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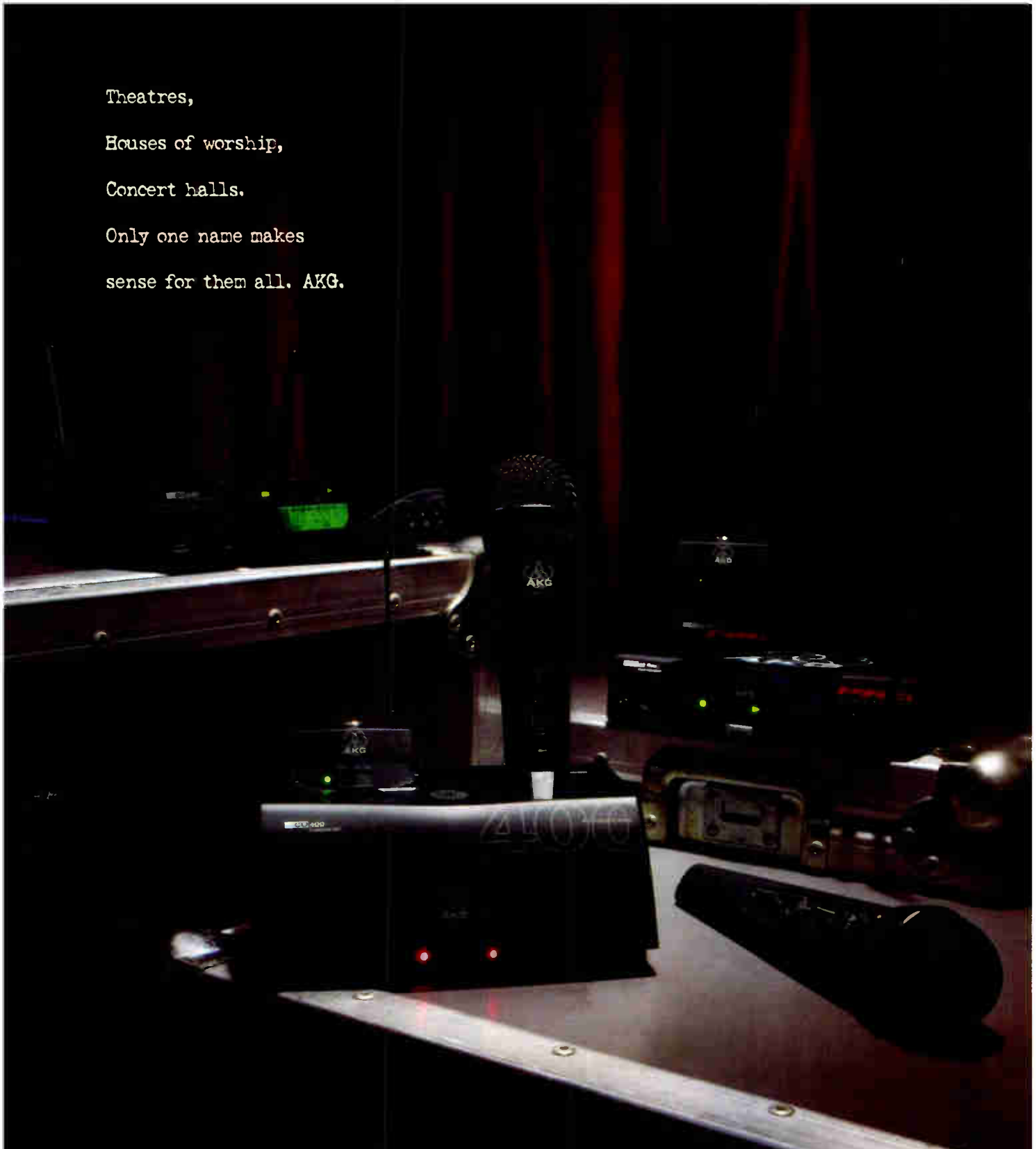


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# MIX

PROFESSIONAL AUDIO AND MUSIC PRODUCTION  
MARCH 2007, VOLUME 31, NUMBER 3



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**On the Cover:** The San Diego, Calif., mix room designed by Chris Pelonis for production of PlayStation games, the 500-square-foot space features Digidesign D-Command, Pro Tools and seven full-range Pelonis Signature Series mains. **Photo:** Ed Freeman.



## features

### Game Audio Special

Developing sound for games used to be an exercise in sacrifice, whether that meant composing within the often oppressive framework of 8-bit bleeps and blips or handing off your carefully crafted sounds to a team of game programmers who viewed audio as an afterthought. Well, we've come a long way: Bigger production budgets, improved authoring tools and the rise of powerhouse game platforms bring audio to the forefront of game development.

Our game audio supplement brings you the cutting edge of game audio technology, from the latest creation tools and playback platforms to pros on the frontlines of audio development for today's biggest titles. Our special coverage begins on page 45:

- Behind the Scenes on *Halo 3*
- Round Table: Game Audio Integration
- Q&A With Soundelux's Scott Gershin
- Next-Gen Game Platforms Compared
- On Tour With *Video Games Live!*

### 28 The Inside Track: Mixing Vocals

*Mix's* latest installment in "The Inside Track" series by technical editor Kevin Becka focuses on the centerpiece of many songs—the vocals. Step by step, he walks through all of the processes that build upon each other to make your track the best it can be.

### 34 Native DAWs

We know you're secretly doing a "Tim Allen" when you dream of more power, more speed and less latency from your computer, especially when you know you can boost those same capabilities in your DAW. Find out what's new in native processing.

### 92 Winter NAMM 2007 Wrap-Up

From the looks of it, the line between MI and pro continues to blur as more developers go native, just one of the trends at this year's Winter NAMM 2007 show in sunny Anaheim, Calif. Check out our report on hot products unveiled on the show floor. Missed the action? Go to [mixonline.com/wnamm](http://mixonline.com/wnamm) to get podcasts, newsletters and video clips.

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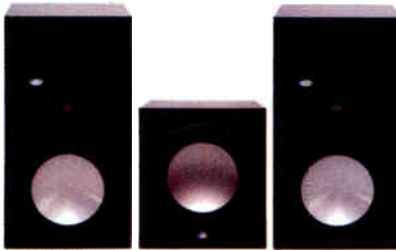
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“Once again you guys exceeded my expectations in every way..”

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## You Gotta Keep 'Em Separated

At some point, the comparisons between films and games are inevitable. I remember my first exposure. It was a *Variety* ad for the James Bond film *Tomorrow Never Dies* in 1997, featuring a huge headline that read: "Worldwide Box Office: \$175 million, Worldwide Game Sales: \$350 million." Of course, since then every newspaper or magazine article about games mentions that the industry exceeds Hollywood in total revenue, as if evidence that new media has eclipsed old. And all the stories in the trades on game audio production seem to chart its rising sophistication, as if it will someday "grow up" and catch up with Hollywood techniques.

To be sure, film sound and game sound have their similarities. Both disciplines seek to capture the highest-quality sound at the root, often recording multichannel 24-bit in the field or on the stage. Both deal with dialog, music and effects in support of storytelling. And both focus an enormous amount of time and creativity on the edit process, the early decision-making stage of post-production. But once the sounds are ready for the final mix, the worlds diverge dramatically, mainly because in game sound, there never is a "final" mix. As almost everyone associated with games will tell you, "The player is the mixer."

Imagine a film that contains more than 200,000 lines of dialog, as a recent "shooter" game was rumored to have. Or if each bodyfall in a fight scene had eight different thumps, depending on the "health" of the character. Or if the score had to change seamlessly depending on which door the main character opened in an octagonal room. The sheer amount of file management in a game project is astounding; the number of options to be considered, mind-boggling. This feeling of infinite possibility within a final mix embodies a whole new mindset from the nonlinear sound designer/editor/mixer. The interactive audio engineer.

Today we have noted film composers like John Debney scoring *Gods of War II* PS3 game, and creative film sound designers like Charles Maynes lending his effects expertise to game titles. Soundelux's Scott Gershin, subject of this month's Q&A, has bridged the two worlds for nigh on two decades now, coming into game sound in the 8-bit, 11kHz MIDI age and now spearheading a group within the Game Audio Network Guild ([www.audiogang.org](http://www.audiogang.org)) to develop technology standards and advocate for quality sound.

Don't forget, film has an 80-year history of technologies and techniques. Film has standards for playback and common formats. Videogame production is still in its adolescence, working out the means to put tools (specifically, middleware) in the hands of audio people and ever-more power in the game engines themselves. Large facilities are being built to service game sound, and orchestras are being recorded in Abbey Road for major titles.

Perhaps most important, there are upward of 160 million game consoles throughout the world, and research has suggested that 40 percent of those are hooked up to surround playback systems. Is there something there for the record industry to take a look at?



Tom Kenny  
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World Radio History

## Letters to Mix



### LESS STUDIO, MORE FAMILY TIME

I just read Rick Clark's "Nashville Skyline" in the December 2006 issue. I am one of those who are blessed to do what they love and love the ones around me. Before I got into the studio business more than 25 years ago, I had recorded at several studios and observed that many engineers had lost touch with their families. I determined that no amount of success or failure was worth that high a price.

Every project will take a certain number of hours to produce. Planning those hours with your family is as important as those hours [spent] recording Sting or the Wauhob Family.

Randy Bugg  
Twelve Oaks Studios

### MIXED-UP ALBUM CREDIT

I read of the passing of Stephen [St.Croix] and am saddened by the news. He was an amazing man, and I'm so very glad that I knew him. In an article by Tom Kenny [From the Editor, June 2006], it said, "He hosted Stevie Wonder in his home for six months during their work together on *Songs in the Key of Life*."

I just want to set the record straight about *Songs in the Key of Life*. I was the engineer on all of the sessions and can assure you that we spent no time at Stephen's house and they didn't work together. Stephen did spend time visiting with us at Crystal Sound in Hollywood (of which I was an owner), but he was never a collaborator, producer or engineer. However, we loved the Time Modulator and used it on the album.

Eddie Germano of The Hit Factory told everyone that the album was done there, when in fact we spent only three months at

his studio out of the two-plus years of work and only used one basic track recorded there. The album was done at Crystal Sound—recorded (except for the one basic track), mixed and even mastered in our mastering room.

It is amazing how many people say that they engineered that album, but it was just me and Gary Olazabal for the more than two years of recording. It is simple enough to look at the album credits to find out who the engineers were. I'm just trying to ensure that the history of this historic album isn't tainted by false statements.

John P. Fischbach  
Piety Street Recording

### WHAT IS "ACCURATE"?

Kevin Becka writes in his "Field Test" of Dave Royer's new condenser mic (Mojave MA200, December 2006), "I really like this mic, but if you're looking for pristine reproduction of your selected source, look elsewhere, because the one word that defines [the Royer mic] is personality."

Evaluators of high-quality professional microphones keep trying to distinguish between "accurate" mics and those with "personality" (or "color," or whatever attribute they use to describe a type of pleasant—but what they perceive to be not really true—rendering of the sound source).

On the surface, that seems to be a logical distinction: Here is a mic that renders true, and there is a pleasant but euphemistic mic that fudges a bit around the edges. But if the "accurate"-type mic were really that capable in representing how we hear the sound source and capable of translating the timbral and spatial detail, as well as emotional weight of the performance, why would we even need a "personality" mic?

My answer is because the accurate mic introduces at least as many artifacts in its representation of the sound source as the personality mic. The difference between the two approaches may simply be that the accurate mic is splendid in performing for our analytical mind, but its imperfections leave our emotional needs to connect with the music wanting, whereas the personality mic may not live up to certain measurable specs, but may render the emotional core of the performance intact.

Which mic's imperfections and approximation of reality is preferable may simply

depend on your needs. If I need to analyze the hall resonances created by the second violinist's foot tapping, I'll grab the accurate measurement mic. But for music recordings, I'd prefer to feel the music and will demand from a very good mic that it reconnects me with the feeling I had when listening to a good performance.

Klaus Heyne  
German Masterworks

### SPREAD THE TEACHING LOVE

I spent 32 years onstage as a performing musician. In 1995, I retired from playing, entered re-education and became an audio engineer and owner of a sound company. Since changing sides of the console, I've learned so many things I wish I had known as a musician that would have made me a better performer—things like microphone technique, monitor dynamics (where to place your monitor for the type of vocal mic you are using) and how to properly roll cables to preserve their useful life.

I urge all my audio brothers and sisters to be gentle teachers. Many musicians want to know these things, but they just don't know it yet because they are onstage. You can be a real mentor to the musicians you work with, and some of them may thank you for it. If you reach one person, it is so worth the effort.

Teri Hogan  
Sound Services, Inc.

### NOT SO SUPER SUPER BOWL

After watching this year's Super Bowl halftime show, my friends and I were very surprised by the lacking quality of audio. We expected nothing but top-notch quality for this event. The biggest sports event of the year and a major performer with Prince, yet the audio was, to put it bluntly, lame.

What really bothered myself and my friends was that it didn't improve at all through the whole of the performance. It seems odd that the last several Super Bowl halftime performances have had sub-par audio mixes. Where was the quality that our industry is capable of?

Come on, we can do better than this.  
Bob Spangler

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## LEARNING HERE FOR ALL



Bringing Web-based music instruction to underserved youth, Berklee College of Music's City Music Network ([www.berklee.edu/community/citymusic.html](http://www.berklee.edu/community/citymusic.html)) has expanded from its Boston base to include Seattle (Experience Music Project), Washington, D.C. (eSharp Music), Los Angeles (A Place Called Home and Sound Art) and Philadelphia (Mount Airy Cultural Center); additional locations are in the works. Technology partner Apple Inc. is providing server support and access to its iTunes University. NAMM is also working with the outreach program by providing musical instruments and equipment.

The school, which is investing \$1 million in startup costs, plans to raise \$10 million to support scholarships.

*Kicking off the City Music Network, Ashley Rodriguez (left) and the 10-piece Berklee City Music All-Stars perform in the Hilton lobby at Winter NAMM.*

## FAIRLIGHT RAISES \$100K FOR WITNESS



After two years of searching, finding and signing, a Fairlight CMI keyboard, autographed by 44 artists, received a winning bid of \$100,000 at the WITNESS Focus for Change benefit dinner and concert in New York City on December 11, 2006. Proceeds from the winning bid will be dedicated to WITNESS, an independent non-profit organization dedicated to empowering individuals to use video technology to expose human rights violations around the world.

"The generosity of 44 Fairlight users to sign the CMI keyboard speaks to the importance of bringing human rights violations to the surface," said John Lancken, CEO of Fairlight.

## STUDIO SOUND IN YOUR CAR

The worlds of pro audio and consumer electronics were bridged at Avatar Studios (New York City) in December, when Bongiovi Acoustics unveiled the Digital Power Station car radio. Demonstrated by Tony Bongiovi in Studio A, the patent-pending, JVC-manufactured technology made a very impressive debut.

The Digital Power Station, embedded in a computer chip, is the first of a new generation of digital audio signal processors that can be programmed to reproduce studio-quality sound in virtually any audio device. Using a combination of filters, EQ and gain amplification, it achieves total linear control over the entire audio spectrum, allowing frequency-specific amplification to achieve desired results in the playback environment.

—David Weiss



*Tony Bongiovi announces the Digital Power Station car radio*

## L.A. OPEN MOVES TO MAY

Scheduled a month earlier than last year, the 12th Annual Mix L.A. Open is set for Monday, May 14, 2007, at the Malibu Country Club. Proceeds will benefit hearing health and audio education programs, including the House Ear Institute's Sound Partners program ([www.hei.org/education/soundpartners/sp.htm](http://www.hei.org/education/soundpartners/sp.htm)) and L.A.-based Sound Art ([www.soundartla.org](http://www.soundartla.org)).

Hosted by honorary chairman Ed Cherney, the tournament's registration and a continental breakfast begin at 8 a.m., with the shotgun start at 10 a.m. The awards dinner and silent auction are scheduled for 3:30 p.m. For information about sponsorships or entry fees, go to [www.mixfoundation.org](http://www.mixfoundation.org) or call Karen Dunn at 925/939-6149.

COMPILED BY SARAH BENZULY

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## INDUSTRY NEWS



Tony Van Veen

Working for **Disc Makers** (Pennsauken, NJ) for the past 20 years, **Tony Van Veen** is the company's new president...**Phil French** has been promoted to president/COO of **Glyph Technologies** (Ithaca, NY), assuming responsibility for both U.S. and European entities; the latter of which was recently opened in Germany. There, **Martin Richert** will handle sales and **Stefan Leihsa** will oversee production and technical support...New CTO at **Ascent Media Group** (Santa Monica, CA) is **José Royo**; he previously served as senior VP, digital services...**Harman Pro Group** (Northridge, CA) brought back **Michael MacDonald** as executive VP, marketing...As part of the expansion and restructuring of **Universal Audio's** (Santa Cruz, CA) engineering group, **Brent Elder** has been brought in as VP of that division...Responsible for sales in Canada, Mexico, Central and South Americas, and the Caribbean is **Adinaldo (Adi) Neves**, director of sales, intercontinental, for **JBL Professional** (Northridge, CA)...**Megatrax Production Music** (North Hollywood) hired **Dennis Pontillano** as director of division development...New national sales manager at **AKG Acoustics** (Northridge, CA) is **Dino Virella**, who previously owned **VirellaPro Sales and Marketing**...New production supervisor for **Sonic Pool's** (Hollywood) Pool Cues Music division is **Grace Anthony**...A seven-year employee at **Walters-Storyk Design Group** (NYC), **Romina Larregina** has been named senior project manager.

## ON THE MOVE

**Who:** Matt Grippo, Manhattan Producers Alliance general director/CEO  
**Main Responsibility:** ensuring our members are getting the most out of the organization by connecting individuals and supporting entrepreneurial activity.

**Previous Lives:**

- 2004-2006: M.B.A. at London Business School; consultation work
- 2002-2004: software architect and engineer at Net Your Work/Workday
- 2000-2002: software architect/engineer at ePropose
- 1997-2000: software architect/engineer at Peoplesoft

**My favorite drumming experience was...**opening for Maceo Parker in Santa Cruz and San Jose, Calif. Holding down a Monday night with my quartet/quintet at the Jazz Gathering in San Francisco. Headlining a Halloween gig with my jazz/hip hop band dressed as a metal head and getting mistaken for the drummer of Napalm Death by the opening band!

**The last great book I read was...***Bait and Switch: The (Futile) Pursuit of the American Dream* by Barbara Ehrenreich.

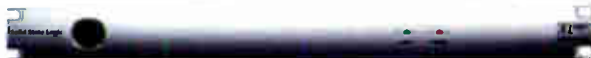
**Currently in my CD changer:** Betty Davis, *They Say I'm Different*; BoyJazz, *In the City Tonight*; Chick Corea, *Now He Sings, Now He Sobs*; Grippo, *Circuits*; John Coltrane, *Live at Birdland*; Louis Jordan, *Let the Good Times Roll*; Me'Shell NdegéOcello, *Comfort Woman*; Sly & The Family Stone, *Fresh*; Squarepusher, *Hard Normal Daddy* and *Feed Me Weird Things*; and Steve Coleman & The Five Elements, *Def Trance Beat*.

**When I'm not in the office, you can find me...**running around the Central Park Reservoir, searching for jazz in Lower Manhattan or wandering aimlessly around Manhattan.



## CORRECTIONS

The Solid State Logic Delta-Link MADI HD (January 2007



"Tools of the Trade") is priced at \$3,595, not \$4,995.

In "Joan Osborne Explores Her Country Roots" ("Recording Notes," January 2007), engineer Neal Cappellino was erroneously referred to as having been an assistant engineer. His role with producer Steve Buckingham has always been in a primary engineering capacity.

Mix regrets the errors.



## GAME SOUND SPECIAL!

Follow *Mix's* expanded coverage on audio for videogames with these online-only features: Education—How are Students Being Prepped for This Burgeoning Field; "Survival Guide" to the Game Developers Conference; and an interview with George Sanger.



## Field Test: Trinnov SRP Surround Recording Platform

**LISTEN:** Check out this DTS 5.1-encoded file of a solo organ recording using the Trinnov SRP Surround Recording Platform.



## "Video Games Live!"

**WATCH:** Peruse an extended gallery of behind-the-scenes photos of the Video Games Live! show in Phoenix.



## Recording Notes

**LISTEN:** Audio clips from Stephen Marley, Daniel Ho and Chubby Checker's "The Twist."



# Sony Computer Entertainment America

By Tom Kenny

It's as if the garage band suddenly stepped out and played the House of Blues. Or the art-house videographer submitted a high-def buddy film to Sundance and won. The world of videogame sound, still the province of renegades and tweekers, innovators and futurist electronics heads, is growing up. Next-gen engines are in place. Dolby True HD 7.1 sound is a reality. And facilities are being built. In a big way.

Electronic Arts in Vancouver and the San Francisco Bay Area. Bungie in Kirkland, Wash. Midway in San Diego and Chicago. Technicolor Interactive in L.A. And now Sony Computer Entertainment America presents a model for the new means of interactive audio production.

"They're doing film, animation, motion capture, music, effects, dialog—only in a much more complex way, so their facilities require even more attention than a film lot would," says facility designer Chris Pelonis. "It's every aspect of entertainment production you can imagine piled into one product."

That product now includes PlayStation 3 and its burgeoning number of titles. But the facilities were built on the backs of PlayStation 2, the most successful of the game engines.

"We were already seeing on PS2 games that with the volume of content, we clearly needed more engineers and more space," says SCEA's Buzz Burrowes, director, tools, technology and services group, and a former Record Plant assistant who cut his code teeth troubleshooting GML automation systems. "If you took the number of hours for linear cinematic sequences in a typical game end-to-end and figure out the time, you're talking six to seven feature films of audio post. Then we hear that the next generation is going to be high-def, 1080p, Dolby True HD. We thought it made sense to have an investment in the future."

The initial facility upgrade plan that Burrowes turned over to Dave Murrant, sound design manager, called for adding a few more edit cubes and another mix room and live space/Foley room. Work began, but then shifted direction once the high-quality foundation of PS3 became known and 10-



PHOTO: COURT MAST

**While a whole lot of people contribute to the planning and execution of a facility this size, the Sony brain trust revolved around, l to r, Chuck Doud, director of music; Buzz Burrowes, director, tools, technology & services group; and Dave Murrant, sound design manager.**

year-old sister facilities in Foster City (south of San Francisco) found open space. Murrant and Burrowes had a lunch with Pelonis, and soon after, the project began evolving and mutating into more rooms, a deeper acoustic integrity and a need for flexible, accurate spaces.

"We cover so many disciplines, but it's not like we can build a room for each one," says Murrant. "We need the Foley room to accommodate music. The mix room needs to do Foley or dialog or music. It wasn't a surprise. It was a requirement from the start that an editor could walk from room to room with confidence that it's true. That's why the Pods are standardized."

The 180-square-foot Pods (read: edit/mix rooms) actually form the nexus in Sony's new model: the multipurpose space. The two new mix rooms are full-range 7.1, the Foley room is loud and dead-quiet at the same time, but the 20 full-range, D-Control/Pro Tools-equipped 5.1 Pods, split between Foster City and San Diego and constructed at roughly the same time, form the seal in the edit/mix connection.

After the team pushed the concept, Pelonis

built a full-range 5.1 mockup as proof of concept, then asked about speakers. Pelonis already builds a line of Dual-Concentric 15 mains through Tannoy, the Pelonis Signature Series. He proposed that Sony, looking to standardize for the Pods, give him a crack at a more near-field approach.

"They gave me the opportunity to design the speakers I've been wanting to design," Pelonis says. "I set up shop in the mockup Pod and developed the electronics and the passive crossover. We spent hundreds of hours to get it right, and Sony was gracious to let me work there."

After a listening test, Burrowes, Murrant and music director Chuck Doud out of Foster City ordered more than 100 of the new 10-inch 110Ps for the Pods (with 12-inch subs) and two sets of seven PS215A active double 15s (with a 16Hz 3dB down-point) for the mix rooms. Additionally, 18-inch subs take the bottom down to 5 Hz.

"We thought a lot before we put in a whole bunch of 5.1 Pods," Burrowes recalls. "This is not the traditional approach. We could have put in a bunch of stereo rooms, but then you look at the number of titles we

# Royer Labs R-122V

## Vacuum Tube Ribbon Microphone

The R-122V is the world's first tube ribbon microphone. Originally designed as a benchmark to test our groundbreaking active ribbon mics against, the R-122V delivers unparalleled richness, depth and detail, especially in the midrange frequencies. From demanding classical applications to vocals, high SPL sound sources (guitars, brass, drums) to whisper quiet room ambience, the R-122V provides a musical experience you'll have to hear to believe.

*"I've reviewed quite a few ribbons, and this one has some serious chops on acoustic and electric guitars, percussion, piano and especially on vocals. I heard it used on two male vocalists and in both situations it enhanced the track, sat nicely in the mix without compression and captured a decent amount of top end. In most situations, surprisingly, the usual woof associated with close miking is reduced, while providing a silky and uncharacteristically extended top end.*

*"The pair (of R-122V's) excelled when placed about 1 foot above the hammers of a Yamaha C5 piano. It was simply luscious when put on a raging guitar amp and then a Leslie cabinet, producing a rich bottom end, smooth top and great grind when the Leslie was pumping at full throttle.*

*"This mic will have legs as long as you own it."*

Mix, July 2006, by Kevin Becka

*"Where the R-122V really excels is in its midrange depth and detail. It's interesting because, in one way, the mic sounds identical to its phantom-powered counterpart (the 122) but, in another way, it's totally different. I'd describe it almost like the difference between a 16-bit, 44.1 kHz recording compared to a 24-bit, 88.2 kHz recording.*

*"On electric guitar. ...it sounded astounding. The bottom end was tight and punchy, the mids were present and dynamic and the top end sparkled.*

*"On another session, this time at my studio, I used the R-122Vs as overheads. In this case I used my GML 8200 EQ to add some sparkle on the top end and the result was wonderful. The kit sound was natural and full. The mic worked equally well capturing tambourine, shaker and finger cymbals.*

*"I don't think there has ever been a ribbon mic that I would purchase solely for vocals. That has changed with the R-122V. I had wonderful results using this microphone on both male and female vocals. The mic has the ability to capture high frequencies without any harshness or distortion and it especially shines on female vocals."*

Pro Audio Review, January 2007, by Russ Long



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put out a year, and we are always mixing. We try to convince our young guys that they're mixing when they have a microphone buried in the tailpipe of a car. We always have to be mixing."

The Pods were an evolutionary development, but from the beginning, the Sony team knew they wanted a powerful mix room and a versatile live/Foley room. The mix room (on the cover), based around D-Control and Pro Tools, is 450 square feet of full-range 7.1/5.1 sound. After some initial hesitation, most everyone who has been in the room has switched to the mains for everyday editing/mixing.

"You don't get fatigued because the system is very phase-accurate," Pelonis says. "All of the time information arrives at you correctly. When you have mid and high frequencies arriving at a different time than the lows, your brain has to fix that. That's where fatigue comes from. Then, of course, distortion is also fatiguing because your ears and brain and body don't like to be bombarded. I've tried to mitigate phase distortion and harmonic distortion as much as possible in my speakers."

As it's shaken out in the first few months online, the San Diego mix facility, with its 15-foot ceiling, is handling a majority of dialog and effects, while the Foster City mix room, with its 9-foot ceiling (due primarily to HVAC considerations), concentrates on

dialog and music. By all accounts, the tracks moving between the two translate seamlessly. Burrowes and Murrant describe the rooms as "true."

Following the San Diego visit, *Mix* visited the Foster City facilities, home base for Burrowes and Doud, who had just returned from recording a 74-piece orchestra at Abbey Road, with score by John Debney, for the PS3 title *Lair*. Five years ago, Doud, a leading authority in music development for games, was constantly asked about licensing tracks from new and established acts. Today, he is more apt to talk about Decca Trees, ensemble cues and adaptive scores.

"The interesting thing about videogames," Doud says, "is that it's a lot more difficult to score a game than it is a film. You have to address it from a compositional level, from an implementing level and from a production level. We've been working with hybrids of a sort lately. We'll go to an orchestral

composer for thematic elements, and then we'll go to a couple electronic guys and give them the multitracks, so what goes into the game is a hybrid. We end up innovating musically by bringing in some really interesting, fresh mixes to make it work. We might have two-and-a-half hours of music playing, and we need to figure out how it will make musical sense through any transition the player might make. You have to anticipate every possible move, and it has to make musical sense."

A lot of fine folks pushed, prodded and fought for the new facility; others contributed stellar work. The complex cable/wiring management system was designed and implemented by Matt Levine of Bug Id Productions. Construction in San Diego by Johnson and Jennings; Foster City, SC Builders. And facilities director Chris Castagno of Sony helped make the whole implementation possible.

"The people we tend to hire have passion for their work," Murrant concludes. "Without the talent and the environment to work in, you won't get the quality in the game. These guys do some crazy hours when the dev team is driving them, and they have to have an environment that is true, where they can make good decisions. If we can grow that talent, we'll get better games." ■

Tom Kenny is *Mix's* editorial director.

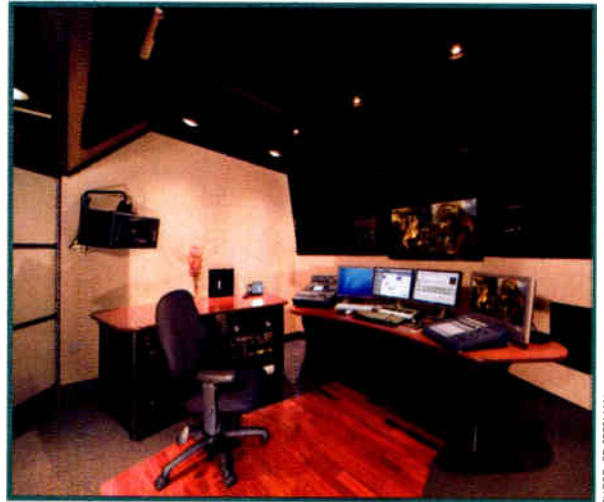


PHOTO: ED FREEMAN

*Each of the 20 5.1 Pods is a THX-certified mix room. "The LCR speakers are flush-mounted," Pelonis says, "but it's in the mid-field rather than the typical near-field fashion for these types of rooms. They're my new passive 10-inch speakers. The idea was to create really articulate environments for these guys so they could move from room to room with accurate translation, even if they come from Foster City to San Diego, or from any of the Pods to the mix room."*



PHOTO: ED FREEMAN

*The Foley/live room was designed to handle everything from the softest breath to a rock 'n' roll band or car doors being beaten by 2x4s. "Dave Murrant constantly pushed for the highest standards throughout the whole facility from day one," Pelonis says. "That's what the Foley room is about. He wanted a big, girthy sound while maintaining efficiency and intelligibility at the same time." This was demonstrated by a Pelonis parlor trick, whereby he kept repeating a whisper as he walked backward some 30 feet to the opposite corner, without a noticeable loss of articulation or perceived level.*



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# The Noise in the Box

## Audio for Videogames, Part 2

In last month's discussion about game audio, I focused on the challenges of making soundtracks for PC-based games. But PCs, of course, are only part of the story. "The PC used to be capable of so much more than the original Nintendo and the other early consoles, but that gap is smaller now," says producer and audio supervisor Mike Verrette of Ironlore Entertainment, a mid-sized developer in Massachusetts. Microsoft itself has recognized this reality: "They shifted to the Xbox, supporting the console market at the expense of the PC market," Verrette says. "For one thing, it's faster to play: You just buy the disc and pop it in. On a PC, it can take up to 25 minutes to install a game since along with everything else, you have to download new drivers for the sound and graphics cards. So maybe by Tuesday you're playing the game you bought on Saturday. But now they're trying to revitalize the PC game market. There's a new game initiative in Vista for auto-loading and auto-installing game software."

Whichever way Microsoft swings, however, the company has heavy competition from powerful new formats: Sony's PlayStation 3 and Nintendo's Wii. And there's a new thrust among game developers to make their products multiplatform-capable. Because the cost of developing many games is now well up into six figures, it makes economic sense to have them sellable in as many markets as possible. There are obvious economies in this strategy: Different platforms can use the same art, the same code base and the same music. But there are plenty of headaches, too.

For composers, sound designers and audio producers, each platform offers its own challenges. As for the dedicated consoles, the most important difference between them and a PC is that all of the data for a console game comes off of a CD- or DVD-ROM with its relatively slow access time, whereas on a PC, it gets preloaded onto a much faster hard disk. Therefore, streaming speed becomes a real issue. "In a typical game, the sound designer usually gets five to 10 percent of the system resources," explains Jason Booth, a designer at Harmonix, the MIT Media Lab spin-off that makes the *Guitar Hero* Series, and which was recently bought by MTV for \$175 million. "On PlayStation 2, you have two megs of RAM for audio. All of the sound for wherever you are in the game has to reside in that memory. Sometimes you have to leave room in there for a streaming buffer, but you also have to worry about the speed of the disc spin. Data on the outside of the disc reads faster than data on the inside, so you have to take that into account—data for loading a new level might be on the inside, while data used during run-time is placed on the outside. A common technique is to load in the sound effects ahead of time and stream the music. But, of course, you have to be okay with the rest of the team

with that: They can't be loading textures at the same time you're streaming music. So everyone has to work together and play nice."

"The trend is toward never loading at all," says Verrette. "You want to never force the player to watch a load screen. We're not there yet, but some games are doing it better than others."

On the plus side, however, says Verrette, "At least with the console, you know that everyone's got the same box. You have the same sound and graphics hardware. And

If you're developing games for  
all three consoles, you can't use  
tools from the console companies  
since they don't work on the others.

You have to build your own.

—Jason Booth

piracy is less of an issue—it's a closed architecture, which makes it harder to get in and crack the copy protection. It's also not a standard DVD format, so to pirate a game, someone would have to write the software to create the disk images."

The tools for developing soundtracks are still very much computer-based. "You build the sounds in Pro Tools," says Alexander Brandon, the audio director for Midway Home Entertainment, and who writes the "Audio-Next" column for *Mix*, "and all the tools for integrating the sounds into the game are on a PC. You test what you're doing by 'baking' a build of the game and making a simulation of it. Ideally, you want to hear what it sounds like in the console itself, and with an Xbox, you can stream in the sound over Ethernet."

Because every game engine handles audio differently, developers have to work with a different set of tools for each platform. PlayStation 2, for example, uses a toolset called SCREAM. "Everyone has something for their hardware," says Booth, "but if you're developing games for all three consoles, you can't use tools from the console companies since they don't work on the others. You have to build your own."

"For example, within Microsoft," adds Brandon, "the Xbox has a different set of 'filters' [DSP functions] from Windows, and the data is organized differently for the hardware. Even the audio compression format is different: Xbox uses XMA, which is its own version of Windows Media."

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## INSIDER AUDIO

A number of enterprising companies, many of whom are game developers themselves, offer cross-platform tool sets derived from their own in-house development. Id Software, makers of *Quake*, sells its engine to developers working in Windows, Mac and Linux, while Criterion Software's RenderWare suite and Epic Games' Unreal engine can generate code for both PCs and consoles. An audio-only tool set, now in its third iteration, is available from Canadian company Audiokinetic. Its WaveWorks Interactive Sound Engine (Wwise, see "Technology Spotlight" in October 2006 issue of *Mix*) started out as a PC/Xbox system, and the company recently added PlayStation 3 compatibility.

Wwise offers a slew of helpful tools for game sound design, including prioritization systems that keep track of how many layers are available at any particular moment; multi-listener support for split-screen multiplayer games; linking reverb settings with particular areas in the game and allowing up to four such environments to exist simultaneously for smooth transitions (I wish some of the software reverbs in my DAW would do that!); allowing the designer to decide whether effects will be added in real time or rendered to help manage CPU power; ducking inaudible voices without forcing them to restart their loops; and a clever Occlusion/Obstruction feature that changes sounds' apparent relative positions using volume and lowpass filtering.

"About 60 percent of developers use middleware engines," says Brandon. "The complexities of the systems, in terms of graphics and AI, have increased tenfold over the last generation, and that makes it much more difficult to roll your own engines. And the engines have a long way to go in terms of stabilization, the way that the audio industry is settled on Pro Tools and Nuendo."

"Usually, the engines get customized for each game," notes Booth. "The interesting part of the job is designing the systems for what they're going to do and how you're going to use them. Features like being able to mix layers of sound in real time are built on top of the API [Application Programming Interface]. You build an abstraction layer that writes to the API and interfaces to whatever sound engine you have. If you do that well, then to the sound designer there are no real differences among the platforms. But in some cases, there are features that one console has—but not the others—so you have to ask, 'Do we spend time on this since it only works on one platform, and only that part of our user base will see it? Do we go for the lowest common denominator or for the best features?'"

"There's a long learning curve for working with new systems, and it's rare to find a company that has a really well-developed sound toolkit," Booth continues. "If a development team is 30 guys, the sound staff is one or two. Sound often gets the shaft: Designers have to work with text files and arcane interfaces. So part of the sound designer's job is to fight, and say, 'My work would go a lot faster if I could have better tools.'"

On the other hand, there is some progress in raising awareness of the role of sound, both in the game and in the development process. "The companies are learning the lesson about finalizing the script before they finish the music," says Brandon. "Since people are now using live orchestras and big Hollywood actors, it's gotten very expensive to do anything over."

The best part is that the quality of game sound is better than ever. "We're in a gratifying time when you can use 16-bit samples and do DSP on the fly," says Booth. Brandon adds, "It's much more possible to have the equivalent DSP power of a last-generation Pro Tools rig running on a black box alongside your game."

Occasionally, though, in an odd way, that high quality might work against a company, especially one that's been around for a while. "Games are about invoking Pavlovian responses in the players," says Booth. "You're creating signals and getting people to react to them. You're showing people a pattern and asking them to break it to win. If you change a sound from one version to another—even if it's better—people may not like it since they've built a reaction to the original sound."

"In *Asheron's Call 1*," which Booth helped design for his former employer, Turbine Entertainment, "when you pushed a button, it made the character more powerful. That's the main reward in a role-playing game. But the original sound was 8-bit, and when we did *Asheron's Call 2*, we re-created it all in 16-bit and couldn't find the original source. We spent about a week re-creating that sound for the second version, trying to make it better. But everyone was so keyed in to the old sound that they objected to any changes, and we had to go back and carefully re-create the original sound at a higher quality."

Game development has become one of the hottest fields to get into for young artists, musicians and sound designers, not just because it can be creative or because of the potential money and fame (at least within the gamer community), but also for the sheer intellectual challenge. "It's complex stuff, and frankly I think that's what attracts people to this industry," says Booth, who studied music production at Berklee College. "People that

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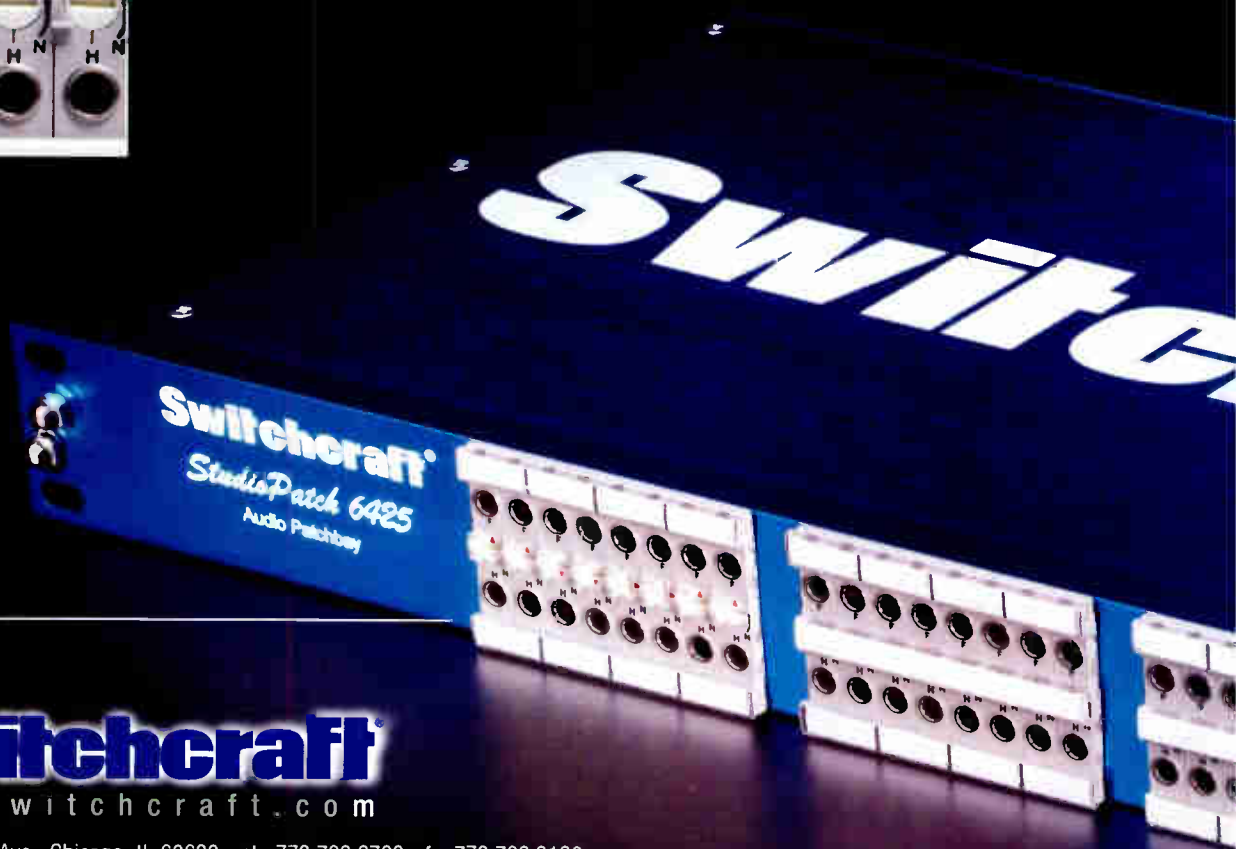
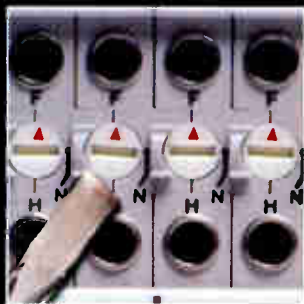
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like working under constraints can engender great creativity. When I was working with multitrack tape, my 8-tracks always sounded better than my 24-tracks. With the smaller format, I had to make decisions earlier—I was forced to make choices and take risks."

Like any young and exploding industry—think office software in the mid-'80s or Internet portals in the late-'90s—there is a tremendous amount of human energy going into game development these days and that creates problems. Like the "Microserfs" of decades past, engineers and designers are being asked to work long hours on projects over extended timelines, and there is a human cost. "It's not like any other industry I've worked in," says Verrette. "In TV post, a long project was a week. Now, projects take years. There are some real horror stories. We interviewed someone for a job here who had been working 12-hour days, seven days a week, for 28 days.

"Part of it is the generation: The average age is 25 or 26, and a lot of these people have never worked anywhere else," Verrette continues. "You have a culture of people who have unstructured days working in a creative environment. We have guys who insist they like to work that way—I work best through the weekend. The perception for a lot of younger people is that this is the price you pay for working in the game industry: 'This is cool and this is what I want to do.' It doesn't make it right, but it's how it is.

"It's simple to get very behind on a project if you're not focused. People don't schedule themselves very well at the beginning and end up working 12 to 16 hours at the end. We're still trying to put in place better project management to avoid that. There aren't very many common practices yet. And technology moves so fast that every project is different. You can't specify the right pipeline to produce widget A because the pipeline changes on each project."

Established strategies from other industries often don't apply to deadline issues in the game-development world. "The publisher's solution to the problem may not be the same as the developer's solution," says Verrette. "If you want to make the schedule shorter, throwing more money and more people at it may not solve the problem, because those people may be sitting around not doing anything, while the key people end up working much harder."

"The model of the game industry is start-up-centric," says Booth. "It's hard to predict how long things are going to take. You have to build it, see what's wrong with it, change it and keep iterating on it. It's very easy for the schedule to get behind and then we have to crunch. Over the years, that's been baked

into the industry. Companies that are not well managed have to constantly crunch to get the game done, because if they get too far behind, they'll go out of business. Other companies that aren't under that pressure sometimes adopt this, as well. But if you sustain a crunch for a long time, more than a week or so, you burn out your employees and they become useless employees. It generates lots of bad will, then people stop caring and the games end up being not as good. [To] people who find themselves in situations like that, I say they should get out. They're hurting their own creativity."

Companies that don't carefully manage their human assets can end up paying a price. In late 2004, the wife of an engineer at Electronic Arts posted to a blog a long, detailed complaint about how the long hours her spouse was working, and the stress he was working under, were ruining their family life. The post triggered a huge outpouring of sympathy from the community—as well as a couple of lawsuits, which Electronic Arts settled this past April for \$15 million.

"At Harmonix, we'll crunch around once a year, for a week or two," says Booth. "Management views this as a mistake in scheduling, that it shouldn't be happening, and they take great effort to make people feel comfortable. They bring in food, massages—they try to make people feel like they're being taken care of." At Verrette's company, Ironlore, "We try to anticipate. We implement crunch periods early on in the project, consistently picking up slack as it goes along, so at the end we don't have a huge, long crunch.

"It's a real problem when you've got an industry that's doubling in size every few years," Booth continues. "How do you keep this growth going and keep yourselves in check so you treat your employees well?"

And there's another result of this huge growth that may ultimately be even more disturbing. "A friend of mine who's a game designer used to be the lead singer of a band," says Brandon, "and he's always telling me horror stories about the record industry. He likes the game industry much better. He says people tell you the truth and are forthcoming. But the more money that goes [into the] industry, the more commercialism is involved. Something's beginning to change: There's more money, and there are also now A&R people." ■

*Paul Lehrman prefers games where you move around a lot and take a shower afterward. His book, The Insider Audio Bathroom Reader, is published by Thomson Course PTR and is available from [www.mixbooks.com](http://www.mixbooks.com), [insideraudio.com](http://insideraudio.com) and the usual suspects.*



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# Mixing vocals

TRANSFORMING YOUR TRACK,  
ONE SMALL STEP AT A TIME

BY KEVIN BECKA

**A** well-mixed and -sung lyric is the emotional centerpiece of any song. But because of the complexity of pitch, tone, nuance and lyrics, vocals need the most massaging when it comes to the mix. Getting a vocal in shape is like peeling an onion: Once you get past the first layer, there's always another to tackle. Our mantra here is "making magic is incremental"; no single technique will give you that "Eureka" moment. To really make your vocal track shine, know what to expect from each process that you layer on and, if you're not getting the results you need, how to move on to the next.

## MAKIN' A LIST

For starters, although you can do some basic vocal editing, tuning and comping while the rest of the song is finished, mixing vocals to a fine degree should be done after the rest of the track is in order. That said, start by solo'ing your vocal and checking it at a fair volume—even if you've done some editing and tuning, there may be an errant click, pop or other ugliness that has escaped your dragnet.

You may want to bring the creative team in to talk about the vocal's direction. Should the vocal be out front? Are you hearing dry, medium or wet ambience? The mix often dictates direction, but it's still a good idea to get an idea of what others on the team are thinking.

## LOCATION, LOCATION, LOCATION

Ultimately, placement of the vocal in the mix is the key to making it shine. This doesn't just involve adjusting the level of the vocal; it also involves consistency in tone. For instance, when the singer goes up to a higher register, does the vocal become strident? If so, add this to your list of fixes. Conversely, when the vocal drops in register and volume, is the tone muddy and the words hard to understand? If so, you've just added to your list again. Next, listen for uniformity in dynamics. Compression can tame the wild fluctuations of a vocal. However, a single application of compression may not do the job; getting the vocal to be heard above the other instruments and remain consistent in tone and feel without crushing it might require several steps. The point here is not to squash the life out of a performance, but merely to get it to where it is intelligible while giving the listener the best experience possible.

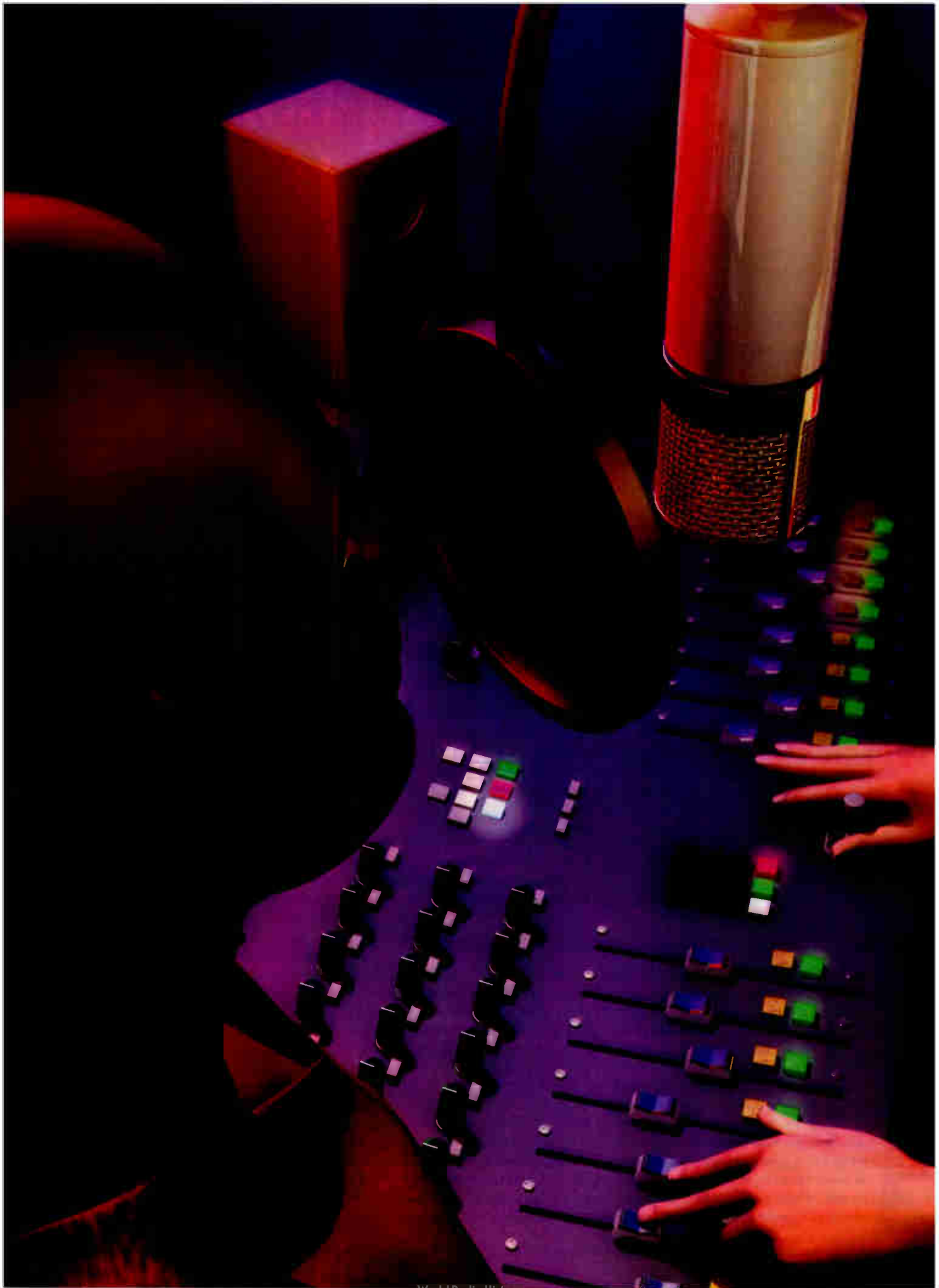
How about pops, clicks, mouth noises and other problems with the voice and recording? What about noise floor? If this was a home recording, was the washing machine running down the hall? Don't laugh—it's possible. Listen to your entire vocal track solo'ed at high volume and you'll be able to hear all kinds of sins. Getting the flaws out of the way without "hearing" the technology (for example, excessive compression, bad EQ choices, etc.) is key to a tasty mix.

## TONING UP

Although you can certainly work in any class of hardware or software, I've illustrated my examples with workstations and plug-ins. A DAW will allow you to address and automate a number of tools that can help you shape your tone to perfection. A good place to start mixing the track is to find a general EQ that works overall, one that improves intelligibility, removes any overbearing low frequencies and enhances overall presence in relation to the rest of the track. When shaping up the vocal with EQ, listen in context with the rest of the instruments: EQ'ing in the dark is an invitation to overdo it.

I like to start by setting up a 4-band EQ on my track. You can add openness, presence and intelligibility by creating a high shelf anywhere from 5- up to 12 kHz. If more presence is needed, try adding a peak EQ in the 3 to 6kHz range, or taking away 1 kHz or adding a little bit of 2 kHz (the main frequency range where the voice resides). Boosting a bit of 200 to 350 Hz will add warmth and fullness, but too much will make your track muddy. These techniques differ from singer to singer and depend on gender. Once you are confident, train your ear by first listening to the vocal solo'ed while you add EQ and then listen to it within the mix.

Once you perform an initial pass of EQ, you can then concentrate on tweaking specific problem areas. For instance, the verse may sound good but the chorus EQ might not work. First, be sure your frequency adjustments sound appropriate at various gain levels. If the singer goes up in range for the chorus—say, into a falsetto—and the track becomes too strident, then you may want to back off the gain on your high shelf for this section. You might also try this technique at the ends of phrases. Riding the gain of your plug-in from the beginning to the end of the song using this band may be just the ticket for fixing these problems.





# What "Inside the Box" Really Means

BY DAVID WEISS

## NEW DUAL, QUAD PROCESSORS PLACE NATIVE PROCESSING FRONT AND CENTER

**A**t a recent Grammy Sound Table event in Anaheim, Calif., coinciding with the NAMM convention, the four producer panelists were asked what seemed like a throwaway question about important technology advances and how they fit into their workflow. Harvey Mason Jr. of The Underdogs chimed in right away: The new Intel Macs, he said. This whole new generation of dual and now quad processors. Carmen Rizzo concurred: "The speed is just amazing, and for my live work, the latency is disappearing." The other two panelists nodded their heads and the panel moved on.

But that simple answer actually spoke volumes about the new means of production. Just a few short years ago, off-loaded host processing was all the rage as a way of freeing up the core CPU to run software without choking the machine. Now, multiple processors in a single Mac or PC have increased processing power and decreased latency. And for a producer like Mason, who averages about a song a day, the speed has absolutely increased his productivity.

These advancements are certainly a boon for music producers, but for developers, they can be a double-edged sword: Yes, there is greater potential to take their software to an even higher level, but there is also great pressure from the audio community to do that as soon as possible.

"The more you can do natively, the more you *want* to do that way, so users are pushing the limits further," notes Jason Davies of

BIAS. "With more CPU power available, we are able to offer much higher-quality real-time and offline sample rate conversion and more powerful native DSP processing than ever before."

At the heart of the current wave of native progress is multicore multiprocessors—which combine two or more independent processors into a single package—from companies such as AMD and Intel, the latter of which is currently shipping its Core Duo, Core 2 Duo and Xeon dual-core processors. Intel also recently introduced a quad-core processor, the Core 2 Extreme Q6700, which runs at a speed of 2.66 GHz with 8 MB of L2 cache. The advantage of these processors is that they allow the signal between different chips to travel a shorter distance, meaning that the signal does not degenerate as much, therefore allowing more data to be sent at the same period of time. They are also more power-efficient and take up less space.

"The number of effects and synths you can use at any given time is dependent on the processing power of the machine," says Michael Hoover, executive VP of products and development for Cakewalk. "The upside is that the faster the processor, the more you can do. The downside is that it's not a fixed, guaranteed amount—it depends on the project size, content and whatever else you are asking the PC to do at the same time. Depending on the software, different systems will let you know more gracefully than others."

"In the early days of using PCs [Mac or PC], users would exceed the CPU power pretty quickly," he continues. "Today, the average user can create great-sounding productions without being hindered by the CPU's capabilities. With the introduction of the multicore, multichip systems, there will be limits, but the limits are so high that few people will be hindered by them. For example, SONAR 6 on 64-bit multicore and dual-processor Intel-based workstation platforms enables outstanding performance for digital audio professionals with improved processing performance and access to eight or more GB of RAM. This will allow musicians to process more of their projects in memory with less data caching to and from their hard drive. Audio and video processes can also perform closer to real time with less latency, which is critical for both audio performance and mixing. And probably most important, the additional access to RAM will enable musicians to use larger, more realistic sample content in their virtual instruments, which will result in richer, fuller, more realistic-sounding music productions."

So what are the disadvantages of multicore? For end-users, there seem to be very few, but for software developers, it means that they have to go back to the lab to ensure their apps are taking full advantage. "The speed of CPUs directly affects the kinds of innovation we can build into our software," says Hart Shafer, senior product manager for Adobe Audio. "Some years ago, the advan-

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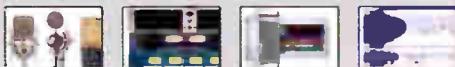
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Acon Acoustica 4 ( <a href="http://www.aconas.com">www.aconas.com</a> )	PC: 800MHz or higher CPU; Windows 2000/XP/Vista	2	VST, DirectX	Two-track editor with FFT analysis, phase metering, restoration tools (de-clipper/de-crackler/de-clicker), integrated RIAA preamp emulator and more.
Adobe Audition 2 ( <a href="http://www.adobe.com">www.adobe.com</a> )	PC: Pentium 4, Windows XP with Service Pack 2 or equivalent	unlimited	DirectX, VST	Record, mix, edit and master digital audio files with powerful tools that bring flexibility and control to your desktop studio. Easily create music, produce radio spots and restore imperfect recordings.
Apple Logic Pro 7.2 ( <a href="http://www.apple.com">www.apple.com</a> )	Mac: G4 (dual proc. recommended), G5 or Intel Core Duo. OS 10.4.3 or later	up to 255 stereo	Audio Units	Supports Apogee Ensemble FireWire I/O and Pro Tools HD7 DAE. Support for stereo ReWire objects and multichannel Audio Units instruments, and can play AAC and Apple Lossless compressed files. Logic Node apps require G5 or Intel Core Duo and Gigabit Ethernet.
BIAS Peak Pro 5.21 ( <a href="http://www.bias-inc.com">www.bias-inc.com</a> )	Mac: G4, G5 or Intel Mac; OS 10.3.9 or 10.4.3 or higher	2 (stereo)	Audio Units, VST (effects and instruments)	Supports up to 32-bit/10MHz, five plug-in inserts and integrated Vbox effect routing, graphical/list view playlist, automated batch processing, support for SMDI samplers, includes more than 25 effect plug-ins. Also available in LE version and in XT Bundle with Peak Pro, SoundSoap Pro, SoundSoap 2, Master Perfection Suite and more.
Cakewalk SONAR 6 ( <a href="http://www.cakewalk.com">www.cakewalk.com</a> )	PC: Pentium 4 1.3GHz or AMD Athlon XP 1500 or better with Win XP (minimum for 32-bit mode)	unlimited	DX, DXi, VST, VSTi	First Native 64-bit and Windows Vista-supported DAW. SONAR 6.2 supports Windows Vista in both 32- and 64-bit modes. 64-bit mode requires Pentium 4 2.8GHz or AMD Athlon 64 2800 (or better) with Win XP/x64. SONAR LE version widely distributed with third-party hardware.
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Magix Sequoia V. 8	PC: 1.5GHz or higher CPU running Win 2000 or XP	999 (stereo/mono/MIDI)	DirectX, VST	This multi-user, network-capable DAW offers most of the updates from Samplitude, but adds multichannel format support (configurable up to 12 channels), 48-track mixer, pitch-shift editing, pitch correction, Robota Pro 8 analog synth, low-latency Hybrid Audio Engine, restoration tools, Amphibia tube channel strip, VarVerb Pro reverb and SampleTank LE with 250MB sounds.
Merging Technologies Pyramix Native ( <a href="http://www.merging.com">www.merging.com</a> )	PC: Windows XP	24	DirectX, VST	The Native Media Bundle is an enhanced version adding surround mixing, eight record/playback I/O, DSP effects, 64 to 192kHz operation and more.
MOTU Digital Performer 5.11 ( <a href="http://www.motu.com">www.motu.com</a> )	Mac: G4/500MHz with OS 10.4.4 (minimum); dual-processor G4/G5 or any Intel Mac (preferred)	unlimited (depends on host CPU)	MAS, Audio Units, VST with third-party wrapper; TDM, HTDM, RTAS and AudioSuite (with PT hardware)	Version includes six new instrument plug-ins, a meter bridge feature, new editing tools and input monitoring modes, clip-based volume automation and more. For film/TV composers, Digital Performer 5 can superimpose streamers/punches/flutters on a QuickTime movie for collaborating with music editors and prepping for soundstage scoring sessions.
RML SAWStudio V. 4 ( <a href="http://www.sawstudio.com">www.sawstudio.com</a> )	PC: Pentium II 450MHz or higher with Win NT/2000/XP	72 mono/stereo tracks, 24 stereo output tracks	Proprietary, DirectX and VST	Recent enhancements include a Hot Track Solo mode, the ability to host VST plug-ins in any folder on any drive, a function for automatically compensating for the latency of VST plug-ins and a bypass of the auto-compensation feature. SAWStudioLite and SAWStudioBasic are also offered.
Steinberg Cubase 4 ( <a href="http://www.steinberg.net">www.steinberg.net</a> )	Mac: G4 1GHz or better with OS 10.4 PC: Pentium or Athlon with 1.4GHz or better CPU; Win XP (Home or Professional)	unlimited audio/MIDI (depends on host CPU)	VST2, VST3	New technologies include VST3 and ASIO 3, new synth engines, Yamaha hardware integration and audio control room routing. Features include 34 new 64-bit plug-ins, new VST instruments, instrument tracks, track presets, configurable channel strip, mixer and notation enhancements, advanced real-time transpose and drag-and-drop inserts. LE version widely distributed with hardware from many sources.
Steinberg Nuendo 3.2	Mac: G5 with OS 10.4 PC: Intel or AMD 2GHz CPU minimum; Win XP (Home or Professional)	supports up to 192 physical I/Os	DirectX, VST	Includes a control room busing/monitoring system for creating separate mixes for headphones, control room and up to four studios, plus foldback and external audio source handling. Nuendo 3.2 also enhances support for Euphonix MC and System-5 MC control surfaces.
Steinberg WaveLab 6	PC: Pentium or Athlon with 1.4GHz or better CPU; Win XP (Home or Professional)	stereo or surround	DirectX, VST	Offering high-res stereo/multichannel audio editing, mastering, CD/DVD burning and CD or DVD-Audio production, WaveLab 6 adds 120 new features, including Spectrum Editor, integration of outboard effects and hardware remotes, loudness corrected SmartBypass, DIRAC time stretch and pitch-shift technology, and Bob Katz's K-System metering.
Sonic Studio soundBlade ( <a href="http://www.sonicstudio.com">www.sonicstudio.com</a> )	Mac: 1GHz CPU with OS 10.3.9; faster CPU and OS 10.4.3 (or newer) recommended	4 to 16 tracks	VST, Audio Units	This stereo production app features instant PQ creation, CD "refs" and DDP file set delivery and optional restoration tools including NoNOISE, plus Sonic Studio's EFM™ and 4-point editing capabilities with the SSE™ real-time audio engine and optional, hardware-accelerated DSP.
Sony ACID Pro 6 ( <a href="http://www.sonymediasoftware.com">www.sonymediasoftware.com</a> )	PC: 1GHz CPU (1.2GHz if using video) and Windows 2000 (SP4) or XP	unlimited audio/MIDI (depends on host CPU)	DirectX, VSTi soft synth, VST effects, ReWire mixer and device support	This loop-based music creator now offers full DAW performance with 24-bit/192kHz audio support and MIDI editing. Features include on-the-fly punch-in overdubs; VSTi parameter automation; drum map editing; Mackie Control Universal support; real-time pitch and tempo matching; 20-plus real-time DirectX effects; and 5.1 mixing.
Sony Sound Forge 8	PC: 500MHz or faster CPU; Windows 2000, XP (Home or Professional)	2	DirectX, VST, ASIO	Version 8 of this 2-track editor/restoration package adds ASIO driver support, batch conversion and CD Architect 5.2 software.





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## What "Inside the Box" Really Means

tage was with host processing because the chips were function-built to handle audio processing. Now, however, native applications like Adobe Audition are reaping the benefits of billions of dollars spent by the likes of Intel and AMD, allowing us to dream up features that weren't possible before.

"There are two main benefits to the user: cost and ease," Shafer adds. "As computer prices continue to fall, it is most often less expensive to buy a standard computer and just add software than it is to buy and use dedicated hardware. Just as important as the lower cost is the ease of entry. New users are generally much more comfortable buying a standard Dell and running with it than worrying about configuring multiple pieces of hardware."

At Rain Recording, which builds the Element line of DAWs, taking maximum advantage of today's native processing power calls for a holistic approach to the entire machine. "The philosophy is one of balanced technology," explains Bill Paschick, president of Rain Recording U.S. "Many people thought for a long time, 'If I have the fastest processor, I'll be the fastest.' But that's not true. If the hard drive is two years older, for example, it won't be able to suck the information off the processor fast enough."

"Not until the last couple of years, when components started to get more balanced, were we able to unlock the power of true multicore," adds Robin Vincent, president of Rain Recording UK. "There had to be a convergence of peripheral component viability so they would all work in harmony. The software people had to write instruction sets for the dual-core processors, but they also had to say, 'What about drive speeds? What about buffer sizes?' The bottom line is that with the Core 2 Duo, there is now a 40-percent increase in processing power at the hardware level, pre-OS. That means, forget Windows XP, forget the operating system—we now have a 40-percent increase in how the computer thinks."

On the Mac side, the combination of Intel multicore processors and evolution of hardware has had an equally big impact on those machines' ability to make the most of native processing. With the Xeon chip now available within the Mac architecture, the G5 has already gone the way of the dinosaur.

"We worked really hard to make native processing and music production work on a dual-core system for some time," says Alec Little, senior product manager, music and audio marketing for Apple Inc. "We believe we have arrived now, and as a by-product, we

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## What "Inside the Box" Really Means

have also been able to arrive at a portable solution with the MacBook Pro. The top-of-the-line Mac Pro [tower] has two dual-core Xeon processors, but there are other elements that make it compelling for audio: huge, 16GB RAM capacity and four internal hard drives

## Meet Vista

With Microsoft's latest platform, Vista, now on the market, PC users are wondering if this is a good thing. Cakewalk's Michael Hoover assures us that it is. "The main performance benefits for DAW users can be attributed to the Multimedia Class Scheduler (MMCSS) and WaveRT implementation in Vista," he says. "DAW users are aware that streaming low-latency audio comes at the price of CPU consumption. Also, there is a threshold beyond which lower latency can cause glitches in audio playback. To address this long-standing issue, Vista has new features designed to aid real-time streaming multimedia applications. The new MMCSS and WaveRT audio drivers offer applications a more efficient mechanism to stream low-latency audio with a lower CPU hit."

WaveRT brings high-performance, real-time, low-latency audio drivers designed for pro audio to Vista. "The streaming model for such drivers is somewhat like [Steinberg's] ASIO and [Windows' previous driver model] DirectKS, but there are important differences," says Hoover. "The WaveRT signal flow permits direct access to the internal audio hardware buffers and sample position counters, allowing a DAW application to stream audio to the hardware in the most efficient manner possible. Direct access to buffers and sample position means no costly user-mode-to-kernel-mode transitions on each audio pump cycle. With ASIO and Kernel Streaming [DirectKS WDM drivers], these transitions were unavoidable in Windows XP. This translates into lower CPU consumption while running at very low audio playback latencies.

"Most off-the-shelf Vista-logo machines that will be available in 2007 will ship with onboard audio that is WaveRT-compliant," he concludes. "This promises low-latency audio playback from even consumer-grade laptops and desktops. When more pro audio vendors make WaveRT drivers available, DAW users will benefit from more efficient low-latency playback."

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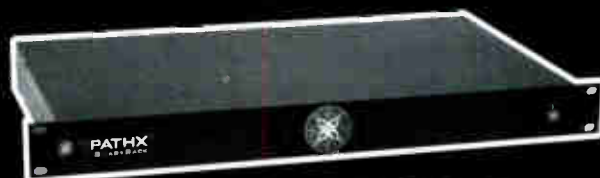
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## What "Inside the Box" Really Means

for up to three terabytes of storage.

"Our previous benchmark for audio performance was the G5 Quad, which had quad processors but older technology," he continues. "In our Logic DAW, the Sculpture soft synth is a very DSP-intensive instrument. With the G5 Quad, we could have 17 instantiations of Sculpture, whereas in the Xeon we can have 30. The Platinum Verb could have 240 instantiations with the G5 and 420 with Xeon. So with this transition to Intel, the Universal Binary applications, we've seen the power of Logic almost double."

The result of these impressive specs is a boost in native capability that takes another step toward truly intuitive operation. "Improved native processing speeds the workflow, providing a better real-time experience," explains Dave Chaimson, VP of marketing for Sony Media Software and its ACID Pro, Sound Forge and Vegas programs. "You can instantly hear or see the results of the edits you make or the effects you apply. It also decreases rendering times. We allow for user-customization to tailor for special circumstances, such as rendering other projects in the background or running with several instances of the application open at once."

Cakewalk's Hoover reminds users that the ultimate technique for optimizing native processing lies in maintaining a machine dedicated solely to audio. "If someone wants to get the most from their native system, then they really need to dedicate a PC to the task," he says. "Installing as few things as possible will keep them making music rather than trouble-shooting the system."

The evolution of native processing may be one of the most important ongoing, behind-the-scenes developments in pro audio as it continues to remove more of the barriers that currently separate human and machine. "Our job is to make sure you forget all about your computer—it should be transparent," says Rain Recording's Paschick. "But it's not about a limitless supply of sounds or effects. It's about being able to use the instruments and plug-ins you like without having to worry about their effect on the system."

"With the advances chipmakers like Intel have brought to processing, we are just now starting to realize the benefits," adds Hoover. "All of this is going to remove, diminish and maybe even eliminate limits to creativity for both the musicians who use our products and for Cakewalk as a developer of products for musicians. Ultimately, this will result in better-sounding music for everyone." ■

David Weiss is Mix's N.Y. editor.

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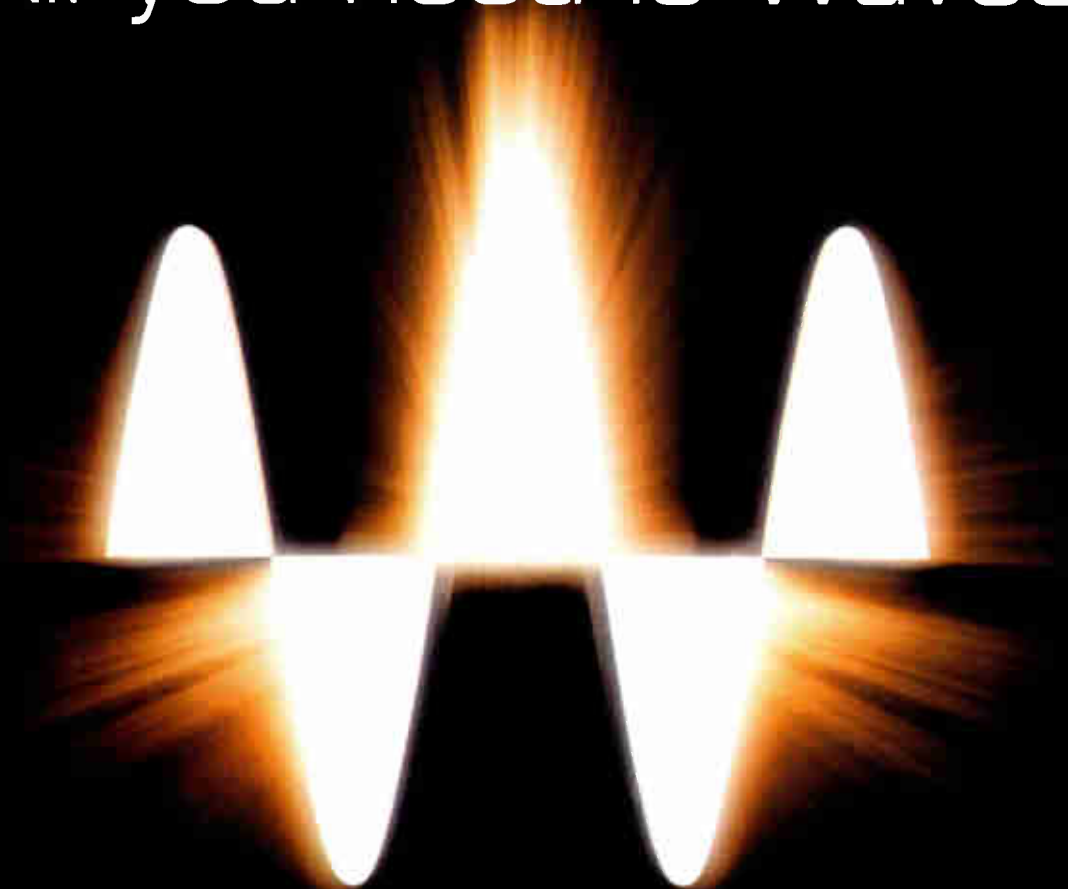
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Special Issue

# GAME AUDIO

INSIDE

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# INDUSTRY BUZZ

## Game Audio Resources

Gamasutra.com, *Game Developer* magazine's Web component, provides technical features, profiles, product reviews and networking resources in all areas of game production, from audio and visual design to legal issues.

The Game Audio Network Guild, aka Audio G.A.N.G. ([www.audiogang.org](http://www.audiogang.org)) provides a community for networking and evangelizing audio issues, as well as fostering education. The group also hosts annual industry awards.

Girls In Games ([www.girlsingames.com](http://www.girlsingames.com)) seeks to attract and promote women in the areas of design, art, audio, programming and production within the global game industry.

The Interactive Audio Special Interest Group ([www.iasig.org](http://www.iasig.org)) helps developers of audio software, hardware and content exchange ideas about interactive sound, and provides resources via standards creation and maintenance, research reports and recommended practices.

## By the Numbers

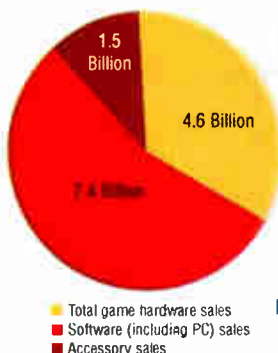
**40.23 million:**

Units sold of *Super Mario Bros.* for Nintendo, best-selling videogame of all time



**29 million:**

Units sold of *The Eagles: Their Greatest Hits 1971-1975*, best-selling album of all time



## Banner Year for Game Biz

Recently released 2006 U.S. retail sales figures show record numbers for the game industry, and the stats just keep rising. Last year's sales for games and consoles totaled close to \$12.5 billion; adding in PC games brings the grand revenue total to \$13.5 billion—up 18 percent over the previous year.

The long-anticipated release of next-gen consoles and continued strength of Sony PlayStation 2 sales accounted for a strong rise in hardware revenues, with sales numbers coming in at \$4.6 billion—a 42.8-percent increase over 2005, with a whopping 87.5-percent increase in console hardware revenues alone. Software sales continue to account for the biggest chunk of the overall pie, however, bringing in \$7.4 billion. And there's no end in sight: The industry is predicted to grow to \$46.5 billion by 2010.

## Who's Playing?

When most people think of gamers, the image of idle teenage boys often comes to mind, but the actual demographics may surprise you. Check out these stats from the Entertainment Software Association:

- 33** ➤ Average age of a videogame player
- 69** ➤ Percent of heads of households who play computer games
- 12** ➤ Years an adult gamer has been playing videogames
- 30** ➤ Percent of women over 18 who play videogames
- 40** ➤ Average age of a videogame buyer
- 25** ➤ Percent of Americans over 50 who play videogames
- 6.8** ➤ Hours per week gamers spend playing videogames

Sources: RIAA, Guinness World Records, the NPD Group, Nielsen Entertainment, Plunkett Research, Entertainment Software Association

The videogame industry is entering a new era, an era where technology and creativity will fuse to produce some of the most stunning entertainment of the 21st century. Decades from now, cultural historians will look back at this time and say it is when the definition of entertainment changed forever."

—Douglas Lowenstein, president, Entertainment Software Association

## Game Developers Conference Hits S.F.



Want a piece of the \$13 billion game industry? Network with the talent behind today's hottest titles and technology at The Game Developers Conference 2007 ([www.gdconf.com](http://www.gdconf.com)), taking place this month in San Francisco. GDC is the world's largest game-creation

event, attracting more than 12,500 attendees annually; the conference, slated for March 5 to 9, offers more than 300 seminars, lectures and networking events for developers, publishers and other content creators for PC, console and mobile game platforms. If you're looking to build up your game audio chops, this is the place to learn: An expanded audio track offers such sessions as "PS3: Audio Development From the Trenches," "The Art of Orchestration" and "Mobile Audio Has Gone Berserk!"

Events run into the wee hours with the 7th annual Game Developers Choice Awards, 9th annual Independent Games Festival, the always festive Audio G.A.N.G. Awards and the wildly popular Video Games Live concert event. (See our profile on page 78.)

Check out our expanded GDC coverage, including convention tips, San Francisco city guide ongoing reports and blogs straight from the show floor at [www.mixonline.com/gdc](http://www.mixonline.com/gdc).

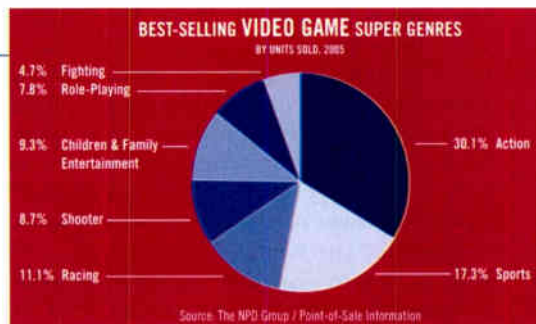


## Cot a Pocket Full of Quarters... And a Lighter

In 1983, Bally/Midway developed an arcade game to coincide with the release of a new album by a hot rock band. In the game, bandmembers had to retrieve stolen instruments while avoiding alien obstacles and return to their spaceship in time to make their intergalactic gig. Although most of the game sounds were generated by chips, during a bonus "concert" round, an actual analog cassette deck inside the cabinet played a loop of a smash hit from the album. If you can name the game, email [mixeditorial@mixonline.com](mailto:mixeditorial@mixonline.com). Correct entries will enter in a random drawing to win a CD box set from this band.

## Need for Speed

When it comes to favorite game genres, fast-paced action games are the most popular, followed by sports and racing. Surprisingly, fighting games fall behind role-playing and family entertainment in popularity.



# LOCKED AND LOADED

## Crafting the Sounds for 'Halo 3' With Thousands of Dialog Lines, An Evil Alien Armada and a Cast of Superhuman Soldiers

It's no secret that the gaming world has changed by leaps and bounds over the past decade. We've all heard the comparison: With today's high-def consoles, games are moving closer and closer to having the same look and feel as big-budget feature films. And at the front of this burgeoning entertainment revolution are the minds behind the massively successful *Halo* series for the Microsoft Xbox 360—and soon for Windows Vista. Even if you're not a hardcore videogame fanatic, you're probably familiar with the *Halo* name—the omnipresent media campaigns have made it pretty hard to ignore. With a storyline that rivals the best parts of movies like *Aliens*, *Terminator 2*, *Independence Day* and the like, the series has garnered legions of devoted fans and is easily one of the most successful video game franchises in history. So when it came time to start work on the third installment of Master Chief's epic battle against the evil Covenant, the development team at Bungie Studios knew that they had their work cut out for them. (Note: Although *Halo 3* was originally expected out this spring, the release date has been pushed back; the current release date, according to creators, is "sometime this year." Consider this a "sneak peak" window into the game development.)

Begun as a basement operation back in 1991, Bungie Studios ([www.bungie.net](http://www.bungie.net)) has been responsible for some of the biggest videogame titles of the past decade, including *Marathon*, *Myth* and, of course, the original incarnation of *Halo: Combat Evolved*. The team got its start creating titles for the Mac platform, and after a number of successful releases, the company caught the attention of Microsoft, which acquired Bungie to create titles for its then-forthcoming Xbox game console. Though still a boutique operation, Bungie is now a



full-service game development house with a complete staff of programmers, artists and sound designers. Heading up the audio group at Bungie are audio director and composer Marty O'Donnell, audio lead Jay Weinland and engineer C. Paul Johnson. The members of the team are all accomplished musicians, composers and sound designers. O'Donnell, for instance, got his start writing commercial jingles, including the classic theme for Flintstones Vitamins.

### TURN AND BURN

Nearly all of the audio content development for *Halo 3* took place at Bungie headquarters in Kirkland, Wash. The audio department is housed in a recently completed custom facility, which comprises three Pro Tools HD-equipped studios and a centrally placed voice-over booth. "We went strictly for functionality as far as games go, so we're similar to a music post house or anyone that does commercials," says Weinland. "We've tailored our stuff to what really works well for games. So we're all surround sound. We're all running Genelec speakers of varying sizes. We're all on Pro Tools HD

rigs, one HD3 and two HD2 rigs. We use Peak heavily, and we're all about Waves Diamond.

"We also have some unique pieces of gear that aren't present in most people's studios, including a Dolby DP564, which is basically a multichannel audio decoder," Weinland continues. "It allows you to take the optical output of the Xbox and bring it into Pro Tools as six channels of AES/EBU. So that's a piece of gear that you don't find in a normal music studio. It's the linchpin of our rigs, as it allows us to monitor the Xbox digitally. Other than that we look like a normal post house. Right now I'm looking at a straight-up 2-channel Avalon mic pre. We're recording voice-over. We're sometimes recording instruments. We're doing Foley. We're doing all the same kinds of stuff that commercials and movies are doing, but we just happen to then have to take it those extra nine yards to get it into the game engine."

"We have three full-blown, nicely isolated 5.1 recording studios, one for each of us," O'Donnell adds. "I have some extra music gear here, so I can compose music and get it ready. Sometimes I do all



of the music here, and sometimes I just get it ready for taking out to a live orchestra and recording that in the Seattle area. Jay and I both have studios that are similarly equipped, and from the way our desks sit, I look one way out through a window to our voice-over isolation booth, and there is a studio on the other side of that, which is Jay's. So he can look into the same booth. We can run Foley and voice-over and individual recording sessions using that booth. And either one of us can run the session from our individual rooms, so we can work pretty independently. It's a pretty nice little setup."

**ONE PIECE AT A TIME**

As is the case with many of today's sprawling, cinematic games, the development process is a bit-by-bit process where the audio team can only create audio as the artists and programmers finish or finalize individual levels, characters and the like. "We have lots of areas in the games like weapons and ambiences and machines and so on. And we can't really design something until someone else is done," Weinland explains. "So we really interface with the people in production and with the art leads and so on to figure out when their assets are going to come online, so that we can then put our little sprinkle of magic fairy dust on it."



"The implementation side of it is really huge," O'Donnell says. "It's not just about, 'We need a sound.' It's all about, 'Here is this vehicle or here is this weapon, which has many different components and many different ways it needs to act in a 3-D audio environment.' The lesson learned here at Bungie is that the audio guys need to be in from the very inception."

Although much of the audio content—like music and background ambiences—is created completely in the Pro Tools environment through the use of sample libraries, soft synths and more sound design-oriented tools, a great deal of the sounds are actually recorded on location. The team employed both their own portable recording rig as well as some rather creative approaches to recording in the field. "To start with, we have a very large collection of commercial libraries that we will hit as needed," Weinland explains. "But if we need particular stuff, we have a couple of Sound Device recorders, the 722 and the 744T, that can be linked together to do up to six channels. We have the Apogee MiniMe and some mobile pre's that can be charged off a portable battery system. So we can sit off in a field somewhere and record eight, 10, 12 channels, if we include laptops in the equation, and record whatever we need. We were involved in a gun-recording session with another MGS group that was Halo-ish, and we basically shared some of those resources.

"A couple months ago, I needed a

nice exhaust sound for something that we were working on," Weinland continues. "So I strapped a microphone on the back of a friend's Fiero here that has dual six-inch pipes on the back, and we drove around town and recorded what we needed. We record stuff as necessary."

One of the most involved aspects of the audio development was the casting and recording of the voice actors, whose performances are a major element of the game as they not only add to the overall realism of the game, but also provide players with crucial information. And unlike a film where things follow a predictable, linear progression, the developers have to record and edit enough dialog to account for the nearly limitless ways a player can move through the game. On *Halo 2*, O'Donnell and Weinland had to contend with more than 16,000 lines of dialog, and with the increased audio capabilities of the Xbox 360, casting the voice talent and managing the dialog were even more involved, all the way through integration.

"That's a big one. I've been doing this for a while in terms of casting voices," says O'Donnell. "I used to do commercial work where I knew tons of very talented voice actors. And when I started working with Bungie, we pretty much cast from the Chicago pool of talent. Then when we moved out here and started working on *Halo*, we were in Seattle and went through a big casting call, and we've gotten a bunch of really



Bungie's Jay Weinland and Marty O'Donnell

good Seattle actors to be part of our stable. And on *Halo 2*, we went to Hollywood and got some people that we thought it would always be fun to have who turned out to be *Halo* fans and wanted to work with us. We've got actors from Chicago, Seattle and Los Angeles in the game. And there is a company in Los Angeles called Blind Light who has helped us quite a bit with casting, especially in Hollywood and contracts and studio booking time and all sorts of stuff."

### THE GHOST IN THE MACHINE

Aside from crafting the actual sounds and music for the game, the audio team has to contend with how the audio will change and react to game play. "We use in-house tools," explains Weinland. "One which handles all of our data and any applicable parameters—volume and pitch variation, EQ, weighting, distance attenuation values etc.—and another for populating sounds in the environment, such as ambient and reverb properties, sound points, etc. The

audio portions of these tools are tailored for our game and allow us to attach sound to just about anything in the game.

"Another component is the scripting system, which among other uses allows Marty to paint music upon a blank canvas, responding to events during gameplay as desired," Weinland continues. "He can for instance highlight a specific event or move to an ALT mix of a piece dependant on gameplay. It's a very subtle yet powerful system that allows the music to flow with the game without appearing to be 'triggered,' as is the case in many videogames."

As players move through the game and interact with different characters, vehicles and weapons, the audio has to reflect physical changes in environment, and the music and dialog have to be constantly mixed in real time so players don't miss important pieces of information and plot developments. This means that the audio team has to spend a great deal of time working with the actual game engine to make sure the audio is properly implemented.

"I think this the key to making good game audio," says O'Donnell. "It's 50 percent the content and 50 percent the implementation. That's just a simple way of saying it. It might even be more implementation. We want to have the absolute best content to start with because it has to be interactive and really controllable at a very fine, granular level. And that means it's not just about going out and recording the best-sounding gunshot or the best-sounding engine sound. It's, 'How do you create an engine sound that is totally interactive, does all the things that an engine does in real time but is completely controllable by the player?' And that takes a lot of horsepower in the [game] engine itself. There are all kinds of things where you have to know how you're going to use the physics of the game to have the sound track as perfectly as possible."

"One of the things that's pretty cool about our code engine is that we actually have real-time ducking in our game," Weinland adds. "So that we can control any individual sound, we can control how we duck it under cinematic or other types of dialog, which is our biggest challenge. If the character is giving you some very important information, and all of a sudden three grenades land at your feet and blow up, you don't want that line to get stepped on. We have real-time parameters where we can say, 'We'll duck this sound nine dB over two seconds and let it ramp back up after the dialog is done, over the course of another

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second and a half.' So it allows us real-time control over the volumes in the game, and it helps us to make sure that we can always hear the important dialog and other things that are important."

"It's almost like designing another artificial intelligence character within the game, and that's the film mixer who sitting off on the side mixing the game in real time," says O'Donnell.

### TOTAL IMMERSION

With a deep and enveloping plot line, a cast of memorable characters, ultra-realistic graphics, fluid game play and world-class multichannel audio, playing *Halo 3* is about as close as one can get to stepping inside a blockbuster sci-fi film, and that is exactly what the team Bungie set out to create. "The unexciting thing is that we're not trying to do anything too revolutionary," says O'Donnell. "The Xbox was the first platform that allowed us to do real-time Dolby surround encode/decode, and that's a huge palette to perform on. So we're just spending even more time on the details, getting better fidelity in every area, having more



voices, more control over how things are mixed, and even the number of characters on the screen. There will be more unique voice actors per level than we've ever had. And so we need even more robust means for choosing what should be heard. So that's really what we're working on. We just hope that when people get in, all of the sounds, all the voices, it just sounds so alive and real that they're not even thinking about how real it is."

"I have a lot of people ask me how

we make our games sound so good, and what I usually come back to is that it's not like we're doing rocket science," Weinland concludes. "We try and make good content, and then we're really stinking anal about trying to make sure that every single detail that should have a sound makes a sound. That way it just sounds natural. If it sounds correct, then we're happy."

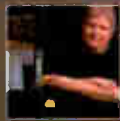
To learn more about *Halo 3* or the developers at Bungie Studios, take a look at [www.bungie.net](http://www.bungie.net). ■

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# SOUND INTEGRATION

## The Next Revolution Will Be Played

BY MICHAEL HENEIN

**A** revolution is taking place in the game world: increased budgets, more hardware resources on target platforms and more high-level software integration tools that are being developed for designers and composers. In the past, audio integration was once solely within the grasp of programmers. It was common practice to have a sound designer create content and then hand it off to a programmer, never to hear it again until the game was released. Although this practice still exists in some ways today, the process is changing as tools for designers become more refined.

The increase in overall game budgets has trickled down to the audio production pipeline, as more money is being spent in all facets, from building quality studios to conducting location recording, Foley work and live music sessions, ensuring that games have a level of sonic quality control that rivals film.

The latest generation of game consoles and PCs are all about sheer processing power. This, of course, translates to more audio! From voice counts to output channels and effects processing, current game systems have broken down many barriers that once existed in game audio.

To dig deeper into the issues surrounding game audio integration, we rounded up a group of pros on the frontlines of audio development for some of the hottest game titles being released. For more on our participants, see "The Players" sidebar on page 54.

*If you are asked to create specific sounds, what types of sounds do you primarily focus on? Also, what are the challenges associated with the sounds that you are primarily integrating?*

**Phil Hunter:** I dealt with the speech files for *Carbon*, and integration occurred constantly throughout the development of the project. The greatest amount of my time is spent designing, recording and tweaking the speech. Since *Carbon* was launched in six languages, integration did take its toll toward the end of the project, as each language contained over 11,000 individual lines of dialog.

**Robb Rinard:** Our company [2XL Games] is currently focused on creating racing titles. The Number One most time-consuming audio production element comes from the creation of the engine audio. There is a broad range of performance across all the different vehicle types we're including, so I've recorded everything from 30 hp go-carts all the way up to 1,000 hp open-header sand rails. The biggest problem is the mix getting really thick. It's one thing to

listen to a high-fidelity race car engine by itself. But once you surround yourself with 10 other vehicles, it's challenging to keep the overall mix sounding good and keep the player vehicle sitting on top of the mix at all times.

*Do you have dedicated programmers for audio integration? If so, how often do the designers interact with programmers?*

**Rinard:** Yes, and in our case the audio programmer is also the sound designer and field recording person. I've worked on past games where the audio designer was not a programmer, and that's always a challenge. It's rough when the sound designer has a vision for doing something cool in real time, but the programmer doesn't quite understand that vision and is struggling with the implementation.

Our latest challenge has been connecting the vehicle to world. In last-gen games, the vehicle typically only has an engine sound, but that's not enough to connect the vehicle to the world in which it exists. Now that we have enough console power and memory, we are adding a host of secondary layers of Foley to the vehicles. These items include a simulation of all the other sounds that the vehicle makes as it moves through the atmosphere, such as tire noise and airflow over the surface of the vehicle. Also included are suspension compression, bottoming out, sliding, skidding, gravel sounds, et cetera.

**Hunter:** The sound designers and programmers work together on a daily basis throughout the entire project. It's truly a combined effort—we throw ideas against the wall and they tell us what sticks, and vice versa. Having that balance of sound/artist creativity and "coder logic" keeps the ideas fresh and fluid. For example, as the cop speech in the previous *Need for Speed* title [*Most Wanted*] proved, a well-designed speech system can significantly enhance the gaming experience for the player. Having the audio programmer and speech designer working closely together from the very beginning eliminates many of the problems that can occur early on. This enables us to focus on getting the player more emotionally involved, which, of course, makes for a better gaming experience.

*Are you using a proprietary or middleware solution for your audio implementation needs? What sorts of features do you look for in a toolset/engine?*

**George Valavanis:** Having strong middleware alleviates the need for audio programmers and streamlines the production process so that the sound designer/composer is in complete control of all sound assets in the game. Wwise, from Audiokinetic, is fantastic in that it minimizes the de-

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## SOUND INTEGRATION

pendency on our engineering department and maximizes my level of control. It has a construct called Real-Time Parameter Controls (RTPCs) that I find very useful. RTPCs are essentially variables that can be mapped to virtually any audio parameter in the tool. Wwise is basically like working with a real-time DAW, only slightly more abstract.

**Nick LaMartina:** FMOD, created by Firelight Technologies, provides a GUI and work methodology that very closely resembles common sequencers and NLEs, so working with it is a very simple, transitional and familiar experience. The thing we all like the most about it is that nearly all of the behavioral and structural data associated with the sound events is handled in the graphic Designer tool, so audio decisions can be made by audio people and programming decisions can be made by programming people.

Ideally, the programmers will only need to step in if something goes wrong, but we'll see how that goes in the future.

**Stephen Miller:** The tools and engine that we use are completely done in-house, giving us a customized solution so we can be more efficient with how we want to work. The proprietary solution we used on *Path of Neo* was both a GUI and a scripting language. Importing sounds into the database to be used in the game was a GUI—and a fantastic one at that. It allowed us to import files from Pro Tools sessions and maintain the layers and timing we had created.

**Rinard:** For the low-level control of the audio hardware, we use the Miles sound system from RAD. Then we wrote an abstraction layer on top of Miles that allows us to manage the sum of the game's audio in a way that is similar to a mixing console. Our game engine has features that allow the audio designer to layer and mix just about anything you can think of, as well as position the sound in 3-D with total control. We can group collections of sound together into a virtual bus, apply effects to any bus and then feed all the buses into a master bus, apply more effects if needed and then ship it off to the hardware for AC3 encoding. On the Xbox 360, we are typically running between 128 and 160 mono channels of audio at any given time in a race.

**Michael Smith:** Most of my projects use one middleware solution or another. Sometimes it's Miles, lately more FMOD, but it ultimately depends on the project and the people making it. I prefer to have the programmer working on backside

## The Players

**Adam Boyd and Phil Hunter:**

Part of the audio team that

worked on *Need for Speed: Carbon* for EA Canada, Hunter handled the speech design and Boyd was the audio lead on the project.



**Nick LaMartina:** sound designer at Cheyenne Mountain Entertainment who is currently working on the *Stargate Worlds* MMORPG (Massively Multiplayer Online Role-Playing Game), which is based on the hit TV show.



**Ed Lima:** audio director of Gearbox Software. Previously, Lima created the audio for 3D Realms' *Prey* and Id's *Doom 3*.



**Stephen Miller:** audio lead at Infinity Ward, creator of the *Call of Duty* Series from Activision. Miller recently worked on the *Matrix: The Path of Neo* game for Atari.



**Robb Rinard:** cofounder of 2XL Games and game designer of *ATV Offroad Fury 2* and *MX Unleashed*. Rinard is currently working on all of the audio development and design of the next-gen racing title for THQ.



**Michael Smith:** Audio director at Sony Online Entertainment, Smith has worked on the *EverQuest* Series, *Star Wars Galaxy* and *Matrix Online*.



**George Valavanis:** audio director at Blue Fang and maker of the *Zoo Tycoon* series for Microsoft.





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functionality and expanding on the tools. Unless a programmer has a really strong background in audio, they're not going to know how best to integrate the sounds.

The integration time depends a lot on the tools you have: If you have well-designed and well-tested implementation tools, the integration doesn't take long at all, perhaps 20 percent of the overall time. However, if the tools aren't so hot or are nonexistent, the integration will likely take much longer than creating the sounds themselves. It's not just a time issue, either. Weak tools also sap the creativity in the sound design process. It's kind of a soapbox issue with me. If the sound designer is dreading the integration phase, there will be less iteration in the sound design, so the sounds themselves won't be so hot. From there, the sound designer will be less likely to do fancy tricks that create that "wow" factor out of fear of breaking something

different kinds of footsteps, cloth movement, whooshes and hits, to gun reloads and sword swishes. When the project was complete, there were over 40,000 sound entries on just the animations.

**Overall, how do you approach mixing?**

Lima: I think about the mix throughout the entire design process. I generally try to bake some slight equalization curves or tendencies into families of sounds. For instance, explosions might be bottom-heavy, voice-over might occupy a higher band or the music might be designed with specific instruments and frequency bands in mind.

Some of that seems pretty obvious, but if carried through the entire sound production effort, what I'll find is that before I start properly mixing the game, the sounds playing in-game can already be heard to a large extent residing in their own frequency pockets, regardless of their playback volume setting. From

If the sound designer is dreading the integration phase, there will be less iteration in the sound design, so the sounds themselves won't be so hot. From there, the sound designer will be less likely to do fancy tricks that create that "wow" factor, out of fear of breaking something.

—Michael Smith

or fear of learning an obtuse integration system.

**What was the most challenging sound integration instance on a recent project?**

Ed Lima: On my last project, the biggest challenge was designing and implementing a real-time ducking compressor on voice-over. The problem we encountered was that, having received final dialog assets relatively late in production, we found that the aggressive music and sound design mix left no headroom for voice-over to be heard. We put together a system wherein we tagged voice-over sound assets with a flag that would drop everything else by 4.5 dB. This produced some pretty good results overall, but we then went back and built a second system to *bypass* the ducking on specific sounds, such as specialized cut-scene sounds, some music cues and so forth.

Miller: One of the most challenging sound-integration tasks I have had to do was placing all the sounds to literally thousands of animations. Everything from

there I can start to tweak until I've got everything right where it needs to be.

Adam Boyd: The audio mix for *Carbon* was done by [audio director] Charles Deenen and myself. We use proprietary mixing software that allows every sound element to be individually controlled at run-time by the game data that is occurring at that particular moment. For instance, we can have the wind noise volume increase proportionally to the car's velocity. This does not need to be hard-coded and will change dynamically as the variables within the game change.

Other mixing systems might allow you to turn down all other elements—sound effects, music, et cetera—within a mix to allow dialog to cut through, but our system has much more detail and control. We can turn down only the elements that interfere with the speech, in terms of frequency masking, which produces a much cleaner and less "crude" mix. Ultimately, our goal is to have our games sound like feature films.

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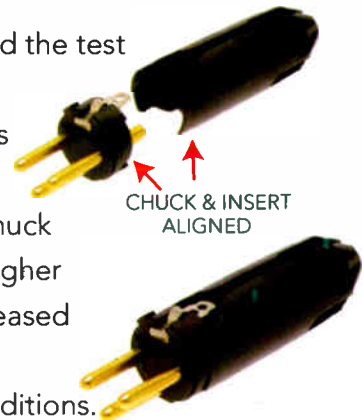


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# SOUND INTEGRATION

*What are some of the challenges you face with surround sound? Also, do you use multichannel streams? If so, are the multichannel streams capable of being panned in 3-D?*

Boyd: The biggest challenge with surround sound is to use it in a way so that it doesn't draw a lot of attention to itself. We tend to approach our audio design from a lowest common-denominator perspective, which means that we want our game to sound great with small speakers through an average TV, as well as have it sound amazing on higher-end systems. Surround is a great tool because it informs the player of where his opponents, or police, are in relation to them.

multitrack editor capable of sample-accurate looping of a 5.1-channel file. Often, the payoff of using 5.1-channel ambience files isn't worth it for in-game use, anyway. Most of the elements we want to play back [are] in a 3-D position that stays fixed to the environment, creating something that the player can interact with, instead of a static scene that does not change position with the player's view.

The amount of data we would have to stream off the disc during the game is also a detracting factor for us. We can get more bang for our buck, so to speak, [by] leaving room to stream other in-game content, such as music or a large explo-

**The biggest challenge in surround is to use it in a way so that it doesn't draw attention to itself. We tend to approach our audio design from a lowest common-denominator perspective, which means we want our game to sound great with small speakers through an average TV, as well as have it sound amazing on higher-end systems.**

—Adam Boyd

It also greatly enhances the player's sense of speed by accentuating the rapid movement of objects around the car.

Many games tend to use too much surround, though, and in the typical living room setup, this can be very distracting. We try to use it in a natural, tasteful way. Regarding multichannel streams, we do use them for our pre-rendered sequences, but not in-game audio. The only multichannel streams we use in-game are environmental ambiences and music. However, every object that emits sound in the game has a position in the 3-D game space. This real-time surround panning is a fundamental component of our in-house audio engine. Through our dynamic mixer, we control what that position is relative to—the player car or the camera—and how these sounds are perceived over distances.

Miller: We often use 5.1-channel streams for movie sequences, but not for in-game. There are several reasons for this; one is we often need looping sounds in game for things such as ambience, but to my knowledge, only with the introduction of Pro Tools 7 was a

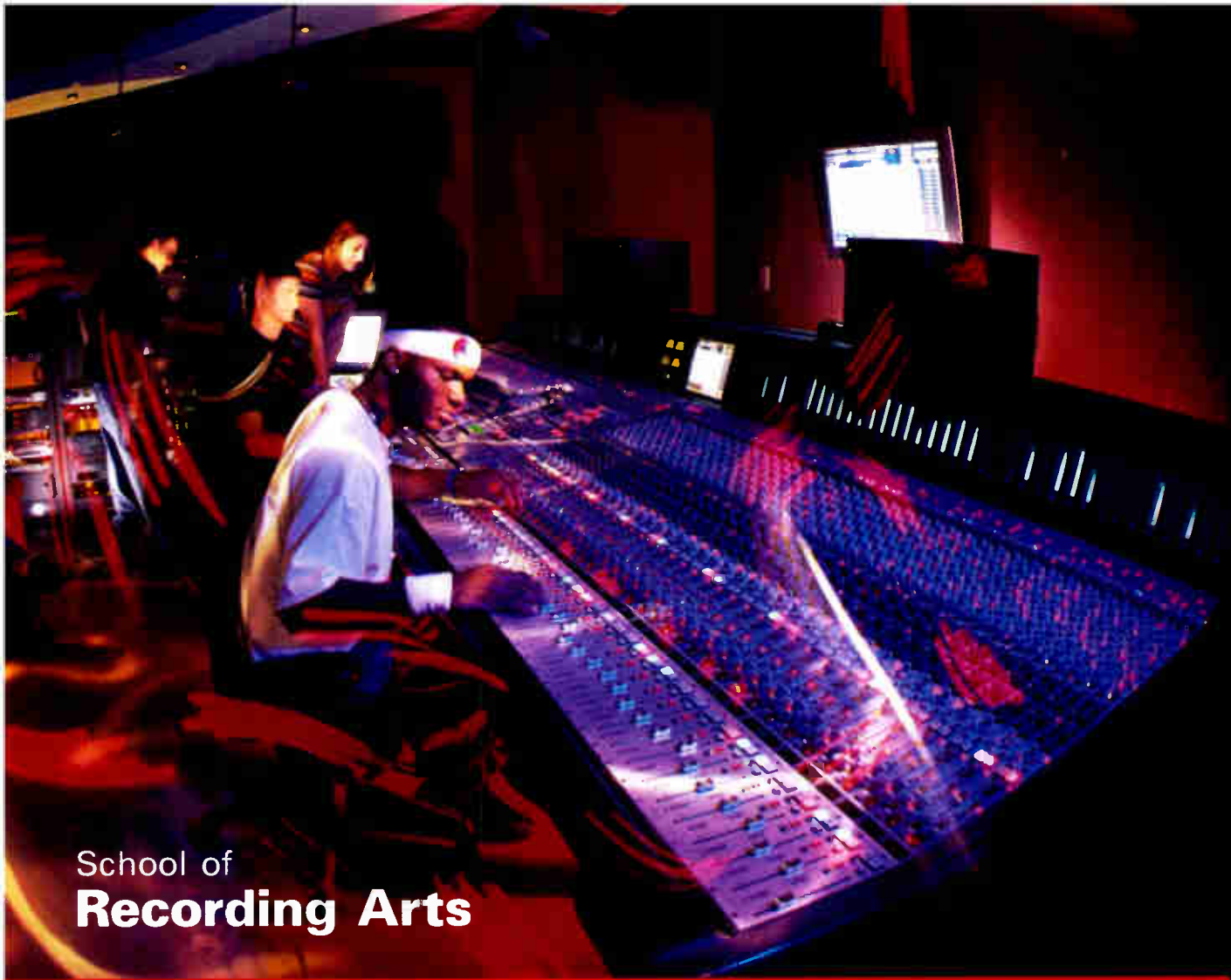
sequence that would not otherwise fit into memory. Another problem with having a lot of 6-channel audio is that there is no multiplatform, loopable compression scheme for it. The Xbox 360 does support this with XMA, which is great, so hopefully others will follow this direction. This leaves us with disc space problems, however.

Valvanis: Zoo Tycoon is a PC franchise and our target market dictates our approach to surround mixing. We mainly focus on the stereo mix since most casual PC gamers do not have elaborate surround systems. Because our market is so large and there are those who have the proper systems, it's important to also spend some time on surround-sanity checks. I do a 5.1 pass using Wwise on everything before we ship.

*One last question: How do you feel about 7.1?*

Lima: Oh, man, let's get 5.1 under control first! ■

*Michel Henein is a game audio consultant, sound designer and entrepreneur based in Phoenix.*



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# Soundelux's Scott Gershin

## At the Crossroads of Game and Film Audio

Scott Gershin is in a unique position on the audio end of the videogame industry. As executive creative director and sound supervisor/designer at Soundelux Design Music Group, he oversees the development of a steady stream of high-end videogames by a wide variety of publishers.

As a leading feature film sound supervisor/designer for more than two decades, he's worked on many Hollywood films—*American Beauty*, *Shrek*, *The Chronicles of Riddick*, the ribald marionette comedy *Team America*, the dazzling werewolf flick *Underworld: Evolution* and Curtis Hanson's forthcoming Las Vegas gambling saga, *Lucky You*. Additionally, he's done sound design work for museums, theme park rides, commercials—the man has his hand in a lot of pots.

Gershin is also an outspoken and articulate advocate for game audio pros, promoting the field at trade shows and in magazines, and as of this month helping spearhead a new organization called IESD: Interactive Entertainment Sound Developers. "It's for sound professionals," he says, "for music, design and integration people. It's a branch of G.A.N.G. [Game Audio Network Guild], but it will also be its own thing." Partnering with Gershin are Sony's Dave Murrant, Scott Selfon from Microsoft and Gene Semel of High Moon Productions. "We've been nicknamed 'The Four Horsemen,'" he says with a laugh.

Recently, we chatted with Gershin to get his perspective on the evolution and rapid pace of changes in the world of game audio.

*You had already been working in film sound for many years when you first got involved with game audio. How did that come about?*

I started in games about 16 years ago. I had always enjoyed games, and around that time, I started seeing [games] move away from FM [synthesis] sounds and into audio samples, al-



though they were being done as 11k/8-bit. Before I even did film, I was working as a synthesist—we're talking about the E-mu [Emulator] I and early Akais, 8-bit, 12-bit/compressed technology. So when I started in gaming a decade or so later, I had already lived through that technology and its creative and technological challenges. I knew a lot of tricks going in [to working on games] from what I learned in the music business—how to get a decent sound out of samplers. Sixteen years ago when I was designing and suping just for movies [at Soundelux], I thought we could utilize our talents in other industries. I started a new company within Soundelux with Wylie Stateman and Lon Bender, which focused on sound design and music composition for interactive entertainment, theme parks, music videos and commercials. It was a really interesting time for us in audio, with all these new sound-with-picture industries coming into existence. We had to make it up and figure it out as we went.

Our first gig came from a friend of a friend of a friend—you know how it goes—who heard about some people who had just bought a company that was called Activision. They were brand new and I had set up a meeting with them to discuss my philosophies and approach to how audio could be used in gaming. I wasn't scared of the technology because I'd been there before with music. It was great fun because at that time it really was guerrilla audio. We ended up doing a bunch of projects out of the chute with Activision, including *Pitfall: The Mayan Adventure* for the PC, *MechWarrior II*, *Spycraft* and *Zork Nemesis*. They were all really different and each required a different creative and technologi-



Gershin was sound designer/sound supervisor for Capcom's *Devil May Cry*.





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cal approach. Since then, we've worked on over 150 games.

**Did the audio limitations of those early games bug you?**

I love technology. I've always been really into gear. It became a technological puzzle. The challenge was how to use limited elements to create new and unique sounds. When I first started doing film, I was a sampler guy using Synclaviers, Fairlights, ADAPs and synchronizers to lay back my sounds to multitrack. At first that was the only technology available. Then disk recorders came out, but they were only 8-tracks. A lot of times I was using way

more elements than that to create my designs. So at that time, disk recording, before plug-ins, was limited compared to what I could do with a sampler. With samplers, I was able to play the sounds using different, often exotic MIDI controllers to give each design a human feel. It really allowed me to mangle the sounds into something new and interesting.

In the beginning of gaming, there were definitely limitations—really low sample and bit rates, as well as codecs that affected the audio in unflattering ways. If you were lucky, the best sample rate available was 22/16; the high ends were rolled off, but it

was definitely manageable. Eight-bit was a whole other challenge that wasn't a whole lot of fun. But I took some of the tricks I knew from the music business and applied them. A lot of it was trying to figure out how to solve problems. It was hard just doing the simplest of things, but that was part of the fun, too. There were no rules and everyone was kind of making it up as we went along. Also, I really liked the people in the gaming world.

When we first started, one of the main limitations was on each platform—like a sampler—how much RAM did we have access to? And that's still an issue. So there's that dynamic: How many sounds can we use in the game? We had loop lengths that had to be divisible by a certain number of samples. All the sounds within a certain game level had to be able to fit in packets of a certain size. Each level would retain certain sounds, such as your character's weapon and fighting moves [packet one] while introducing new sounds to support the new characters and challenges, such as an adversary's sound and weapons [packet two]. All sounds had to fit into one or the other packet that was being used for that level. There were all these strange little formulas.

Another reason game audio was difficult back then was the codecs. It wasn't just the 11k, 8-bit. It had to go through data reduction and that alone created some very strange artifacts. There are times you'd do a whoosh or some kind of sound, and then you'd put it through the codec and what would come out was almost nothing like what you put in.

**And things improved as new formats came along?**

Yes. I think a couple of things happened. We got more RAM and higher-capacity game storage with discs compared to cartridges; the codecs started sounding better; and we were able to stream audio, which was very big. Then the next technology was a combination of streaming and RAM, where we could get sounds with low-latency availability through RAM while the rest of it streamed off the hard drive or disk, similar to what a [Tascam] GigaStudio does today. So that was important.

And then some consoles were able to stream multiple tracks. With next-gen platforms, we're able to stream large numbers of tracks and support plug-in-style technology. Now all of a sudden the ability to do bigger and better audio has become available. Graphics have gotten much more sophisticated and are starting to be compared

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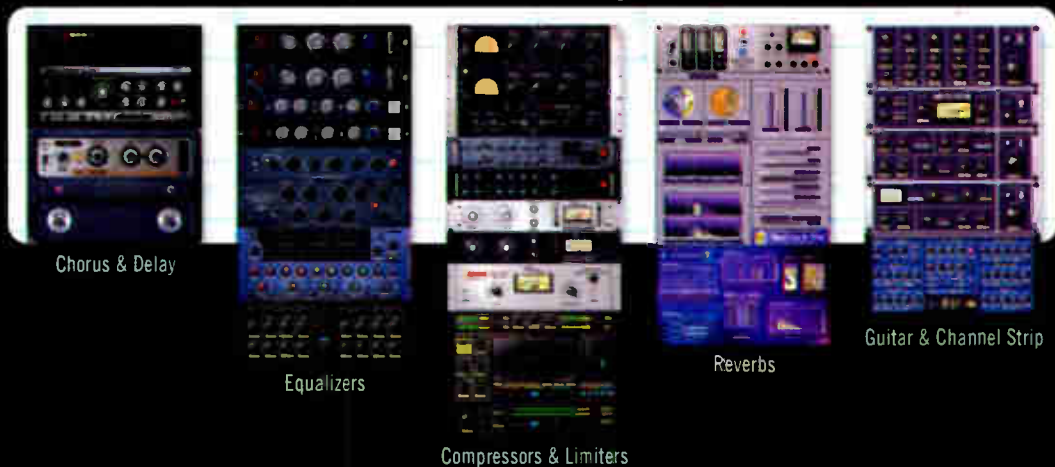
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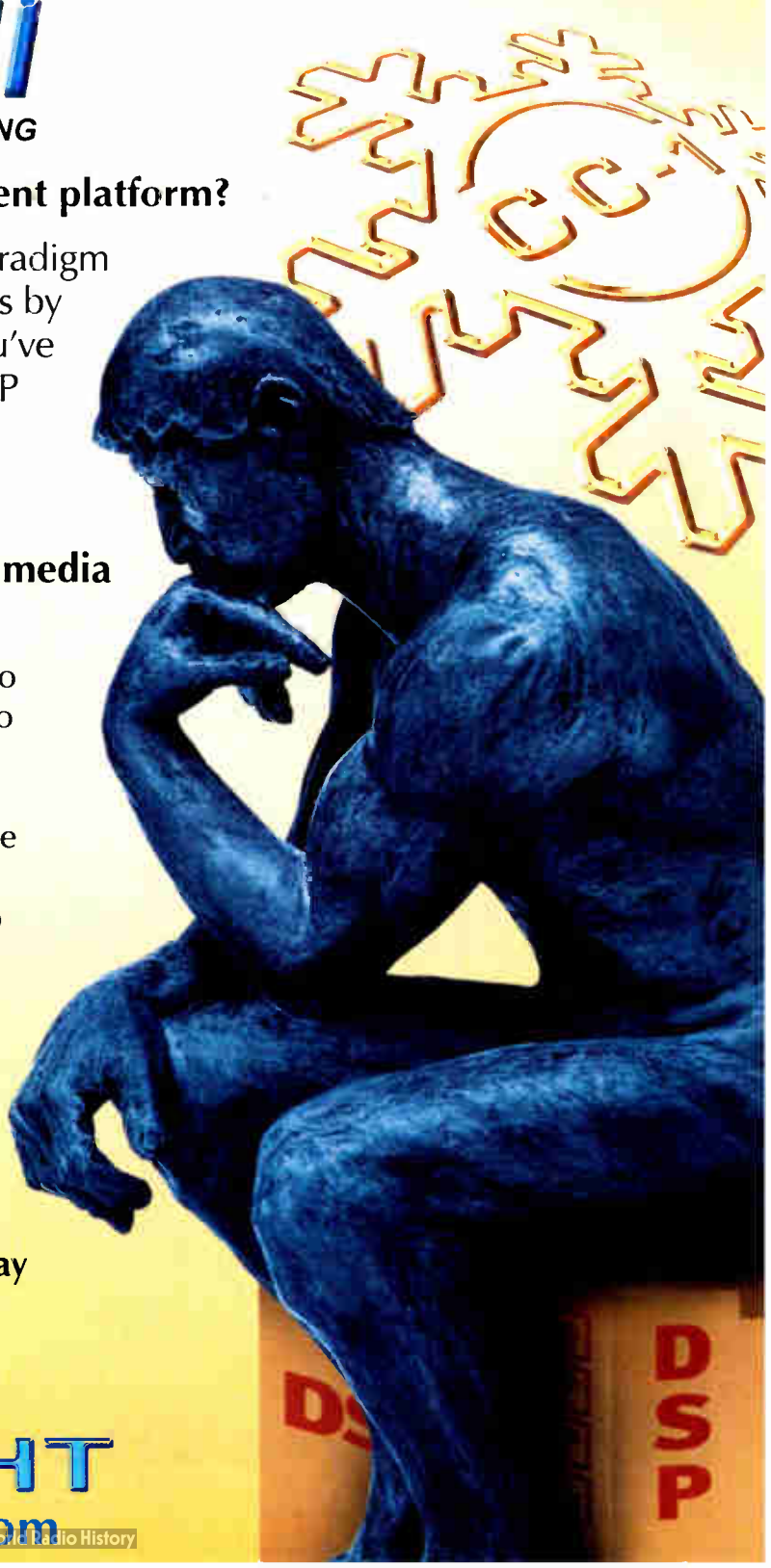
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They're different: Gaming is a medium you experience by participating; movies are a medium you experience while watching. What's happening, though, is games are becoming more story-based and much more episodic. They're becoming franchises—you can play part 1, part 2 and part 3, and follow a long, complicated storyline with all these adventures along the way. There are so many wonderful games out there that have in-depth stories, whether you create them [within the game] or the game designers create them. Something like

*The Chronicles of Riddick* is a movie, an anime and a game. All of them span different time lines within the universe of the Riddick chronicles. So if you see all three, you get more of the story. This approach really expands the art of storytelling and character development.

*Are there pieces of technology that have come out in the past year or two that you think are advancing the state-of-the-art in game sound?*

Sure. Gaming is a very technological industry. I actually equate it more to movie animation than movies themselves

because the dev cycles are longer. There are different technological issues that have to be understood and dealt with compared to film. I see more of a parallel between high-end CG animated movies and games.

Probably the biggest recent technological development is the advent of what's called 'middleware tools,' which will allow [the games you develop] to play on multiple platforms—sometimes competing platforms. I think that's huge. It used to be when you developed a project, you developed it for Sony or for Microsoft or for PC. The developer would make it for one platform, send it to a company and then they would rebuild the game to make it work on another platform.

There are two interesting companies supporting what we call middleware—Wwise and FMOD—that have enabled audio content to be somewhat more easily ported between multiple platforms, so we don't have to keep reinventing the wheel. In the past, you had to create for the lowest common denominator. If you were creating for, say, two platforms, where one platform would only stream two to four channels at best and the other platform could stream 30 to 40 channels, you always had to stick to the smaller platform. *What's a recent game you've worked on that you're excited about?*

We just finished [Capcom's] *Lost Planet*, which I'm very proud of. Heading up the project was Tomoya Kishi from Capcom, Peter Zinda and myself. We and our crew worked on it for about two years. It was one of those projects where everything jelled and clicked. It was nice to have the time to work on something and experiment a lot—that really makes a difference.

*Are the sound budgets for big games getting to be comparable to big films?*

It's apples and oranges. The whole business paradigm is very different. On something like *Lost Planet*, we were on and off the project for a long period and there were different phases. On a movie, most of the time when you're on it, you're on it. In between phases, I did four or five movies during that two-year period.

*Obviously, you still like doing both.*

Oh, yes. I have a passion for both film and games. I've been incredibly fortunate to be able to participate in both and work on some really great projects in both industries. If I could stay this way for the next 20 or 30 years, I'd be a happy camper. ■

Blair Jackson is Mix's senior editor.

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# Audio Middleware

## The Essential Link From Studio to Game Design

When I first played games such as *Pac Man* and *Asteroids* in the early '80s, I was fascinated. While others saw a cute, beeping box, I saw something to be torn open and explored. How could these games create sounds I'd never heard before? Back then, it was transistors, followed by simple, solid-state sound generators programmed with individual memory registers, machine code and dumb terminals. Now, things are more complex. We're no longer at the mercy of 8-bit, or handing a sound to a programmer, and saying, "Put it in." Today, game audio engineers have just as much power to create an exciting soundscape as anyone at Skywalker Ranch. (Well, okay, maybe not Randy Thom, but close, right?)

But just as a single-channel strip on a Neve or SSL once baffled me, sound-bank manipulation can baffle your average recording engineer. I'd like to help demystify this technology, starting by explaining what middleware game audio engines are because they are the key to understanding what makes game audio different.

In games, once sound is captured, there's a whole other level to explore: integration. That's where middleware comes in. Middleware is software that connects game developers with the hardware (Xbox 360, PS3, PC, etc.) they use in development. Just as Pro Tools lets you generate sound from a computer, middleware lets users link sounds to game objects, such as animations (firing a gun, running), scripted events (a column falling across a road, a ship going to lightspeed) or areas (inside a church, at the foot of a cliff). Where a programmer was once required for all this integration, this is no longer the case.

### GAMECODA

From Creative Labs' Sensaura division comes GameCODA ([www.gamecoda.com](http://www.gamecoda.com)) for the Xbox, PS2, PC and Gamecube platforms. It supports audio in WAV, AIFF, VAG, AD-PCM, Xbox ADPCM and Ogg Vorbis formats, from mono through 5.1 surround, and the code is low-level, with run-time and APIs. Sounds are automatically compressed to console format.

Within GameCODA is CAGE producer, a sophisticated bank-management tool that's cross platform-compatible, and its tab-type switching between consoles is an excellent feature. While the engine is fully compatible for hookup with Renderware, Alchemy, Gamebryo, Karma, Fonix and Havok middlewares, it doesn't have direct integration with Unreal 3. CAGE plug-ins provide control of 3-D sounds directly in 3DS Max and Maya. However, most game audio engineers aren't familiar with that environment so it is not that conducive to place sounds using those tools.

If your programmers know how to use Renderware, then you can hear real-time parameter changes using

GameCODA. The same is true of Renderware native audio tools. One caveat: Criterion is now owned by Electronic Arts. The Renderware site was last updated in 2005, and many developers are scrambling to Unreal 3 due to uncertainty of Renderware's future. Pity, it's a pretty good engine.

Streaming is supported, though it is not revealed how it is supported on next-gen consoles. What is nice is you can specify whether you want a sound streamed or not within CAGE Producer. GameCODA also provides the ability to create ducking/mixing groups within CAGE. In code, this can also be taken advantage of using virtual voice channels.

Other than SoundMAX (an older audio engine by Analog Devices and Staccato), GameCODA was the first audio engine I've seen that uses matrix technology to achieve impressive car engine effects. Imagine being able to crossfade samples across a grid to achieve multiloop, seamless transitioning during shifting and RPM change. It's that cool.

Alas, there's no way to link directly to game events without a programmer's help. Unlike DirectMusic, there's no VisualBasic scripting equivalent, and unlike RenderwareAudio, there's no message system. However, it is possible to link messages in Renderware to samples in GameCODA directly if you're using that approach. Still, it won't just "work" out of the box, which is what we all have been waiting for. Interactive music support is coming soon. According to company announcements, GameCODA will link seamlessly with Creative's ISACT (Interactive Spatialized Audio Composition Technology).

On the upside, GameCODA is one of the first really hard-hitting audio middleware products of its kind, and where most thought it was dead, it is still possible to license it. It features extensive integration functionality using 3DS Max and Maya, matrices, timeline editing and multiplatform seamless production. Support is provided within a 24-hour response time. GameCODA is also less expensive than some other engines. However, how is next-gen supported? That isn't yet revealed, although it is hinted at in FAQs and press releases. In addition, a number of developments on the horizon could make this engine even better, such as direct ISACT support and other plug-ins for speech recognition. Linking closely with Renderware and not Unreal 3 is also a problem; Unreal 3 is the Number One middleware these days.

### ISACT

Also from Creative Labs, ISACT (<http://developer.creative.com>) supports the PC, Xbox and Xbox 360 platforms, and is free if a PC hardware output layer is used. The program supports WAV, AIFF, CDDA (import), PCM, ADPCM, WMA,

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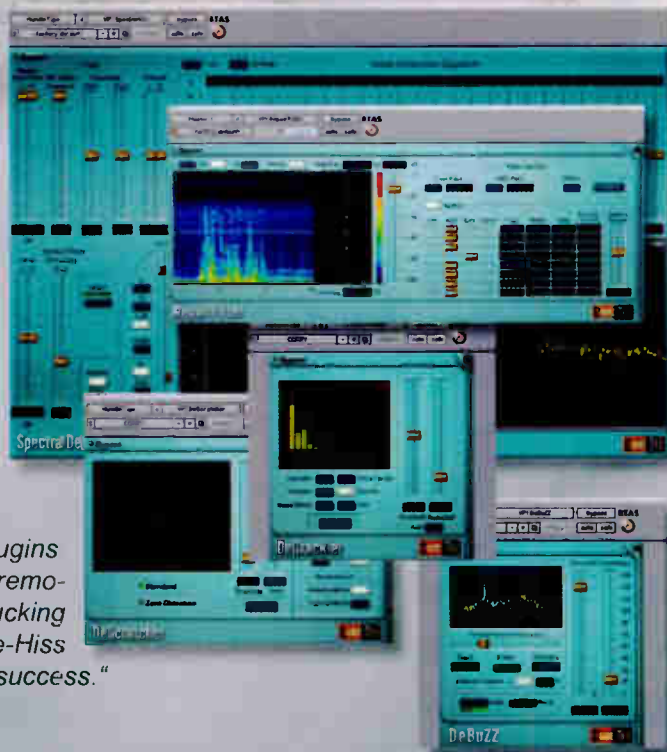
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XMA and Ogg Vorbis (export) sound formats, as well as any configuration of surround audio. Sounds are automatically compressed to console format using the Target Platform Settings tool.

ISACT Production Studio (IPS) is essentially a multitrack editing environment. However, the "tracks" are far more varied than audio or MIDI. IPS gives you control of a completely new suite of objects specifically oriented to gameplay situations such as Sound Randomizers, Sound Events and Sound Entities. Don't get scared; it's a whole new ballgame, a whole new playground.

Using the IPS function Realtime Parameter Controls and the run-time component with a network connection to your target platform, you will have real-time control during game play of all ISACT functions.

Although it's somewhat convoluted, it is possible to use Sound Entities and Groups to create a ducking behavior. I've found the best way to do this is to assign each sound or sound object in your hierarchy to a group that you define. Then in a matrix (think Excel document), set priorities (one group ducks a set of another's or an individual), volume and duck time. ISACT makes it nec-

essary to create variables within objects and, well, without going into too much detail, it isn't as simple as my method.

Although there aren't any sound matrices lying around for you to use, once again, the Sound Entity is your friend! Create parameters such as RPM, shift, gear and such, and assign them to pitch and crossfades using RPC (Realtime Parameter Control). Again, not quite as fast or intuitive as other methods (such as GameCODA's), but a Sound Entity is a much more open-ended tool.

As with GameCODA, you can specify whether you want a sound streamed. The plus here is that you can specify preloaded sounds (this means the first chunk of a streamed sound is loaded to avoid the disk-loading latency associated with standard streaming sounds). It's extremely useful for quick, load-required streamed sounds such as voice-over.

ISACT can load a CAGE Producer file for interactive music. ISACT was originally designed to be an interactive music system, and as such, you can create tracks containing music objects with individual volume and spacialization (as with most multitrackers). ISACT also allows you to randomize these, transition them with controllable crossfades linked to events and much more.

Here again, the Sound Entity lets users create parameters that will link to game events. Unfortunately, as with GameCODA, you can't just look up events in a list in your game world editor and then type them into IPS and have them work.

On a happy note, ISACT won a Frontline Award two years ago for a reason: It was the first tool that used a track layout to associate it more closely with traditional DAWs for game audio integration. At this point, it has a huge amount of open-ended, great features that put it in a category all its own. The fact that it is free and allows you to create your own kind of sound behaviors is more than worth the learning curve. And ISACT's near-instant e-mail response to support is excellent. However, it's a bit challenging to get your head around the concepts of Sound Entities, and at this time, there are no plans to go Wii or PS3. At a company like mine, that creates quite a few limitations.

**MORE TO COME**

So far, I've looked at the first two of the bunch. In future segments, I'll delve into Wwise, FMOD, Unreal 3 and Miles. ■

*Alexander Brandon is the audio director for Midway Home Entertainment in San Diego, Calif.*

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# ONE-UPMANSHIP

## Next-Gen Game Consoles Promise Exciting New Opportunities for Sound Designers and Composers

**T**he battle for living room supremacy is on: No longer a fringe element in the consumer electronics universe, videogame consoles are fast becoming all-in-one entertainment systems, delivering high-def gaming, video, audio and Internet connectivity in one easy-to-use system. And with the prices of high-def-capable LCD TVs and multichannel home theater systems plummeting to new lows, the buying public is quickly getting cozy with all things HD. So it's not surprising that the gaming industry is striving to meet and push this demand.

On the audio side, the news just keeps getting better for developers. All three of the major gaming consoles—Sony PlayStation 3, Microsoft Xbox 360 and Nintendo Wii—feature some form of surround sound, and the PS3 and Xbox 360 both include support for next-gen optical media formats—Blu-ray and HD-DVD, respectively. Add to that faster CPUs, more physical RAM and access to massive amounts of game data, and it's easy to see the vast potential that these systems represent for audio content creators.

### WHAT'S IN THE BOX?

As most people already know, videogame consoles are essentially boxed computers, and as computers go, all three of the major consoles sport some rather impressive features and specs. The PS3 features the multicore Cell processor. Jointly developed by IBM, Sony and Toshiba, the Cell combines a 64-bit PowerPC processor with eight additional processing cores on a single chip. The current Cell processor hums along at a stout 3.2 GHz per core, and speeds could go as high as 6 GHz within a year's time. The PS3 includes 256 MB of system RAM and 256 MB

of dedicated video memory. Users can choose between a 60- or 20GB hard drive or drop in a Serial ATA drive of their choosing. Processing and memory aside, the PS3 includes both optical audio and HDMI connectivity (with full 1080p HD video resolution) and supports up to 7.1 surround sound, including DTS and Dolby True HD. When surround hardware is unavailable, the box defaults to Pro Logic II and stereo. And, of course, the PS3 includes a standard Blu-ray high-def DVD player.

Microsoft's Xbox 360 uses three custom PowerPC-based CPUs, each running at 3.2 GHz. The unit includes 512 MB of physical RAM and a user-replaceable 20GB hard drive. The unit supports 5.1 DTS and Dolby Digital via an optional optical audio output, and like the PS3, the unit defaults to Pro Logic II or stereo output. The unit can be further upgraded with the recently released Xbox 360 HD DVD Player, which, as the name attests, adds complete HD-DVD video support and a wireless remote.

Nintendo is a little more tight-lipped about its console's specs than Sony and Microsoft. What is known is that Wii uses the IBM Broadway CPU, another PowerPC-based chip. Unofficially, most industry insiders have the chip clocked at around 729 MHz. The unit has 88 MB of RAM, though 24 MB is dedicated strictly for video. For storage, the Wii ships with 512 MB of Flash memory, which can be expanded to 2 GB. Audio output is limited to analog stereo outs with Dolby Pro Logic II, though the Wii controller itself includes a built-in speaker. The unit lacks either HD-DVD or Blu-ray compatibility, but standard DVD playback is rumored to be a forthcoming feature.

That said, it's encouraging to see

surround becoming a reality for all of the platforms. "We finally have an environment where all three major game consoles are supporting some kind of Dolby surround sound," says Jack Buser, worldwide technology evangelist for Dolby. "So I think people that are creating audio for game-development houses no longer have to negotiate with their producers over whether support for 5.1 surround be included or not. It's one of those things that have sort of become the de facto standard for game audio. So as a result, rather than argue over format, they'll be able to spend their own clock cycles in a much more productive way, going out there making game sound even better."

### THE FIGHT FOR MORE

With extra horsepower, expanded memory and support for multichannel audio, the approach to creating audio content for these platforms has changed dramatically from the early days of game audio. Audio teams are now brought into the development process sooner than ever before because, in addition to creating multichannel audio from the start, all of the major consoles use shared memory, where all game-play elements are drawing from the same finite resources. "Moving from PS2 to PS3, the big difference is that we've got HDMI on the box, which allows us to have up to eight channels of discrete audio for game use, something we weren't able to do on the last platform," explains David Murrant, sound design manager at Sony.

"Fundamentally, that is a huge change for us, having to deal with and manage assets that have to be developed for the environment," Murrant continues. "The most we had done is Pro Logic II audio, which is sup-



ported out of the box for game use. The other big difference is that the PS2 had dedicated audio memory, which was a dedicated sound processing unit. So we had two megs of RAM on the previous box. Now on the newer system, we have to essentially fight for our corner because it is a flat memory model. So with the PS3, we have 512 megs of total memory, and half of that is used for video. So of the main memory that is left, approximately 256 megs, we try and shoot for approximately 10 percent of that for audio."

Developers working on the Xbox 360 faced a very similar shift when moving from the original Xbox, which, like the PS2, had dedicated audio processing hardware and memory. "I'll be honest, it's sort of a double-edged sword for us because there is so much more processing power in the 360, but it's all shared processor power," explains Marty O'Donnell, audio director and composer with Bungie Studios (owned by Microsoft). "And that means we have to grab for as much of that processing power as we can get. On the Xbox 1, that fight never happened because there was a chip just dedicated to audio processing. And we got what we could get out of the Xbox, which was really nice.

"On the Xbox 360," he continues, "there are three beautiful processors, and if you wanted to do a graphics-only game, you could use all three processors to make the most incredible graphics. So there is a little more of a give-and-take kind of thing. We have to make sure that the engineers and the artists and the audio guys get together early in the process and stake out their respective territory."

**HOW DOES IT SOUND?**

But hardware support for multichannel



audio and fixed-memory models are not the only major changes happening on the audio front. With more memory available to audio, as well as the processing power to render and process more voices effectively in real time, the overall quality and fidelity on the PS3 and Xbox 360 have improved significantly from the previous versions.

"We can get more content and do more streams with the PS3, but the biggest difference is fidelity and the quality of the content we can create," Murrant continues. "Typically on a PS2 title, if you've got a ton of sounds, you've just got the two megs of RAM, and there were some creative ways to get more memory. But you've essentially got to start downsampling. A lot of samples can be anywhere from 17k to 22k for sound effects, depending on the frequency range of the sound. On the PS3, with the additional memory, we're able to have full 44.1 samples. The fidelity and the quality of the output is significantly better."

"On the first Xbox, we were capped at 64 surround sound voices," says Jay Weinland, audio lead at Bungie Studios.

"And those are voices that could be encoded as 5.1, not stereo or mono. And now the sky is the limit. We've been told that it is possible for the Xbox to handle up to 320 simultaneous [surround] voices. I don't think anyone has actually been able to hit that. But we certainly are able to do a lot more surround sound voices than we were able to before. And the second big change is that we've moved from a fixed-rate compression scheme to a variable bit-rate compression scheme, which allows us better compression that sounds better."

"Most people who are doing audio for television or movies never have to think about [data] compression," adds O'Donnell. "They might have to think about the medium and make sure that their mix sounds good out of a TV speaker, but we also have some data restrictions. We're recording everything at 24/48, but when it comes down to what we put in the game, we have to go through steps to get things compressed. And now that we have variable bit rate, we don't have to compress everything in the same way, so that is pretty cool."



**PlayStation 3**

Processor: multicore Cell processor at 3.2 GHz  
Voices: 512  
Sampling: 44.1/48kHz, 16-bit  
Channels: stereo/DD/DTS, up to 7.1  
RAM: 256MB system, plus 256 MB dedicated to video



**Nintendo Wii**

Processor: IBM Broadway CPU  
Voices: 64  
Sampling: 44.1/48kHz, 16-bit  
Channels: analog stereo/Pro Logic II  
RAM: 88 MB, including 24 MB dedicated to video

**HIGH-DEF: NOT SO FAST**

On paper, support for next-generation optical media formats—Blu-ray and HD-DVD—would seem like an instant shot in the arm for game consoles, allowing game developers to create games up to 50 Gigabytes in size. The reality is that while it's possible to store many times more data than a standard-def DVD, seek times haven't ramped up at the same pace. And for games that require streaming, the add-

ed storage won't necessarily translate to enhanced capabilities until access speeds can be increased. "We look at something like HD-DVD and see all of the increased memory footprint, and that's great," says O'Donnell. "But getting data off the disc is actually more important to us than how much data you can put on the disc. Speed of access is hugely important to a real-time game. DVD is not faster, in terms of access times, than a CD. And HD-DVD and Blu-



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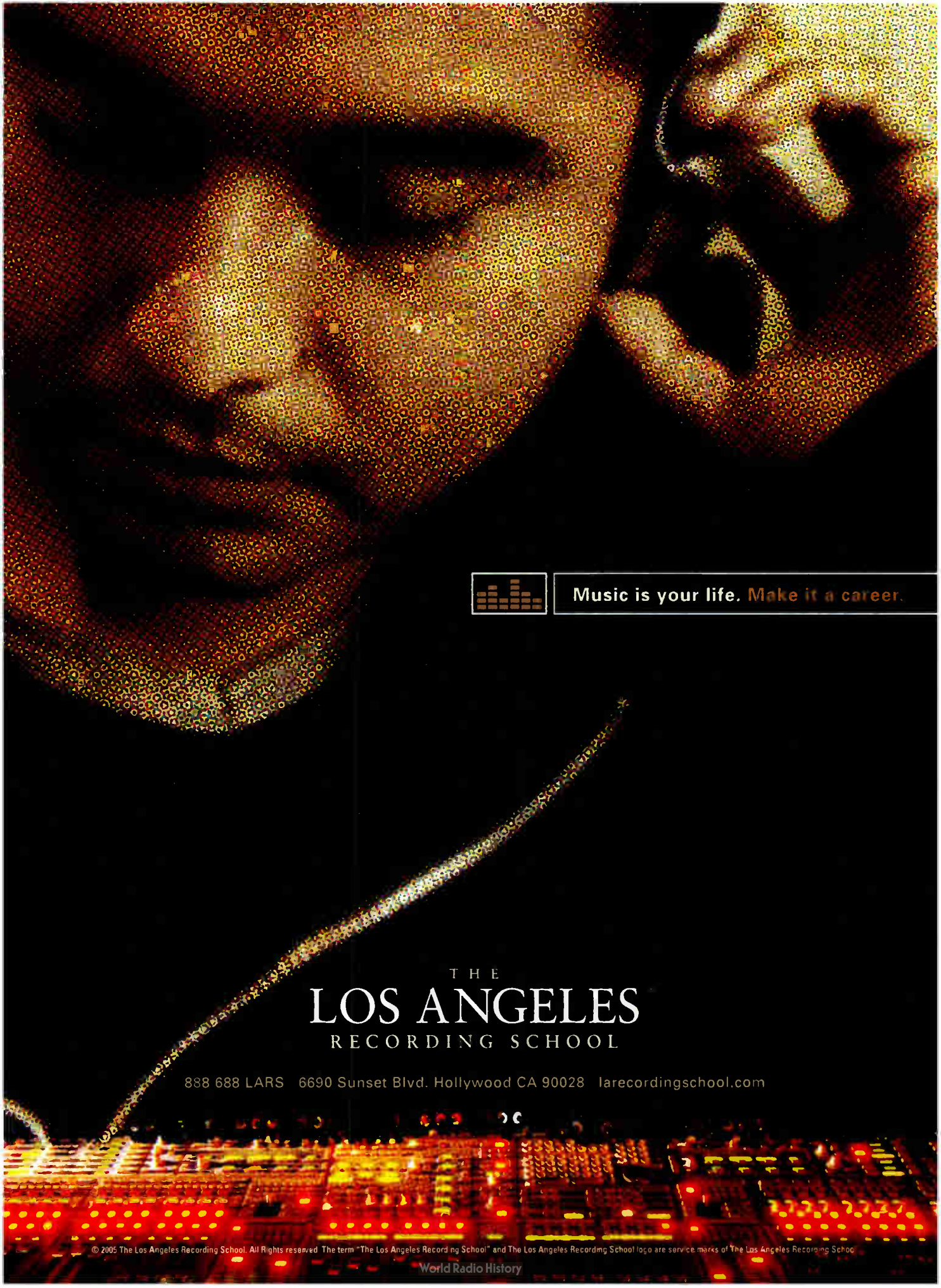


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World Radio History





ray, I believe, are even slower.”

“Resistance: Fall of Man and NBA 07, which were two launch titles, were both on Blu-ray, and essentially what that means for us is that there is a greater volume of content that we can store,” adds Murrant. “The bottleneck comes down to whatever the game is doing. If you’re streaming lots of textures or maps, or who knows what, we’re all kind of fighting in the background to keep those resources moving. That’s the issue for us. On the

PS2, we were able to say that typically most levels would be loaded into memory, and as you’d finish each level, the next one would load. There wasn’t a lot of game content being streamed so we could have up to eight streams of audio playing off the disc because we could pretty much take care of it. The things we have to contend with on the PS3 is that everyone is trying to stream, and these worlds are big and detailed, and everyone keeps wanting to bring more stuff in and they’re hitting the



**XBOX 360**  
 Processor: 3 cores at 3.2 GHz  
 Voices: 256  
 Sampling: 44.1/48kHz, 16-bit  
 Channels: stereo/DD/DTS up to 5.1  
 RAM: 512MB system

disc harder and harder.”

While integrated surround sound and the ability to stream more voices of audio content are certainly allowing game developers to create more detailed and complex-sounding games, some of the biggest advancements in game sound are happening as a result of increased fidelity and the ability of the game engines themselves to intelligently process audio assets in real time.

“I worked back in the day when you had 64k of memory for music and sound effects,” concludes Murrant. “And what I’m seeing now is truly next generation. Take, for instance, the technical aspects of, ‘Hey, I want to hear this sound filtered because it’s on the other side of a door.’ I shouldn’t have to be designing it to sound like that. We should be able to do all of this filtering on the fly. And that capability is here now. Am I seeing it in a lot of titles? No. But as people get more and more into the development cycle, you’ll see a lot more of that. Also, we’re no longer limited by the reverbs that we had on the PS2. We now can create our own reverb set, which is getting close to some of the high-end commercial reverbs that you can buy for Pro Tools. And you’re hearing those things being used in the games. The quality aspect is getting closer to film.”

Rob Hanson is a former editor at Mix and Remix magazines.

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# VIDEO GAMES LIVE

## Legendary Music From Old and New Games Takes to the Stage in Blockbuster Concert Tour

Imagine a concert featuring some of the hottest videogame music ever: from retro-classics like *Super Mario Brothers*, *Frogger* and *Donkey Kong*, to modern blockbuster titles such as *God of War* and *Halo*. Add a live symphony orchestra, choir and rock guitars, all performing to game footage being projected on a humongous screen—plus state-of-the-art, rock concert-style lighting. Perhaps this is a glimpse of videogame nirvana?

That must have been exactly what game industry icons Tommy Tallarico and Jack Wall envisioned when they created Video Games Live (VGL). Tallarico explains, "My goal with Video Games Live is not only to celebrate the entire videogame industry, but to get this music out there to people who might not know videogame music. And if they come to this show, they'll see and hear all of this and realize just how much of an art form videogames have become."

### NOT JUST FOR GAMERS

It all started on July 6, 2005, with a sold-out show at the Hollywood Bowl. Since then, VGL has embarked on a historic journey to concert halls around the globe, performing for generations of both gamers and non-gamers. "It's great to see people supporting their loved ones' enthusiasm of videogames," Tallarico says. "After each show, a lot of non-gamers tell us that they found the performances both spectacular and beautiful, and they finally see why people enjoy videogames so much. We also feel it's important to bring the power of the orchestra to younger generations who normally wouldn't go to a concert hall to experience an orchestral performance." There is also a festival before the show, which includes contests for best costume and best *Guitar Hero* shredder. Contestants receive cool

prizes, while the best prizes—like Acer Ferrari laptops or cold, hard cash—are reserved for the winners.

*Mix* couldn't pass up an opportunity to attend one of the shows in Phoenix in the newly built, world-class Ikeda Theater at the Mesa Arts Center.

Wall, a record producer and songwriter who has worked with David Byrne and Patti Smith, and who conducts the show's orchestra, was inspired to score videogames when he played the original *Myst* game. Since becoming a videogame composer, he has scored music for such notable hit games as *Jade Empire*, *Unreal II*, *Myst III: Exile* and *Myst IV: Revelation*.

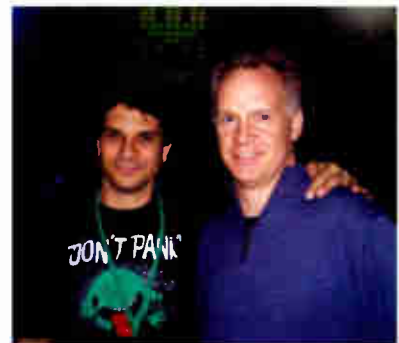
### GUERRILLA TACTICS

Because the show uses a video projection system to display captured game footage on a large screen, the concert is driven by DVD. "Since this is a debut show, economics always become a factor," Tallarico explains. "We opted to use a prosumer DVD player that pretty much drives everything. The image is being driven by a large video projector, while five channels of audio are coming from the DVD: a mono click track—which is being fed to Jack, the orchestra and choir—in addition to two stereo outputs that contain synth elements and percussion, which are being fed to the console and mixed with the live elements."

### SYMPHONIC SOUND, ROCK 'N' ROLL ATTITUDE

Front-of-house engineer Matt Yelton, who has worked with The Pixies, finds the VGL show challenging and exciting. "We could have gone with a more traditional symphonic sound, but I wanted the show to sound big, including lots of low end in the mix, using subwoofers to really rock the audience.

"We use local sound companies at



Tommy Tallarico (left) with Jack Wall

each host city to provide equipment," Yelton continues. "Because this show is so dynamic, I prefer to use a digital board, such as a Yamaha PM5D, for the recall. However, I'll usually warm up the sound with tube compressors and EQs, in addition to using a nice analog compressor—Summit, et cetera—on the master bus." For the FOH speaker system, Yelton prefers Meyer Sound, EAW or L-Acoustics V-DOSC arrays.

The ensemble is captured using a variety of different mics, which Yelton will add or subtract to the input list depending on the size of the local orchestra and choir. "I'm a big fan of DPA mics and use them as often as I can, but I have other mics that I use, as well," says Yelton. "I have found, for instance, that using a pair of [Sennheiser] e604 tom mics for choir-left and -right works well because of their incredible rear rejection. But I'll use a condenser, like [a Shure] SM81, to anchor the center of the choir." For the orchestra, "I pretty much use SM81s for the strings, moved a bit closer for some edge in the mix, [and] also for brass and woodwinds, although for the French horns I'll use a pair of SM57s," says Yelton. "For percussion, I use a pair of [Sennheiser] e609s or SM57s for timpani and a large-diaphragm condenser for the remaining percussion."



All of the monitors are also fed from FOH. "We run four monitor mixes through a Rane headphone mixer to an additional small [Mackie] mixer that sums the click system," Yelton continues. "Both are placed where Jack is so he has control for the orchestra."

The orchestra's mix comprises a mono click track, stereo percussion and backing tracks from the DVD. A mix is fed to each musician through Koss ED3TC single earphones. For the choir monitor mix, the setup calls for two to three wedges, depending on size. Yelton adds, "The choir gets the click track, some stereo percussion tracks and a hair of the extra stereo music tracks [from the DVD] for rhythm and to fill in the picture for them. Also, I'll place synths and drones in their mix for pitching purposes, but the overall wedge volume for the choir is very low." The soloists get a wedge mix that is rarely loud because they are usually unaccustomed to having sound reinforcement. The pianist receives the final mix, which is delivered on a wedge near the piano. "Most of the pieces performed do not use the back tracks from the DVD percussion loops and synths, generally," Yelton adds, "but the click and count-off are always fed to the orchestra."



PHOTO MICHELE LEE WILLSON

### HELLO INTERACTIVITY, MEET ORCHESTRA

"This show is all about having fun," Wall says. "This isn't like watching a traditional orchestral performance. As soon as the show starts, we rile up the audience and let it be known that they are going to have a blast."

"We pull random members of the audience onstage and actually have them play a game live, competing with one another, while the orchestra plays along in real time," Tallarico adds. "But to spice it up a bit, we throw up a countdown and time the players as they try to achieve the goal before running out of time."

For one such interactive segment, an audience member comes onstage to play a game of *Space Invaders*. Wall conducts the orchestra so that it plays in time with the movements of the space aliens as they slowly inch their way toward the player on the giant screen—as the aliens speed up, so does the tempo. The player is given a big Fire button for shooting at the mother ship as it flies across the top of the screen; the twist here

is that the player must physically move onstage to hide behind the virtual barriers in the game and avoid getting hit by the aliens shooting down. This gives the illusion that the player's movements are being tracked and that the data is being updated directly to the game itself.

"Not so," says Tallarico. "While it may seem we are using a state-of-the-art motion-capture system to pull this off, the reality is we have someone backstage with a feed off the player's screen, in addition to a split off the joystick cable. So while the person onstage is physically moving around, someone in the back is just following that person moving left to right with a joystick, and all the player onstage has to do is avoid the onscreen bombs being dropped and fire at the mother ship. Each time the player hits the mother ship before the countdown expires, they win some cash."

The evening ended with a grand finale in which music from *Halo*, both the original and the sequel, is performed beautifully alongside the stunning visuals from the games. The show, however, continued to blow us away with a preview clip of *Halo 3*, courtesy of Bungie, with the live orchestra performing music from the still-unreleased title—definitely a treat. ■



PHOTO MICHEL HENEIN

Matt Yelton stresses low end in his rock/orchestra mix.

## Talib Kweli



### Photos and Text by Steve Jennings

Talib Kweli's sold-out performance at San Francisco's Fillmore Auditorium had the crowd thumpin' to the music from the rapper's latest, *Ear Drum*. For this tour, front-of-house engineer Dave Dar is only carrying a portable Pro Tools system, which is used on the back of the tour bus. As the crew is not carrying production, Dar specs a Midas Venice Series board because "the EQs are very accurate and precise, plus the mic pre's sound chunky and warm. On this tour, there are seven inputs: DJ left and right, two background singers [Candice Anderson and Tari Torray], Talib's vocal, DJ Chaps' vocal, special guest Buckshot's vocal, so it's a fairly simple setup."

Also on Dar's rider are dbx compressors, and Yamaha REV7 and SPX990 reverbs. "I come from a recording studio environment and

would always use these pieces for a mix," Dar explains. "For delays, the TC Electronic D2 is great-sounding and an easy device to use."

Due to his label commitments, Talib rarely has time to attend soundchecks. "I work very closely with the house monitor engineers," says Dar. "We go over every single wedge together, adjusting levels and EQ for both music and vocal. Whenever you come to see a Talib Kweli show, you are going to hear every single line he breathes. The head-nod factor will be intense, and you will be exposed to the three principle aspects of hip hop: MC'ing, DJ'ing and B-Boy'ing. And if you are not a hip hop fan, you will be converted."



FOH Dave Dar

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## News



PHOTO: RICHARD MINTER

According to vocalist Corinne Bailey Rae's monitor engineer, Duncan Wild, he chose the Sennheiser e935 because it "gives a wonderful, clean definition on Corinne's voice, and complements her dynamic variations."

Cakewalk and Roland Systems Group's REAC (Roland Ethernet Audio Communication) for SONAR enables the recording of 40 channels of 24-bit/96kHz audio from a split of the RSS S-4000 digital snake system by a direct connection to a PC's Gigabit Ethernet port. A beta program is also being introduced that will allow registered participants to work with the RSS digital snake and SONAR to provide feedback for the final product release... Following the recent opening of its U.S. offices in Nashville, InnovaSon opened a UK base of operations for its sales and distribution at Stirling Audio, which will soon host demos and training sessions... EAW KF760 Series line arrays were supplied by the new U.S. operation of ML Executives for the recent Iron Maiden tour. ML Executives' line array technician Michael Hackman oversaw the house system; Brantley Sound of Nashville supplied gear for the U.S. leg... Guitar legend Les Paul selected Future Sonics Ear Monitors™, Sennheiser wireless microphones and Hear Technologies systems for his upcoming performances... Robbie Williams played the National Stadium (Santiago, Chile) as part of his current Close Encounters world tour. Sound services are being coordinated through UK-based Britannia Row Productions. For this gig, Chilean rental vendor Cristian Olavarria Ltd. supplied 72 JBL VT4888DP line array elements; sound design was reviewed in collaboration with independent UK-based engineer Tony Szabo, along with system engineer Sherif El Barbari.

## FixIt

*Ben Grossman has been wowing audiences with his electroacoustics vielle a roué, or burdy-gurdy as it is also called. He's currently out on the road with BT and Trifon, as well as Thomas Dolby, creating a mesmerizing live performance that combines visuals with live 5.1 surround sound.*

I've really been taking advantage of the dual-engine structure of the Eventide H8000FW. It gives me extreme quad and octal effects on the first engine. Then I'm feeding that signal into the second engine to create a 5.1 reverb. On one level, you've got a number of interesting things happening in quad; then when you feed it into a reverb with channels being crossfed, it really brings the sound to life. With the H8000FW, I've been able to, in real time, create surround sound textures and atmospheres that are a huge part of our show. For such a computer-centric tour, it's ironic to note that there are some things that can only be done with the H8000FW for gorgeous, live surround sound design. But really, you should have seen BT and Thomas. Their jaws hit the floor about 10 seconds after they heard me using the H8000FW!



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## On the Road

### Justin Timberlake

This \*NSYNC'er-turned solo artist is currently touring the U.S. with a full band after a stint in Europe. *Mix* caught up with monitor engineer Kevin Glendinning, who is manning a Digidesign VENUE board (part of a two-console setup at monitor world; the other board is manned by Scotty Reikowsky) from Showco.

#### Do you have a specific mixing style?

We try to keep that rig as simple as possible. My monitor desk is right on the outside upstage lip of our in-the-round stage. I can gather what he's getting up there off the room, low-end response from Andy [Meyer, FOH] and his feeling about the mix from his facial expressions. For the first time, I am mixing him post-fader and off of the L/R stereo bus—"FOH style." Using the master bus results in better stereo imagery to the [Sennheiser G2] ears this way. There are also the backline mixes, both keyboard players and the dancers' mixes on the A console. Everyone in the crew and band all know that my focus is directed to Justin the entire show and if a change or problem occurs we chat after the show or at sound-check the next day, [a] true sign of [the] real pros we work for.

#### Is everyone onstage using in-ears?

Everyone gets a stereo ear mix. We're using Sennheiser G2s, still the best out there as far as audio quality and RF availability are concerned. The band mixes are pretty conventional; Justin's, however, keeps me busy. Lots of things up and down, on and off throughout the two one-hour sets. The ear system is augmented with a wedge for our percussionist and both keyboard players; the MD, Kevin Antunes, being a stereo pair.

#### Your thoughts on the tour as a whole?

This animal is just getting started but the production staff out here is really doing an amazing job. I think we are up to 22 semis in North American arenas and the caliber of staff we have out here is really exceptional.

## Now Playing

### Trans-Siberian Orchestra

Sound Company: db Sound (Chicago)  
FOH Engineer/Board: Dave Whitman (East Coast, Kurt Vanderhoof (West Coast)/Midas Heritage 3000

Monitor Engineer/Board: Tony Luna (East Coast, also crew chief), Stewart Wilson (West Coast)/Midas Venice

P.A./Amps: Electro-Voice X-Array/Electro-Voice P3000

Monitors: Electro-Voice Xn, P3000

Outboard Gear: Klark Teknik DN360/DN6000 RTA, Electro-Voice X-Array control

Additional Crew: FOH systems techs Brian Duffy (East Coast) and Tom Carlson (West Coast, also crew chief); systems techs Carlos Salabarry (East Coast), Craig Comte (East Coast), Tommy Gragg (West Coast), Rick Roman (West Coast)

### Chimaira

Sound Company: Jay Wolfe Productions (Rochester, N.Y.)

FOH Engineer/Board: John F. Winter/Midas H2000

Monitor Engineer/Board: Brandon Borgus/house-provided

P.A./Amps: Electro-Voice MT4/Crest

Monitors: Electro-Voice XW15

Outboard Gear: Empirical Labs Distressor/Lil Freq, BSS 404/504, dbx 160xt, TC Electronic



M2000/2290, Eventide Eclipse, Yamaha SPX-2000  
Mics: Shure Beta 91/57A, SM81, SM58; Sennheiser MD509, e609, e604; AKG C 451; SE Electronics 361; Audix D2

## "MTV Live" Brings in CSP Expertise

CSP Mobile's ([www.cspmobile.com](http://www.cspmobile.com)) digital audio/video trucks, Unit 6 and Unit 3, were on hand for Fearless Entertainment's new *MTV Live* series from the Hard Rock Cafe in New York City. Fall Out Boy, Gym Class Heroes, Nas and Akon (pictured) each played one-hour sets at the mid-January event, where audio engineer Lance Vardis recorded the performances on Unit 6's Yamaha PM-1D digital board.

"Akon uses a clever blend of turntables, replay and live band," Vardis says. "His rhythm section sits right in the groove pocket and Akon's vocal sat right in the mix. I used a Shure Beta 87C vocal mic, which seems to give Akon a great presence without a lot of additive equalization."

Though he often uses the onboard dynamics of the Yamaha PM-1D, Vardis went with a little bit of outboard tweaking, relying on a pair of Distressor EL8s with British EQ across the drum bus and two more on the bass group and lead vocal. "I love using an Eventide H3000SE for vocal double, as well as a good old TC Electronic 2290 for slap," he adds.





## Taking it back.

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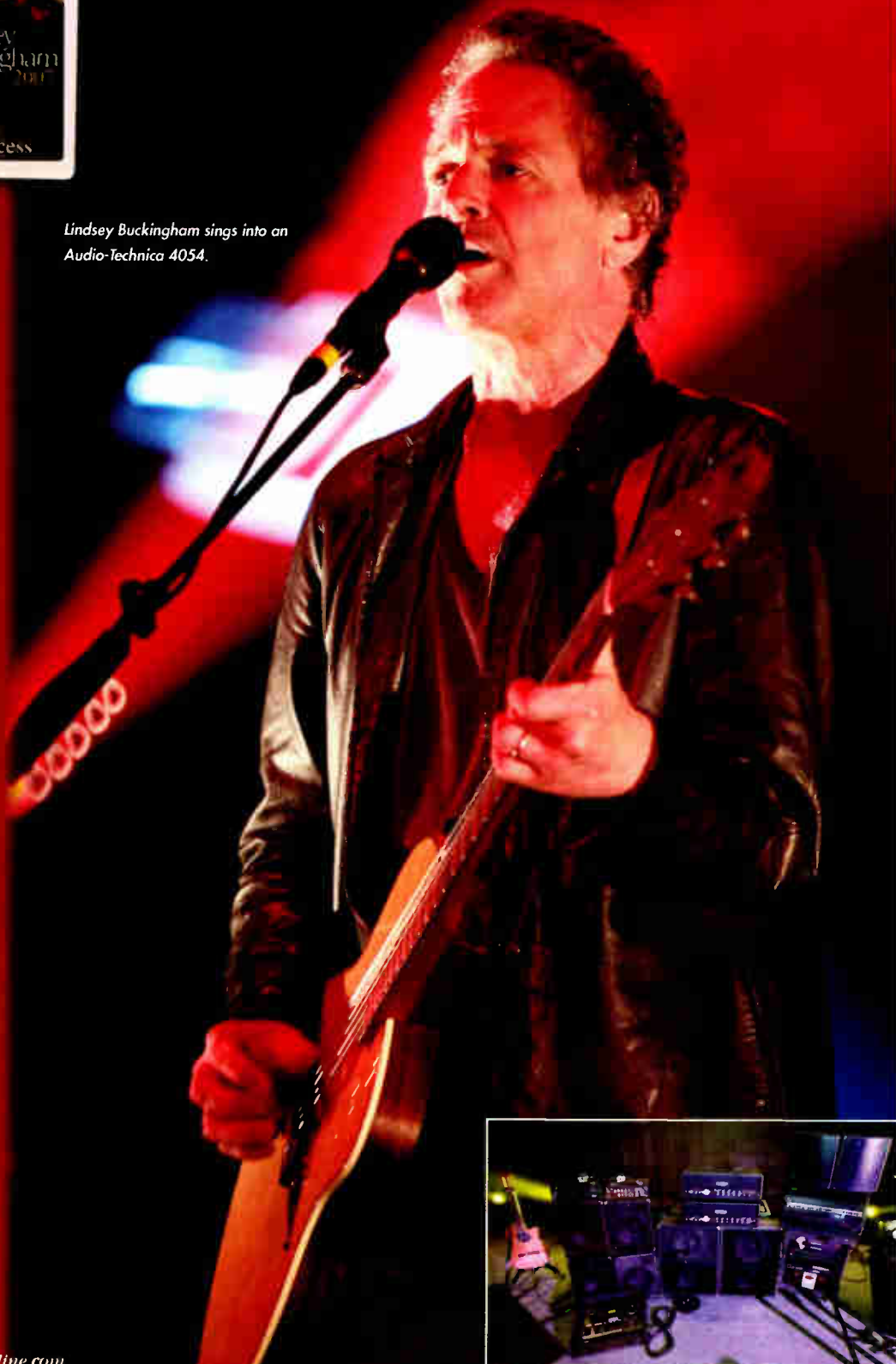
# Lindsey

Lindsey Buckingham recently wrapped up the second leg of his first U.S. solo tour in nearly 14 years. *Mix* caught up with Buckingham and his three-piece band at the historic Golden State Theatre in Monterey, Calif. Constructed in the '20s, the Golden State had suffered the fate of many large movie palaces—it was divided into smaller rooms and painted gray when its ornate murals began to fade. The theater was recently meticulously restored and now provides an awesome backdrop for film and live performance engagements. Amidst the neo-classical paintings and decor, Buckingham played songs from new release *Under the Skin*, as well as tunes from past solo albums and Fleetwood Mac classics. The charismatic entertainer had the audience on their feet and dancing in the aisles.



Photos and text by Steve Jennings

Lindsey Buckingham sings into an Audio-Technica 4054.





# Buckingham



Front-of-house engineer Joe Walsh is manning a Midas Heritage H3000 (44 inputs) while relying on house P.A.s: six to 10 boxes hanging per side and three to five subs; front-fills are small two-way boxes, but that can vary from stop to stop. Sitting alongside the board is a fairly simple rack setup: four dbx 160a units, a Roland SDE3000, Lexicon PCM80 and an Eventide H3000.

"As far as mixing this show, it's all in the source," Walsh says. "I just reproduce what's sent to me and put it in the proper context. I am actually using the automation in the console, and because of the strict discipline of the band with volumes and settings, everything comes right back night after night, provided that I EQ the system correctly each day. It's a real pleasure to work with Lindsey, an artist who can tell you exactly what he wants—no guessing, no fuss, a true talent."



Meanwhile on the side of the stage, monitor engineer Matt Lavoice is working a Yamaha 4000M, running 46 inputs and 10 outputs. "For rack gear, my motto is, 'simpler is better,'" Lavoice says, noting he is carrying a DM360, a Lexicon PCM80 and a Roland SDE-3000.

Guitar tech Stanley Lamendola runs us through Buckingham's axes: "Lindsey's signature electric guitars are Turner model 1, and the acoustics are Turner



Renaissance, built by Rick Turner. The design of both was inspired by Lindsey's playing and criticisms of other guitars. He needed a solid-body electric that was more compatible with his fingerpicking style. He also uses two Gibson Chet Atkins nylons that have been modified by Rick, as well as a Carruthers baritone and some Taylor 914s.

"This is my first tour as Lindsey's guitar tech," Lamendola continues. "Taking over Lindsey's tech duties has been a challenge, to say the least. There are open tunings, drop tunings, capos, guitars with five strings, et cetera. Along with guitar changes on every song, I'm switching amps and effects during the show. It really keeps me on my toes."



Buckingham and Heywood use Sound Image PD 1x12 wedges, while Tuggle relies on SI PD 1x15s. Hirano is on Sennheiser EW300 in-ears.



Bassist/keyboardist Brett Tuggle's gear lineup comprises a vintage Wurlitzer 200A, a Triton LE synth and an E-mu sampler. The bass rig is an SWR and a couple of Ernie Ball/StingRay basses. He also plays through an SWR California Blonde acoustic guitar amp. He sings through a Shure SM58.



Neale Heywood uses Fender Strat guitars. His gear comprises a Fender Vibro-King amp and an SWR California Blonde acoustic amp. He also has some boutique pedals. His backing vocals are heard through an Audio-Technica 4054.



For Yaku Hirano's drum kit, mics include SM57 on hat and shaker, 414s on overheads and SM91 on cajon. "The drum kit is [Roland] V-Drum," monitor engineer Matt Lavoice says, "so we take direct outs for kick, snare, toms and other sounds."

# Drummer Boy Sound

## Little Big Fish Sets High Standards in South Florida

**F**ounded just three-and-a-half years ago, Miami's Drummer Boy Sound Productions Inc. ([www.drummerboysound.com](http://www.drummerboysound.com)) has done quite well. Whether supporting local bands at clubs or large-scale festivals, the company has become known in SR circles throughout South Florida as a premier sound company that can handle an array of production needs: audio, video, lighting, staging, backline and even design. (The latter comes through a partnership with founder Harold Cummings' wife, Tangela, and her Admarde Solutions Inc.) And in addition to relying on strategic marketing tactics to attract new clients, DBS emphasizes a word-of-mouth campaign; most often heard from repeat customers is the quality of service. Maintained within the newly built warehouse facility, the company boasts high-end gear from the likes of Electro-Voice, Dynacord, Midas, Klark-Teknik, McCauley Sound, Yamaha, Shure and Sennheiser.

But this diverse inventory wasn't always the case; the company truly began with two powered speakers and one small mixer. Cummings' (who is also a full-time Miami police officer!) interest in sound started in his teenage years, when he installed car audio systems for local neighborhood car shows. He then learned to play the drums, along with other instruments, and has since followed that with doing church sound recording and now owning DBS. "I started out small with no equipment, but a passion for the music industry has kept me disciplined and humble," Cummings recalls. He credits his rapid growth in the business first to God and then to his clients and the support from local sound companies.

Cummings used to work off-duty jobs at the American Airlines Arena and the Miami Arena to watch and learn from engineers traveling to those facilities. "I would be on duty at [concerts] and would sit behind the monitor guy or front-of-house guy and pick their brain," Cummings says. In addition to the information he would gain from these conversations, Cummings also got the 4-1-1 on the latest products and equipment. Cummings began buying used equipment from local sound companies, but soon realized that he heard a difference in the sound of a used piece of gear vs. the sound of a "fresh-out-of-the-box" product—and so began his lifelong pursuit to own anything audio, which would take him from his home base of operations to his current warehouse digs.

"And now we're considered the little big guys because we've only been around three-and-a-half years and we're doing bids against companies that have been around 15, 20 years," Cummings enthuses. "But people know about us and we're winning these bids for big shows and our clients have always been happy. A lot of the other sound companies here use us for their logistical stuff—generators, backline, et cetera—because they don't have, for



*DBS did sound for Marilyn McCoo, where Cummings brought out a Midas Verona board, Dynacord mains and E-V's Phoenix monitors.*

example, three or four drum sets, they don't have six keyboards, they don't have the multiple bass rigs and guitar rigs [that we have]. "You have to remember that these guys have been around 20 years and they have been able to build up from sound to lighting to staging to logistics. We don't have 20 generators, but we have enough to do two or three big shows. We don't have a 60x40 stage, but we have 15 decks and we're getting more."

In addition to this steady rental stream, DBS is on hand for high-end clients, including Wyclef Jean, Monica, the MLK 2007 festival, local charity events and Ruby Baker. "[Baker] uses us because, according to her, we're the only sound company that in the 15 years she's been singing commercially, has been able to get her sound onstage perfectly and quickly," he says. "When we do her show, I like to mix her because I know how she needs to sound: a little reverb to where she can hear it in the monitors but not too much where it's overdone, and she wants slightly more in the house so that when the house and monitors are on together, she can hear that reverb effect." For these larger events, Cummings will handle the mix himself, but will most often be found floating around the gig, ensuring that everything goes as planned so that the client is happy. In this case, DBS employs two full-time engineers and draws upon a list of subcontractors.

While DBS continues to stay busy, Cummings is not content to rest on his laurels: He plans to bring DBS into the international touring market while continuing to service his regional clients. "I just want to keep on growing," he says. "I can remember just a year ago we were in a house and now we're in this warehouse and now the warehouse is full. We want to be the only company you can call and get everything at one time." ■

*Sarah Benzuly is Mix's managing editor.*



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# Unraveling the Sound for “Zodiac”

## Music, Effects Capture an Era in David Fincher’s Serial-Killer Drama

By Blair Jackson

The Zodiac murders were a series of brutal, seemingly random killings in Northern California that baffled police and terrified residents in the late '60s. Through the early '70s, Zodiac taunted detectives and journalists with cryptic notes, and though many theories about the killer's identity surfaced throughout the years, Zodiac has never been positively identified. The murder spree inspired a number of books,

Parker, effects mixer Michael Semanick, dialog editors Malcolm Fife and Rich Quinn, and ADR editor Gwen Whittle (all of whom have worked on past Fincher films), plus sound designer and music mixer Ren Klyce, another Marin native who has worked on all of Fincher's features and runs his own sound design company based in Sausalito, Mit Out Sound.

On a lovely early fall afternoon, I headed up to Skywalker to check out the post work in progress. (The film was originally scheduled to be released in December; it comes out March 2.) *Zodiac* is taking up the facility's three biggest studios, with Semanick premixing backgrounds in one room, Parker mixing dialog in another and, in the busiest hub that day, there's music recording on the Scoring Stage, with engineer Leslie Ann Jones at the Neve 88R, Klyce supervising and composer David Shire conducting a 54-

there were holes in some scenes that could benefit from music.

“So I started to reach for this music score that I really loved: Francis Coppola's *The Conversation*, composed by David Shire,” he continues. “I got a CD of the score and started cutting it in [as a temp track], mostly for myself to feel what the film might be like with some solo piano underscore. I really loved the way the solo piano in *The Conversation* reflected Harry Caul's character, so I thought that might be an interesting approach for the characters in our film. I started showing it to David, and he said, ‘Yeah, this is great, but I promised the studio I wasn't going to put any music in it, so if you're going to do that, it has to be all source music.’”

A number of e-mails between Klyce and noted sound and film editor Walter Murch, who had earned an Oscar nomination for his work on *The Conversation* back in 1975, led to one inescapable notion: The best way to get some of the feeling of Shire's lonely piano music into *Zodiac* was to actually hire him to write some cues, studio be damned. With Murch's help, Klyce contacted Shire and began detailing the plot and themes, talking about the idea of “the unraveling of the film's characters.” Fincher remained apprehensive, but sent Shire a script and flew him in for a meeting and screening in Los Angeles. Soon after, the studio agreed to bring Shire onboard.

“At first, they wanted about 15 or 20 minutes of score,” Shire relates between takes on the scoring stage, “but it ended up growing into something bigger. Besides the piano-based score, I also brought along a classical recording I thought might have some of the texture I was looking for—a Charles Ives piece called ‘The Unanswered Question.’ I think it popped in my head one day because this whole movie is an unanswered question. So I brought in some of the Ives texture, and we also had some *Conversation*-based cues, and by the time we spotted the picture, we were up to 37 minutes of original music.”

Once he had a sense of where the score was heading, Shire huddled with his producer and orchestrator, Martin Erskine,



Sound designer Ren Klyce, left, with composer David Shire

speculative TV shows and feature films (including *Dirty Harry*, whose psycho killer is known as Scorpio). But David Fincher, director of such gritty films as *Se7en*, *Fight Club* and *Panic Room*, is the first major filmmaker to tackle the story in all of its dimensions: *Zodiac* is a gripping crime drama, a police story and a saga about journalists in action—all rolled into one.

The film was shot at various locations around California and posted at Skywalker Sound and Tyrell Sound in Marin County. Fincher actually grew up in Marin, and early in his film career worked for Industrial Light & Magic there, before splitting off to make commercials, music videos and, eventually, features. *Zodiac*'s post team included a host of regular or occasional Skywalker denizens, including supervising sound editor Richard Hymns, dialog mixer David

piece orchestra for assorted cues.

“Initially, David [Fincher] didn't envision an original score for the film,” Klyce recalls. “He wanted it to be a tapestry of sound design, vintage songs of the period, sound bites and ethereal clips of [AM radio giant] KFRC and ‘Mathews Top of the Hill Daly City’ [home of a prominent hi-fi dealership of the time]. David and I both grew up in the Bay Area, and we remembered all these sounds from our childhood, like La Brea's Warehouse waterbeds, Captain Mitch, Denevi Camera and on and on. I was apprehensive, however, because while reading the script, I kept seeing places where I thought, ‘This should have music—not just a pop song.’ Unfortunately, David had told the studio he didn't need a composer and would buy a bunch of songs instead. They agreed. But as the film developed and hit its stride, I felt

PHOTO: MERRICK MORTON



to flesh out the composer's ideas. "We'd do the cue, then send it to Ren over an Internet system called PIX," Shire explains. "Ren's team would put it to picture and send it to Fincher's office. Then he'd type his notes, and Ren would type his notes. It would come back to us, and Marty and I would work on it some more. We did that on 31 cues. It's a lot of work, but it means that when you get to the scoring date, you don't have a room full of musicians sitting around doing nothing because you're suddenly rewriting cues. You can spend the recording session working on the last interpretive details. It's been a great experience."

Indeed, on the afternoon I was observing the scoring session, there was a mellow give and take of ideas between Klyce, Shire and Erskine, as Jones ran the session from the board. The orchestra (from the San Francisco Opera and S.F. Ballet orchestras) was nearly all strings—14 first violins, 12 seconds, 10 celli and eight bassists—augmented by some solo trumpet, French horn, guitar (on one cue) and piano (not played by Shire, who was conducting; he recorded his solo cues on another day). Jones miked the orchestra with a combination of Neumann overheads and section mics, "and one thing we did that was a little different on this session is I asked David Shire if he wanted to split the first and second violins," Jones says. "A lot of times, they're right next to each other, but for this we separated them because of the way he had written the parts—they were playing mostly different lines, and that ended up being a big part of the sound of the score." The session was recorded to Pro Tools at 24/96, though it was delivered to the stage at 24/48.

Klyce was deeply involved in each cue's minute details. After a take of a slow, eerie crescendo, Klyce mentioned to Erskine that he thought that the build-up sounded "a bit cliché. It's like 'leading the witness.'" After some minor consultation, they decided to strip away the basses and taper the crescendo more.

Over the talkback, the changes were relayed to Shire, who then passed them on to the orchestra. With the next take it was clear that the change was a good one, and everyone, Shire included, seemed pleased. And so it went. On one cue they worked in a new string ritard. On another, Klyce wanted the violas quieter. The piano was removed from a third cue. At one point, Fincher called in from L.A. and was patched into the session briefly so he could hear a cue or two.

"It was the best kind of collaboration on a film," Shire notes. "The score *evolves* rather than the composer and director talking, then the composer disappears for six weeks, writes the score and the first time the director hears it is on the stage, which can lead to disaster."

In many ways, Klyce was the fulcrum in the film's production because he was intimately involved in both sound design and the score, *and* he is extremely close with Fincher and consults with him on matters large and small. It was a lot to juggle, but Klyce insists the needs of the film dictated how decisions came down.

"Just yesterday," Klyce tells me at the beginning of the final mix a few weeks later, "Michael Semanick, David Parker and I were mixing, and all of a sudden I started pushing the music faders up, and I looked up at Michael, and said,

'You know what—we're going to have to lose all that intricate sound design we did here.' I felt torn inside because we were discarding all our sound work, but with the combination of the sound design and Shire's music, this weird alien music surfaced, making the scene sound dischordal. It wasn't right. The good news was that because it was just us, there was no fighting about it. The sound editor in me was disappointed, but you move on.

"One good thing about being involved in both the sound design and the music is that I knew where the music was going to be important and I also knew what was happening with the effects and ambiences, so there were places where we tried to build the sounds around the music and vice-versa," he continues. "Early on, when David [Shire] would send a mock-up of the piano, I would then try to put ethereal tones that would complement his music if I could."

On the sound design side, Klyce says he became positively obsessive about having the proper period typewriter, phone and vehicle sounds—while also allowing room for creativity. "Throughout this project, I've become almost a typewriter fetishist," he says with a laugh. "I started collecting them, and I had to stop because it started to get a little weird. I went on eBay and looked for





Leslie Ann Jones, director of music recording at Skywalker Sound

and then with my team we'd go record these typewriters at various locations [using a Sound Devices 722 digital 2-channel recorder]. So, for instance, we'd record an IBM Selectric at my home and record it from different perspectives—from 20 feet, sometimes in mono, sometimes in stereo. We did a 'concert' for two IBM Selectrics at 40 feet. We did the same thing with the telephones. We had the typewriters and telephones at the *Chronicle* being the 'newer' technology, and then the typewriters at the Hall of Justice, where the cops were, were all manual typewriters—since they're government people!

"And even though it might not have been correct historically," Klyce continues, "the phones for Hall of Justice have these 1920s rings. At one point, we took all the IBMs and the manual typewriters into a church in Mill Valley and recorded those from many perspectives. We also went onto the Skywalker Scoring Stage, which had a more ambient vibe. As my fetish grew, I started asking the prop people to send me their typewriters, so all these typewriters were showing up in these massive boxes from FedEx."

He and supervising sound editor Richard

Hymns brought a similar attention to detail to the period cars, which included everything from VW bugs to Ford Galaxies. "People who don't do sound effects think, 'Oh, don't you just have a recording of a car going by?'" Klyce says with a chuckle. "Well, yeah, but it's a not a Studebaker stopping past the mic in the rain at 15 miles per hour.' Each vehicle angle or shot in the film must be re-performed. It's tedious work, but worth the time and trouble it takes."

Toward the end, even Fincher got into the act, coming up with an audacious audio idea of his own: After many different actors (including dialog editor Malcolm Fife) lent their voices to the mysterious (but never fully seen) Zodiac, Fincher said he wanted to splice together two different actors' voices to form a single performance (alternating each word). "[ADR editor] Gwen Whittle and I thought it was a pretty bad idea and that it would never work," Klyce says. "Splicing from one actor to another? Forget it! We said, 'Okay, let's just do it and show David that it can't work.' So Gwen started to do this—and it worked! It was so weird.

"Besides," he adds, "it *is* his movie. But if it were wrong, David would want to know. He wants it to be as good as it can be." ■

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World Radio History

## Lines Between MI and Pro Keep Fading As Developers Go Native

By the *Mix* Staff

**S**olid State Logic was at NAMM for the second straight year, this time releasing five new products. Apple's booth just keeps growing, though its main announcements took place up in a private room with Apogee. Microsoft was running the floor touting Vista's release. There were speakers costing \$60,000 and mics down to \$99. Everyone was dabbling in native processing, and we even found an effects controller for your ring finger. And while we didn't find any breakout products at this year's NAMM (January 19-21, 2007) show, we did find the range of pro gear to be growing ever wider.

### NATIVE ARRIVES

Much of this technology trend is driven by the ever-increasing price/power ratios of current laptop and desktop computers—both PC and Mac. Today's multicore CPU designs and a couple gigabytes of RAM under the hood are ideal for native processing applications. Need proof? We visited the MOTU ([www.motu.com](http://www.motu.com)) booth, where Digital Performer Version 5.11 ran 1,000 plug-ins on a stock Mac Pro tower with Quad Intel Xeon processors without a hiccup.

At last year's NAMM, the buzz surrounded apps revving up for Apple's Intel-based machines. That trend certainly continues, and on the cusp of the official release of Microsoft Vista, there was a lot of interest in the new OS from PC aficionados, too. Cakewalk ([www.cakewalk.com](http://www.cakewalk.com)) is now shipping SONAR 6.2—the first native DAW application with Windows Vista support. The free update for SONAR 6 users also adds new features such as MIDI input quantize, X-Ray Windows, Bit Meter plug-in, AudioSnap™ and ACT™ (Active Controller Technology) enhancements, interface and workflow improvements, field recorder support, color scheme import/export and more.

MOTU is now offering Windows Vista drivers for its PCI, FireWire and USB audio and MIDI interfaces. MOTU has also posted Vista-compatible public betas of its cross-platform (Mac/Windows) virtual instruments.

Sony ([www.sonyplugins.com](http://www.sonyplugins.com)) has also looked at the increased power of native processing and



made its Oxford plug-ins, which can demand a lot of space/memory, in Audio Units, VST and Pro Tools formats.

Anyone wanting to go native on the Mac with true portability should check out Apogee's ([www.apogeedigital.com](http://www.apogeedigital.com)) Symphony ExpressCard, a \$595 PCIe card interface providing direct connectivity from your MacBook Pro to Apogee's Rosetta 800, Rosetta 200, and AD-16X and DA-16X converters. It's compatible with Core Audio software applications such as Logic Pro, Cubase, Nuendo and Digital Performer, and provides up to 32 tracks with 1.6ms latency.

In other mobile news, Universal Audio ([www.uaudio.com](http://www.uaudio.com)) announced the UAD-Xpander ExpressCard DSP system for laptops. The UAD-Xpander comes in three versions: the UAD-Xpander Xpress (\$999, with a \$500 plug-in voucher), the UAD-Xpander Xpert (\$1,399, with \$1,000 voucher) and the UAD-Xpander Xtreme (\$2,199 with all UAD plugs to V. 4.5—a near-\$3,000 value).

### GET IN, GET OUT

Solid State Logic ([www.solid-state-logic.com](http://www.solid-state-logic.com)) is obviously looking at the front and back end of



Universal Audio UAD-Xpander ExpressCard DSP system

Apogee Symphony ExpressCard



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whatever DAW you choose, unveiling three 48-channel, 24/96 AD/DAs in its XLogic Alpha-Link converter line, designed to operate stand-alone or with the new Soundscape Mixpander PCI card to create flexible I/Os for native PC-based workstations. SSL also showed an 8-channel line mixer/summing box in its X-Rack Series and the Delta-Link 128-channel MAIDI-to-Pro Tools format converter—just the thing for interfacing a MAIDI console to your Pro Tools rig. Described as providing “kick-ass drum processing,” SSL’s \$299 Drumstrip

plug-in for Duende offers gating, LF/HF enhancement, transient shaping and Listen Mic Compression.

Focusrite’s ([www.focusrite.com](http://www.focusrite.com)) Saffire Pro 10 I/O puts eight mic/line preamps, eight balanced line outs and stereo S/PDIF I/O in a single-rackspace case. The unit can be bus-powered or run from an AC adapter, and includes the Saffire plug-in suite (EQ/compression/reverb/amp simulation in Audio Units and VST formats), 24-bit converters and controls for headphone and control room monitoring. Phonic’s ([www.phonic.com](http://www.phonic.com)) FireFly 302 is a portable, 5-in/6-out FireWire interface with 24/96 converters, S/PDIF digital I/O,



**Mackie Control Universal Pro**

MIDI I/O and XLR mic pre with phantom power. It’s bus-powered and retails at \$119. On the back end is Dangerous Music’s ([www.dangerousmusic.com](http://www.dangerousmusic.com)) D-Box, with eight channels of analog summing and a programmable monitor control section with analog and digital ins, D/A converter, talkback, headphone amp, speaker switcher and more.

**STAYIN’ IN CONTROL**

In keeping with NAMM’s portable/powerful theme, manufacturers were debuting their new compact DAW controllers. Mackie ([www.mackie.com](http://www.mackie.com)) showed its next-generation control surfaces, the \$1,549.99 Mackie Control Universal Pro, which connects to a Mac or PC, and has nine motorized, touch-sensitive Penny & Giles faders, eight V-Pots, more than 50 master buttons and a large LCD. An \$899 Mackie Control Extender Pro can add eight more channels for up to 32 channels total.

The Alesis ([www.alesis.com](http://www.alesis.com)) MasterControl combines a control surface and FireWire interfacing with two XLR mix inputs, six line ins, 18 digital inputs (Lightpipe and S/PDIF at 44.1/48 kHz—or 10 ins at 88.2/96 kHz) and three stereo outputs (reconfigurable as one 5.1 out). MasterControl has eight channel strips (with solo, record-enable, mute and select), a jog/shuttle wheel and dedicated transport controls.

**MICS AND MONITORS**

Mics with USB outputs continue to be popular, with units from RØDE, Samson, Blue and MXL reporting brisk sales. MXL ([www.mxl.com](http://www.mxl.com)) showed a slick \$99.95 accessory that lets you connect any mic to a computer’s USB port. The cool part? This cigar-sized device uses patent-pending technology to supply phantom power from the USB bus—no simple feat.

Blue Microphones ([www.bluemic.com](http://www.bluemic.com)) showed its soon-to-be-shipping Woodpecker



**Blue Woodpecker**

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## Winter NAMM 2007

active ribbon mic, a handsome model with a wooden body and blistering 136dB SPL handling. Sennheiser ([www.sennheiserusa.com](http://www.sennheiserusa.com)) bowed its updated e60211, which has been optimized for kick drum and other low-end apps. SE Electronics ([www.seelectronics.com](http://www.seelectronics.com)) had a smaller version of its Reflexion Filter that keeps problem reflections from returning to your mic. ADK ([www.adkmic.com](http://www.adkmic.com)) showed the very affordable A-6 (\$230), which takes the electronics from its Vienna and Hamburg models and spins them into a fixed-pattern condenser. For field or studio use, RØDE's ([www.rodemic.com](http://www.rodemic.com)) M3 condenser runs on standard 48-volt or 9V battery. The \$399 CV-12 from Avant Electronics ([www.avantelectronics.com](http://www.avantelectronics.com)) has a cabernet-red finish with a 9-pattern tube condenser mic under the grille. The mic includes three tubes (6072A, ECC81 and ECC83) that are interchangeable.

NAMM has always been a show of extremes, offering everything from \$0.50 kazooos to \$41,000 Disklavier 2 systems. Ocean Way Studios ([www.oceanwayrecording.com](http://www.oceanwayrecording.com)) owner Allen Sides teamed with Sonic Reality ([www.sonicreality.com](http://www.sonicreality.com)) to create Ocean Way

Drums, with samples from some of the world's best drummers—impeccably recorded at 48 and 96 kHz in one of the world's most notable studios, Studio B at Ocean Way. To show them off, Sides brought in one of his custom monitoring systems, now offered through GC Pro ([www.gcpro.com](http://www.gcpro.com)). The monitors' \$60k price may seem steep, but it includes acoustic space evaluation and room correction. Other high-end monitor debuts included Phil Jones' AAD ([www.aadsound.com](http://www.aadsound.com)) model 7001s, a passive design at just \$12,500/pair; or KRK's ([www.krksys.com](http://www.krksys.com)) update on its near-field flagship Exposé E8B, retailing for a mere \$5,995/pair. For a little less (okay, a lot less) dough, there's M-Audio's ([www.m-audio.com](http://www.m-audio.com)) new AV40, a powered desktop system from its Studiophile Series at only \$199 pair.

### HARDWARE—WITH SYNTHS, TOO!

No, hardware is not dead. Forest Audio, a new division of Radial Engineering ([www.radialeng.com](http://www.radialeng.com)) showed Q6 (\$2,500), a 6-band, passive-coil EQ with an active front end. It offers +4/-10dB or instrument-level connections, plus a Drag control to simulate the guitar/amp relationship. Little Labs' ([www.littlelabs.com](http://www.littlelabs.com)) LMNO Microphone Preamp (\$1,680) has up to 74 dB of clean



Waldorf Blofeld

gain and an LF resonance control to create a tunable proximity effect without being close to the mic. Creation Audio Labs' ([www.creationaudiolabs.com](http://www.creationaudiolabs.com)) MW1 is a do-almost-everything, single-rackspace box with a transformerless DI and signal splitter, impedance matcher, re-amp and buffered signal booster to your amp. It also lets you use line-level gear in your signal chain before your amp. After much tweaking, Crane Song ([www.cranesong.com](http://www.cranesong.com)) released the Egret 8-channel mixer/converter with balanced direct outs, AES single-wire output at 192 kHz and S/MUX out to 96k, cue send, color control, panner and level for each channel. Bomb Factory founder Dave Amiels and Pendulum Audio's Greg Gualtieri have formed AnaMod ([www.anamodaudio.com](http://www.anamodaudio.com)), a company that uses analog modeling to create complex analog circuitry. Its first product is the ATS-1 (\$2,995), a 2-channel analog tape simulator with user-installable upgrade cards that

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# REMIX [hotel]

# Miami

*Remix* magazine's traveling music-production seminar, Remix Hotel, is heading back to the National Hotel on South Beach for a long weekend of interactive workshops for studio pros and bedroom beat makers alike.

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mimic the sound of different recorders. A-Designs' ([www.adesignsaudio.com](http://www.adesignsaudio.com)) EM-PEQ is a \$1,500 module that puts the sound of Pultec's famed EQP-1A into the compact 500 Series module frame size without compromising the original design.

Virtual instruments remain hot, but we were surprised by the number of new hardware synths on the floor. Waldorf (dist. by Qtec Designs, [www.qtecdesigns.com](http://www.qtecdesigns.com)) had limited-edition models of the MicroQ, Q and Q+, but showgoers were jazzed by Blofeld, a compact MIDI module with 1,000 classic Waldorf sounds and a street

price around \$500; the Stromberg keyboard hybrid analog/digital synth (around \$4,000); and Zarenbourg, a Rhodes-like 76 wood-key controller with electric piano sounds. Known for software emulations of classic synths, Arturia ([www.arturia.com](http://www.arturia.com)) unveiled Origin, a hardware MIDI sound module that re-creates sounds from classic synths, but lets users mix/match sections of each, like Minimoog oscillators with filters from an ARP 2600.

Kurzweil ([www.kurzweilmusicsystems.com](http://www.kurzweilmusicsystems.com)) is back with the PC3, an 88-note keyboard with 128-note polyphony and hundreds of sounds, including the famed Triple-Strike Grand Piano, basses, drums,

guitars, vintage key sounds and 250 pro orchestral and string programs.

**LIVE SOUND**

Mid-priced, handheld live sound mics were everywhere on the show floor. AKG ([www.akgusa.com](http://www.akgusa.com)) debuted its supercardioid dynamic D 5 (\$156) and cardioid condenser C 5 (\$299). Audio-Technica's ([www.audio-technica.com](http://www.audio-technica.com)) new AT2010 (\$169), brings the sound of its 20 Series to the stage. Listing at \$299, the Audix ([www.audixusa.com](http://www.audixusa.com)) VX-5 has recessed onboard switches for -10dB pad and bass roll-off. RØDE's S2 is designed to provide the clarity of its TEC Award-winning S1, but at a more affordable \$149 street price.

Sabine ([www.sabine.com](http://www.sabine.com)) wowed us with its Phantom Mic Rider. Barely larger than an XLR connector, it packs an FBX Feedback Exterminator, automatic gain adjust, control of proximity effect and plosives, and infrared mic gating in a phantom-powered \$119 inline accessory.

Bring on the mid-priced, pro-level speakers! Community's ([www.loudspeakers.net](http://www.loudspeakers.net)) SONUS line includes four full-range models (all switchable for bi-amped or passive operation) and two subs priced from \$599 to \$1,399. The PRX500 Series from JBL Professional ([www.jblpro.com](http://www.jblpro.com)) has five models priced from \$1,359 to \$1,799, all with 500 to 650W of onboard Crown Class-D amplification. QSC's ([www.qscaudio.com](http://www.qscaudio.com)) HPR122i is pole-mountable or flyable with a 12-inch woofer, 1.4-inch compression driver and 500W of bi-amping in a birch-ply cabinet that streets at \$799.

Geared for mixing front of house, monitors or both, Crest's ([www.crestaudio.com](http://www.crestaudio.com)) CV-20 console has 24/32/40/48/56 inputs with 4-band EQ, 12 aux sends, eight subgroups, LCR panning, 128 VCA assignments, 144 mute scenes, 11x4 matrix, and dynamics on all subgroups and main buses. Another slick console debut was Allen & Heath's ([www.allen-heath.com](http://www.allen-heath.com)) WZ3Monitor, a 16 mic/line input monitor mixer. With onboard passive mic splitting, 4-band EQ and 12 mix outs assignable as mono or stereo pairs, it's perfect for in-ear monitoring.

We'll present more products from NAMM in *Mix* and at [www.mixonline.com](http://www.mixonline.com); also check out [mixonline.com/wnam](http://mixonline.com/wnam) for podcasts, video and newsletters from the show floor. Meanwhile, NAMM returns to Austin from July 27 to 29, 2007. ■



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## Tools of the Trade



### A DESIGNS EM-PEQ

This new unit from A-Designs Audio ([www.adesignsaudio.com](http://www.adesignsaudio.com), \$1,500) is meant to mimic the classic all-tube Pultec EQP-1A and fits into its compact 500 Series module frame. The unit uses the same discrete Class-A/B amplifier found in A-Designs' solid-state Pacifica mic pre, and offers a nickel-core output transformer, gold Grayhill rotary switches and Wima caps. The EM-PEQ uses a custom-wound tapped

inductor wound to the original values and has a true hard bypass.

### M-AUDIO STUDIOPHILE AV 40

These desktop-friendly, close-field speakers from M-Audio ([www.m-audio.com](http://www.m-audio.com), \$199.95/pair) offer balanced and unbalanced connections, headphone output, additional aux input and video shielding. The cabinets boast a custom design said to eliminate resonances and minimize vibration by using a dense



wood construction. The twins feature 4-inch polypropylene-coated drivers and 3/4-inch ferrofluid-cooled silk-dome tweeters with OptImage III waveguide technology. They are powered at 20 watts per channel.

### SUBMERSIBLE DRUMCORE 2.S

New features in the latest version of DrumCore from Submersible Music ([www.drumcore.com](http://www.drumcore.com)) include MIDI stand-alone mode, which allows the user to play DrumCore as a live drum module, plus pad swapping to easily create Frankensteinian hybrid drum kits, drag-and-drop sample assignment, real-time editing and numerous new songwriting features. New content is available for registered users, including a GrooveSet by premier Latin percussionist Luis Conte.

### BLUE WOODPECKER

The Woodpecker from Blue Microphones ([www.blumic.com](http://www.blumic.com)) features

a handsome, polished wooden body and an aluminum-ribbon pressure-gradient transducer. The \$1,299 mic is an active ribbon, meaning it requires phantom power to operate. It also means that the usual impedance matching and level requirements needed with a ribbon mic are moot. The mic will take a blistering 136dB SPL, generates internal noise less than 22 dB (A-weighted) and has a dynamic range of 114 dB. The Woodpecker ships with a custom-made, solid-brass shock-mount and wooden storage box.

### APOGEE SYMPHONY MOBILE

Meant to give the Apple MacBook Pro true studio capabilities anywhere, Apogee's ([www.apogeedigital.com](http://www.apogeedigital.com)) Symphony Mobile card (\$595) fits neatly into the PCIe slot on the MacBook Pro. The mobile user can now achieve up to 32 channels of digital I/O with less than 1.6 ms of latency at 96k. The card is compatible with any Core Audio software applications and uses Apogee's Maestro software for advanced control and routing and VBus



for virtual routing between applications. The Symphony Mobile connects with any of Apogee's converters with a single 32-channel PC-32 bidirectional connector.

### MCE TECHNOLOGIES BLU-RAY DRIVE FOR MAC

Storage junkies rejoice! MCE Technologies ([www.mctech.com](http://www.mctech.com)) is now offering a Blu-ray SuperDrive disc for Mac (\$699), using 25GB single-layer and 50GB dual-layer discs. The unit is preconfigured for operating on either the Mac Pro or G5. Not only can you heap your files onto Blu-ray discs, but for smaller jobs, this unit is also compatible with all DVD and CD recordable media, including DVD±R/RW + Dual/Double Layer, DVD-RAM, and CD-R and CD-RW. The drive ships with Toast 8 Titanium and includes a 25GB Blu-ray rewritable disc.

### FOSTEX FR-2LE FIELD RECORDER

Fostex ([www.fostex.com](http://www.fostex.com)) takes it to the streets with its FR-2LE field recorder (\$599). It records BWF (up to 24-bit/96kHz) or MP3 files to a Type-II Compact Flash card and will operate for up to eight hours with the internal Ni-MH batteries. There are plenty of fail-safe features for the recorder on the go, including one-take equals one-file operation, a prerecord buffer, and auto-file closing and saving. The unit also offers an onboard limiter and highpass filter, and ships with a wired remote.

back-beveled panels used predominantly for corner trapping and eight 16x48x1-inch rectangular back-beveled panels to cover a total of 64 square feet. The SonoSuede HT System comprises four 16x48x2-inch back-beveled panels and eight trapezoidal-shaped 16x48x1-inch square-edge panels for total coverage of 54 square feet. Each system is priced at \$1,399. Panels come in black/red and black/tan; other colors can be custom-ordered.

### ULTRASONE/RUDIStOR NX-02 SISTEMA

Ultrasonne ([www.ultrasonneusa.com](http://www.ultrasonneusa.com)) has collaborated with RudiStor ([www.rudistor.com](http://www.rudistor.com)) to offer a combo pack of headphones and a custom-matched amplifier: the NX-02 Sistema amp made to operate with the ProLine 2500 headphones. All orders are custom-made and take up to eight weeks. Prices: \$1,199 (amp and headphones); \$875 (amp only).

### SSL DRUMSTRIP

Adding more power to the Duende platform, SSL's ([www.solid-state-logic.com](http://www.solid-state-logic.com)) new Drumstrip drum processing plug-in offers a collection of five audio processing tools, including a transient shaper; a gate with range, attack and release; an HF and LF enhancer; and the classic SSL Listen Mic

compressor mimicking the utility hardware compressor originally found on the 4000 E Series consoles. Tools can be put in any order, and a handy input and output level meter offer additional RMS meters. The plug-in is available exclusively on the SSL Website; price \$299.

### RADIAL ENGINEERING FOREST Q6

The first product in Radial's ([www.radialeng.com](http://www.radialeng.com)) new Forest line is the Q6 Counter-Coil EQ. In the past, the Coil EQ was known for a finicky nature and unique sound; however, Radial claims to have made this unit less noisy and more consistent in this 6-band passive coil equalizer, which features 12-position boost/cut switches on each channel, low noise and up to 28 dB of gain. The front panel offers individual bypass switches for each band and a gentle high-cut filter; the back offers +4dB line-level and unbalanced -10dB connectivity. The unit also offers a unique, guitar-oriented front-end DI to connect instruments directly into the box for stage use, plus Drag Control load correction to simulate the relationship between an electric guitar and amplifier. A pair of footswitch-selectable ¼-inch input jacks on the rear facilitate quick instrument changes during live performance. An effects loop can be turned on remotely via a standard footswitch. Price TBA. ■

### TASCAM FIREONE INTERFACE

The FireOne from Tascam ([www.tascam.com](http://www.tascam.com), \$399) is a FireWire audio interface offering edit keys and a weighted, backlit jog wheel, allowing for zippy navigation across your DAW's timeline. It also offers a pair of phantom-powered mic inputs, line inputs and a pad with converters capable of operating up to 24-bit/192kHz. Handy instrument inputs and MIDI I/O make it a natural for desktop DAW production or for use with video editors such as Apple's Final Cut Pro and Adobe Premiere.

### AURALEX SONOSUEDE

SonoSuede is the newest family of all-in-one D.I.Y. room treatment systems from Auralex ([www.auralex.com](http://www.auralex.com)). The SonoSuede Pro system comprises four 16x48x2-inch (WxHxD)





# PreSonus DigiMax FS

## Eight Mic Preamps With Conversion and Flexible Routing

It's been six years since PreSonus launched its popular DigiMax line, and nearly four years since the DigiMax last received a facelift in the DigiMax LT and DigiMax 96K models. Building on many of the LT's technical aspects, the DigiMax FS is the latest in the line aimed directly at project studios needing lots of high-quality microphone preamps and simple cross-platform interconnectivity and routing flexibility. The DigiMax FS is an 8-channel Class-A microphone and instrument preamplifier with ADAT optical and 96kHz dual SMUX input and output conversion as its primary selling feature.

your interface or digital mixer, but with no compatible gear to make use of them. Its back panel is absolutely loaded with I/O, featuring SMUX-configured ADAT input and output (dual sets of multiplexed optical ports for up to eight channels of 88.2 or 96 kHz), BNC word clock connectors and 24 analog connectors arranged into three sections—all of which are simultaneously usable.

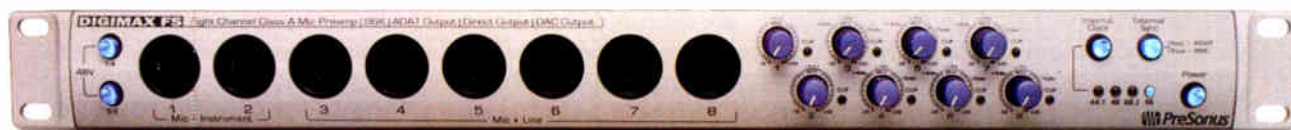
The first section groups eight balanced ¼-inch TRS DAC outputs that are directly sourced from the ADAT input. This conveniently converts ADAT optical signals to analog outputs, ideal for sending additional monitor mixes or alt sends from a

clock, which are indicated by red and blue backlighting, respectively.

### CLEAN AND VERSATILE

The business end of the DigiMax FS sounds fantastic. Its preamps are capable of huge gain boosts while remaining neutral to the signal, and deliver an uncompromising, clean sound that is truly impressive, especially for this price range. Even when I pushed them really hard on distant miking, they produced an uncolored and consistent sound that I'd classify with some of the best transformerless designs out there.

I recorded tracks using a Rode Classic II



### MEET THE FS

The control panel of this robustly constructed 1U box reveals that all inputs are up front, which might not be the best solution for everyone but, as we'll discover later, the reasoning behind this design decision was a good one. The inputs are Neutrik Combo connectors comprising balanced XLR and ¼-inch TRS hi-Z instrument inputs on channels 1 and 2, while inputs 3 through 8 offer mic or balanced line-level inputs. All eight microphone inputs include selectable +8-volt phantom power (in groups of four) and individual preamp gain control. Input is measured only by red "clip" indicators. The line-lump power adapter features a lock-nut for ensuring that no loud pops will result from accidental pulls to the power cord.

### ALL ABOUT THE I/O

What really sets the DigiMax FS apart from the pack is its ability to expand on the often-underused, or completely sequestered, ADAT ports of our project studio equipment. If you're like most home recordists, you probably find yourself maxing out the analog inputs of your audio interface on a regular basis, wishing it had more—and better-sounding preamps, too! Similarly, you've likely cursed the fact that you see a perfectly good set of ADAT Lightpipe receptacles on

digital mixer or DAW whose analog outs are already maxed. The next section has eight TRS direct analog outputs, giving you the option of sending line-level outputs straight from the preamps to a console or backup device during mixing or live recording. The third group comprises eight TRS connectors that are configured as insert points for each input on the DigiMax FS—a very cool feature. Returns 1 and 2 also act as the line-level inputs for channels 1 and 2. You can daisy-chain unlimited DigiMax FS units, and a 75-ohm Terminate switch allows you to terminate the word clock signal on the final unit. Now you understand why the bulky Combo inputs are placed up front.

### GOT THE JITTERS?

The DigiMax FS is the first to feature PreSonus' new JetPLL jitter-reduction technology. Developed by TC Electronic, it uses a wide range and variety of frequencies and noise shaping to remove nearly all audio-band jitter with the aim of providing superior converter performance, plus fast-locking and tight synchronization. The Internal Clock selector on the far right of the front panel allows you to set the DigiMax FS as the word-clock master at various sample rates (44.1, 48, 88.2 and 96 kHz), while External Sync toggles between ADAT/slave sync and BNC word

and compared the PreSonus unit with several stand-alone and audio interface preamps ranging from budget to high-end models, and I was particularly impressed with the DigiMax FS' transparent highs, and its dynamic and present midrange. It produced a generally fuller and bigger sound than I was used to hearing from pre's in its price range. Its excellent transient response resulted in some of the most spacious sounding stereo recordings I've captured, and its two instrument DFs were equally sweet on guitar and electric bass, again revealing a lovely low-midrange gusto that would normally be missing from pre's in this price range. This brings up a good point: Because much of your typical audio interface's cost is in its converters and not necessarily in its pre's, you just may find that using the DigiMax FS as a front end improves upon the sound of your more expensive interface.

Like its predecessors, the DigiMax FS works well with DAWs because its analog and digital outputs are active simultaneously. I was able to monitor the analog outputs with zero latency while recording digitally. With no real metering to speak of on the DigiMax FS, you must rely on the meters within your DAW. Similarly, the unit's lack of discrete phase buttons means DAW users will need to perform inversions in software. Curiously,



# "Acoustic music has never sounded so good"

~ Jerry Douglas

Whether you play a jumbo, dreadnaught, dobro or triple-0, the tone going from your guitar to the PA system depends entirely on every component along the way. And your DI box is the most important component of all: It takes the guitar signal, converts the impedance from hi-Z to low-Z, balances the line and then drives it hundreds of feet to the mixing console.

An active direct box like the Radial J48 is in fact an instrument preamplifier. And like studio mic preamps, the quality varies. But what actually makes a great direct box? Simple: If you take the time to design the circuitry so that you get the lowest harmonic distortion, virtually zero phase-shift, reduce inter-modulation distortion, and provide sufficient headroom so that even the loudest guitar will not choke the input stage, a funny thing happens... It sounds better.

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"I'm really happy... I replaced my old DI's and found the J48's to have more output and less coloration. Acoustic music has never sounded so good."

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(world renowned guitarist/performer)

"It is nice to find great sounding industrial grade equipment still being made today!"

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(U2, Robbie Robertson, Bob Dylan, Peter Gabriel)

"Over the past 13 years I have used a variety of DI boxes. The Radial J48 is without a doubt the best, cleanest and most versatile DI I've ever used."

**Paul Richards**  
(California Guitar Trio)

"With a Radial DI, the difference is surprising and dramatic. The sound is punchy, warm, solid and accurate. There's no going back!"

**David Oakes**  
(Front of house engineer - Pat Metheny group)

"When it comes to sonic integrity, nothing touches Radial. Great gear built by great guys."

**Steve Stevens**  
(Billy Idol, Atomic Playboys, soundtrack - Top Gun)



the manual skips around discussing the gain section in any detail, but I'm happy to report that due to the unit's excessive headroom, it's more than happy with hot signals, so the lack of input padding isn't missed.

#### PLAYS NICE WITH OTHERS

On the technical end, the DigiMax FS' ADAT bridging allowed me to finally turn my Digidesign 96 I/O (which comes standard with only eight ADAT optical inputs and outputs) into the 16-channel audio interface that it truly is. Using a pair of Toslink Lightpipe cables, I created bidirectional communication between the DigiMax FS and my 96 I/O using the 96 I/O's eight channels of ADAT optical I/O (the 96 I/O doesn't support the SMUX configuration) and set the DigiMax FS to be the master clock for the system at 44.1 kHz. This allowed me to feed eight additional channels to Pro Tools and simultaneously receive eight channels digitally, with the FS converting them through its DAC outputs. This allowed for more physical aux sends in my PT rig, as well as for luxurious sundry tasks, such as supplying stems to tape decks, submix components to headphone stations, outputs for surround monitoring and more, without having to tie up valuable Digidesign

interface channels. I could quickly configure this setup in Pro Tools' Hardware Setup and busing pages, and then enjoy a plethora of new routing options. And, remind me again, this convenience is all from a preamp?

I also tried slaving the DigiMax FS to my Apogee AD-16X, which does support SMUX, and once again, synchronization was brilliantly fast and robust. Thanks to PreSonus' JetPLL technology, the DigiMax FS ensures that any incoming digital source shares its jitter spec, regardless of which unit serves as the master clock. After subjective tests between the much pricier 96 I/O, Apogee's acclaimed Big Ben C777 chip within the AD-16X and the JetPLL technology, I feel confident that the DigiMax FS' clocking abilities compare favorably.

Having the ability to insert an external EQ or compressor after the preamp but before the A/D converter is such a huge boon to the DigiMax FS, it cannot be overstated. The converters sound on par with my Digidesign unit and, arguably, even my beloved Apogee. I honestly don't know what kind of magic PreSonus is pulling off here.

#### SOMETHING TO CHEW ON

Digimax FS is a multitalented powerhouse.

As an expansion device, it serves many cool functions, including the ability to add high-definition sample rates and extremely high-quality clocking to older interfaces or digital mixers, or to act as a stand-alone ADAT/SMUX-to-analog converter. Since so many interfaces feature only one or two mic inputs, it's also a great and inexpensive way of adding the immediacy of always-active microphones to a compact recording setup. I became greedy and wished for discrete AES/EBU or S/PDIF on each channel for some very esoteric purposes in my setup, but I'm assuming that customers who buy this product will be interested mainly in its ADAT provisions, and won't miss those features at all.

Bottom line: The DigiMax FS provides eight transparent sounding mic pre's, an impressive audio spec at any price range, first-rate construction, highly flexible routing options and rock-solid clocking. Purity in the project studio just got more affordable. Price: \$799.

PreSonus, 800/750-0323, [www.presonus.com](http://www.presonus.com).

*Jason Scott Alexander is a producer/mixer/remixer in Ottawa, Ontario.*



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# Blue Sky SAT 12, Sub 15 2.1 Monitoring System

## Beefy, Smooth and Highly Detailed Midfield Studio Speakers

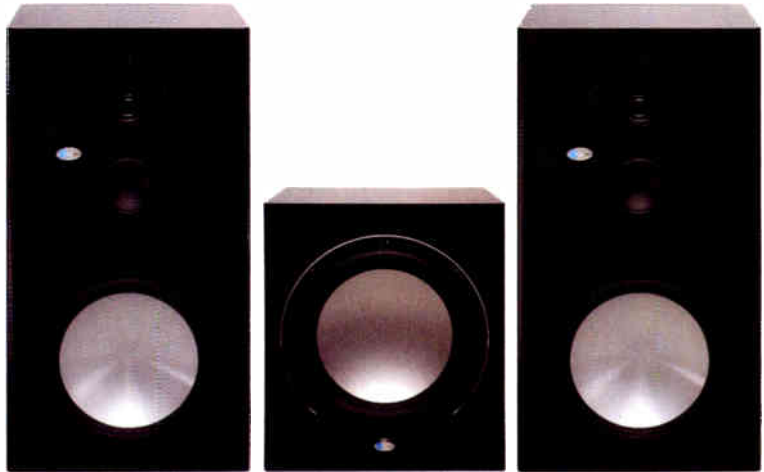
**Y**ou don't often associate the word "muscular" with audio systems, but it's an appropriate term for Blue Sky's latest: a 2,000-watt, 300-plus-pound 2.1 midfield monitor system. Each SAT 12 cabinet weighs in at a hefty 92 pounds—be careful moving these around! A thick, solid support surface is recommended for sonic accuracy and overall safety.

The tri-amped, three-way system's panel that houses the MF and HF drivers is rotatable for vertical or horizontal use, making it suitable for a variety of setups. Dual 200W amps (into 4-ohm loads) drive the LF and MF speakers, while a 100W amp (also into 4 ohms) drives the 1-inch HIF, with dual-concentric "bullet-style" diaphragm and integral wave guide. The 125-pound, 1,000W Sub 15 tested here (RMS into 4 ohms) handles the low end, with a 15-inch forward-firing driver in a sealed box enclosure. The 2.5-inch dual voice coil and massive 36-pound driver kicks out a total of 2.6-inch, peak-to-peak excursion.

### VARIETY ON TOP AND BELOW

On the rear of the main speakers, the smartly designed layout provides a variety of connection and system-alignment options. Separate full-range and crossover XLR inputs allow dual configuration of the system for easy A/B comparisons, with and without the subwoofer. There's also a master gain trim pot and seven dip switches, providing flexibility for proper setup and calibration, including a -10dB and 0dB dip setting and a switch to electronically facilitate the previously mentioned baffle adjustment. In addition, there is a four-position EQ dip switch for each driver: HF, MF and LF, respectively.

As for the sub, a variety of highly useful features allow precise tailoring of bass management to your room and power requirements. Six XLR jacks include right in, right out, left in, left out, and sub in/out—all for easy use of the sub in any situation, with or without the various Blue Sky systems. Below that is the real heart of the system, which includes a Universal vs. Blue Sky switchable crossover, left and right variable frequency cut-off controls for difficult rooms, and an overall sub amp gain control



pot. Three more toggle switches provide LF extension (for larger rooms), a phase switch and auto-power for idling/muting the amp when no signal is present for 15 minutes.

### I HEAR YOU!

Setup was a breeze: The well-written owner's manual has a highly useful calibration and subwoofer placement guide for proper setup and alignment, along with downloadable zipped test files available at the company's Website. As large as this system is, you'll need some space to create a comfortable working environment; my preference was 5 to 6 feet out from the center, with the suggested 60-percent arc working best for my space(s).

Working on a variety of recent projects with these as my alternate "reality-check" second system, I did not experience any ear fatigue or harshness. A live concert taped in December for a public radio broadcast featuring New Orleans blues singer/guitarist Corey Harris with pianist/singer Henry Butler was mixed on the complete 2.1 system, as well as some final mastering of a classical organ concert by Cherry Rodes—all from the Kimmel Center in Philadelphia. The sheer muscle and endless low end available from the Sub 15 made it all the more enjoyable. There were no wild or odd resonances with the system. It exhibited smooth low end with a minimal amount of tweaking in each of the three rooms where I used the system.

I use subwoofers in all aspects of my work and found the A/B input options quite

useful. To have the option to work quickly with and without the sub (without changing or patching cables) was very handy. The SAT 12s are quite useful without the sub, but as a stickler for low-end info, it was important to be able to toggle between the two for that final low-end decision-making.

### NOTHIN' BUT BLUE SKYS

Alone or as part of the complete 2.1 system, these units are serious sonic tools. My first impressions were of effortless power and superb sonic imaging with detailed mids and silky highs. Everything I auditioned sounded as it should have—jazz, rock, classical, blues and vocal—with no surprises or anomalies. Not surprisingly, these speakers immediately reveal the difference between MP3 and WAV file versions of the same material. (Note: The first thing to go is a solid center image; the SAT 12s create a solid, believable center image.)

If you're looking to hear something new—and clean, and powerful—in the world of 2.1 powered systems, the Blue Sky SAT 12s and Sub 15 are an absolute must for your 2007 shopping list. For power, detail and long periods of fatigue-free listening, these units are just the ticket.

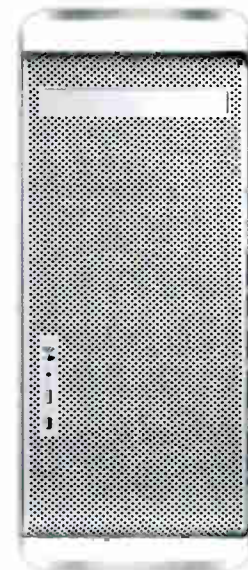
Prices \$7,500 for a 2.1 system (\$2,500 for each SAT 12; \$2,500 for the Sub 15).

Blue Sky, 516/249-1399, [www.ablue.com](http://www.ablue.com). ■


*Joe Hannigan runs Weston Sound & Video in Philadelphia.*

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# SPL Passeq Passive Equalizer

## Taking the EQ Notion to Higher Levels

Passive EQs are generally known for their natural and transparent sound. When SPL's design engineers set out to create the Passeq, one of their goals was to take these inherent qualities to the limit. Each filter in this 2-channel unit was given its own coil, and every coil was placed on its own core—the latter is a first in passive equalizer design—to improve phase performance and minimize THD. Proprietary, discrete 120-volt op amps were also used to provide makeup gain boasting a 116dB signal-to-noise ratio, gargantuan 150dB dynamic range, lightning-fast 200V/ms slew rate and a 100kHz bandwidth.

SPL then added high-performance Lundahl I/O transformers and gave the box a whopping 72 interleaved frequency choices per channel. The result is a very unique and compelling equalizer for tracking, mixing and mastering applications.

### IT LOOKS COOL, TOO

The 4U, rackmountable Passeq sports no less than 28 rotary controls on its front panel. Each channel has six switched frequency selectors, which respectively serve three boost and three cut bands equally delegated to cover roughly high, middle and low-frequency ranges (with one boost and one cut band for each range).

Each of the six bands has either a gain boost or gain cut control, and all are detented except those serving the midrange bands. Maximum gain boost is between +10 and +17 dB, and maximum cut is -11.5 to -22 dB, depending on the band chosen. The only Q controls are those serving each channel's high-frequency boost filter, and these were also not detented on my review unit. However, SPL told me that all controls will be detented by the time you read this. The Passeq's high-frequency boost and midrange boost and cut filters are all bell configuration. Passeq's high-frequency cut and low-frequency cut and boost filters are all wideband bell filters that approximate shelving response.

The granddaddy of the Passeq's controls is the 41-position ALPS output attenuator for each channel. Illuminated channel-bypass switches sit below the power-status indicator on the front panel. The Passeq's rear panel has balanced XLR I/O connections, power



and ground-lift switches, an IEC receptacle for the detachable AC cord and a 110/220V voltage selector.

### PLEASE, USE THAT TONE WITH ME

I used the Passeq both on individual tracks and across my mixer's stereo bus at mixdown. In every application, the Passeq's filters sounded smooth, focused and pristine. In subtle ways, tracks processed with the Passeq sounded as if they had been recorded using better mic preamps—highs sounded sweeter, mids smoother and lows rounder.

I had to use more EQ than usual to hear the Passeq working. Conversely, I could get away with using a lot more boost or cut than I normally would have applied without a hint of smearing or edginess. With almost 6 dB of boost at 15 kHz on a stereo acoustic guitar track, the high end sounded eminently sweet. Transients were preserved on kick, snare and tom tracks, even with considerable equalization applied. Electric bass sounded phenomenal with its bottom end boosted—warm and round, but with no hint of blurriness. I also got superb results equalizing lead vocals and electric guitar tracks.

Boosting 80 Hz and 13 kHz on a full mix lent a more rounded and detailed sound with added nuance. The unit did not distort, even when delivering +26.5dBu mix bus levels to the inputs. Maximum input and output levels are stated to be +28 dBu and +32 dBu, respectively.

### TRANSPARENTLY YOURS

Monochrome knobs made my review unit's control settings difficult to discern, but SPL maintains this has since been rectified by substituting controls with black indicator lines. However, most of the Passeq's shortcomings

are inherent limitations of its neo-classic passive design. The lack of individual bypasses for each band makes instantaneous before-and-after A/B comparisons impractical. Filter Qs were generally too broad for surgical tracking and mixing apps. And the omission of high- and lowpass filters is a slight hindrance to mastering applications and precludes fashioning a steep bandpass filter (by combining an HPF and LPF) on individual tracks. (The shelving filters have a mild 6dB/octave slope.) However, the Passeq's *raison d'être* is its gorgeous sound.

That said, I would have preferred having higher frequencies offered in lieu of the 10, 15 and 18Hz choices included in the low-frequency boost band. Similarly, I can't remember the last time I effected a high-shelving cut at 580, 780, 1,200 or 1,800 Hz, which are the four lowest frequencies offered for the highest-cut band; I'd prefer a more bountiful choice of even higher frequencies. SPL's design intent here was that a midrange cut can be made using high shelving at a low corner frequency, countered by a shelving boost at a higher frequency to restore highs.

Such an approach highlights the idiosyncratic nature of working with passive equalizers. But if you're willing to change your work methods and can afford the \$5,200 list price, the Passeq's stellar sound quality will absolutely delight you. If you're looking for an ultrapristine 2-channel equalizer with a sweet, smooth, round sound, the Passeq might be your box.

SPL, 951/272-3465, [www.spl-usa.com](http://www.spl-usa.com). ■

Mix contributing editor Michael Cooper is the owner of Michael Cooper Recording in beautiful Sisters, Ore. Visit him at [www.myspace.com/michaelcooperrecording](http://www.myspace.com/michaelcooperrecording).



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# Trinnov SRP Surround Recording Platform

## Recording and DSP-Based Manipulation of Multichannel Sound

Ever try to explain a completely new idea? Like a car that's also a tanning booth and a washing machine? Although not as crazy, that's my dilemma in explaining the Trinnov SRP. It's a surround recording platform (SRP) that features an eight-mic array and a CPU with I/O that inputs eight channels, outputs 5.0 and has a touchscreen that lets users manipulate the apparent room "size" after or during the recording. The CPU and milled-aluminum mic holder are supplied, while the user must provide the mics (eight Schoeps, DPA or other compatible omni mics), cables and a set of eight mic preamps. For this review, Trinnov supplied eight specially designed Audio-Technica omni mics and an RME OctoMic 8-channel mic preamp with optical output.

### INSIDE OUT

The easy part to describe is the mic setup, which comprises a horseshoe-shaped holder with numbered holes and a small cam system to fasten each mic to the bar. Cables must then be routed in the proper numbered order to your mic preamps and then to the CPU or recorder. The rear of the CPU has eight balanced analog I/Os on TRS connectors, eight channels of AES/EBU on a 9-pin S/PDIF connector and three ADAT optical I/Os. (Optional MADI I/O is also available.) A word clock I/O keeps everything locked to the session sample rate, should you record at 44.1 or 48 kHz, or all rates can be clocked via the ADAT cable. If you're using the optical inputs for a 96k session, then mics 1 to 4 are input on a single Lightpipe (ADAT 1) as are mics 5 to 8 (ADAT 2). The 5.0 output can be sent on a Lightpipe or through the analog or digital outs.

On mixdown, the box has a number of slick-looking modes to monitor input levels, output levels, time delay between tracks and spatial monitoring in the 5.0 field. The part of the GUI that most interested me was a green sphere that changes shape as you change the audio character with four presets: Omni represents the full room, Oblate lowers the ceiling, Frontal 1 shrinks the back of the room forward and narrows the focus of the front, and Frontal 2 does that even more so.

### IN MY VIRTUAL ROOM

Using the SRP, you can route your mics to your CPU and then out to a 5.0 recorder, making your "room" decisions before you record. Or you can record your 8-channel feeds to a recorder and manipulate them later. I went with the latter for this review in both live and overdub situations. Because of latency associated with the process, all overdubs were done with cues directly from the mic feeds, pre-CPU.

I first set up the SRP mic array in the center of a large room with a 20-foot ceiling and then did two separate sessions with three different passes of eight, choosing to place the player in a different spot in the room for each overdub. Even though the company does not usually recommend this application, I thought it a good test to see how the rig responded in this situation.

Later, I set up the Trinnov tracks for mixdown by sending all of my separate passes out of a single 8-channel output bus and into the Trinnov CPU via the Lightpipe output on my 96 I/O. After much experimentation, I found the "overdub" application to be unusable. Although the separation of parts was very good, the overall sound was phase-y and unsatisfactory.

### LIVE RECORDINGS

On another session, the rig was set up in a church where a 20-piece choir was recorded directly to an Alesis HD24 via the eight mics and later ported to Pro Tools for mixdown. This was a live recording done in one pass, resulting in an 8-channel track ported to the SRP for mixdown. I had much better results in this situation. The surround soundfield was excellent, with a clear separation between the front, sides and back of the room. In Omni mode, it sounded very much like you were in the room. I played with the various room presets and found them all to attenuate the rear and focus the front as promised, although the Oblate setting was still too phase-y for my tastes.

I also set up the array in the middle of the studio and recorded a Hammond B3 and



Leslie that was placed at one end against the wall. This one pass was recorded directly into Pro Tools on an 8-channel track and can be heard on the *Mix* Website in "Online Extras" as I change the room settings every 30 seconds. This recording confirmed my conclusions about the choir recording. I think this box sounds better when used in a more traditional setup—i.e., a live recording.

### DOES SHE GO?

The Trinnov SRP does a standup job of taking eight omni mics and representing an acoustic space. In comparison tests with a stationary rig of five cardioid mics set in an ITU array and a dedicated mic for LFE, the Trinnov was richer and more detailed. However, I'm disappointed that there is no allowance for an LFE mic in the array. Although an LFE feed would be supplied by the bass manager, it would be nice to have the ability to have a dedicated LFE mic or mics in the array.

As for the DSP box, it does as advertised; it manipulates the room, giving the user the ability to change the acoustics of the environment after the fact. My favorite in all recordings was the Omni setting where the room is unaltered. I found the Oblate setting to be phase-y and unusable. The Frontal 1 and Frontal 2 presets did shrink the room as the 3-D drawing of a sphere indicated, but I found its use to be questionable. In all cases, I liked the space as it was.

Despite fine execution and great sound, the SRP isn't useful enough to me to justify its \$15k price tag. However, I'm not the only cowboy in the rodeo—your applications may vary and the Trinnov SRP may fill the bill.

Trinnov Audio, 714/840-1065, [www.trinnov.com](http://www.trinnov.com). ■



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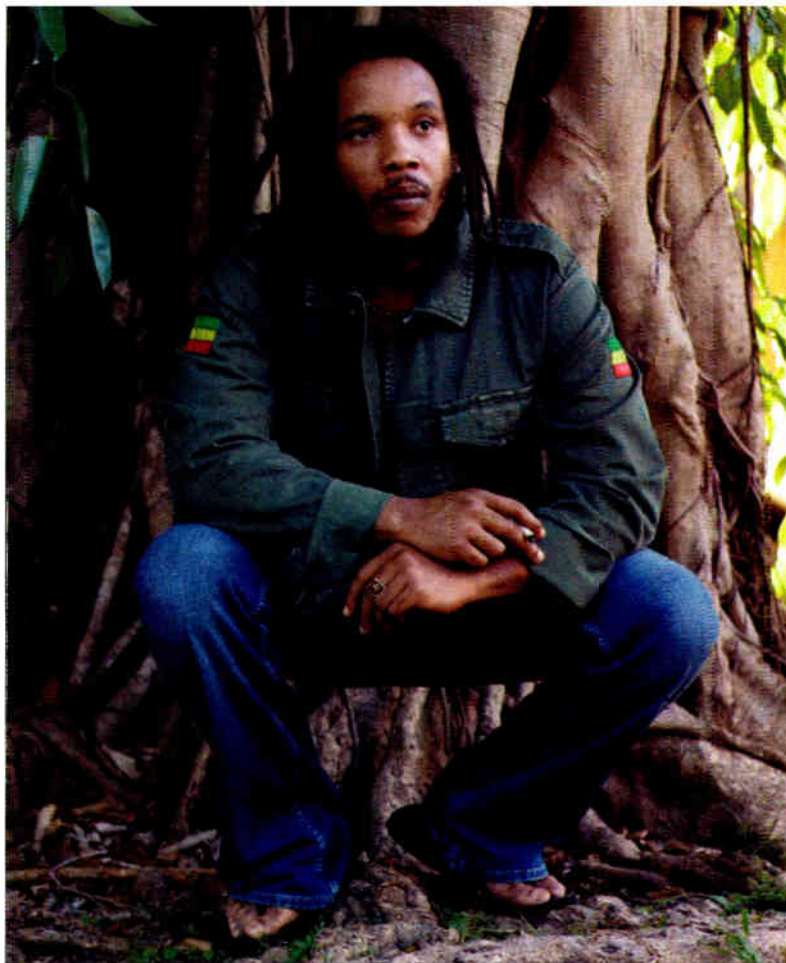
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## STEPHEN MARLEY

ALL IN THE FAMILY

By Blair Jackson

Stephen Marley has been around music his entire life. As the third child of Bob and Rita Marley, born in 1972 (David/"Ziggy" and Cedella are older; there are eight additional half-brothers and -sisters, several of them musical, including Damian/"Junior Gong," Julian and Ky-Mani), he only got to spend time with his famous father for nine years, but he has been a part of the "family business" practically since he could walk. His first recording came at the ripe old age of 6. If his name is not as well-known as Ziggy Marley's and Damian Marley's, it's because Stephen Marley mostly toiled in the background, singing and playing on and occasionally producing his brothers' and sisters' albums—two of them, Damian Marley's *Halfway Tree* and *Welcome to Jamrock* earned Grammys—and for many years he was a member of Ziggy Marley's group, the Melody Makers. He has also worked a lot outside of the family, doing production work with the likes of The Fugees, Eve, Erykah Badu, Buju Banton and Krayzie Bone (of Bone Thugs-N-Harmony).

So it's not too surprising that Stephen Marley's first bona fide solo album, the just-released *Mind Control*, offers up a compelling mixture of traditional reggae

tracks and several modern hip hop numbers, as well as lots of other influences, from flamenco to soul. "I like all different music," he says in his thick Jamaican accent by phone from his Miami studio, Lion's Den. "For me, was never only reggae. I love hip hop from the first time I hear it. Music come from the soul, mon—it's a soul ting. People ask me if I do hip hop to be 'modern.' No, it doesn't matter where you are physically in time; it's where your soul is."

I ask him how he learned his way around the studio. "I was around the music from my father's time," he says. "I was in the studio with him a lot, and as a kid growin' up, I had relationships with the engineers. Even from then I would go in and power up the board and I learned how to use the group buttons and solo buttons and such forth. But it was about 1990, when there was no engineer around and I wanted to work, I had to step up to the plate and really learn my way around the studio. It come natural to me; I always loved it."

Stepping into the producer's chair seemed like a logical choice for Marley because "I work well wit' people. I play a lot of instruments and I listen to a lot of different kinds of music, so I was prepared for anything. I had my brothers to learn off of. We always talk a lot and we tried different ways of working and doing things. You learn through the years how to get

—CONTINUED ON PAGE 120



# DANIEL HO

## HAWAIIAN MUSIC MOVES INTO A NEW HOME

By Blair Jackson

Though Daniel Ho has become very well-known in traditional Hawaiian music circles thanks to his co-production work and playing on last year's Grammy-winning CD *Masters of Hawaiian Slack Key Guitar, Vol. 1* and this year's Grammy-winning *Legends of Hawaiian Slack Key Guitar: Live From Maui*, he has had a long and interesting career working in many different musical genres. The multi-instrumentalist (guitars, keyboards, drums, programming, etc.) is a classically trained pianist; he fronted a contemporary jazz ensemble; he's an accomplished singer/songwriter whose tunes often fall outside of strictly Hawaiian styles; and he's a successful record company owner. Daniel Ho Creations has put out dozens of CDs of mostly Hawaiian-themed music, from his wonderful collaborations with George Kahumoku Jr. of Hawaiian hymns to his series on *Classic Hawaiian Hulas, Ukuleles in Paradise* (Ho with Herb Ohta Jr.) and much more.

When I suggest that he's a mini-record mogul, Ho laughs and quickly disabuses me of the notion. "The 'record company' is just part of my house [in the Westwood section of Los Angeles]," he says. "My studio is in the master bedroom. Our 'office' is in a back room, and the 'warehouse' is shelves in my garage. But keeping everything small and manageable is how we've been able to put out as many CDs as we have and not go completely broke doing it."

Ho was born and raised on the Hawaiian island of Oahu and as a youth studied piano, organ, ukulele, classical guitar, electric guitar, bass, drums and voice. He went to the mainland (L.A.) to study at the Grove School of Music and then stayed in the area and formed his first band, Kilauea, which, despite its Hawaiian name, was actually a very commercial-sounding, contemporary instrumental jazz band. During the course of some seven years together (1990 to 1997), Kilauea put out six very successful albums, with Ho acting as leader, keyboardist and producer. Two of their records hit the Top 10 on *Billboard's* jazz charts and the group was widely embraced by smooth-jazz radio stations.

But after a point, Ho became disillusioned



PHOTO: UYOA IWASHIRO

by the increasingly strict requirements of the smooth-jazz format and longed to start his own label and explore other musical styles. "I wanted a lot more freedom, so in 1997 or '98, I put my own money down and I started a vanity press—Daniel Ho Creations—and I managed to secure national distribution because of the sales I'd had with Kilauea.

"I got back to my roots in Hawaiian music and went back to working almost exclusively with acoustic instruments. I couldn't wait to get away from synthesizers and programmed music," he says with a laugh. "So my label is pretty much all acoustic music and we deal with soloists, duos and trios, and that's really about it. It's easy to support a record as a soloist. That's a reason I went from keyboards to guitar. I can travel all over: You get a guitar and jump on the plane and you don't have to worry about whether the rinky-dink keyboard on the other end has 88 keys or 61, or what it sounds like."

The first artist Ho worked with on his new label was slack-key master George Kahumoku Jr. on the first *Hymns of Hawaii* album Ho recalls, "He'd been wanting to record an album of Christian hymns sung in Hawaiian for 10 years, but no label wanted to do that, so I gave him that chance. I feel that when an artist does music that's true to them, that's

more important than something that is supposedly commercially viable. But because we work at such a grassroots level, we can afford to take those chances and not have to earn tons of money on a CD to break even."

Through the years, out of necessity, Ho has learned to be fairly self-sufficient in the studio, handling rudimentary engineering tasks. "I've learned on the job all along," he comments. "I learned the production skill part of it producing for Kilauea. We cut our teeth on 2-inch tape in various studios around town [including Ocean Way, Mad Hatter and others]. In the mid-'90s, when ADATs came out, I started doing pre-production at home, and that's how I picked up tracking. At that time, I had a Mac SE [and I used] Sound Designer II, and could only do stereo files, and it was really quite tedious to work on. I have a friend from Hawaii I've known since we were kids named David Ho [no relation], who does movie post-production now, but he builds studios and he's been an audio engineer. He told me exactly what to buy for my studio and how to use it. Then, after learning how to mike things and do tracking, I learned how to manage the sound and add EQ, and that took years and years. Right now, I have the Mac Pro

—CONTINUED ON PAGE 121

## CHUBBY CHECKER'S "THE TWIST"

By Blair Jackson

As a certified dinosaur, I wish I could claim that my first hit of rock 'n' roll was seeing Elvis on *The Ed Sullivan Show* in 1956. But I was only 3 then (and living in Italy, no less), so my first dose of digging rock actually came three years later when, through my older brother, I discovered the Philadelphia "teen idol" sound of Bobby Rydell, followed in close succession by Chubby Checker, The Dovells, Dee Dee Sharp and various non-Philly hit-makers, from Bobby Darin to The Shirelles. Okay, in retrospect it doesn't seem like the hippest music on the planet, but it's what was on AM radio and what my friends listened to; I make no apologies. Dark secret Number 2: At the age of 8, I used to comb my hair into a Rydell pompadour. (Now I need to call his toupee-maker!) Anyway, the point of this meandering autobiography is to stress that covering Checker in "Classic Tracks" is a big deal to me—this was some of the music I loved most as a youth.

Of course, anyone who knows their rock history is aware that "The Twist" cannot begin at Cameo-Parkway's Philly studio, because the Chubby Checker 1960 hit was actually a cover tune. The song was written by and originally recorded by Hank Ballard in 1959 as the B-side to a rather drippy ballad called "Teardrops on Your Letter." Ballard got his start as a singer in his native Detroit during the early '50s. His first widespread exposure came as a member of a group called The Royals, who changed their name to The Midnighters when Ballard became lead singer, and scored a succession of R&B hits beginning in 1954 with the suggestive "Work With Me Annie," "Sexy Ways," "Annie Had a Baby" and "It's Love Baby (24 Hours a Day)," all for the Federal label. A number of The Midnighters' tunes were banned by radio for being too risqué, but, of course, that was also part of the group's appeal and what made them a popular attraction on the club circuit in the mid- to late '50s.

By the time "Teardrops" came out, the group had become known as Hank Ballard & The Midnighters and were recording for King Records. "Teardrops" was a sizable hit (making it to Number 4 on the R&B charts), and the flip-side, "The Twist," also generated some interest; it landed at Number 16 R&B. Ballard later recounted that he was inspired to write "The Twist" by watching some of The Midnighters' dance motions as they sang—sometimes it seemed like they were stamping out a cigarette as they twisted their bodies and sang their backups. Others have noted that Ballard purloined the melody of his own earlier song, "Is Your Love for Real," when he wrote "The Twist"; certainly, he wasn't the first (or last) to do that.

Now, let's move on to Philadelphia. The City of Brotherly Love became a major player in the burgeoning world of rock 'n' roll in the late '50s and early '60s, mostly because of one man: Dick Clark. Clark had moved to the city in 1952 to be a DJ at WFIL, which also had a TV outlet that aired a daily music and dance program called *Bob Horn's Bandstand*. Clark occasionally substituted for Horn on the show, and by 1956 had



taken over hosting duties. Already regionally popular, in 1957 the show went national, airing weekday afternoons on ABC as *American Bandstand*. It caused an immediate sensation, becoming the place for teenagers across America to see singers lip-synch their latest singles and watch their peers (Philly teens all) dance to other pop records.

As a major city but only a second-tier market, Philadelphia had relatively few recording studios—New York was unquestionably the center of the music business at the time. Still, there were a few small rooms and local record labels located there. Cameo Records was started at 1405 Locust St. in 1956 by bandleader/producer Bernie Lowe and lyricist Kal Mann. The label had its first smash a year later with Charlie Grace's Number One single "Butterfly" (written by Mann and Lowe). Shortly after opening, Lowe hired Dave Appell to work with acts, lead the house band and run the label's small studio. Appell was already well-established in the music business, having worked as an arranger for Jimmie Lunceford, Benny Carter, Earl Hines and others, and once at Cameo he even had a few instrumental hits of his own (as Dave Appell & The Applejacks), including "The Mexican Hat Twist" and "Rocka-Conga." He also became Mann's main songwriting partner, and together they churned out a multitude of big hits for Cameo and (beginning in 1958) Parkway acts.

Reached by phone, the 84-year-old Appell recalls, "I had no background of working in the studio at all; I learned the hard way—on the job. The first date I did, I had the fellow who built the board come in and he showed me a few things. He says, 'See that needle? Get that up around the red area and you won't have to worry about anything else.' I was recording three saxes and a rhythm section—seven guys. 'Great, that's your first lesson!' Cameo's tiny room "didn't have anything high-tech," Appell relates. "It was a small mono board and we went mono to mono [bouncing]—we had two mono machines. And because the studio was so small, for the vocals we went to another Philly studio called Reco-Art, on 12th Street, which was owned by a guy named Emil Korsen. Sound-wise, it was one of the better ones around; it even had an echo chamber. Later, Joe Tarsia, who worked with us

at Cameo, bought the studio from Emil and that's where he started Sigma Sound."

Between them, Appell, Lowe and Mann knew all the best musicians in Philadelphia (some of them were already playing part-time in the Applejacks), so assembling a house band for the Cameo and Parkway labels was no sweat—indeed, most of the hits that came out of the label featured the same musicians, with occasional variations. The big, honking tenor sax sound was usually courtesy of either Buddy Savitt (who played with Woody Herman and others) and/or George Young (who achieved greater fame *after* his Cameo period); Dan Dailey played bari sax; Appell and/or Joe Renzetti played guitar; Joe Macho was often the bassist; keyboards (mostly piano during this era) were handled by Roy Stragis or Fred Bender; and on drums was either Bobby Gregg or Ellis Tollin, who played with the great Clifford Brown and is also credited with co-designing Rogers Drums' "Dyna-Sonic" snare with Buddy Rich and a couple of others.

Tarsia, who came onboard as a tech assistant to Appell in mid-1961 after having worked in electronics for Philco and doing repair work at various Philly studios, recalls that the musicians were a tight-knit group

"who could play anything and pretty much nail it immediately. They were [sight] readers and professional musicians and most of this stuff was easy for them—they'd all played jazz! The typical date was you booked three hours, you went in with four charts, and if you were lucky and you had 20 minutes left, you try to get the fourth tune. It was all live, of course; there was no fixing it in the mix. You might do five or six takes of a song, but if you're doing another take, it's probably for feel and not because someone hit the wrong note. Today, a three-hour session gets you a bass drum sound! But in those days, everyone sat down and you played—boom! The downbeat was when the clock struck three, and at six the guys were putting their instruments back in their cases."

As for miking, "Typically, we'd have one on the piano, two on the drums [bass and overhead], one on guitars, one for the saxes," Tarsia says. "We had one good Telefunken mic and the rest were probably Electro-Voices and Shures. A mic I used from day one on snare drums was the E-V 633, which was incredibly durable—you could use it as a hammer!" Appell also notes that in the early days at Cameo-Parkway they had a few RCA mics.

Background setting established, we can now introduce Ernest Evans. Born in South Carolina but raised in south Philadelphia, Evans was working as a chicken plucker at a store called Fresh Farm Poultry after school during his teenage years and would occasionally entertain customers at the store by telling jokes and doing imitations of popular singers of the day, including Fats Domino, Elvis Presley and The Coasters. According to Appell, "Chubby" Evans would also hang out at the Cameo-Parkway studio "and we were always kicking him out. A nice kid, but..." Evans' break came when he got to record some of his impersonations for Dick Clark for an audio Christmas card he sent out. It was Clark's wife, Barbara, who gave Evans the second half of his stage name, a humorous knock-off of Fats Domino, of course. The novelty idea was then picked up by Parkway Records in 1959 and came out as Checker's first single, "The Class," which made it as high as Number 38 on national charts.

The 18-year-old Evans/Checker was an appealing and decidedly non-threatening African-American lad, perfect for *American Bandstand* it turned out. Around the time "The Class" was hitting the airwaves, Ballard's "Teardrops..." backed with "The

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"Twist" was doing well on the R&B charts. The story goes that because of Ballard's reputation as a singer of suggestive songs, *American Bandstand* was reluctant to book him. It was Clark's idea to then re-record "The Twist" and have one of the acts on his own Swan Records labels—such as Danny & The Juniors—sing it. However, once "The Class" hit, Checker was tagged to sing on the already completed instrumental track, and he turned in an uncanny imitation of Ballard—so much so that when Ballard first heard it, he thought it was his own, and he later described Checker's version as "a clone." Buddy Savitt played the sax line, Ellis Tollin was the drummer—"he came up with that cymbal hit on the 2 and 4," Appell says admiringly.

It took awhile for the song to catch on, but with plenty of AM radio and *American Bandstand* exposure, the record eventually soared to Number One in September 1960, knocking Presley's lugubrious "It's Now or Never" out of the top spot, launching Checker's career into the stratosphere and igniting a dance craze that swept the world. The following year, Appell and Mann penned a wildly successful follow-up, "Let's Twist Again," which made it to Number 8

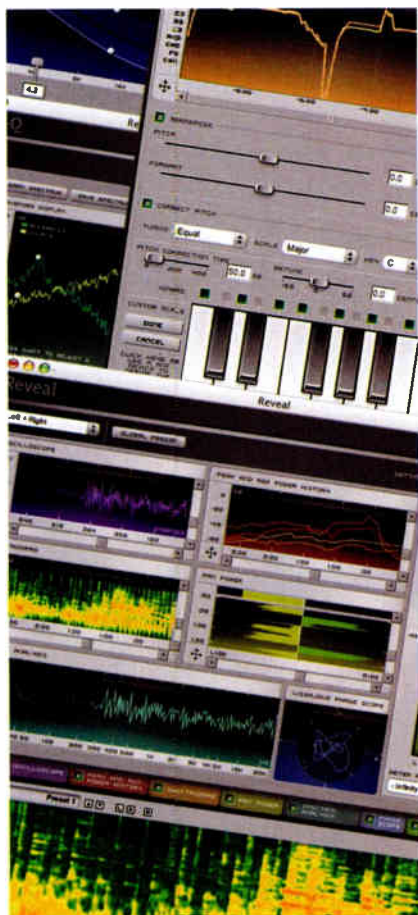
(Young played the sax solo on that one), and in the fall of 1961, Checker's original of "The Twist" became the only song of the rock era to hit Number One after more than a year off the charts.

From 1960 through '63, Checker cut what seemed like a million other dance songs, including "Pony Time" (Number One in '61), "The Fly," "Limbo Rock," "Dance the Mess Around," "Slow Twistin'" and that truly immortal number, "The Hucklebuck"—"You wiggle like a snake, you waddle like a duck/ That's what you do when you do The Hucklebuck!" Other Cameo-Parkway artists also cashed in on dance fads, too: The Dovells introduced "Bristol Stomp" (one of the all-time great songs of the era) and "Do the New Continental"; Bobby Rydell tried to get us to do "The Fish" and "The Cha-Cha-Cha"; and Orions sang about "The Wah-Watusi."

The success of these and other hits led to Cameo-Parkway building new studios in late 1961, with Tarsia helping build the home-made console out of Altec modules used for P.A. systems and purchasing a number of new, better mics. The glory days of the labels were to be relatively short-lived, however. In February 1964, The Beatles conquered America and the whole music world went

*kablooey!* Self-contained bands that wrote their own songs came into vogue, the clean-cut look and sound of teen idols suddenly seemed like it belonged to another time, and within a couple of years, the way albums were recorded also changed dramatically. In some respects, the way Cameo-Parkway operated was sort of the last gasp of the '50s way of doing things.

Appell left Cameo in 1964 and, believe it or not, is still working. Among his later successes are Tony Orlando & Dawn's big records from the '70s. Tarsia went on to become a primary architect of the Philadelphia sound of the '70s (and beyond), working out of his own Sigma Studios with The O'Jays, The Spinners, The Stylistics and countless others—his is truly one of the great recording careers. Checker has cashed in *big time* on his early successes. Though essentially an "oldies" act from The Beatles era on, he's made occasional forays onto the charts with this or that song (including a Top 20 rap version of "The Twist" with the Fat Boys in 1988) and manages to tour successfully year after year. In the late '80s, he even headlined the Super Bowl half-time show. Not bad for a guy some consider a "one-hit wonder." ■



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## STEPHEN MARLEY

FROM PAGE 114

the best out of any person. You get to know the limits, and you learn to work your way around and through different problems that come up.”

Chief among his studio mentors was the legendary engineer Errol Brown, who has been among the top Jamaican studio pros since breaking into the business in the late '60s. Through the years, Brown has recorded dozens of top reggae artists, including Bob Marley (*Survival* and *Uprising*), Burning

Spear, Jimmy Cliff, Judy Mowatt, Gregory Isaacs, Israel Vibration and all the recording Marley children. “I’ve known him almost as long as anybody,” Marley notes. “He taught me a lot—he knows the equipment and he knows how to work wit’ musicians.”

On *Mind Control*, Brown mixed some of the more roots-oriented tunes such as “Inna Di Red” and “Chase Dem,” as well as Marley’s fresh reggae take on the old Ray Charles chestnut “Lonely Avenue.” Marley called on other mixers, too, including James “Bonzai” Caruso, who worked on Damian Marley’s last two albums (as well as the controversial 1999

hip hop/remix album of Bob Marley material, *Chant Down Babylon*, for which Stephen Marley acted as executive producer) and hip hop savvy Commissioner Gordon, whose credits include Mary J. Blige, LL Cool J, Will Smith and many others, plus tracks on Damian Marley’s *Halfway Tree*. The album was recorded over a long period at Lion’s Den and Marley Music Studios (formerly known as Tuff Gong Studios) in Kingston, Jamaica. It was mixed at Lion’s Den and Hit Factory/Criteria in Miami. Stephen Marley’s studio is centered around an SSL G Series console and Pro Tools. Engineers on the project included Caruso, Brown, Mark Lee, Greg Morris, Jason Chantrelle, Alrick Thompson and Dave Heuer (with Morris and Lee working on most tracks).

Marley says that “the vibe was right” to make his solo venture now and that he has been amassing songs for it for a number of years. “I wasn’t looking at it as a collection of songs at the beginning,” he says. “I had a song here, a song there, so it was more like each individual song had its own life and its own t’ing. They were written different ways. Sometimes I make a demo with my brothers or whoever, sometimes we just go in and start recording.”

Friends and family make guest appearances throughout the album. The reggae/hip hop “Iron Bars,” which is an angry song about being thrown into jail briefly for weed, includes brother Julian, sister Cedella and rap interludes from Mr. Cheeks and Spragga Benz; “The Traffic Jam,” which has already been a hit in both England and Jamaica, features Damian prominently; Mos Def is on the slow-burnin’ hip hop number “Hey Baby”; Ben Harper lays down a searing slide guitar line on the moody (but still rhythmic) ballad “Inna Di Red”; and Maya Azucena adds a nice female counterpoint to flamenco-influenced “Let Her Dance” while Illestr8 lays down a fast rap. There’s lots of variety in both arrangement styles and sonic textures, which include plenty of interesting electronic vocal treatments, turntable scratches, the occasional string and horn section, and even funky clavinet on “Lonely Avenue.” On different tunes, Marley handles guitars, keyboards, percussion and programming; he’s all over the disc. As for the “children’s chorus” on “Inna Di Red,” it’s three more Marleys: Shacia, Mystic and Summer.

“The hardest part of the whole album,” Marley says, “was knowing when a song was done, ‘cause we like to try ideas but sometime it’s too much, you know? But at some point you gotta say, ‘Dat’s it; we done!’ Because you can *always* put on another part—you wake up in the night with a new guitar part in your head or something. But

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you have to resist that at a certain point."

Marley will tour on his own in support of the album, but even this so-called "solo" jaunt will likely have family written all over it. It's just the way they work: "I know that it was meant for us to be a musical family because it works effortlessly," he concludes. "We don't quarrel a lot. We're very spiritual together and we cherish each other. It's a very nurturing family and we support each other to the fullest. We don't take the name Marley lightly, mon." ■

## DANIEL HO

FROM PAGE 115

with the 2.66GHz Woodcrest processor, but I'm in the process of revamping my setup. I just bought 20-inch monitors and a couple of terabytes of memory. I'm looking at a few things: I'm excited about the [new] Mackie 1200F Onyx preamps."

Ho says his house is great for recording acoustic music, with its oak hardwood floors and a long hallway that has a wonderfully natural reverberant sound. He occasionally augments the built-in acoustics with a

checkerboard of Fiberglas panels on the walls. "When I record guitars and vocals, I just throw a blanket over the drum set so nothing is ringing, and the wood in the room makes the sound pretty nice," Ho says. "But for those, I'm close-miking."

The two slack-key guitar compilation CDs that earned Grammy attention were hardly ideal from a recording perspective. Every Wednesday night for the past few years, the Ritz-Carlton hotel in Kapalua, Maui, has hosted a slack-key show run by George Kahumoku, and featuring some of the finest players in the Islands. Paul Konwiser, who helps put on the shows through his Hawaiian Slack Key Guitar Productions, approached Ho about putting together a DVD based on the Ritz-Carlton shows, "but I told him I have very little experience with visuals and I know it's very expensive to do a multicamera shoot," Ho says.

But he mentioned that he had CDs of every single show, so I suggested putting out CDs instead. He gave me hundreds of CDs and had me go through them to pick out the best tracks. These were very simple recordings—they were archiving direct to a CD writer—and not mixed in any way. On some there was no separation between vocals

and guitar, so sometimes the guitar would be super-soft and the vocal was too loud, or vice versa. Usually, I started with the limiter if the voice was too loud, which was often the case. Then I used EQ—pretty severe cuts on certain frequencies. The only outboard processor I use that I swear by is an old Lexicon PCM 90. That's how I re-create the room."

Because of the technical limitations of the recordings, Ho and co-producers Konwiser and Kahumoku had to be quite selective in choosing tracks for the anthologies, but in the end they succeeded brilliantly: Both discs serve up a wonderful, soothing mix of some of Hawaii's finest players, including Ledward Kaapana, Dennis Kamakahi, Ozzie Kotani, Cyril and Martin Pahinui (sons of the late slack-key titan Gabby Pahinui) and, of course, Ho and Kahumoku.

Ho goes over to Hawaii every other month, either on business, to play music or see family (or all three), and if anything, his record label seems to be picking up steam now that it has gained wider recognition. "It's great being able to work with so many great musicians and give them the opportunity to make the music they want to make," Ho says, "and to be part of this great tradition and to hopefully take it into the future." ■

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## ON SALE NOW!

## L.A. GRAPEVINE

by Bud Scoppa

I'm sitting behind the just-installed SSL 9080 J console in the Record Plant's ([www.recordplant.com](http://www.recordplant.com)) Studio One (also known as SSL-1) rapping it down with Rose Mann-Cherney, the first lady of the L.A. recording studio community, and head tech engineer Jason Carson. On the front wall, the waves break in a video seascape of the Southern California coastline on four synched-up 37-inch Panasonic plasma screens, adding to the serene vibe of the womblike, completely redesigned room.

art technology and personal service," says Mann-Cherney, a 30-year veteran Record Plant president, manager and partner. The combination seems to be working—among the A-listers who have produced and mixed at the Record Plant in recent months are will.i.am (Fergie, Talib Kweli, the *Freedom Writers* score), The Neptunes (Gwen Stefani, Gavin Rossdale), Kanye West (Common), Matthew Wilder (Lucy Walsh, Joe Walsh's daughter), Lil Jon (Ciara), Julio "Doki" Reyes (Jennifer Lopez) and Rudy Perez (Beyoncé).

"The idea of turning this room into a living space and a recording studio was behind the whole thing," says Carson, a 2001 Berklee graduate who started as a runner and got his present gig two years ago. "We removed a bunch of diffusers from the back wall and some Dolby racks that hadn't been used in years—that sort of thing. The construction took a month, and it took us six days from the time the console showed up to have the room ready, but the process of deciding what would go in here took four or five months. I was the guy who got to go around and look at all the gear, and it was interesting to see how different

companies were trying to evolve and what they were leaving behind."

Breaking in the remodeled room is Pussycat Dolls singer Nicole Scherzinger working with producers Akon, will.i.am and West, with Geffen Records chief Ron Fair, who has made the Record Plant his base of operations for the past five years. "It makes sense to work out of this place," says Fair. "I can make calls in a studio, but I can't make records in an office."

Working closely with Fair is another recent Berklee grad, Justin Sigel, who pops into SSL-1 to tell me what he's been up to. Sigel spent the summer after his sophomore year as an Interscope intern, splitting his time between learning the ropes of radio promotion at label HQ in Santa Monica and getting a crash course in record making right

—CONTINUED ON PAGE 126



From left: Geffen A&R rep Justin Sigel with the Record Plant's president, Rose Mann-Cherney, and head tech engineer Jason Carson

This snazzy, ultramodern recording environment is the product of a team effort, with renowned acoustic designer Vincent van Haaff contributing the sleek yet inviting décor and Carson handling the hardware updates, which also include Neve 1073s, Crane Song Ibis EQ, Chandler TG1, Tube-Tech CL 1B and SPL Transient Designer 4, along with the requisite Microsoft Xbox. Carson talks about the 2001 model J Series console (fitted with 72 inputs and winged with a Surround 959 module), which he'd located in London, as if he'd scored the deal of a lifetime on a cherry late-model sports coupe that had only been driven by a little old lady on Sundays. Across from the control room is a cozy, well-appointed lounge. All in all, the new, improved SSL-1 is a posh yet super-comfortable spot for making a record.

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## NASHVILLE SKYLINE

by Rick Clark

Hillsboro Village is one of the most desirable commercial and residential areas in central Nashville. It's got great shops, restaurants and hotels only minutes from Music Row, downtown and Vanderbilt. Anyone who owns a house in that area knows they've got a piece of prime real estate.

Sweetbriar Recording ([www.sweetbriarrecording.com](http://www.sweetbriarrecording.com)) is located there and has become a destination for those who are on a limited budget (and who isn't these days?), but desire something nicer than the average ubiquitous project studio found throughout Nashville. The facility is owned by producer/engineer/songwriter Mark Thompson, whose background includes working with The Judds, Wynonna Judd (collectively 11 years, most as bandleader), Jessica Andrews, Chely Wright, Billy Dean, Suzy Bogguss, John Berry and a number of other artists. Thompson also co-wrote the theme song for TNN's *Prime Time Country*. A sideline business he started about 10 years ago, Thompson Music Rental morphed into a full-time business. Then, in 2005, Thompson decided it was time to take his home studio and create a much more professional setting.

Sweetbriar was originally a 1,200-square-foot pool house and two-car garage that was converted into a studio facility by a French publishing company, which has since left Nashville. Michael Cronin (Bop Studios in South Africa, Ocean Way and Blackbird in Nashville, Mutt Lange's studio in Switzerland) was brought in to design and build the rooms, which offer floating cherry floors, custom racks, Acoustic Systems doors and numerous equipment isolation cabinets.

"I think the primary function of excellent sound and an open, comfortable feel was successfully accomplished," says Thompson. The primary format is Steinberg Nuendo 3 and Cubase 4, though there is also a Digi 002 rack installed. Monitors are Mackie HR824 and Yamaha NS-10s with a PreSonus Central Station.

The lounge, which features a stone fireplace, vaulted ceilings and lots of glass to the outside, also doubles as the



## NEW YORK METRO

by David Weiss

Yamaha C7 piano room. The control room is spacious, so having players recording direct there doesn't cramp the flow of the studio. There is also a B3 in the control room with a Leslie wired in the booth.

Clients at Sweetbriar have included engineer/mixer Brian Tankersley (Brooks & Dunn, Shania Twain, Judd, Billy Dean), producer/engineer Mike Clute (Alan Jackson, Blackhawk, Faith Hill, Steve Wariner, Exile) and producer/songwriter Bobby Huff (Alaina Beaton, Tim Finn, BlackHawk, Mindy McCready).

"I'm simply aiming for a part of the market where I can offer savings to help keep budgets in line by paying a smaller price for a smaller room, instead of paying for a full-size studio when only utilizing part of it," says Thompson, who charges \$300 a day (which includes setup but no engineer). "To me, it makes sense for big projects to use one of the fine large-scale recording facilities for tracking, then bring those tracks to Sweetbriar Recording for vocals, solos or any recording where multiple rooms are not required." That said, Thompson has recorded full bands at Sweetbriar with excellent results and has an upcoming month-long block-booking with a Virgin UK act.

Most recently, Thompson and co-producer Anita Cochran produced the latest

—CONTINUED ON PAGE 126

In the 1982 sci-fi movie classic *Tron*, a tech-head is sucked into a computer and must battle to return to the real world. Sound familiar? In a way, there's a little Kevin Flynn (*Tron*'s hacker hero) in all of us, but fortunately, we can always reshape the physical environment that surrounds our DAW to increase our level of productivity.

Nowhere is the ability to effectively manage your space, and therefore your creativity, more important than in New York City, where space is at a premium and potential distractions are rampant. For New York-based megamixer Bob Power ([www.bobpower.com](http://www.bobpower.com)), whose expert tweaking skills have graced the likes of The Roots, A Tribe Called Quest, Ozomatli, NAS and many more, managing creativity is a form of audio-based feng shui that is central to who he is.

"As both a mixer and a producer, I try to not have a 'sound,'" explains the often philosophical Power. "Your sound should be the sound of the artist, and everything you do should be steered to making their vision come alive. That said, after 25 years of working, you start to notice things about yourself, and my tendencies are toward warm, fat and present. The way I mix is what I call 'tall,' where everything is represented from the lows to the airy highs.

It's not just about volume, EQ, pan or ambience, but how all those things work together."

For ears as active as Power's, you'd assume that every inch of his working space is meticulously engineered—and you'd be wrong. Instead, Power's approach to molding the 250-square-foot room on Broadway and 27th that he took over a little more than a year ago reflects a combined reliance on luck, intuition, science, ergonomics and seat-of-the-pants engineering that adds up to a very productive space for both him and his clients.

Forced to move when his previous space was converted into condos (a frequent New York City business

PHOTO: DAVID WEISS



Producer/mixer Bob Power

hazard), Power and his co-tenant, Steve Adkabbo of Shelter Island Sound, located a former audio post facility ripe for the taking. "My raw room was great because it was odd-shaped, with no parallel walls. But until you get your gear in there, you never know," he comments. "My feeling with a facility like that is to do as little as you have to: Get your gear in there and live with it for a little while, and then you find out what the room really needs. I brought my powered speakers in with my iPod, moved them around the room pointed in different directions and found which area sounded the best."

As a low-end specialist, Power considers his confidence in those frequencies crucial to maximizing his practice. "My Genelec S30 monitors only go down to about 70 or 80 Hz, so I put in a sub, which I had generally not liked to work with," says Power. "The Blue Sky sub is there, so I don't have to worry. I have to be able to question, 'Will this be too loose at 40 Hz or is it just as it should be?' I put a footswitch on the sub with a light, so I can kick it in and out."

Although Power's room bristles with choice gear such as Neve 1095 preamps, Pendulum Vari-Mu compressors, Empirical Lab Distressors and an original-issue SPL Vitalizer, low-tech solutions are given equal weight. For example, each of his Genelecs rests on a \$7 lazy Susan that he uses to spin

—CONTINUED ON PAGE 127



Sweetbriar owner Mark Thompson working on Tammy Cochran's *Where I Am* with co-producer Anita Cochran



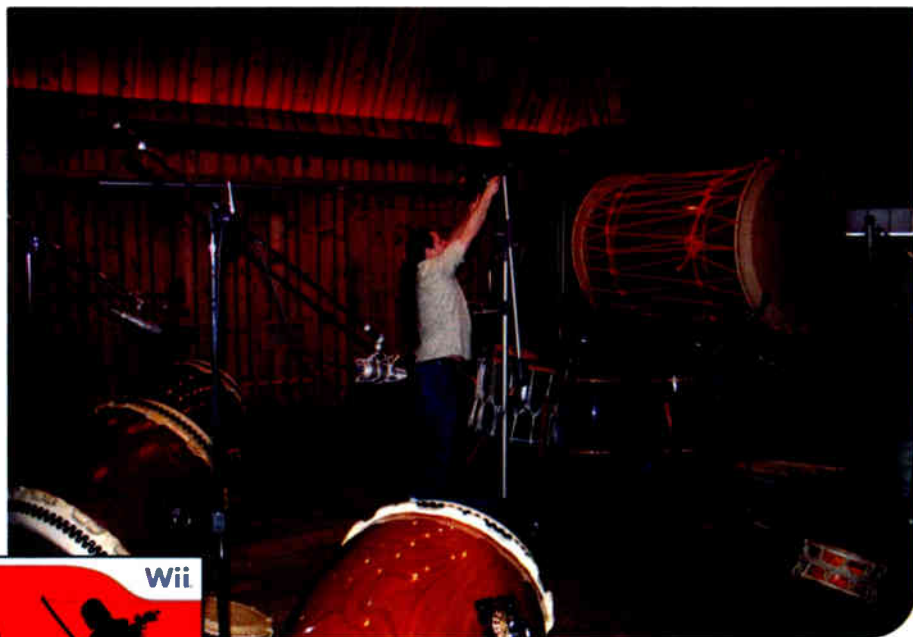
CAPTURING TAIKO DRUMS FOR UBISOFT'S *RED STEEL*

Ubisoft's *Red Steel* was one of the first videogames released for Nintendo's Wii platform. Action surrounds the violent struggle between fictional Japanese crime families, and to embellish the Far East atmosphere, Tom Salta's score blends electronic instruments with traditional ones, such as the Taiko drums of Japanese group Taikoza.

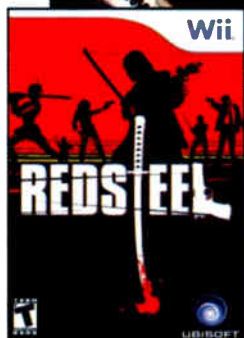
Salta produced the Taikoza sessions at New York's Avatar Studios ([www.avatarstudios.net](http://www.avatarstudios.net)) in Studio C, working with longtime friend and Avatar chief engineer Roy Hendrickson. "We've done a lot of projects together," Hendrickson says, "dance remixes, trance records, crossover classical. He gets various kinds of work because he can do most everything."

Hendrickson, whose history with Avatar goes back to the years when the facility was The Power Station, recorded the drum group to Pro Tools. He says that to a certain extent his studio setup followed the lead of the five members of Taikoza; their method of playing is very performance-centered and the engineer needed to accommodate that. He set up close mics on the instruments where the musicians placed them, and then used rehearsal time to place room mics.

"It was laid out to how you would see them performing a show," he says. "It seemed to be most comfortable for them. They have a lot of physical energy when they're playing, whether they're sitting



Avatar chief engineer Roy Hendrickson sets up mics for the Taiko drum sessions.



or standing or going to different positions. They're also always changing mallets, which might be anywhere from about 4 feet long to the size of little drumsticks.

"We placed the mics by ear," Hendrickson continues. "There were four or five room mics. I just walk around the room to find where I thought I would get that little extra low end or a longer decay—some kind of character I liked. While they would be rehearsing the particular pattern they would go for, we just moved things around and listened.

"Those drums are very, very loud, especially the big drum. We had to be very conscious of capturing the ambiences around them—to capture all the low end, these really big wavelengths—and sometimes the room helps enhance those things. I would say maybe 50 percent of the sound is close-miking and the other half is finding key positions in the room."

Hendrickson used mainly Neumann U87s and KM86s, and Sennheiser 421s. He says he also especially liked KM56s as an overhead pair. The room itself was also a key recording tool. "[Studio C] is not overly huge, but it's big enough to really be excited by those big drums," he says. "It's got a short reverb time, and I don't want to use the word bright, but it's alive without being long. It's got a nice reverb time in the low end, too, which helps enhance those drums and makes them sound a little bit bigger."

After the drum recording sessions, Hendrickson created a number of pre-mixes in his own studio at Avatar, Studio R, before handing them over to Salta to be incorporated with many other elements in Salta's Connecticut studio.

Meanwhile, Hendrickson, who has also recorded music for Sega Games such as *Sonic the Hedgehog* and *Daytona Racer*, has turned his attention back to more traditional music projects, including sessions with contemporary Christian artist Nicole Mullen and legendary singer Roberta Flack.

Taikoza performing music for videogame *Red Steel*.

—Barbara Schultz

## BEHIND THE GLASS

### GOOD NEWS FROM NOLA



At The Truckfarm studio: Dr. John (left) with Truckfarm engineer Jack Miele

James Andrews, lead singer and trumpeter of the New Birth Brass Band, did some tracking for his new album at The Truckfarm studio in New Orleans. The CD features guests such as Trombone Shorty, Walter "Wolfman" Washington and Dr. John. Engineering and mixing the sessions was Jack Miele.

### LURSSSEN'S LAB



Film score and music mixer/recordist Frank Wolf (left) and mastering engineer Gavin Lurssen

After 15 years, a Grammy and a number of Oscar nominations, Gavin Lurssen has left Doug Sax's Mastering Lab to open his own mastering facility, Lurssen Mastering (Hollywood). Lurssen is one of three engineers working out of the new multiroom facility. His space is built around a Sonic Studio soundBLADE workstation and ATC 150 monitors.

### SOUTHEAST

For those who haven't heard, Cypress Moon Studios (Muscle Shoals, AL) is the new name of the facility formerly known as Muscle Shoals Sound. Early sessions in the newly christened studio included members of the Amazing Rhythm Aces and many others working with co-producers Tonya S. Holly and husband Kelvin Holly on the soundtrack for a feature film titled *When I Find the Ocean...* At Catalyst Recording (Charlotte, NC), the New Blacks recorded a new nine-song CD with producer Rob Tavaglione and assistant engineer Ben Millwood. The Dead Kings were also in working on their latest Scatboy Records release with producer Stabb Frehley and Tavaglione engineering.

### NORTHEAST

Wilco's latest release was produced by Jim O'Rourke, who also co-engineered with T.J. Doherty at Sear Sound (NYC). Also at Sear, Lee Ranaldo of Sonic Youth produced mixes for Bob Dylan documentary *I'm Not There* in Studio A; Doherty engineered... Spyro Gyra were in HarariVille Recording Studios (Weehawken, NJ) to complete recording of their latest album with engineer Eric Carlinski and assistant Frank Lakatos. Also in HarariVille, Matt Witte and his band, Chainsaw Trio, recorded demos for EMI with producer/engineer Rob Harari... CSP Mobile (Saco, ME) recorded *Barenaked Ladies* with the Boston Pops at Boston Symphony Hall in December. The performances, part of a private fundraiser for the orchestra, will be broadcast on CBS-4 TV Boston during the 2007 holiday season. Steve Colby of Evening Audio Consultants handled the audio... Avatar Studios (NYC) hosted Andre Previn playing solo piano in Studio A. Bob Sadin produced, Dave Darlington engineered and Anthony Ruotolo assisted. Also recently recorded in Studio A was the cast recording for the off-Broadway show *How to Save the World and Find True Love in 90 Minutes*. Producer Lawrence Anderson worked with engineer Peter Hylenski and assistant Ruotolo. In Studio B, Russ Elevado mixed tracks for Angelique Kidjo, assisted by Justin Gerrish. Also, Rob Thomas and producer Matt Serletic recorded vocals for a Disney film project; David Thoener engineered and Brian Montgomery assisted... At Power Station, New England (Waterford, CT), Jewel recorded vocals for the *Arthur and the Invisibles* soundtrack with engineers Brian Sargent and Dave Wilkerson.



Dubway's Eric Spring and dance queen Lisa Lisa

### DUBWAY SESSIONS

Coming to an art house near you: Patti Smith was in Dubway Studios (NYC) recording narrative for a Steven Sebring documentary about her life. Emery Dobyns engineered with Dubway assistant engineer Eric Spring. Also in: '80s pop star Lisa Lisa, recording vocals for a new album project with Spring.

### MIDWEST

Mastering engineer Bob Boyd has installed a new SPL PQ mastering equalizer in his Ambient Digital Studios (Houston). One of the first projects on which Boyd used the new EQ is a live release from Shawn McDonald, to be released on EMI's Sparrow Records. Ambient also hosted sessions for a 10-year retrospective album by Dur Lady Peace titled *A Decade...* The Taker Thunderbolt worked on their first full-length album with engineers Brad McGrath and Andrew Ragin at Brick City Sound (Highland Park, IL)... Nigerian recording artist Benjamin Odunsi completed a full-length album, *Oba Aagbara*, at Tierra Studios (Houston). The album was engineered by Aaron Morris, who also assisted Femi Djetunde with the final mix.

### NORTHWEST

San Francisco Bay Area band Neveragain tracked their *The Great Betrayal* release at Hyde Street Studios (San Francisco). Band member Paul MacLachlan produced, and Justin Phelps engineered. Brian Krawcykowski will be doing overdubs in the band's Oakland, CA, studio.

### SOUTHERN CALIFORNIA

Tracks for Ry Cooder's new album, *My Name Is Buddy*, were recorded at Sound City Studios (Van Nuys, CA). Cooder self-produced the tracks, which were recorded by engineers Martin Pradler and Don Smith... At indie mastering studio Sound Bites Dog (L.A.), engineer Hans DeKline mastered releases by Rosanna Fiorazo (mixed by Jim Watts) and Dopesnake (recorded and mixed by Bradley Cook). ■

Please send "Track Sheet" news to [bschultz@mixonline.com](mailto:bschultz@mixonline.com).



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## L.A. GRAPEVINE FROM PAGE 122

here as Fair produced the Black Eyed Peas' track for *Legally Blonde*. Back at Berklee that fall, Sigel, a music business major, was appointed the head of the school's Heavy Rotation label. A year after graduating, Sigel took a job assisting Fair in the studio, and just a few months later joined the A&R staff of A&M Records, Fair's previous fiefdom, working with the producer/label head on projects for the Pussycat Dolls and Keisha Cole, as well as the Black Eyed Peas' last album, *Monkey Business*.

"That's when things started exploding," Sigel recalls. "I did odds and ends for Ron when he was in the studio, which allowed me to become a sponge. It was an unbelievable experience sitting there and watching him make records and phone calls for a year, just to study how he did both at once. But then all those records happened, and Jimmy [Iovine, Interscope Geffen A&M chief] asked Ron to become chairman of Geffen and we moved over there about nine months ago."

After our conversation, Sigel will try to locate a 1-inch tape machine and then head over to Bernie Grundman's facility for the mastering of Macy Gray's comeback album, a project that Fair, who signed her, is over the moon about. Grundman himself will master half of the album produced by Fair with a human rhythm section, while Brian "Big Bass" Gardner will handle the hip-hop-inflected tracks produced by will.i.am.

Before he has to take off, the cerebral 25-year-old takes a minute to tell me about an intriguing project he's working on. Sigel agrees that the CD's days are numbered, but he believes there will continue to be a demand for physical product, and to that end he's developing a configuration with producer Jack Joseph Puig, another recent Fair hire, though he still operates out of Ocean Way Studio A. "It caters more to where kids' minds are at right now in terms of being customizable," he says. "I don't want to say too much about it, but it links up to the computer, it engages the listener and it's a piece of marketing, whereas there's only so much you can do with a compact disc."

As Sigel talks, I recall what a friend once said about the young John Mayer after seeing him perform in 2001: "That kid will be the dictator of a small country in a few years."

"I love having these kids around," says Mann-Cherney with obvious affection. "They really energize the place." She then turns reflective. "Y'know, I was just thinking about my very first day at Record Plant all those years back. Stevie Wonder was in one room, The Eagles in another and Van Morrison in the third, with Buddy Miles and a bunch of CBS Records execs just hanging out—it was



When *Mix* visited, Kanye West was on-site producing Nicole Scherzinger of Pussycat Dolls.

like a private club. Last night, I'm walking out and there's Kanye and Common, Pharrell and Britney [Spears], will.i.am and Macy, Jennifer Lopez and Jimmy Iovine all hanging out upstairs. The vibe is always the same; it's just the faces that change." ■

Send L.A. news to [bs7777@aol.com](mailto:bs7777@aol.com).

## NASHVILLE SKYLINE FROM PAGE 123

effort by Tammy Cochran (no relation to Anita), *Where I Am*, at Sweetbriar. Cochran, who scored some sizable hits beginning in 2001, including "Angels in Waiting" and "Life Happened," says, "From an artist's standpoint, Sweetbriar is a comfortable place to record. It has all the necessities of the big boys, while keeping it intimate and private. It's almost like walking into your best friend's home; there's no stuffy atmosphere and you instantly feel welcome."

*Where I Am* was recorded with nearly all of the musicians in the studio, playing together and exchanging ideas. Thompson says, "I love the interplay of talented musicians taking a really good song and pumping life and dimension into it with fresh-sounding intros and dynamic arrangement suggestions. We had Steve Turner on drums, Dow Tomlin on bass, Tony Harrel on piano and Hammond B3, Anita Cochran on acoustic guitar, and either Mike Johnson or Peter Finney on steel, and Tammy singing really good scratch vocals—all performing together. We overdubbed electric guitars, solos, violins and all vocals. Anita and I played all electric guitars—she covers the clean sounds; I am mainly the overdriven and effected styles.

"We recorded 12 songs in a total of four three-hour sessions for the basic tracks," Thompson continues. "Our original plan was to narrow it down to 10, but we liked them all, so all 12 are on the CD. Tammy wrote or co-wrote all songs. "We used a lot more than



four sessions of time for overdubbing—Anita and I took our time and played around with a lot of parts. The string section is Paul Reissner performing four to six tracks, then we took parts from verse 2 and 3 and stacked them on verse 1 to sound like 12 to 18 players, then moved that to all the verses.”

For the vocal chain, Thompson found a combination that worked especially well on Cochran: “The Avalon 737 responded well to Tammy’s voice, and no surprise that a 1958 Neumann U47 beautifully maintained by Mike Bradley of the Mic Shop was always used. The entire recording was made with Steinberg Nuendo 3, tracking to mixing completely in the box, other than a Yamaha SPX-990 used as an external effect through Nuendo.”

“After working at Sweetbriar, I have switched over to using Nuendo and Cubase in my home studio, too,” Anita Cochran notes. “This way, I can leave Sweetbriar with a computer hard drive, go home and do an overdub and bring the drive back the next day. The studio also has just about every plug-in you would need. When you spend half of your life in the studio, it becomes your home away from home.” ■

Send Nashville news to [mrblurge@mac.com](mailto:mrblurge@mac.com).

#### NEW YORK METRO FROM PAGE 123

the monitors from his own sweet spot to one that faces the client couch opposite his mix position in the small room. In another instance, Power couldn’t put his trusted Apogee AD-8000SE converter where he could view it, but a strategically placed mirror changed all that in a flash. “The metering is phenomenal, but I couldn’t see it from my mix position,” he explains, “so I put a mirror up on my wall out of the soundfield. The meters are backward, but I can see them!”

The next level of enlightenment he advises other creative managers to reach is knowing when to skip technical excellence and when to ‘Use the force, Luke.’ “I have a flat wall behind me painted eggshell,” says Power. “I said, ‘I have to take some high end off this shiny paint on the back wall.’ So I got these diffusers, put them up and although technically it may have been the right thing to do, the tonal balance didn’t feel comfortable to me. So remember to search your feelings after doing ‘the right thing.’ Use your ears and use your brain. People talk about having good ears, but everyone has the same ears—it’s just what your brain does with that information.” ■

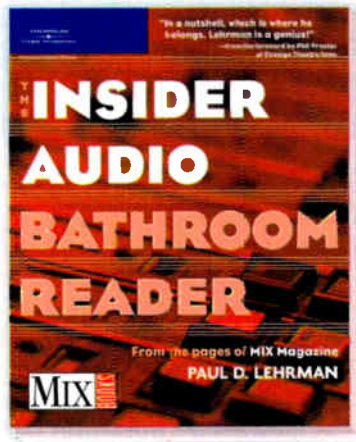
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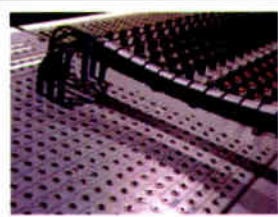
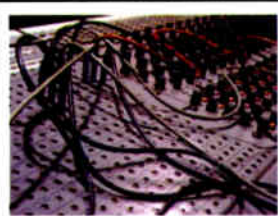
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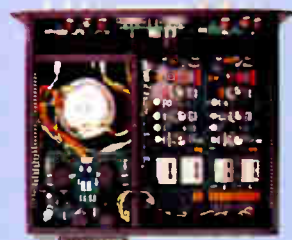
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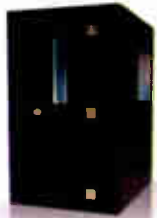
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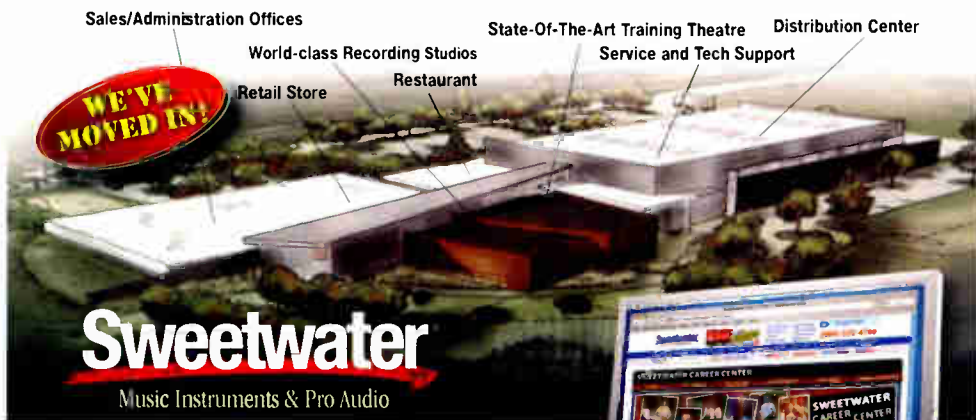
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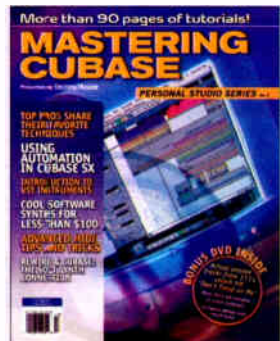
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Your DP mastering and processing lab awaits you: **BIAS Peak Pro 5** delivers award winning editing and sound design tools, plus the world's very best native mastering solution for Mac OS X. With advanced playlisting, superb final-stage processing, 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), Sqweez-3 & 5 (linear phase multiband compression/limiter/upward expander), Reveal (precision analysis suite), PitchCraft (super natural pitch correction/transformation), Repli-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 — and finishing touch — to Digital Performer 5.



## Control room monitoring

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 mode. 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 music production process.







## Portable hands-on control

AlphaTrack by Frontier Design Group combines intuitive tactile controls in a compact and highly portable package, with native support for Digital Performer. Ride a 100mm, touch-sensitive, motorized fader with true 10-bit resolution for smooth and precise level control. Three touch-sensitive encoders let you adjust your DP track and plug-in parameters while the 32-character backlit display shows detailed feedback in response to your touch. Map your favorite shortcuts from the Commands menu to AlphaTrack's user-programmable buttons. Jog and shuttle with the touch of your fingers using the integrated Scroll Strip. Slide one finger across the Scroll Strip surface and your project's timeline scrolls in response. Drop a second finger onto the strip, and now your fingers control DP's shuttle speed. Zoom through your project with two fingers, then just lift one finger and slide to quickly set the precise position you want. AlphaTrack is powered entirely through its USB connection so it makes the perfect companion to your portable MDTU recording rig.

## Accurate monitoring

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. Namely, 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.

## Hands-on control for the studio

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 levels. 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 MDTU Digital Performer engineering team. Mackie Control Universal 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.



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# Steinberg WaveLab 6

## Tips for Faster Editing and Cleaner Sounds

For years, I've been using WaveLab to edit half-hour radio shows and assorted podcasts, as well as for CD mastering. My own decision to upgrade to Version 6 was made easier by the addition of several new features to a stereo editor I already enjoy using. The new functions are not eye- or ear-candy, but serious productivity-enhancing tools. Here are some of my favorite shortcuts for using WaveLab 6.

### THE NEW VIEW

Take advantage of WaveLab 6's ability to view audio in Spectrum or Loudness Envelope modes. Spectrum displays a spectrographic image with frequency on the vertical axis and intensity represented by color. Try enabling the Spectrum editor in this mode, which lets you define and edit specific frequency regions. Alternatively, Loudness Envelope displays a graph of loudness over time for the overall signal, as well as within three definable frequency bands. As both displays are independent in the overview and main windows, you can choose to view Loudness Envelope in the overview window and Spectrum in the main window.

### SURGICAL EDITING

Together, these two modes make quick work of cleaning up audio. The Spectrum option is particularly useful because it shows things that may not be visible in any other view and the editor allows for surgical removal. For example, low rumble due to air conditioning is usually visible as a line running through the Spectrum view. Using the Spectrum selector, you can select a portion of that line that appears in a quiet passage and extend that selection throughout the audio file.

Using the editor, the selected noise can be "damped" or filtered out with a linear phase filter whose slope is variable up to a steep 96 dB/octave, or can be set to "infinite," which Steinberg says gives a slope in excess of 1,000 dB/octave. The selection can also be faded out and back in for a more subtle approach. By adjusting the crossfade time, WaveLab smooths out the areas where the filtered audio meets the unfiltered. The results are every bit as good as I get using a broadband noise-reduction plug, but without the artifacts.

### P-P-P-PLOSIVES

When dealing with nasty vocal plosive sounds, the Loudness Envelope shows these artifacts quite clearly for editing, and the Spectrum editor also takes care of them. By editing the lower frequencies only, nasty "p" and "t" sounds can be tamed without affecting the intelligibility of the audio.

### NAVIGATING THE MODES

Both Spectrum and Loudness Envelope modes recalculate the display when you scroll or zoom, which can be very slow, especially when you are working with long audio files. To avoid this, switch to the Wave view before scrolling or zooming, and then switch back to Spectrum or Loudness Envelope mode. The default key commands for Wave, Spectrum and Loudness Envelope modes are 1, 3 and 5 on the upper keyboard row, so this is quickly accomplished.

### ADDING ROOM TONE

Sometimes it's necessary to add some space between lines of dialog or remove a cough without affecting the timing of the surrounding sentences. WaveLab 6 has expanded its Silence command, adding an option to insert room tone instead of pure silence. Just save a small file of clear room tone and load it into the Silence dialog box. You can either insert the tone at the cursor or use it to replace a selected region. If the room tone is shorter than the audio to be replaced, WaveLab will loop it for you.

### CREATE PRESETS

WaveLab lets you create presets for many (if not most) operations, so as you work, don't forget to create presets—lots of them. WaveLab 6 stores the plug-in settings (as well as their order) in Master Section presets, so if I am using the same plug-ins more than once, then I'll create a preset for that chain of effects. I've built a half-dozen versions of a compressor/tube saturation/EQ/compressor chain for an in-your-face sound, each using different compressors and different settings,



*In Spectrum mode, users can identify and edit specific frequencies, leaving adjacent frequencies nearly untouched.*

and everything is stored in the preset. It is far faster to recall a preset and tweak settings than it is to rebuild an effects chain from scratch. The same advice holds true for other operations, such as normalization, window layouts and time stretching.

### FASTER SAVES

Version 6 seems faster even when it isn't. WaveLab creates .gpk "audio peak" files to accurately display a waveform. Previous versions displayed a blank screen while creating this file, and the only indication was a creeping progress bar at the bottom. In V. 6, WaveLab displays the waveform as it is being created. While this does not appreciably speed up the process, at least it *seems* faster. Version 6 also offers the ability to specify one folder for all of your .gpk files. Doing this will go a long way toward cleaning up your hard disks, and the program's disk operations actually are faster than they were in previous versions.

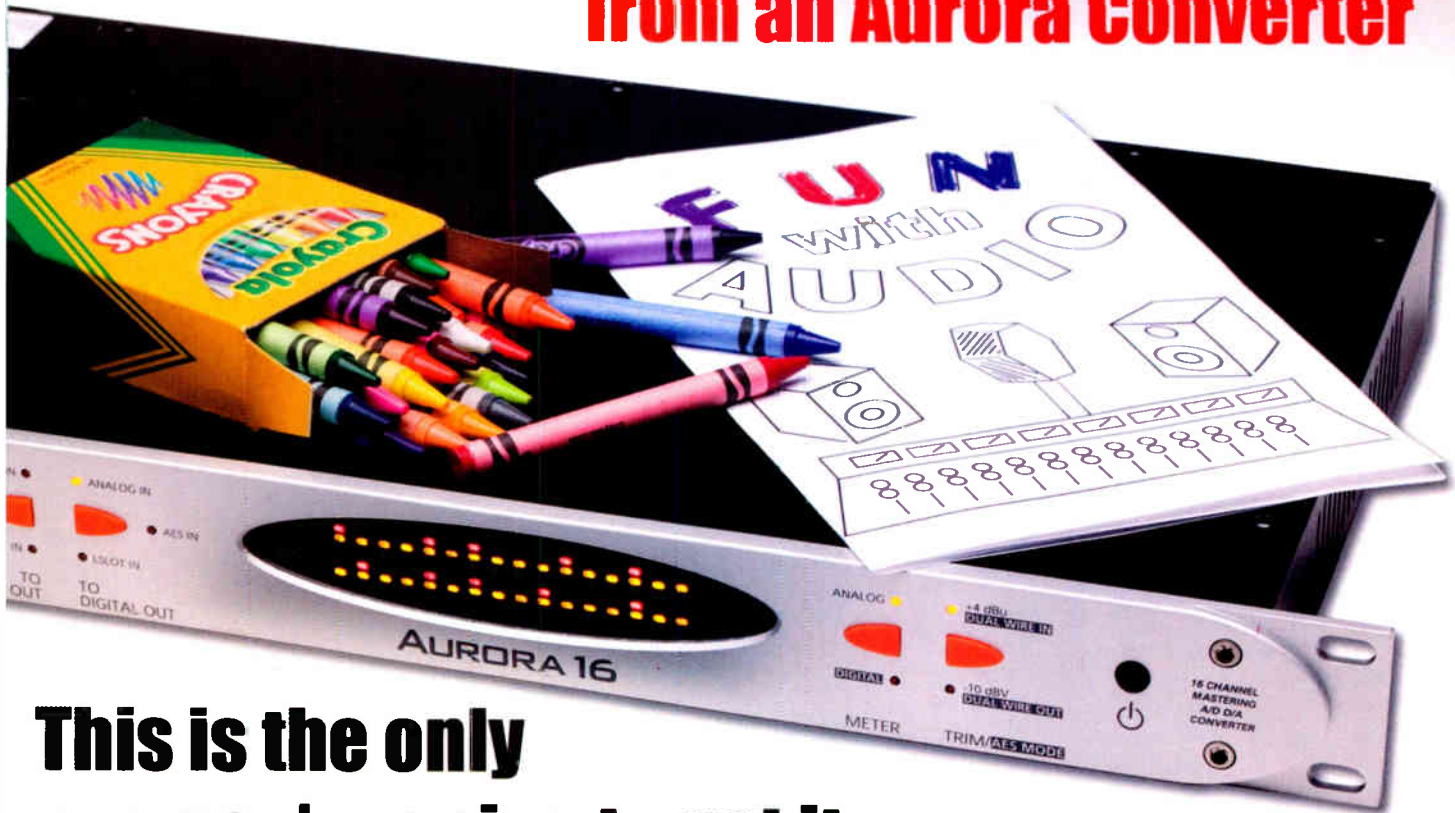
### TO UPGRADE OR NOT

For existing WaveLab users, it would be just plain foolish not to upgrade to V. 6 for the Spectrum editor alone. Add to that the Master Section presets that store plug-in settings, improved time-stretch algorithms featuring DIRAC technology and a better-looking display overall, and the \$199 upgrade price verges on being a bargain. ■

*Steve Cunningham is on the faculty at the University of Southern California.*



# If you're looking for coloration from an Aurora Converter



## This is the only way you're going to get it.

When we designed the Aurora 16 and Aurora 8 AD/DA converters, we had a simple goal. Converters with clear, pristine, open sound and no coloration or artifacts. We wanted you to be able to get the identical audio out of Aurora converters that you put into them. From what we have heard from you and the major magazines, that's what we have accomplished.

Aurora includes no compression, no limiting, no equalization. No coloration. Why?

First, if you want or need coloration, you already have that handled. You have carefully selected your signal processing, which you can add to the signal chain at any point you like, or leave it out altogether.

Second, how would we know what processing would fit your needs and your tastes? We could nail it for our tastes and for a few of our friends, and completely miss what you want.

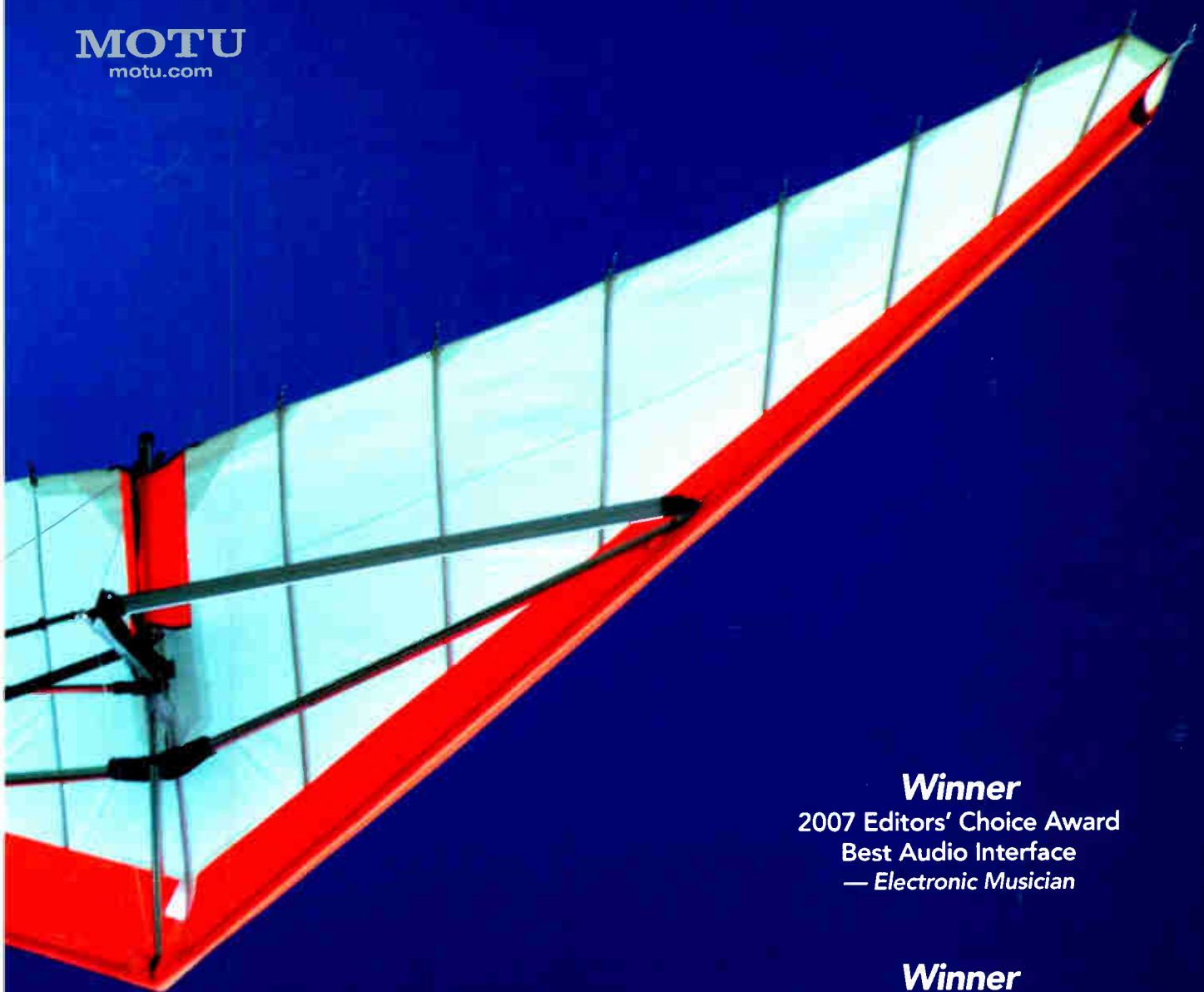
Third, we wanted to build the best possible AD/DA converter – period, not a converter/signal processor/preamp/exciter. Adding these functions would add the price of Aurora, for features you may not want or need.

Instead we packed in features such as our exclusive SynchroLock™ word clock, LSlot expansion port for optional interfaces, and exclusive remote control options into a single rack space format. And, most importantly, world-class audio quality that rivals converters costing many times the price.

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