to be compatible with your software, can't go through a hub either, and my MIDI interface's timing gets all screwy. So where the heck am I supposed to plug all these things, not to mention my mouse?

Sir, you only need a DingleDong when a program is launching. So unplug all the DingleDongs except the one for the application you're starting. Then swap out the DingleDong for each program. It only takes a moment.

Yeah, right. Jump up and down whenever I get my studio going. Guess I better not shut anything off. Okay, next question: I bought a plug-in from you that's supposed to emulate a 1960s vintage QRZ-4711 equalizer, but every time I try to instantiate it, it tells me to enter a serial number for my original QRZ-4711.

And do you have a QRZ-4711, Mr. Grimpuffin?

Of course not! If I had one, I wouldn't need the plug-in. *We do apologize and we are aware of this problem. You see, the Malaysian startup that recently bought the old QRZ trademarks has threatened to sue us if we allow anyone to use that plug-in who doesn't own an original unit. So our legal staff required this feature.*

That's nuts! Those things cost thousands of dollars! Why should you care what some third-world company thinks?

Well, sir, we're working out a licensing deal with them, but in the meantime, we have to be very careful.

So you're being blackmailed?

Blackmail is such an ugly word, sir. We prefer to think of it as "free trade."

Okay, here's the last thing and it's the worst. I've been trying to install your upgrade to Version 10.5 and my computer keeps rejecting it. Something about not having the proper Swedish-language resources.

Are you in Sweden, Mr. Griffelbomper?

No!

In that case, sir, what operating system are you using?

Uh, Windux 2100 EZ Pro, with HolePatcher 12.1a.

There's your problem, sir. We have not authorized our product to be used with anything later

than HolePatcher 11.6. You'll have to erase your internal hard disk and re-install your system.

Erase my hard disk? Are you insane?

Or you can stay with Version 10.4, but none of our other products are compatible with that version's file format. It's entirely up to you, sir.

Okay, that does it. I've had it with these damn computers. To hell with all of you!

Sounds of phone slamming, dial tone, number being dialed.

AnalogAudio Army, Sgt. Hertz here. Hertz, it's P.T.

Grump! 'Sup?

You were right, I should have never gotten rid of my analog gear. So how about that Ampex 8-track you've been trying to sell me. Is it ready?

Pretty soon, man. Just missing a capstan bearing. But I've got a line on a '54 Chevy V8 engine. I'll pull the crankshaft out of that sucker and shave the rear bearing down by a couple mils and we'll be good.

Think I can have it by next week?

No problemo. And we got tape, too.

Hey, that's great. Where'd you find it?

We found a whole bunch of 2-inch reels in a dumpster behind Channel 69. They finally converted to U-matic. We cleaned the guacamole and pigeon poop off and they're almost good as new. But you gotta trim it.

Trim it?

It's easy. Just lay it out on the floor with a two-by-four, a tri-square and a protractor. Then get the sharpest razor blade you can find. With your left hand, run the blade along the yardstick, holding the tri-square with your elbow and the protractor with your teeth, and with your right hand...

Sounds of telephone being thrown through window. ■



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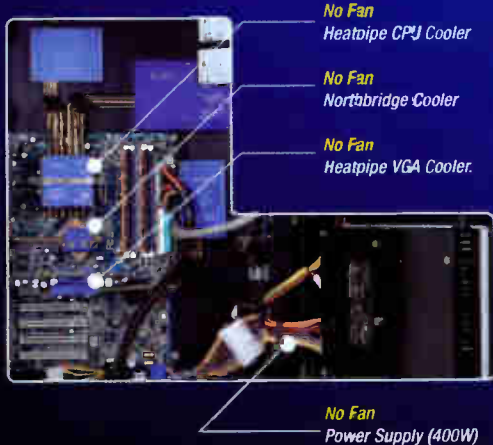
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