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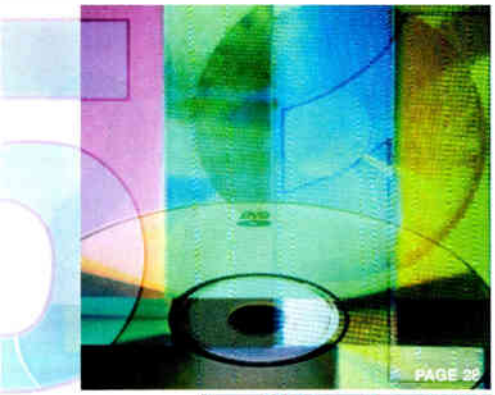

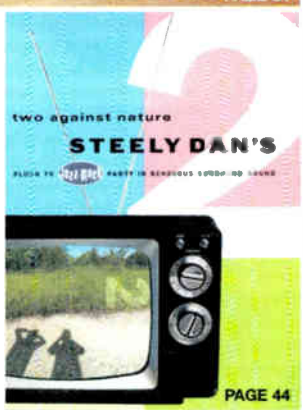

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On the Cover: Studio A at Marcussen Mastering, Los Angeles, houses a custom 6-channel console, Sonic Solutions DAW, and B&W 802 Nautilus (stereo and surround) and Quested H108 reference monitors. Architectural design by Frank Glynn; acoustics by George Augspurger. For more by owner/engineer Stephen Marcussen, see "5.1 Mastering" on page 28. **Photo:** Edward Colver. **Inset photo:** Steve Jennings.

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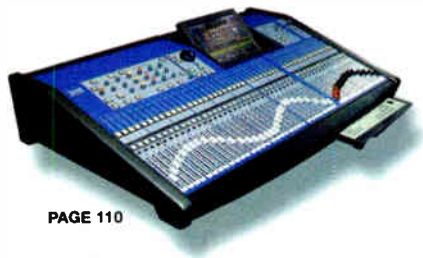

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Soul of a Tradeshow

There's no denying that the past couple of months have been strange. Since September 11, the nation has been gripped by the fear of further hijackings, anthrax-laced mail deliveries, and an up/down economic climate that rivals the motion of a Tilt-a-Whirl. Combined with the terrorist attacks, the war in Afghanistan and the financial downturn that began earlier this year, 2001's fiscal portrait is less than rosy. We all hope for—and look forward to—better days ahead in 2002.

However, for now we need to focus on the present. The AES show was postponed until November 30, and in the weeks that followed the announcement, the industry was awash in rumors, speculation, and an almost-daily count and recount of whether various major companies were exhibiting or not.

Certainly, those companies that decided to drop out of the show had compelling reasons, such as the proximity of the rescheduled AES to NAMM (just six weeks away) or simply as a means of improving Q4 financials by not spending money on exhibiting.

But whatever the reasons for exhibitor cancellations, these actions had a negative ripple effect throughout the industry, particularly for companies that make products for professional users and don't exhibit at musical instrument-oriented shows like NAMM. Not all audio manufacturers have the marketing clout of JBL or Sony (both of which *will* be at the show), and for many of these smaller companies, AES provides an all-important, essential outlet for reaching working engineers and students alike. Here, AES provides another vital role, as a nesting site where new companies can nurture and grow. These days, a "wait until next year for AES" attitude doesn't cut it, for exhibitors or attendees, especially with the rate of technology change in today's market.

AES made the right decision by offering free VIP show passes to the industry (downloadable from its Website) to bolster attendance. As an alternative, several non-exhibiting companies decided to create "virtual tradeshows" as a means of showcasing products—but the communication is essentially one-way and hardly the same hands-on experience of grabbing a fader or kicking a tire.

Despite the techno-dazzle of the new toys on the show floor, the soul of AES is the people. Far from the dealer-driven (and groupie-laden) NAMM, an AES convention is the forum for the exchange of ideas, concepts and information among professionals within the engineering community. No other event allows serious users a chance to converse with leading designers of our day—whether it be George Massenburg or John Meyer—and have a meaningful conversation on technical issues or provide user feedback on existing products.

Even away from the Javits Center, the action during AES is nonstop. Numerous off-campus events, parties and demos offer an excellent opportunity to network, make contacts and meet friends—both old and new. Take a quick after-hours cruise of the bars at the main show hotels and you're likely to see somebody scrawling out a product concept, flow diagram or schematic on a rum-stained cocktail napkin, for something that may debut at next year's show.

People are the soul of AES, and every additional person who attends the show makes the party that much better. And if you're at AES, drop by the *Mix* booth, say hello, give us some feedback and let us know what *you* think.

See you there!

George Petersen

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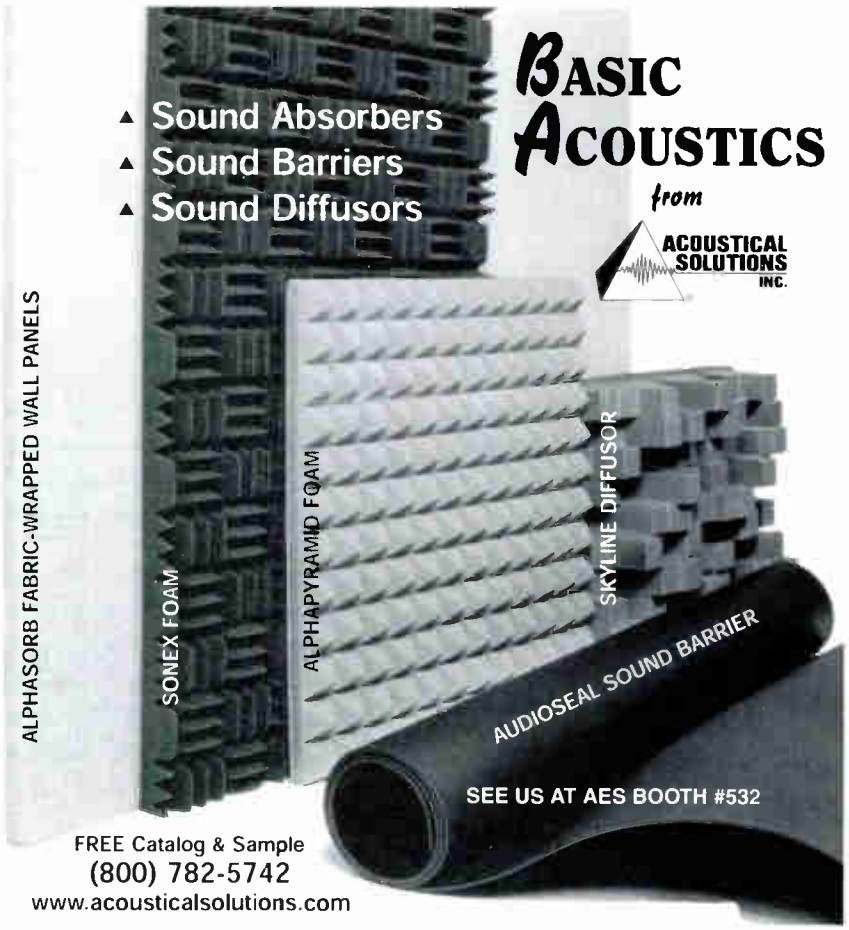

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*Malcolm Atkin
SPHERE STUDIOS, LONDON

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Letters to Mix

ILLUSTRATION KATHERINE STREETER

You Can Drive My Car

I'm surprised that none of Robert Porembski's students tried to extend his analogy to its illogical conclusion (October 2001 "Feedback"). If he'd asked for my keys (MP3s of songs I've written), I'd have said, "No need for the keys, I've got an unlimited supply of cars just like it sitting right here, motor running; it's all yours. Take it. Let me know how you like it. It took me about two hours to make it on a garden-variety PC and a few peripherals in my bedroom. I borrowed a lot of the parts from other people, but it clones just like the luxury models. It's not a Mercedes, but I guarantee it will get you from point A to point B just like the expensive models do.

"If you like the car, keep it. I figure, if you like driving my car, you like me. Send me whatever you think is fair. Now, I know some folks won't drive just any old car: They want a car that took months to make it into an exotic manufacturing laboratory. But I'm here to tell you that I can make just as good a car at one-thousandth the price."

It seems to me that the same artists who are screaming "intellectual property theft" the loudest are the same ones with the biggest PR budgets to ensure that their songs are in heavy rotation on the hot FM stations and music TV. In other words, they're giving you a free sample, and the difference in fidelity between your average, urban FM/TV audio and your average Napster MP3 is not that significant.

I'm not saying that artists aren't entitled to compensation for their efforts, but assigning a monetary value to a lossy copy of something that can be obtained freely is not the way to do it, and Napster replacements are already up and running anyway. Regardless of whether they're giving away freebies or not, if Big Music wants to stop this "theft" of music over the Internet, then they will have to admit that the value of the music is determined primarily by the whims of the listener, and not some accountant, or even the artist. What is a song worth? What makes one copy more valuable than another? Is there some algorithm or formula to nail it all down? No, the listeners decide. If you get too nickel-and-dimey about it, the listener will definitely take his money elsewhere.

Artie Turner
Via e-mail

Those Were the Days

My name is Diane Renay. I sang the hit recording titled "Navy Blue" back in 1964. Mike McCann e-mailed me your article, "Living on Borrowed Culture" ("Insider Audio," September 2001). I just want to say that you couldn't have explained it any better!

What has happened to the music today is a crime! A couple of years ago, I visited my former record producer Bob Crewe at his home in L.A. We talked about the music that is being recorded today, and he said, "I am very worried about what has happened to the music industry, and what the music that is being created today has turned into."

At that time, he told me that Lauren Hill just did a hip hop version of his song "Can't Take My Eyes Off of You," which he originally produced for Frankie Valli. Just yesterday, while having dinner in a restaurant with my husband, who is a professional guitar player as well as an inventor, we heard the Lauren Hill remake.

Let me say this: The lady has her own style of singing, she is very pretty, but she *killed the song*. Hip hop just doesn't cut the mustard.

I hope that the school systems will bring back the music and start to teach the children of today how to really play an instrument, how to really sing in the school choir, without wavering and whining their way through each note that they attempt to sing.

When I was active as a recording artist and I was in the studio cutting a record, Bob Crewe made sure that I hit every note on the head, and sang the songs that he wrote for me so that people would hear and remember both the melodies and the lyrics, long after they stopped playing on the radio. This was the way it was for me and other artists at that time.

Although some of the new female artists have good, strong voices, such as Whitney Houston, Mariah Carey, etc., if they didn't yodel and whine their way up and down the scale of notes, I wonder if they could sing a song straightforward, without cheating to hit the notes right on, one at a time.

Thanks for your honest article. Let's hope that by some miracle, the younger generations will one day start to make real music again.

Diane Renay
Via e-mail

Fond Memories

I would like to thank you for the heartfelt tribute you gave to Bill Nisselson ("Current," August 2001). I've worked as a freelance systems installer for Sound One on and off since 1988. I can honestly say that Bill always had a wonderful attitude, disposition and a kind word when helping people, whether they were clients or staff members. The last time I saw Bill Nisselson was in January 2001 on the elevator while we were going to our jobs on our respective floors. The picture you published is exactly how I remember him—smiling, saying, "How ya doin'?" to whoever was on the elevator at the time. If you have already received letters from the Sound One staff, please add mine to the list. He will always be missed and always be in our hearts.

Nancy Albino
Systems installer
New York City

Some Folks Do Go Both Ways

I'm wondering if anyone else noticed the two totally opposite opinions expressed in different sections of the September 2001 issue of *Mix*?

First, I read Paul D. Lehrman's "Insider Audio" column, which I always enjoy and feel a connection with. He wrote, "Today's underground musical heroes are not singer/songwriters...they're remixers, rappers and DJs who build fame by taking other people's creations, slicing and dicing them, ranting and chanting on top of them, or stringing them together...Yes, there is craft in this kind of composition, but it pales when compared to the true act of making music."

Then, flip over to the interview with Dave Pensado. "The idea of taking a record, putting it on a turntable and creating something new out of that was captivating to me. I truly see no difference in the skill in doing that and the skill in sitting at a piano and playing Mozart...in terms of the talent and creativity, I see no difference."

I'm not sure why I point it out exactly. Just something fun that caught my eye.

Michael Nickolas
www.studionineproductions.com

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MICROSOFT, EUPHONIX COLLABORATE ON HDCD

Michael Ritter (right), founder of Pacific Microsonics, passes on wisdom about the Model Two to Dave Hanson, VP of product marketing at Euphonix. Ritter is helping with the transition of the product from Microsoft to Euphonix.

Microsoft Corp. and Euphonix announced an agreement whereby Euphonix will manufacture, sell and support the HDCD Model Two Processor, a high-resolution A/D converter designed for DVD and CD mastering.

The two companies will work together on marketing efforts to continue the adoption of HDCD (high-definition-compatible digital) technology by top recording artists, producers and engineers.

"The Model Two fits into our philosophy of offering the absolute highest-quality audio equipment," said Dave Hansen, VP of product marketing for Euphonix.

For more, visit Euphonix online at www. euphonix.com.

IN THE STUDIO

The Faint Do the Remix Danse

Current underground darlings **The Faint** have been busy crisscrossing the country in support of their latest release for Saddle Creek Records, *Danse Macabre*. While on tour, the Omaha, Neb.-based band has farmed out some remix work to a number of other acts, including Death Cab for Cutie and I Am Spoonbender. The self-produced band will also work up a couple of their own remixes at **Presto Recording Studios** (Lincoln, Neb.), and all of the material will be released on a forthcoming EP.

TANNOY CELEBRATES 75 YEARS

The first time that the Dual Concentric was released, at Radio Exhibition in Olympia, circa 1947

Tannoy groundbreaking ceremony of new facility in Kitchener, Ontario, March 31, 2001

This year marks the 75th anniversary of loudspeaker pioneer Tannoy. After opening the company to serve the needs of broadcasters in 1926, Guy R. Fountain, founder of Tannoy, produced his first discrete, two-way loudspeaker system in 1933. One year later, the company had developed a complete range of high-quality mics, loudspeakers, amplifiers and measuring equipment. The widespread use of Tannoy equipment in Britain, particularly at RAF airfields during WWII, resulted in the word "Tannoy" becoming synonymous with P.A. systems in general. By the 1950s, Tannoy studio monitors were installed in both Decca and EMI recording studios, and Tannoy's Red and Gold dual-concentric loudspeakers became standard recording equipment throughout the '60s Beat Boom and beyond. Fountain sold the company to Harman International in the early '70s, and the Beatrice Food Company purchased Harman International in 1977. Tannoy was purchased back from Beatrice Foods by the company's working directors in 1981, and in 1987, Tannoy merged with Goodmans Loudspeakers Ltd. to form TGI plc.

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QUEEN RENDEZVOUS

A 5.1 DVD-Audio CD of Queen's *A Night at the Opera* was released in November. Transfer from the original tapes to Nuendo at 24/96 took place at Abbey Road Studios (London) and Dog House Studios (L.A.)

Pictured here at Dog House mixing the DTS 5.1 release of "Bohemian Rhapsody" are, left to right, producer/engineers Rory Kaplan (DTS), Elliot Scheiner and Greg Ladanyi.

PHIL RAMONE, LES PAUL HEAD TEC AWARDS LINEUP

Father Guido Sarducci, master of ceremonies, returns to the TEC Awards on Saturday, December 1, at the New York Marriott Marquis, to lead these confirmed presenters at press time: Carlos Alomar, Simon Andrews, Frank Filipetti, John Frye, Abe Jacobs, John Kilgore, Eveanna Manley, George Massenburg, Tony Maserati, Elliot Scheiner and Zoe Thrall.

Phil Ramone will present the Hall of Fame Award to Roy Halee, and Steely Dan will receive the Les Paul Award from Larry Carlton and Les Paul. For ticket information, contact Karen Dunn at KarenTEC@aol.com.

NOTES FROM THE NET

In a landmark agreement, the **National Music Publishers' Association** (NMPA), the **Harry Fox Agency** (HFA) and the **Recording Industry Association of America** (RIAA) have confirmed a licensing structure for streaming music for new Internet-based subscription services.

According to the agreement, the HFA will issue licenses to new services that offer on-demand streaming and limited downloads. Once rates are determined, royalties will be payable on a retroactive basis from the beginning of the service. Also, the RIAA will pay the HFA an advance of $1 million toward the yet-to-be-determined royalty rate. If the RIAA and the HFA do not settle on a rate in the next two years, the RIAA will pay monthly advances totaling $750,000 a year until the rate is set.

The **U.S. Justice Department** has expanded its antitrust investigation into online music ventures by sending civil subpoenas to the RIAA and members of MusicNet and Pressplay. The DOJ will determine the extent to which the industry has sought to control the distribution of music over the Internet by working together to determine rates, copyright procedures and licensing practices.

In other RIAA news, the **Motion Picture Association of America** (MPAA) and the RIAA filed a lawsuit in U.S. District Court for the Central District of California for copyright infringement against a number of music and movie-sharing services, including **MusicCity.com** and **MusicCity Networks** (which runs the Morpheus service).

The court document describes attempts by the RIAA to notify MusicCity that it was infringing on copyrights. The plaintiffs charge that instead of ceasing and desisting, the service expanded its file-sharing offerings through the Morpheus network, allowing movies, images and software to be traded, including not-yet-released-for-rental films *Planet of the Apes* and *Legally Blonde*.

Representatives at MusicCity were unavailable for comment.

COLORADO SOUND STUDIOS MARKS 25 YEARS OF MAKING MUSIC

Next month, Colorado Sound Studios (Westminster, Colo.; www.coloradosound.com) will enter its 25th year of recording and producing projects ranging from albums to custom soundtracks. Owner/studio manager/chief engineer Kevin Clock has been with the studio since its inception in 1977, and has hundreds of projects (from bluegrass to pop and jazz to rock) under his belt as engineer and/or producer.

The studio offers a Euphonix CS 2000P recording console, two Pro Tools 24|Mix Plus 24-bit systems, an Otari MTR-90II 2-inch 24-track recorder with Dolby SR, and a healthy selection of outboard gear, mics and monitors. The newly redesigned Studio B, a mastering and MIDI room, is a SMPTE-based pre-production studio and has been used for everything from song demos to fully orchestrated film scores with video lockup.

Personnel at Colorado Sound include: Tom Capek, composer/producer and mastering and MIDI specialist; Cheryl Winston, office manager; Lorne Bregitzer, engineer; Steve Avedis, engineer; Jeff Shuey, engineer; and James Tuttle, engineer.

(L to R): Tom Capek, Kevin Clock and (standing in rear) Lorne Bregitzer in Colorado Sound Recording Studio's newly redesigned B Room

World Radio History

ON THE MOVE

Who: Mark Yonge
Position: Manager, AES Standards Committee
Main Responsibilities: My primary task is to make sure that the work of [the specialist groups] is properly supported and encouraged, and that due process is observed such that the standards and other documents they produce will have the necessary international stature. I will also be a point of communication to a number of standards bodies, including SMPTE, EBU and IEC.
Previous Lives:
- product manager, Solid State Logic (Oxford, England), 1988-2001
- application engineer, Dolby Laboratories (London), 1978-1988
- sound engineer, Granada Television (Manchester, England), 1972-1978

I became involved with the AES Standards Committee... through a rising sense of frustration, I suppose. Everybody in this industry depends on being able to store and exchange recordings. It seemed to me that the lack of such a basic thing as interchangeable audio files would soon stand in the way of developing smarter and more valuable applications of digital audio. I started to show up at a series of AES standards meetings, and I suppose I must have shot my mouth off once too often, because I was, some while later, asked to chair a new group [AES31] to continue the work within a new subcommittee on computer audio.

My best moment in this industry was: July 1995. Months and years of intense effort came to a head with the BBC's first broadcast using the [SSL] Axiom. The occasion was the first Promenade Concert of a series of 70 concerts that summer. It featured Mahler's 8th, the Symphony of a Thousand, a huge orchestra, multiple choirs, live-to-air from the Royal Albert Hall; no retakes, no excuses. We had installed the console [Yonge was Axiom's product manager at the time] into the BBC truck at SSL's premises near Oxford just a few weeks previously. I was in the truck with Keith [Wilson, BBC sound balance engineer] that evening, mostly trying to keep out of the way. The concert ran flawlessly.

The first concert ticket I ever bought was: King Crimson, early 1970, at the Greyhound Pub in Croydon—packed, hot and loud, but the best sound I'd ever heard up to that point.

Currently in my CD changer: Paul Simon, always. Steely Dan, of course. JS Bach, Vaughan Williams and Thomas Tallis, Afro-Celt Sound System, Daily Planet.

The last great book that stirred me was: *Almost Like a Whale*, by Steve Jones, is an updated look at the *Origin of the Species* in the light of modern scientific discovery.

I enjoy...when I'm not in the office: Walking, gardening and photography—not necessarily in that order.

EXPANDING YOUR MIND

Pro Production 2002. Pro Production 2001 hits the San Diego Convention Center on January 11-13, 2002. Presented by *Pro Lights & Staging News*, the trade show will feature workshops, panel discussions and manufacturer exhibits. The show will kick off on Thursday, January 10, with the Rick O'Brien Memorial Open Golf Tournament at Riverwalk Golf Course. For more, visit www.plsn.com.

Surround 2001. The Third Annual Surround 2001 Conference and Showcase returns to the Beverly Hilton in Beverly Hills, Calif., from December 7-8, 2001. Full conference details or to register, go to www.surroundpro.com or call 800/294-7605, ext. 507.

Ultimate Streaming Seminar. Covering MPEG, QuickTime, Real Media and Windows Media training for video-on-demand and live streaming, Future Media Concepts and Sorenson Services USA debut this seminar at training centers in Boston (December 6) and Philadelphia (December 13). Visit www.fmctraining.com to sign up.

Broadway Master Classes Canceled. The ninth annual Broadway Lighting Master Classes (BLMC) and the first Broadway Sound Master Classes (BSMC), scheduled for December 5-9, 2001, has been canceled. The annual *Entertainment Design* EDDY Awards, scheduled for Friday, December 7, at the John Jay Theatre in New York City, will be held as planned. Visit www.BLMC.net or www.BSMConline.net.

Industry News

Roscoe Anthony has been named president of **Wave-Frame** (Emeryville, CA); **Ron Franklin** moved up to chairman of the board...Following **Universal Audio's** (New York City) acquisition of **Kind of Loud Technologies**, the company announced new management team: **Bill Putnam**, chairman of combined companies; **Dr. Jonathan Abel**, CTO; Paul Rice, CEO; **Tim Prince**, VP of analog development and manufacturing; and **Joe Bryan**, VP of engineering. Joining the company is **Mikail Graham** (co-founder of Emagic) as VP of marketing and product strategy...Former CEO and vice chairman **Dan Slusser** assumed the role of chairman at **DTS** (Agoura Hills, CA), while **Jon Kirchner**, president, adds CEO duties...**Crescent Communications Corp.** (Kenner, LA) and **TEL Systems** (Ann Arbor, MI) are **Professional Systems Network Inc.'s** (Princeton Junction, NJ) new affiliates...**Rex Whitehead** has been promoted to director of product planning at **Rockford Corporation** (Tempe, AZ)...Bringing 30 years of pro audio experience, **Mick Whelan** joins **Telex** (Burnsville, MN) as general manager of U.S. concert sound...**Carl Owen** is now manager of the Soundscape brand for **Mackie** (Woodinville, WA)...**Sony Electronics** (Park Ridge, NJ) has named **Dave Christenson** Western regional audio manager for the pro audio division...The new manager at **3 Artist Management** (Sherman Oaks, CA) is **Jeff Castelaz**...Former customer service manager for the New England area, **Dawn Birr** has been promoted to product manager for **Neumann USA** (Old Lyme, CT)...Promoting the **Tascam** (Montebello, CA) line for over 17 years, **Casey Zygmont** now handles the Southern California market as district sales manager...**Ron Olesko** joins the sales staff of **Audio Plus Video International Inc.** (Northvale, NJ) as a sales executive...**Bag End** (Barrington, IL) products will now be distributed in India by **Sound of Music** (New Delhi, India)...**Millennia's** (Placerville, CA) entire line of pro audio equipment will be distributed in Canada by **HHB Communications Canada Limited** (Toronto)...**Nexo USA** (San Rafael, CA) has appointed **RightTrack Marketing** (Whitestone, NY) as its exclusive representative for the mid-Atlantic region...**Line 6** moved its corporate headquarters to: 29901 Agoura Rd., Agoura Hills, CA 91301; 818/575-3600...Gainesville, Fla.-based **Z-Systems Audio Engineering** tapped **Media&Marketing** (Los Angeles) to handle all PR functions for the company.

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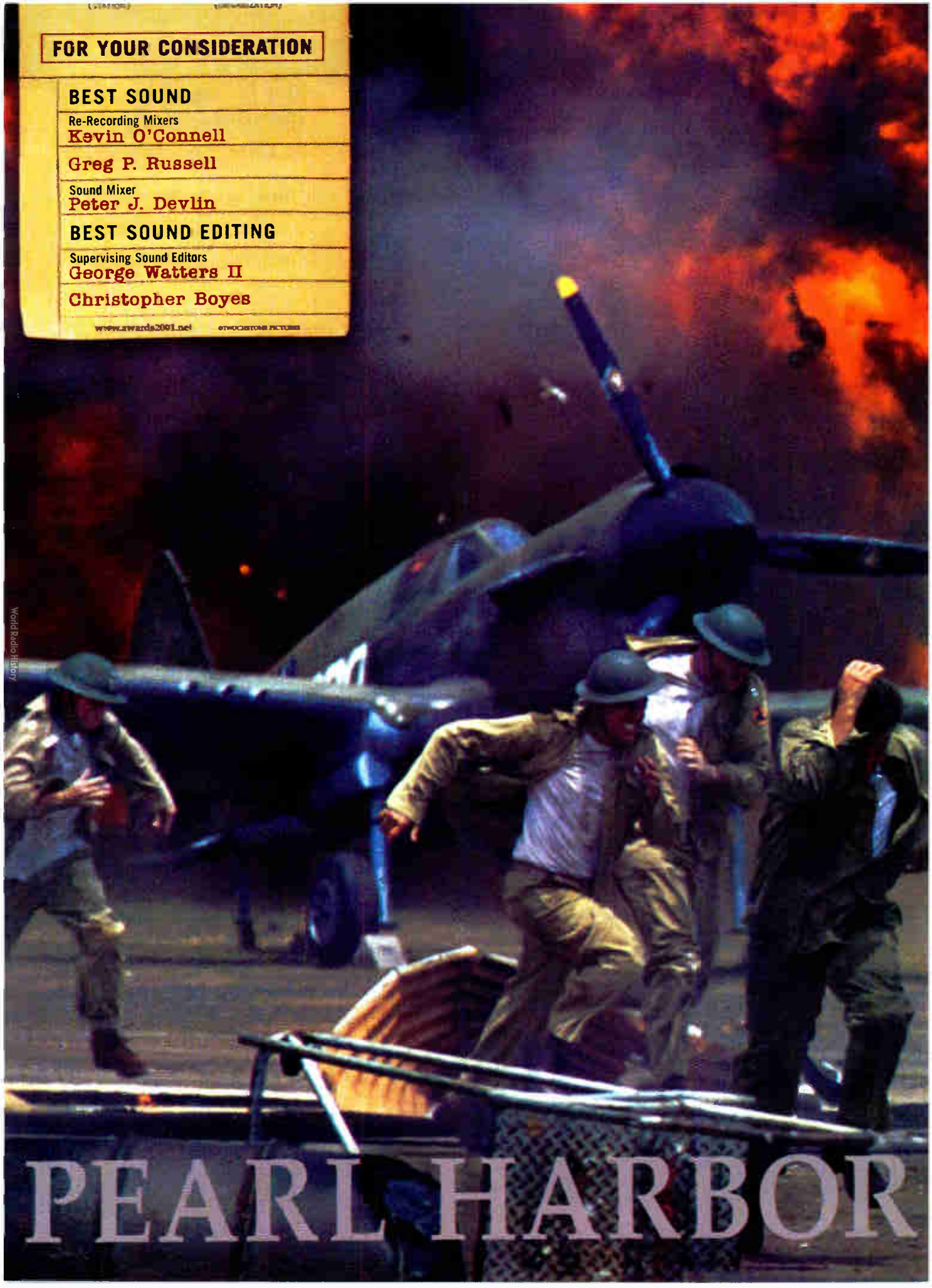

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AN OPEN LETTER FROM THE AES

By Roger Furness, Executive Director

Here in New York, as the city continues to restore its business community, the Audio Engineering Society is honored to present what is the largest event in the professional audio industry at the 111th Convention. For the Society, it takes on even greater importance after the tremendous challenges that September 11 posed to us as a city and a nation.

We wish to express our gratitude to all who have made it possible for us to gather at the Jacob Javits Convention Center for what promises to be four days of the most celebrated convention in AES history. With the support of our dedicated exhibitors who have stayed with us despite concerns of low attendance, program participants whose enthusiasm was not hindered by the necessity of a rescheduled program, a convention committee whose job has lasted far longer than expected, and all of our friends in the press who were eager to help us promote our new dates, we are able to propel our industry forward.

Today's research yields endless possibilities for the evolution of audio technology. The exhibition and technical programs of the 111th Convention emphasize the tremendous significance each area of audio has in the advancement of the industry as a whole.

AES conventions are held annually in the U.S. and Europe, where we bring people together to exchange information on the latest advancements in audio. Each of the conventions provides valuable educational opportunities. These include a full program of technical papers, seminars and workshops that focus on current research and new concepts and applications. The AES also hosts conferences throughout the year in different parts of the world, which are on a much smaller scale and are highly focused on a specific area of audio. Please visit www.aes.org to find out more about our upcoming events.

While not everyone can attend AES events, the Society has more than 140 sections around the world, and we strongly encourage audio professionals all over the world to become active in section membership. The AES is not just about audio. It's about the people who make professional audio the exciting industry it is, and we are proud to serve such a dedicated group of professionals.

The Audio Engineering Society is a global organization devoted exclusively to the advancement of audio technology, and its membership is drawn from every part of the world. The 111th Convention will serve as a rallying point for the entire industry. We wish endless success to all members of the audio community and look forward to joining our many friends at future AES events.

CORRECTIONS

On page 44 of the *AES New Products Guide*, the QSC CX168 was incorrectly priced at $1,350 U.S. The correct price is $2,450.

In October "Current," the studio credit for Stevie Wonder's *Songs in the Key of Life* left out Crystal Sound Studios (Hollywood).

In November "Coast to Coast," Jessica Simpson worked with engineer Andy Blakelock, not Doug Wilson.

Mix regrets the errors.

OXFORD TOWN

Paul Allen's Action Sports and Entertainment Mobile Television recorded (in hi-def!) the recently aired Groundworks 2001 concert series (on VH-1, Thanksgiving day) in Seattle with the Sony Oxford digital console. Pictured are engineers Scot Charles (left) and Tom Size. Director of engineering Mike Janes oversaw the operation.

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BY STEPHEN ST.CROIX

Eeny, Meeny, Meiny, Mo

Plant a Standard, Watch It Grow

Standards. Ain't we already gots all we needs? I thought the point of a standard was to standardize stuff so that equipment could hook up and work with other equipment. Or maybe so that we could listen to music, or even watch TV. Compatibility and all that, you know.

But we have so many standards that they are no longer really standards. We don't need no steenkin' standards if all we can get is the Costco Thirty-Pak.

Audio standards are certainly way out of control, and that's nothing compared to video standards. How many HDTV definitions are there today? Two more just cropped up recently, just to assure that you couldn't actually remember them all. I propose 1873ip, more pixels than we need, in case some fail, and one interlaced frame set for every 10 progressive, unless it's 3:2 pulldown, in which case only the interpolated delta from the first field of every 10th interlace set is exclusive—or read with the next progressive frame. Now before you laugh, this looks *really* good on *Galaxy Quest*, but I am still working on some motion artifacts that appear when using it on old KC and The Sunshine Band videos.

BUT SERIOUSLY, FOLKS

The concept of standards itself is problematic: You want to reach a generalized, optimized compromise that everyone can use, but everybody and their brother shows up with what they feel is a serious contender—some with really significant new features and improvements, and others with secret or not-so-secret advantages specific to the companies that propose them...And the public pays again every time a new standard pops up.

Every new technology begins with one standard that is usually determined by the original developer. Think about it: 5.1 wax cylinders are *very* rare. Not that Edison was incompetent; he was interested in getting the hot, new heavy metal song of the day captured somehow so that he would have something to listen to on those long trips from home to the lab. Actually, I guess that original recording of "Mary Had a Little Lamb" was more rap than metal. But he got it—on wax, in mono. And he invented lo-fi at the same time. Little did he know that his new radical lo-fi would soon become laughable in light of technological developments in the decades to follow, only to enjoy an impressive, worldwide resurgence with the advent of MP3.

Anyway, hi-fi eventually followed. All it took was smashing the little cylinders into little discs. I still have lots of hi-fi records, lots of Deccas and Londons. Yup, hi-fi was pretty cool. It sounded almost like real music, and in my case it came out of one big-ass Klipsch. That walnut (remember walnut?) folded horn sat in the middle of my room...like a fireplace you watch with your ears, it was magic. And like a fireplace, the time came when I had to remove the front and sweep out the ashes. Maybe that 125-pound, 300-watt power amp was a bit much after all.

AND THEN IT GOT TWICE AS COOL, AND TWICE AS EXPENSIVE

Stereophonic sound came along right after sweep-out day, and it seemed a perfect time to make the jump, so I did. I got some cheap, British, 12-inch bookshelf jobs, and they stayed a long time, to eventually be replaced with Wharfedales—mostly because they used sand-filled walls and had very cool transparent purple tweeters that looked a lot like two baby Portuguese Man-O-Wars. But then again, in the '60s lots of things looked like lots of other things. Especially when it was time to listen to music.

We have so many standards that they are no longer really standards. We don't need no steenkin' standards if all we can get is the Costco Thirty-Pak.

I made the transition from mono to stereo without much thought. I never stopped to realize that this was actually a new format, a new standard, and that it was fighting the old for world dominance. I do remember that I would buy stereo albums that I might not have gone for in mono just because they were stereo, and I wanted to hear as much of that technology as I could. Stereo was seriously fun, and we all convinced ourselves that it was essentially perfect, and that given the right circumstances, it was indistinguishable from reality. And if we weren't given the right circumstances, we all knew exactly where to buy some.

And so we skip to the recent past. Movies became available on Laserdisc, and format complications appeared almost instantly. I won't spend any time on all that; it was far too confusing to discuss. I will only remind you that there were several analog-encoding schemes, and then several sort-of digital ones, and finally everyone realized that no matter what player

—CONTINUED ON PAGE 220

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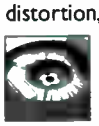
It is well known that dbx® invented the VCA and the modern compressor. It is also well known that a vintage 160 Compressor/Limiter will command a pretty high price if you can find one. The reason: smooth and classic sound. Think of your favorite album, chances are, a dbx 160 was used in the recording.

Cut to the present. *"Carte Blanche"* was given to the engineering team when they embarked on the quest to design the best compressor in the world. The end result is the dbx® **160SL Compressor/Limiter**. We spared no expense in the pursuit of audio purity. The heart of the 160SL is the patent-pending, dbx V8™ VCA that provides an unprecedented 127dB of dynamic range. Our discrete high-drive output stage with world-class Jensen® output transformers has been optimized to cancel low frequency distortion, give better transient response and drive 1000 feet of Belden® 8451 cable effortlessly. A mu-metal triple-shielded power supply  eliminates noise and provides 24-volt power rails for the widest dynamic range. Even the custom VU meters, high-visibility LEDs, and milled aircraft-aluminum front panel show that not only are electronics a work of genius, but the mechanical design is a work of art. Like the original 160, in its time, the result is brilliant. To see just how good a no-compromise Compressor can be, take a test drive at a select dbx® Pro Studio dealer today.

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Baby Bottle

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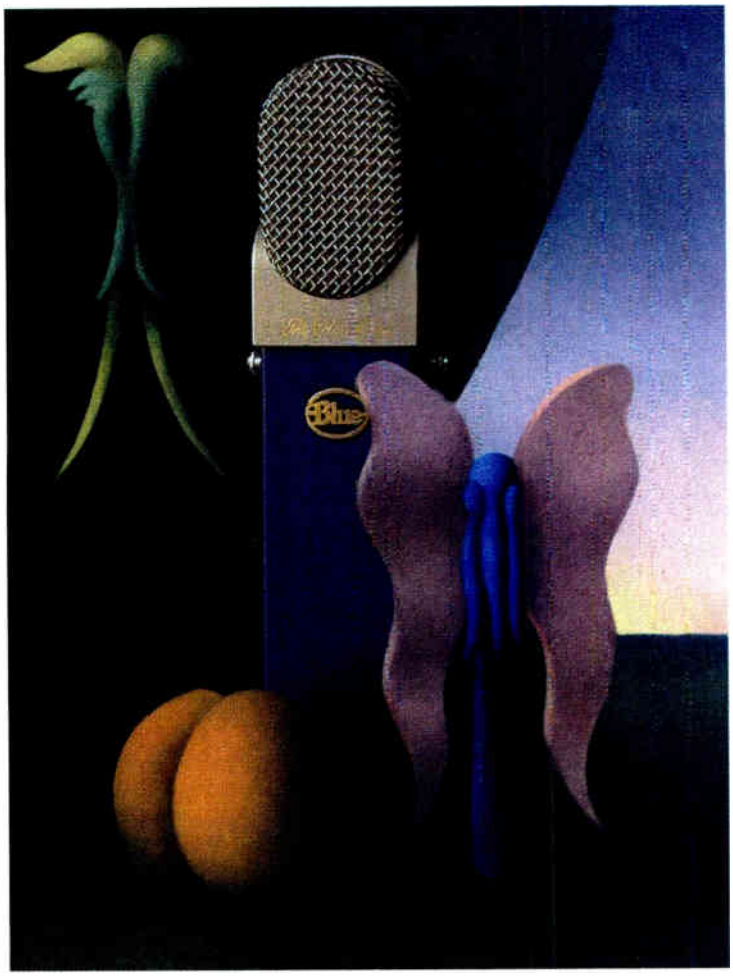
Berry Good.



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World Radio History

BY PAUL D. LEHRMAN

Strange Times, Other Voices

Music Makes the World Go 'Round...When It's Allowed

ILLUSTRATION RICHARD DOWNS

I usually write "Insider Audio" about two months before it's published. So this month's column was supposed to be about the New York City AES convention, which, as I write, should have just ended. As we all know, things worked out very differently.

You may well be at the rescheduled convention as you read this. I hope you are. I hope I am. I hope life in New York City, and everywhere else, has managed to regain a measure of normalcy, and I hope that good things—like love, family, and productive and creative work—have again become the dominant forces in all our lives.

Today, as I finish the final draft of this column, the U.S. launched the first bombing attacks on Afghanistan. Unlike the Gulf War, where the opposition at least was clearly defined and visible, the enemy in this engagement is highly diffuse and difficult to find. I agree with the government voices who say that this is going to be a long struggle, but I believe that the outcome, despite their rhetoric, is far from certain. We are in a new era, and nobody knows where it's going to lead us, politically, militarily or economically. The world has always been a dangerous place, but now, for the first time in at least one generation, Americans—who have traditionally managed not to think about it too much—understand.

Besides the bombs and bullets in Asia, there are other little wars along the home front. The first casualty of war is truth, as goes the old saying, and we've already seen at least one casualty in that sphere: When *Politically Incorrect* host Bill Maher dared to label the perpetrators of the September 11 horror as "not cowards," there were loud protests (primarily from people who didn't actually *see* the program) resulting in several sponsors pulling out of his show and several stations dropping it, and forcing Maher to sprint around the talk-show circuit and publicly eat crow. But truth can be told in many ways, and one of the ways that we in the audio industry are most familiar with is through song.

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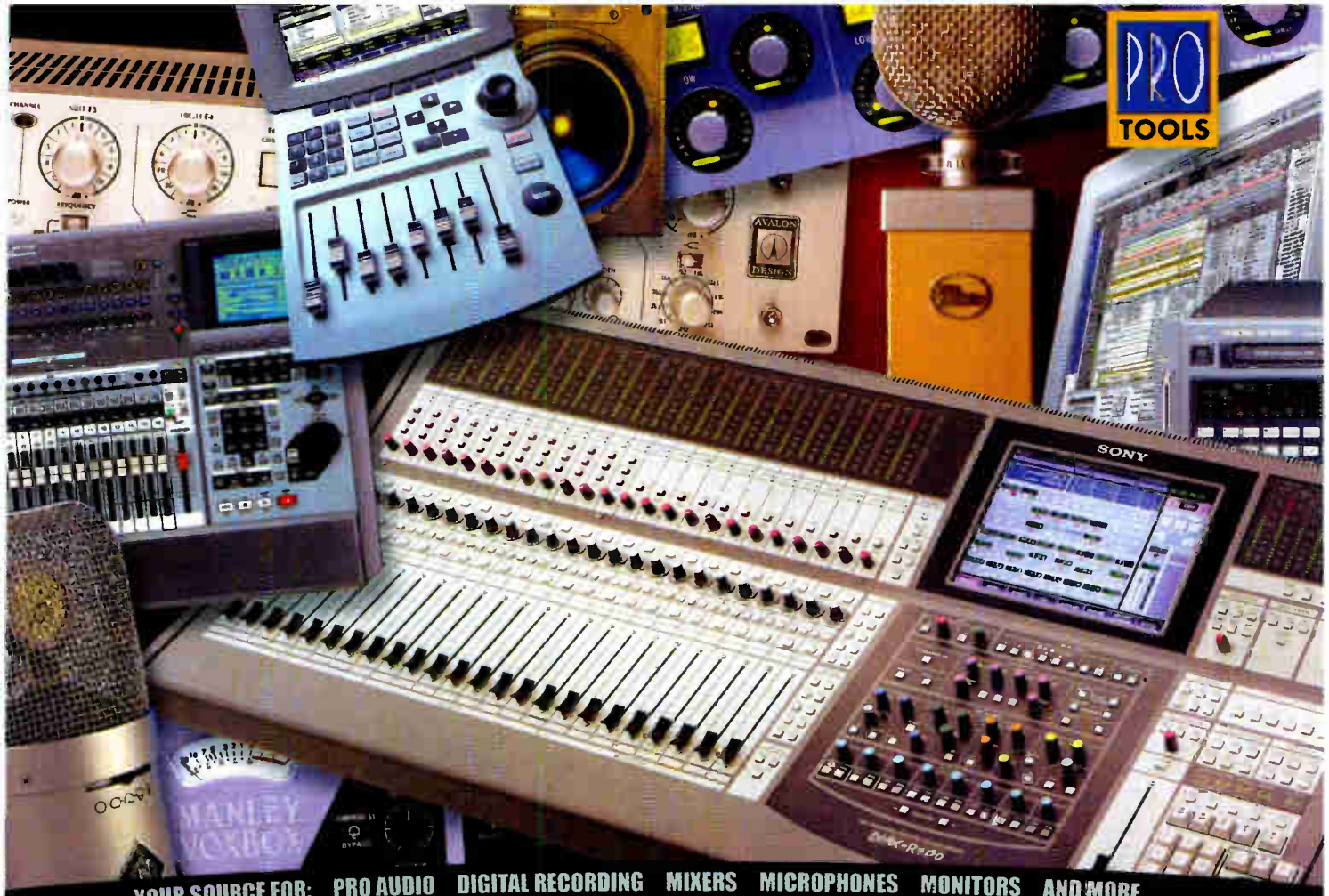

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The core of this column consists of the words of others: song lyrics that I have recalled, or that have been brought to my attention, in the weeks following September 11. Some of them are sublime, some mundane; some I agree with, and some I don't. Some of them are immediately relevant, while others might have you scratching your head as to why I've included them. But besides coming into my field of view, they have something else in common, something very unsettling, which will be revealed at the end of the article.

Oh I've been smiling lately, dreaming about the world as one
And I believe it could be, some day it's going to come
'Cause out on the edge of darkness, there rides a peace train
Oh peace train take this country, come take me home again

If you hear the song I sing
You will understand
You hold the key to love and fear
In your trembling hand
Just one key unlocks them both
It's there at your command
C'mon people, now
Smile on your brother
Everybody get together
Try to love one another
Right now

I wake up in the morning and I wonder
Why everything's the same as it was
I can't understand, no, I can't understand
How life goes on the way it does

I saw a film today oh boy
The English Army had just won the war
A crowd of people turned away
But I just had to look
Having read the book
I'd love to turn you on

Six o'clock—TV hour
Don't get caught in foreign towers.
Slash and burn, return, listen to yourself churn.
Locking in, uniforming, book burning, blood letting.
Every motive escalate. Automotive incinerate.
Light a candle, light a votive. Step down, step down.
Watch your heel crush, crushed, uh-oh, this means no fear cavalier.
Renegade steer clear!
A tournament, tournament, a tournament of lies.
Offer me solutions, offer me alternatives and I decline.
It's the end of the world as we know it...and I feel fine

Yo, this is the message to all that can hear it.
If you got secret information now's the time to share it.
Call your congresswoman, your senator, your Mayor.
It's time for all the scholars to unite with all the playas.
Rearrange and see, times is definitely changing.
They used to tap the phone, now they tapping while you paging me.
It's crazy yet it's plain to see who's the enemy. Who's left?
The NRA, the ATF, the AMA? OK, OK, it's all irrelevant.
'Cause in the new millennium there'll be no central intelligence

By order of the prophet
We ban that boogie sound
Degenerate the faithful
With that crazy Casbah sound
But the Bedouin they brought out
The electric camel drum
The local guitar picker
Got his guitar picking thumb
As soon as the shareef
Had cleared the square
They began to wail
The shareef don't like it

I close my eyes, only for a moment and the moment's gone.
All my dreams pass before my eyes in curiosity.
Dust in the wind

How many times must a man look up
Before he can see the sky?
How many ears must one man have
Before he can hear people cry?
How many deaths will it take till he knows
That too many people have died?
The answer, my friend, is blowin' in the wind

I'm inferior? Who's inferior?
Yea, we need to check the interior
Of the system that cares about only one culture
And that is why
We gotta take the power back
To expose and close the doors on those who try
To strangle and mangle the truth
'Cause the circle of hatred continues unless we react
We gotta take the power back

Anyone perfect must be lying, anything easy has its cost
Anyone plain can be lovely, anyone loved can be lost
What if I lost my direction? What if I lost sense of time?
What if I nursed this infection? Maybe the worst is behind
It feels just like I'm falling for the first time

They say Spain is pretty though I've never been
Well Daniel says it's the best place that he's ever seen
Oh and he should know, he's been there enough
Lord I miss Daniel, oh I miss him so much
Daniel my brother you are older than me
Do you still feel the pain of the scars that won't heal
Your eyes have died but you see more than I
Daniel you're a star in the face of the sky

I wish that I could fly
Into the sky
So very high
Just like a dragonfly
I'd fly above the trees
Over the seas in all degrees
To anywhere I please

Won't you look down upon me, Jesus
You've got to help me make a stand
You've just got to see me through another day
My body's aching and my time is at hand
And I won't make it any other way

When darkness comes
And pain is all around,
Like a bridge over troubled water
I will lay me down

Imagine there's no countries
It isn't hard to do
Nothing to kill or die for
And no religion too
Imagine all the people
Living life in peace

And in the streets the children screamed
The lovers cried, and the poets dreamed
But not a word was spoken
The church bells all were broken
And the three men I admire most
The Father, Son and the Holy Ghost

—CONTINUED ON PAGE 239

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MASTERING FOR 5.1

What the Masters Have To Say

By Paul Verna

EVEN THOUGH THERE IS STILL AMPLE UNCERTAINTY ABOUT HOW THE 5.1-CHANNEL REVOLUTION WILL PLAY OUT IN THE MARKETPLACE—WITH FORMAT CONFUSION CHIEF AMONG THE OBSTACLES—MASTERING ENGINEERS WHO HAVE BEEN WORKING IN THE MEDIUM SINCE ITS INCEPTION HAVE LEARNED MANY LESSONS ABOUT HOW TO BEST DELIVER THEIR CLIENTS' MULTICHANNEL PROJECTS TO THE HOME THEATER.

THREE OF THE TOP ENGINEERS—BOB LUDWIG, DENNY PURCELL AND STEPHEN MARCUSSEN—TOOK TIME TO SHARE THEIR VIEWS WITH *MIX* ABOUT THE AESTHETICS, LOGISTICS AND TECHNICAL ASPECTS OF SURROUND. EACH OF OUR INTERVIEWEES IS AN ENGINEER/FACILITY OWNER WHOSE BODY OF WORK REPRESENTS THE STATE-OF-THE-ART IN 5.1-CHANNEL MASTERING.

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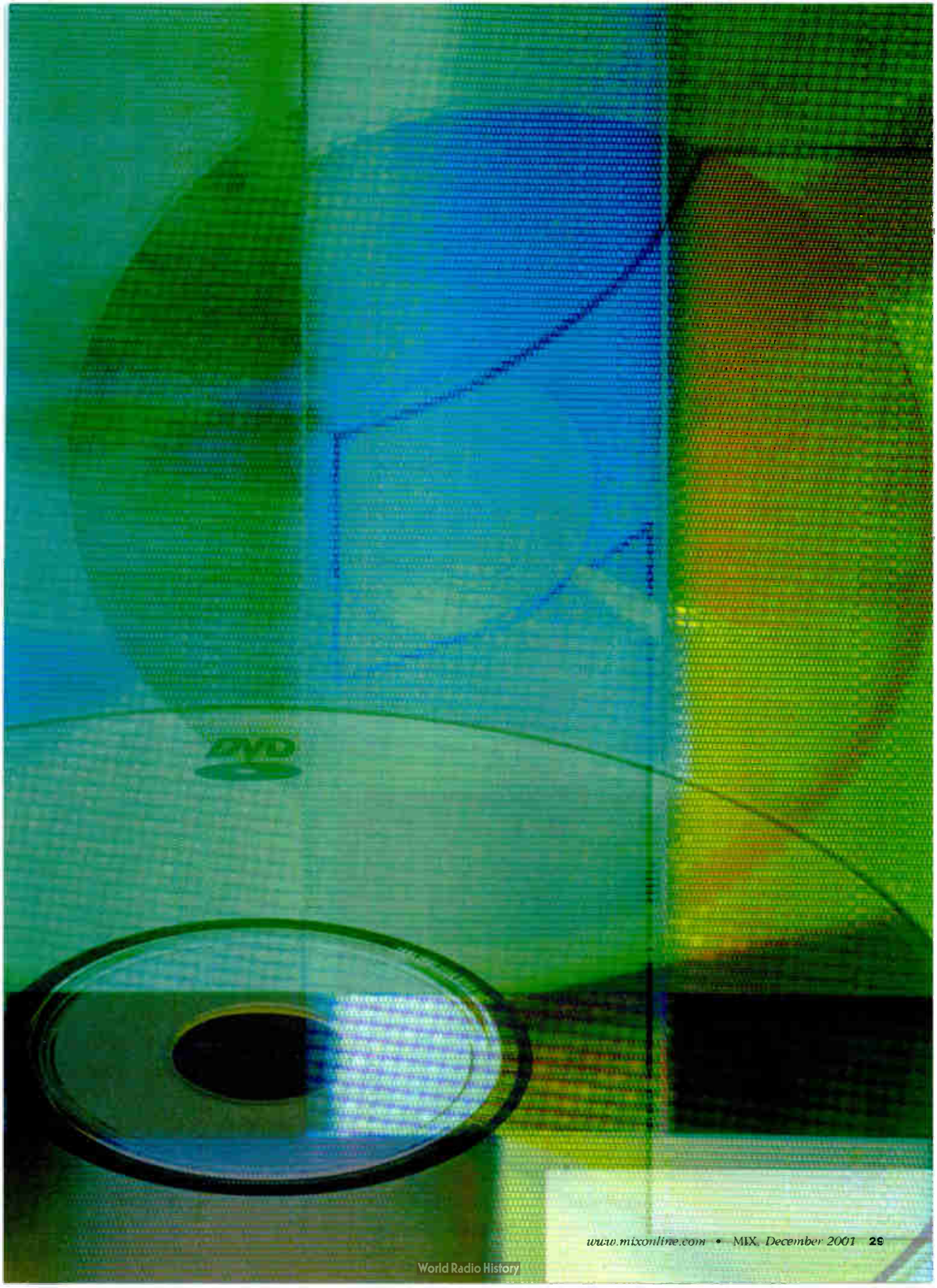

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MASTERING FOR

Bob Ludwig's Gateway Mastering and DVD in Portland, Maine, was already renowned as one of the world's leading music mastering houses when Ludwig decided, early on, to take the plunge into DVD and, later, Super Audio CD. Like his counterparts in the audio mastering business, Ludwig took a no-holds-barred approach to audio integrity, sparing no expense in his quest for the ultimate sound. However, unlike the vast majority of music specialists, Ludwig also embraced the visual and interactive side of the DVD experience with an authoring department headed by Brian Lee, who has been at Gateway since soon after the studio opened in 1993.

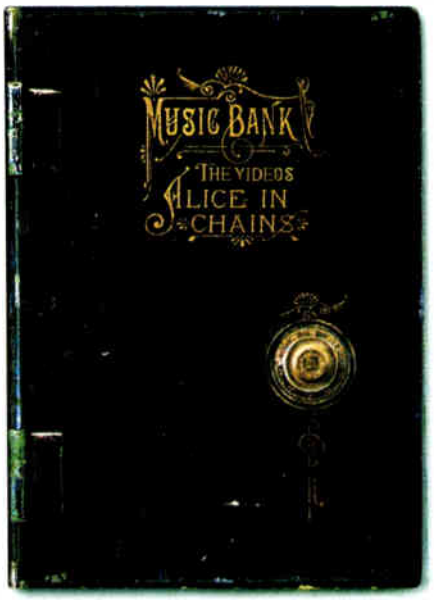
Similarly, Purcell's Georgetown Mastering in Nashville has a reputation for turning out some of the most acclaimed music recordings in the business, with clients including Neil Young, Mark Knopfler, the Dixie Chicks, and a host of other rock, pop and country stars. An early believer in the power of surround sound, Purcell was instrumental in setting high audio standards for the DVD-Audio specification. He also has been a key proponent of DTS, both in its initial CD incarnation and in its current DVD-based version.

Los Angeles-based Marcussen—who recently opened an eponymous studio after serving for two decades at Precision Mastering, and then operating briefly out of the now-defunct A&M Mastering Studios—is a relentlessly musical engineer whose clientele reflects his commitment to quality: e.g., Johnny Cash, Alice in Chains and Tom Petty. Having experimented with DVD mastering at A&M, Marcussen built his new room as a surround environment (this month's cover), and has since done a significant amount of DVD-Audio and DVD-Video work.

Creatively and technically, Ludwig, Purcell and Marcussen have different preferences and methods. However, they share a passion for the 5.1 experience and a belief that surround is here to stay, notwithstanding some of the technical and marketing hurdles that stand in its way.

"There's never been a doubt in my mind that surround is going to make it because of the success of DVD-Video," says Ludwig. "More and more, people are going to start putting in home theater systems. There is a hell of a lot of Dolby chips out there. Unlike quad, where there were a lot of reasons why it didn't succeed, including sound quality and technical reasons, there are enough numbers with DVD that this isn't going to go away."

Having said that, Ludwig is quick to share his concerns about the various surround formats. As far as DVD-Video is concerned, Ludwig is less-than-thrilled about the format's audio limitations, which necessitate the use of lossy compression systems in order to deliver six discrete channels.



"The lossy compression systems, Dolby Digital and DTS, are similar to [Sony's] ATRAC, in that they can't be compensated for because it's a resolution situation," says Ludwig. "It's like saying, here's a cassette, make it sound like a 30 ips half-inch tape. There's no knob you can use that'll do that."

He adds, "From a frequency response standpoint, they're both pretty good. We did a test where we ran compressed and uncompressed data into a frequency analyzer. When you subtract the two waveforms, you get a flat line."

Despite his reservations about lossy compression, Ludwig has no choice but to use it, because at least 50% of the DVDs he masters are released on DVD-Video. The rest are coming out on DVD-Audio, which allows for six discrete channels of uncompressed audio. (Technically, the audio is compressed, but the algorithm that is used, Meridian Lossless Packing, is "lossless," i.e., bit-for-bit identical at the input and output.) For more on Ludwig's views on DVD-A and much more, flip to "Mix Interview," page 56.

Purcell, too, has done a broad range of projects in a variety of formats, including DVD-Video (using DTS and Dolby compression), DVD-Audio and DTS' proprietary CD-sound carrier. Among his credits are Vince Gill's *High Lonesome Sound*, Mark Knopfler's *Sailing to Philadelphia*, Van Morrison's *Moondance*, titles by the Doobie Brothers and America, and Neil Young's *Harvest*, which has yet to be released.

Purcell has carved out a niche as a DTS specialist, first with the early CD-based version of the format, and now with the DVD permutation. However, despite his sonic preference for DTS, Purcell advises

Stephen Marcussen

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all program developers to put Dolby AC3 bitstreams on their DVDs. "Thirty million players can't be wrong," he says, referring to the installed user base of Dolby-equipped DVD players.

Compression or no compression, DVDs have captivated the hearts of music fans—and engineers—because the surround experience is compelling unto itself, according to Marcussen. He says, "When you hear some of these DVDs, they sound great. You have this plane of sound that has a tremendous amount of dimension."

From a professional's standpoint, too, the bigger canvas has opened up new creative possibilities. "Creatively, it's interesting, because you don't have to be as aggressive as far as levels go," says Marcussen. "I'm sure levels will inch up over time, but I hope they don't. It would be really tiring to be in the middle of something that's pumped to the wall. One of the things I've learned is that less is really more. When you put yourself in that kind of landscape, it's cool that things pop, and it's cool that things get quiet."

Marcussen uses five B&W 802 speakers to monitor the 5.1 projects he's done, which include Alice in Chains' *Music Bank: The Videos*, Hootie & The Blowfish's *Cracked Rear View*, and a live DVD by Ringo Starr & His All-Star Band. Marcussen arranged the speakers according to the ITU spec, which calls for 30° angles for the front left and right speakers in relation to the sweet spot, and 110° angles for the rears.

Denny Purcell

"That configuration gives you a bigger sweet spot," Marcussen explains. "When you're sitting at the console, you can go a little off to either side and still hear a good left/right balance, or you can roll back in your chair and not be blown out by the rears."

Purcell's speaker placement is similar to Marcussen's, if not more homespun. "I believe that three or four guys on a porch can come to clarity much more quickly than 20 guys in a boardroom," he says, referring to the years-long corporate

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jostling that yielded the DVD-Audio specification. "So, after [producer/engineer] Chuck Ainlay and I—and [MCA Nashville president] Tony Brown and [DTS principal] Rory Kaplan—scratched our heads, we came up with what I call 'Hillbilly 5.1.' We used a plum bob, a level, a measuring string and a protractor and ended up with two equilateral triangles. You put the sub where you want and the center in front of you. Chuck uses that method to mix, and I use it when I master."

Regardless of the placement of the five main speakers, the low-frequency effects (LFE) channel is a challenge unto itself, according to the engineers surveyed for this story.

Ludwig says, "The main thing about mastering for DVD-Video is bass management. It's really important—even if you have five full-range speakers that go down to 10 Hz—that you check everything on a bass management system of some kind. When you're monitoring discretely, the LFE and five main channels aren't being electrically combined. You need to hear what they sound like when they're being combined. In my situation, the TC Electronic System 6000 has enough stuff on it that you can do a downmix and hear what it sounds like. Also, we set up our second room with a consumer Bose system, which uses small satellite speakers and severe bass management. We encode the master with Dolby Digital and hear it there; sometimes, we need to make adjustments."

Besides compression, speaker placement and bass management, other technical challenges in multichannel mastering include finding the processing and authoring tools for the job. In the beginning of the 5.1 era, dedicated multichannel equipment was virtually nonexistent, which led engineers to fashion their own mastering chains from a motley range of existing analog and digital gear.

"When I did Steely Dan's *Gaucho*, which was one of the earliest [projects] I did, almost every project was done on a different piece of gear to see how it would do," recalls Ludwig. "First, I mastered on a Yamaha 02R as well as on a beta version of a console Neve was developing called the Logic 2. Then, when

Bob Ludwig

96kHz stuff started happening for DVD-A, there was initially a dearth of gear. The only stuff I had available was Daniel Weiss boxes. There were no 6-channel compressors or EQs. But now, things have gotten a lot better. There are more and more 6-channel processors, like the TC Electronic System 6000, which does six channels of EQ, compression or bass management. Or the Z-Systems EQ or Weiss, which just came out with a 96k de-esser."

While the processing equipment needed to create DVDs has been in short supply until recently, the digital and analog console choices have also been limited. Ludwig, Purcell and Marcussen are all either using or developing custom consoles to accommodate their 5.1 channel work. Ludwig's will be a multichannel board he plans to use for the analog projects that come into Gateway, like R.E.M.'s *Reveal*. Similarly, Marcussen uses a custom-built analog console that he likes both for its sonics and for the fact that its analog architecture gives him maximum flexibility at a time when the digital formats are still in the process of shaking themselves out.

"The analog console came about as a result of two factors," explains Marcussen. "First, a large portion of my work is still analog. That's not to say there's anything wrong with digital; higher sampled digital sounds great. But there are days when that analog console just wins. The other factor is that we wanted to be ready for both formats, DVD and SACD."

Purcell is building a new 5.1 room that will feature a customized analog/digital console. Based on acoustical measurements that indicate that mastering rooms sound best when there is as little mass as possible in them, Purcell is intent on building a small-footprint console that will handle his analog and digital routing and processing needs. A tall order, to be sure, but if anyone can do it, Purcell can. In the meantime, he uses a Neve console for his analog work and a Sony DMX-R100 for digital projects.

Most of the digital consoles and processors currently available are Pulse-Code Modulation (PCM) units. That is, the units employ the digital audio process that underlies most multitrack recording, processing and mixing, as well as the CD and the DVD. Initially available only at CD-level resolution (i.e., 44.1 kHz and 16 bits), PCM gear has grown in the past few years to accommodate DVD specifications, which call for 24-bits sampled at

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resolutions of up to 192 kHz.

On the other hand, the Super Audio CD format—based on the Sony/Phillips Direct Stream Digital (DSD) technology—is still in its infancy. Accordingly, very little production equipment is available to record, mix or master in DSD. In that regard, SACD is today where high-resolution PCM was four years ago.

"Sony knows that, in order for SACD to be more usable in the marketplace, they need to get more gear out there," says Ludwig. "If there was a problem getting 96 kHz for a while, there's definitely a problem getting SACD equipment. Almost everything has to be done in the analog domain or upsampled from PCM, which almost defeats the purpose of SACD."

Despite its current technological limitations, SACD is the most satisfying digital format Ludwig has heard to date. "Aesthetically, I like SACD a lot," he says. "My body seems to be more relaxed when I listen to it. There's something very attractive about it. It's the same feeling as when I'm listening to my analog tape machine."

As SACD shifts into a higher gear and the DVD-based formats—DVD-Audio and Dolby, and/or DTS-encoded DVD-Video—solidify their hold on the market, engineers continue to wrestle with some of the philosophical questions that this format explosion raises.

"There's the possibility for a lot of consumer confusion with DVD," says Ludwig. "I look at my dad, who just barely made it through DVD-Video. Now you're going to have DVD-Audio, and a couple of record companies don't want to put the backward-compatible Dolby Digital stream on their discs. That could make a bad situation even worse in the marketplace."

Purcell says that the engineering community's love affair with surround sound means nothing if the customer doesn't embrace the medium. "We're doing a science experiment to ask this question: If we were to give the consumer the best-sounding, highest resolution, closest-to-the-original source that's been made, would he attach value to it, think it had musical worth and want it?" says Purcell. "I'm concerned for all of us [engineers] that we're in this self-adulation mode and, until we get to the consumer, we won't even know the answer to that question. But I do know that, resoundingly, what I get from anybody who never heard 5.1 [before] is, 'It's what I used to hear, only now I'm hearing everything that's going on.'"

Marcussen believes that, despite the threat of format confusion, multichannel has arrived and is here to stay. Accordingly, he predicts that he will be doing

"two or three times as much multichannel work next year as we did this year."

If his prediction doesn't bear out, then he will have no trouble parceling out the 5.1 equipment in which he has invested in. "If surround went away tomorrow," he says, "I'd be able to equip two more studios." ■

Paul Verna is Mix's New York editor.

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World Radio History

SURROUND MONITOR SYSTEMS

This Year's Top-of-the-Line Models

A custom ATC Loudspeakers installation at Sony Music Studios, New York.

By Randy Alberts

No consumer format in the history of audio has succeeded so quickly as DVD, which offers attractive functions and features such as 5.1 surround sound, interactive menus, and bonus tracks in a format that's ideal for both home and portable applications. Consumers are upgrading to multichannel home sound in record numbers.

Today, record labels and movie studios—both majors and independents—know that there's a large, appreciative audience looking for new product, which is good news for audio pros. With the production of new releases and mastering/remixing yesterday's hits (music or cinema), the surround floodgates are wide open and getting wider.

One of the key ingredients in upgrading your studio for surround production is a quality monitoring system, and we queried more than 30 loudspeaker manufacturers about their top-of-the-line surround systems. Each company listed here offers its best system for recording, editing and mixing in surround, whether that's a custom-designed system and/or a packaged surround setup. Most of the companies also offer downsized systems for smaller rooms and project facilities—and manufacturers' contacts are provided so that you can explore further on your own—but for the purposes of this article, we wanted to examine their ultimate systems.

A.D.A.M. (Advanced Dynamic Audio Monitors), distributed by McCave International, offers the ASM-3 Surround Monitoring System ($10,995). Consisting of five S3-A active near-/mid-field speakers and the company's Sub-1 active subwoofer, the ASM-3 Surround System is developed in Germany under the direction of Klaus Heinz. Based on Heinz's work with Dr. Oskar Heil, inventor of the modern ribbon transducer (Heil Air-Motion Transducer), the three-way S3-A includes A.D.A.M.'s proprietary ribbon technology to produce transients to 35 kHz. Each S3-A monitor includes three 100-watt amps, and can be oriented horizontally or vertically. The Sub-1 subwoofer has dual 10-inch drivers driven by a 200W amp. Max system SPL exceeds 122 dB (at 1 meter), down to 25 Hz.

ATC Loudspeaker Technology (distributed in the U.S. by Flat Earth Audio) offers a surround package that includes the British-built SCM15AP4 Pro and SCM50A Pro reference monitors, and SCM 0.1/15A subwoofers. Designed with medium-sized rooms in mind, the $79,900 package comprises three SCM15AP4 Pro active monitors ($16,700 each) for the front speakers, two SCM50A Pro ($7,050 each) three-way active speakers for the rear channels, and two of the company's SCM 0.1/15A subwoofers ($7,850 each). The SCM15AP4 Pro front speakers include a dedicated amp and feature repositionable tweeters for horizontal mounting, a 375mm bass driver and a 150-liter enclosure. The SCM50A Pro rear-channel speakers include six matched MOSFET amp blocks to provide 112dB max SPL. The twin SCM 0.1/15A subs, each with built-in 1,000-watt amps, can be used as the LFE source in a multichannel system

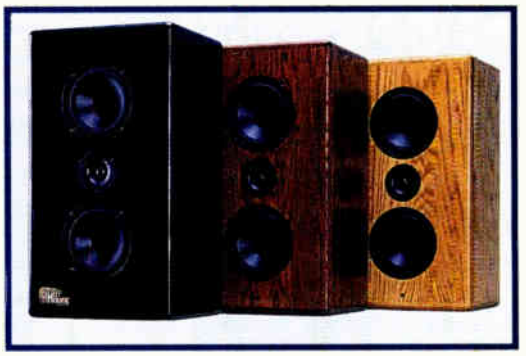
HHB Circle 5A

Yamaha MSP10

World Radio History

Genelec 1035B

JBL LSR28P



Hot House Professional ARM265

or to extend extreme LF in 2-channel systems with smaller monitors.

Bag End Loudspeakers' studio surround monitoring system comprises five of the company's MM-8H Time-Align monitors ($1,320 each) and one Infrasub-18 ELF subwoofer ($1,670), for a total package price of $8,270. Targeted at post, mastering, and film/video production facilities, the MM-8H is a two-way, coaxial, passive monitor with an 8-inch LF cone and 1.75-inch aluminum HF compression driver. Weight is 29 pounds, and the cabinet is 16.5x12.5x8.5 inches (HxWxD). Bag End's Infrasub-18 is an extended low-frequency powered sub for the project studio and home theater. The unit has an 18-inch ELF cone transducer and an onboard 400-watt power amp, with a built-in ELF dual integrator to provide a flat acoustical response all the way down to 8 Hz. The sub is available in black vinyl; walnut, oak, maple and rosewood enclosures are also available.

Blue Sky International's THX pm3-approved Blue Sky System One ($3,295) is designed for reference near-field monitoring, and includes a remote 5.1-channel volume control with full bass management. System One includes five SAT 6.5 bi-amplified satellite speakers, one SUB 12 200-watt subwoofer and one BMC 5.1 Channel Bass Management/Remote Controller. The SAT 6.5 satellite speakers ($425/each) feature a cast-aluminum frame, a 6.5-inch hemispherical driver, and a 1-inch diaphragm tweeter with integral waveguide for improved off-axis response. Powered by dual 100W amps with an optimized electronic crossover, the SAT 6.5 Satellites deliver a frequency response of 80 to 20k Hz (±3 dB), measure 12x8x10 inches (HxWxD) and include OmniMount Series 100 mounting inserts. Specifically designed to complement the SAT 6.5 speakers, the SUB 12 ($545) includes a 12-inch forward-firing woofer and a dedicated 200W amp; frequency response is 20 to 200 Hz. Rounding out the System One package is the Blue Sky BMC ($625), a rackmount main processor, which also functions as the input unit. (I/O connections are balanced XLR.) Connected via RJ-11 telephone cabling, the microprocessor-controlled remote provides control over channel/system level, monitor/system mutes, system reference level and more.

Dynaudio Acoustics (distributed by TC Electronic) offers the BM 5.1A surround bundle for $11,198, a considerable savings over the unit prices. The system includes five BM15A speakers ($3,599 each) and a BX30 subwoofer ($2,200). The BM15A is a large, two-way, active monitor with a 10-inch woofer, a special version of the Dynaudio ESOTEC soft-dome tweeter, and an electronic phase-aligned crossover with built-in dual MOSFET amps. The front-ported BM15A's cabinet has radiused edges on the front baffle to reduce boundary effects. Dynaudio's ported BX30 subwoofer is designed to work in tandem with the company's BM15A and BM6A monitors. Features include selectable internal filtering, continuously adjustable phase, a 130-watt amp, and a 305mm woofer with a 102mm voice coil.

The flagship surround system from **Event Electronics** includes five 20/20bas bi-amplified Direct Field Monitors and the 20/20/15 System Subwoofer at a system cost of $3,695. The mag-shielded 20/20bas mains ($499 each) are two-way active monitors with two onboard amps (130-watt woofer; 70-watt tweeter), an 8-inch polypropylene woofer, and a 25mm Ferrofluid-cooled, silk-dome tweeter. The crossover (2.6kHz) is an active fourth-order asymmetrical type, and the 20/20bas has a frequency response of 38 to 20k Hz (±2 dB). Additional features include variable input gain and high-/low-frequency trims, and the cabinet measures 10.25x 14.75x11.75 inches (WxHxD). The 20/20/15 subwoofer ($1,199) features a 15-inch, long-throw woofer. The unit includes a 250W linear amp, frequency response is 28 to 120 Hz, and maximum SPL at 1 meter is 120 dB. The integrated full-bass management control system has six discrete, active balanced inputs with pass-through outputs, and controls include LFE channel input sensitivity, monitor input sensitivity, mute, monitor/subwoofer phase control and a Bypass switch.

Genelec offers a wide range of monitors and subwoofers for customized high-end surround monitoring solutions. For example, the Genelec system that was recently installed at Right Track Studios (featured on the cover of the October 2001 issue of *Mix*) includes five Genelec 1035B Main Control Room Monitor Systems and four Genelec 1094A subwoofers. Such a system costs in the neighborhood of $123,000, shipping included. Each 1035B has two 15-inch woofers with a pair of 1,100-watt amps, two Genelec 5-inch mids, each with its own 250W amp, and a single 2-inch HF compression driver driven by its own 350W amp. Designed for flush mounting, each 1035B offers a frequency response of 29 to 22k Hz (-3 dB) and a peak SPL capability of 136dB SPL per pair (at 2 meters). Two 5-inch, high-sensitivity, direct-radiating cone drivers are loaded with Genelec's Directivity Control Waveguide, which is user-adjustable and reportedly improves stereo imaging, increases driver efficiency, and reduces distortion and cabinet edge diffraction. At Right Track, four Genelec 1094A subwoofers, each with a single 15-inch driver and 400W amp, provide LF energy down to and below 25 Hz. The 1094A sub features a front-loaded driver for improved passband efficiency and stopband rejection.

Griffin Audio Design's top surround system includes five loudspeakers, three bass management controllers and a pair of subs, all for a total cost of $74,750 (amplification not included). This system includes five Griffin Mastering Loudspeakers ($12,450 each, and available in both

World Radio History

SURROUND MONITOR SYSTEMS

freestanding or in-wall models), two Griffin .1 subs ($6,250 each) and the Griffin ACU (Active Controller Unit). The Griffin Mastering Loudspeaker is a three-way, active/passive design capable of providing over 120dB dynamic range and a flat response from 22 Hz to over 20k Hz. The two Griffin .1 subs incorporate the same RCF L18P300 18-inch woofer as in the Mastering Loudspeaker and are used in tandem. Each Griffin ACU contains the crossover from the bass system to the passive mid/tweeter system, as well as tilt and level control for all bands. All Griffin products are available exclusively through Francis Manzella Design Limited.

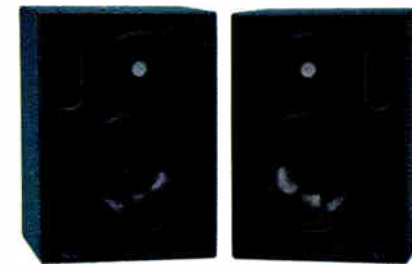
New for 2001, **Hafler** offers a surround system made up of five TRM8.1 powered monitors ($749 each) and a TRM12s powered sub ($699). Featuring a more streamlined, vinyl-clad enclosure than its predecessors (the TRM8 and TRM6), the new TRM8.1 is a bi-amped, two-way system offering a free-field frequency response of 45 to 21k Hz. An integrated 75-watt amp for the HF driver and a 150W LF amp power the system's frequency response of 20 to 20k Hz (0.1% THD). Signal-to-noise ratio is greater than 100 dB. The TRM8.1, which incorporates Hafler's Diamond Series Trans•nova amp technology, is mag-shielded and can be mounted in two different positions via Omnimount hardware. Hafler's TRM12s subwoofer includes a 12-inch woofer with 2.5-inch voice coil. The downfiring speaker, which is mounted in a 2.0-cubic-foot vented cabinet, is driven by the company's advanced VFET Transana 200W power amp and can output in excess of 115dB SPL.

The Surround Pack ($4,895) from **HHB Communications** includes five Circle 5A active monitors and a Circle 1 subwoofer. A new cone design in the Circle 5A promises to eliminate many of the problems associated with conventional speaker cones, and features variable surface thickness to minimize resonance. Its 140-watt amp drives the 8-inch bass/mid driver, and a 70-watt amp powers the tweeter. Available in both passive and active versions, the mag-shielded Circle 5A is available as a pair or with an additional center speaker (HHB Circle 5AC) for surround work. The powered Circle 1 sub combines a 12-inch woofer with a 100W amp module and includes 5-channel active filtering. A Mode switch for various surround sound decoders and a LF boost control for low-level monitoring are included. Connection to the Circle 1 is handled via six balanced XLR inputs.

The ARM265 Surround System ($29,999) from **Hot House Professional** is a freestanding setup intended for medium- to large-sized control rooms. The system's flat, wide bandwidth response is provided by five bi-amplified ARM265 Active Reference Monitors (250-watt high and low-frequency amps; -3 dB @ 30 Hz and 21.5k Hz), an ASB215 Active Sub Bass system (-½ dB @ 15 Hz), and a Model Two Thousand High-Resolution Control Room Amp (1,200 watts per channel). All necessary Teflon wiring and full isolation mount system parts are included. The ARM265 reference monitors have input level, ultra-high frequency and room compensation frequency-adjustment switches, while the SBX Controller affords flexible subwoofer alignment capabilities. The ASB215 sub system is driven by the SBX Subwoofer Crossover Controller and adjusts to compensate for varying room size and speaker placement. A slightly lower SPL version of the ARM265 Surround System for smaller listening environments, available for $22,999, substitutes a pair of PRM165s driven by a Model Four Hundred amp for the rear ARM265s and an ASB115 subwoofer.

JBL offers a complete 5.1 surround monitoring system ($7,174) based on the TEC Award-winning, bi-amplified LSR28P monitor ($1,179 each) and the LSR12P subwoofer ($1,279). Incorporating JBL's proprietary Linear Spatial Reference (LSR) technology, the LSR28P includes an 8-inch, low-frequency transducer and a 1-inch tweeter. An active crossover system feeds into 250-watt and 120W amps for low and high frequencies, respectively. A notable feature of the system is JBL's Differential Drive technology, which utilizes two voice coils in each driver and a third coil to act as a dynamic brake at maximum excursion, reducing audible distortion and doubling power handling. Frequency response range is 50 to 20k Hz (+1, -1.5 dB), and the LSR28P can reproduce peaks greater than 111dB SPL at 1 meter. The LSR12P powered sub offers a 28 to 80Hz frequency response range (-6 dB). The internal amp provides 250 watts continuous. Additional features include multivoltage capability and a choice of input levels for -10dBv and +4dBu operation.

Now distributed by Stanton Magnetics, **KRK Monitors** offers a range of speaker/subwoofer combinations. One such system includes five V88 monitors ($799



KS Pro Sound ADM 2

M&K Professional MPS-2510P

Mackie Designs HR824

NHT Pro C-20

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Shown is the VS2108 full range monitor with the VS1115 Sub-Woofer/ Surround sound manager, featuring 4 inputs – LCR plus a separate effects input with independent filtering. Just one of the many options from Quested's broad range of professional products for surround sound monitoring.

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World Radio History

SURROUND MONITOR SYSTEMS

each) and one S12 subwoofer ($999). The bi-amped, video-shielded V88 houses a 160-watt amp for the low end and a separate 60W amp for the tweeter; each speaker uses a 1¼-inch polymer tweeter dome, an 8-inch woven Kevlar bass driver, and offers gain and HF/LF controls. The S12 sub sports both vertical and horizontal internal braces, a 12-inch woven Kevlar woofer and 160W amplification. KRK has also just released a surround package, the company's 5.1 Orbit Surround Pack ($1,749).

KS Pro Sound Systems of Germany (distributed by CAP Audio) offers a top-of-the-line surround system including five ADM 2 reference monitors, two ADM W subwoofers and a remote-control unit. The ADM 2 ($4,950 each) is a two-way, active, studio reference monitor that includes both analog and AES3/EBU digital inputs—the system incorporates a 24-bit digital controller with FIRTEC internal 32-bit floating-point processing. Components include an 8-inch woofer, a 1-inch tweeter and a 200-watt amp; frequency response is 38 to 20k Hz. The ADM W subwoofer ($3,250 each) features the same analog and digital input connections, and contains two 10-inch speakers and a 400W amp; frequency response is 25 to 100 Hz. Overall system control is via a KS remote-control unit ($295). Both monitors and subs feature quality wood cabinets in gray black finish.

M&K Professional's top-of-the-line multichannel monitoring solution consists of five of the company's MPS-2510P monitors ($1,999 each), an MPS-5410 subwoofer ($2,999) and an LFE-4 Bass Management System ($800). M&K's system is designed for music, mastering, broadcast and film sound post-production in medium-sized control rooms (3,500 cubic feet or a monitoring distance of 6 to 8 feet). Based on M&K's acclaimed MPS-2510 speaker, the new bi-amplified MPS-2510P is THX pm3-compliant and features dual 150-watt amps with user-adjustable gain control. The MPS-5410 powered sub has dual 12-inch drivers, each with a long-throw, high-power voice coil, and incorporates M&K's new 400W Active Balanced Push-Pull Dual-Drive Amp. The company's LFE-4 Bass Management System accepts inputs for all five surround and LFE channels, and provides an 80Hz highpass filter for the five main channels.

Now THX pm3-certified, the HR824 from **Mackie Designs** is a bi-amplified monitor with an 8.75-inch polypropylene cone woofer and a 1-inch aluminum dome tweeter with a Ferrofluid-cooled voice coil. The monitor's LF amp is rated at 150 watts to a 4-ohm load; the HF amp is rated at 100 watts into 6 ohms. The HR824 uses a modified Linkwitz-Riley crossover configured at 24 dB/octave at 1,800 Hz. Its free-field frequency response is rated at 39 to 22k Hz (±1.5 dB). The HR824's rear panel provides both ¼-inch and XLR input jacks, plus switches for acoustic space, LF roll-off and HF adjustment. MSRP: $799 each. Unveiled at AES Amsterdam and slated to begin shipping next month is the HRS120, a companion subwoofer that combines a 12-inch LF driver, 12-inch passive radiator and onboard 600W amp.

Connect five **Meyer Sound** X-10 Linear Studio Monitors, a pair of X-800 Studio Subwoofers and one X-01 Crossover, and you get a top-of-the-line surround monitoring solution from Meyer Sound. The X-10 ($21,000/each) is a self-powered, bi-amplified, two-way studio monitor with a 15-inch woofer and dedicated 1,200-watt MOSFET amp. Proprietary Power-Sensing Active Control (PSAC) technology with a pressure-sensing device positioned in front of the woofer ensures consistent linear response. The X-10's HF section includes a 4-inch diaphragm driver with low-distortion waveguide and complementary power MOSFET 620W amp. Designed to work specifically with the X-10s, Meyer's X-800 sub ($5,250) extends the dynamic headroom of the monitors by up to 5 dB while maintaining system linearity. The X-01 Crossover ($3,450) allows connecting single or dual X-800 subs to an X-10 system for surround operation, and includes phase correction and level balancing. Included with all prices is Meyer Sound's SIM II alignment service for each installation. (Travel and expenses not included.)

The M3D and M3F systems ($75,000 each, tuning included) from **Munro Associates** are both complete, active 5.1 surround sound systems. Featuring five M3D cabinets, two single 18-inch subwoofers, three XTA DP224 digital crossovers, six Dynaudio Acoustics T1000 amps and a Munro custom monitor switching system, the M3D system is designed for audiophile-quality 5.1 monitoring in free-standing or soffit-mount applications. The THX-approved M3F version of this system is designed for applications where L/C/R

Tannoy System 800A

KRK V88

Truth Audio TA-2A

Griffin Mastering Loudspeaker

A.D.A.M. ASM-3

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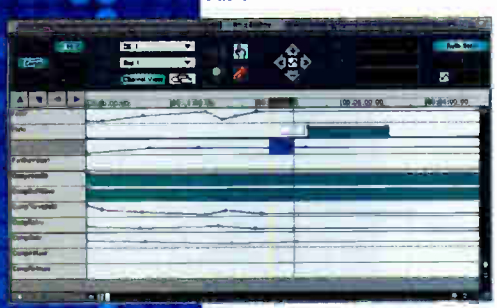
Mackie Real Time OS™ 3.0 Fat Channel Screen.



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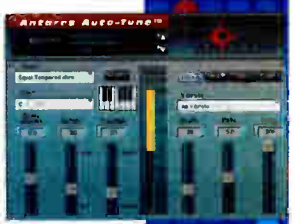

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World Radio History

SURROUND MONITOR SYSTEMS

cabinets must be mounted behind a projection screen or at a distance from the listening position. A switching system for both M3D and M3F versions allows the user to switch between 5.1 monitoring and stereo modes. Both systems are available in a variety of hardwood and matte black finishes.

NHT Pro offers a variety of surround combinations, most notably its ABC 5.1 system ($6,800), based on the company's A-20 Stereo Monitoring System ($1,800 a pair). The system's 250-watt amp, though designed and EQ'd for the A-20, is rackmounted in order to keep monitor size smaller, avoid vibration issues and put system controls close to the mix position. The two-way acoustic suspension A-20 incorporates a 6½-inch woofer and a 1-inch metal-dome tweeter. Features include balanced inputs, a 5-position input-sensitivity control and a 5-position high-frequency switch to compensate for distance to the listening position. The B-20 Subwoofer System ($2,000) is a powered subwoofer system consisting of two 14-inch enclosures, each housing a long-throw, 10-inch woofer. As for the A-20, rackmounted 250W amps power the B-20 system; all system controls are the same as the A-20, except for the high-frequency compensation. The B-20 system can operate in either stereo or mono (LFE) modes. Rounding out the ABC 5.1 system is the C-20 center channel speaker ($1,200), which is identical to the A-20 except for a flat front instead of an angled one.

The **PMC/Bryston** BB-5 Active System ($138,000) is a top-of-the-line powered surround system from the **Professional Monitor Company**. The BB-5 monitor is available in active stereo pair configurations and comes in black ash, walnut, oak, cherry and rosewood finishes. Its transmission-line design features a 15-inch radial woofer, 3-inch fabric-dome midrange, and 1-inch silk soft-dome tweeter with double chamber. Available in passive and active versions, the latter includes an external amp and electronic crossover, and sports a frequency response of 17 to 25k Hz. The company's XB3-A sub ($7,000 each) rounds out this massive system with its own 15-inch radial woofer, double-veneered MDF cabinet and 800W power-handling rating.

High-end 5.1 surround systems from **Quested Monitoring Systems** ($54,000 to $113,000, depending on configuration) employs the company's Q412 cabinets for front left and right channels, the Q212 for the center, and either the Q212 or Q412 for rear channels. The Q412 is Quested's largest three-way monitor and is designed for soffit mounting in large control rooms. The Q412 uses the same custom 12-inch radial chassis bass drivers as the Q212, and its mid driver and tweeter are each soft-dome units (3-inch and 34mm, respectively). Both the Q412 and Q212 are supplied with analog crossovers or optional digital crossovers that offer 80 user presets, and four of the company's AP800 amps deliver over 2,000-watts RMS to each cabinet in the Q412 (1,400W RMS in the Q212). Quested's QSB118 subwoofer can be used for bass extension and/or the bass effects channel, and comes with a separate electronics package that also includes the AP800 power amp delivering 450W RMS into 8 ohms. The subwoofer's main cabinet contains one 18-inch driver with a 4-inch, four-layer voice coil, triple rear suspension allowing for peak-to-peak movements up to 20mm, and a vented magnet for enhanced voice coil cooling.

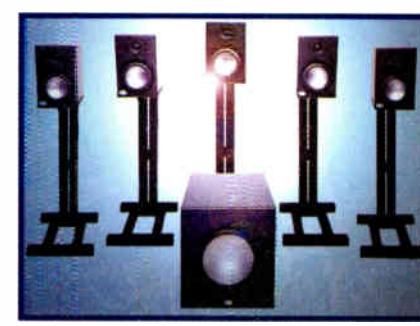
SLS Loudspeakers' SLS 6.1 System ($8,000 in custom oak finish, $6,850 in black) is a digital-ready surround studio monitoring solution that incorporates the company's S8R monitors and a pair of matched PSS12 powered subwoofers. The S8R is a two-way monitor that is used for all channel configurations (5.1 and up), and features a 5-inch ribbon tweeter and an 8-inch woofer in a 19x10½x11¼-inch (HxWxD) enclosure. Frequency response is 44 to 20k Hz (±2.5 dB), and maximum SPL is 110 dB. The PSS12 subwoofer includes a 12-inch woofer, offers a 28 to 150Hz frequency response and features a variable crossover (50 to 100 Hz). The SLS 6.1 System features the company's new PRD500 ribbon driver; SLS' line-source technology reportedly provides higher transient response, extended dynamic range and sonic accuracy.

Offering no less than four 5.1 packages and three 10.2 solutions, **Tannoy**'s top-of-the-line 5.1 system is the company's System 800A Surround Package ($5,736). Comprising five System 800A active loudspeakers and a PS350B subwoofer with bass-management control, the System 800A system can be switched from 5.1 surround to full-range stereo operation via a footswitch, ideal for referencing 5.1 mixes to source-stereo program material. The

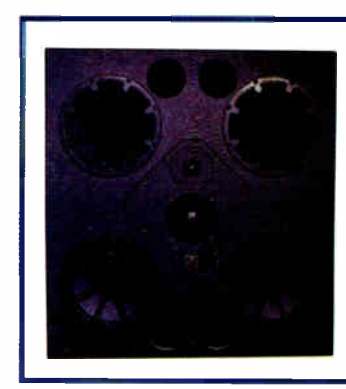
SLS Loudspeakers SLS 6.1 System

Bag End Infrasub-18 ELF and MM-8H

Event Electronics 20/20bas and 20/20/15 sub



Blue Sky SAT 6.5 and SUB 12



Quested Q412

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2001 603

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System 800A monitors, all magnetically shielded, employ Dual Concentric drive units well suited to multichannel operation and are bi-amped (90 watts for both LF and HF sections).

Now handled through Wave Distribution, the TA-2A from **Truth Audio** is an active mid-field design with two 8-inch polycone woofers and a 1-inch, cloth-dome tweeter offering a frequency response of 25 to 20k Hz. Power is via a 530-watt internal amp, yet each monitor weighs just 60 pounds. Retail is $1,499.50 each. The speaker is also available as the TA-2P (passive), an unpowered version that's $749.50. The optional TA-SW active-powered subwoofer features a 12-inch driver, internal 250W amp, and a frequency response that ranges from 32 to 160 Hz (sweepable). The sub is designed to work with either the active or passive TA-2s in 5.1 and 6.1 applications.

One of many custom surround installations by **Westlake Audio** includes a BBSM/Lc8.1 system for Greg Ladanyi at Tidal Wave. In this system, two-way passive BBSM-5 monitors ($1,497.50/each) are used for the five surround channels with a Lc8.1SW subwoofer ($4,795/each) holding down the low end. The BBSM-5s are phase-coincident, low-distortion monitors that each include two 5-inch woofers and a 1-inch tweeter; frequency response is 55 to 20k Hz. Incorporating steep slope crossovers, the BBSM Series monitors can be ordered in bi-wired or passive bi-amplification modes. The passive Lc8.1SW subwoofer stands 27 inches tall by 14 inches wide, contains two 100-inch woofers, weighs 100 pounds, and features a 34 to 18k Hz frequency response.

Yamaha's best pro surround system centers on the company's MSP10 speakers and SW10 subwoofer. The bi-amplified, magnetically shielded MSP10 ($749/each; $799 for sunburst maple finish) reproduces 40 to 40k Hz (-10 dB), and features an 8-inch LF woofer and a 1-inch titanium-dome tweeter, which are powered by 120- and 60-watt amps, respectively. The MSP10's back panel includes a low-cut filter switch at 80 Hz, a 3-position low/high switch, and master volume and tone controls. The SW10 ($849) is a front-ported subwoofer that features a redesigned, long-stroke, 10-inch woofer and built-in 180W power amp; frequency response is 25 to 150 Hz. Three balanced XLR inputs/outputs are included. ■

Randy Alberts is a California-based audio and music author and journalist. His first book, TASCAM: 25 Years of Recording Evolution, *is in final production.*

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Designing THE Music DVD

THE COMPLETE GUIDE

By Gary S. Hall

There's no denying that DVD is now a part of our world. For home video entertainment, it is the medium of choice for millions. Penetration is still numerically less than VHS, but no informed person doubts that DVD will displace that now-venerable format.

The reasons for consumers to accept DVD have as much to do with convenience and control as they do with fidelity of picture and sound. Rapid access to scenes and value-adds, such as interviews and featurettes, are at least as seductive to the consumer as widescreen video and surround sound.

WHY MUSIC DVD?

DVD is great for music, too, in both DVD-Video and DVD-Audio formats. DVD is an attractive option when:

- Music ties to video, as in a concert title.
- Music will be presented in discrete surround.
- Music will be presented in high-resolution/high-sample rate form.
- The presentation includes extras, such as liner notes, bonus videos, interviews, games, sheet music, etc.

Any or all of these can apply to your title. If none applies, then you may as well release on CD.

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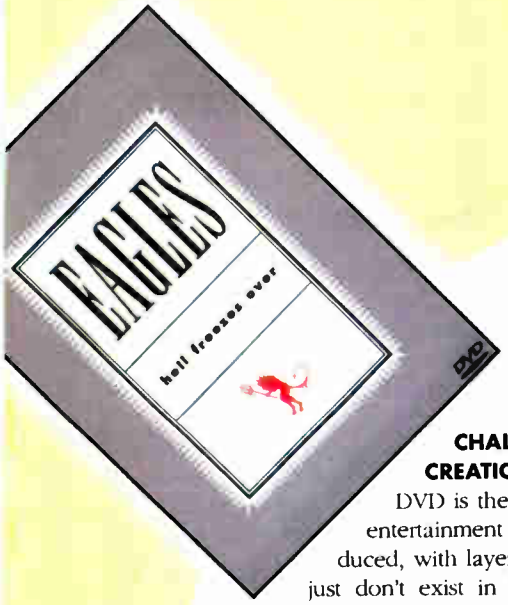


CHALLENGES OF DVD CREATION

DVD is the most complex mass entertainment medium ever introduced, with layers of complexity that just don't exist in other formats. Even with the simplest titles, a fiendish level of complexity lurks underneath.

Software for DVD authoring reflects the medium's inherent complexity. Authoring-capable programs are becoming available at attractive prices, but truly professional DVD authoring software—full-featured and robust enough to meet every challenge—commands a premium price.

For music DVD producers, the wealth of options is a challenge. DVD (both DVD-Video and DVD-Audio) supports a range of audio capabilities well beyond those of CD, including multichannel surround and high-density audio, but provisions must be made to ensure proper playback on systems that don't have these abilities. DVD-Audio offers even greater fidelity, but at this point, with a small percentage of consumers actually equipped to play a DVD-A disc, production in hybrid DVD-A/DVD-V format is a marketing necessity.

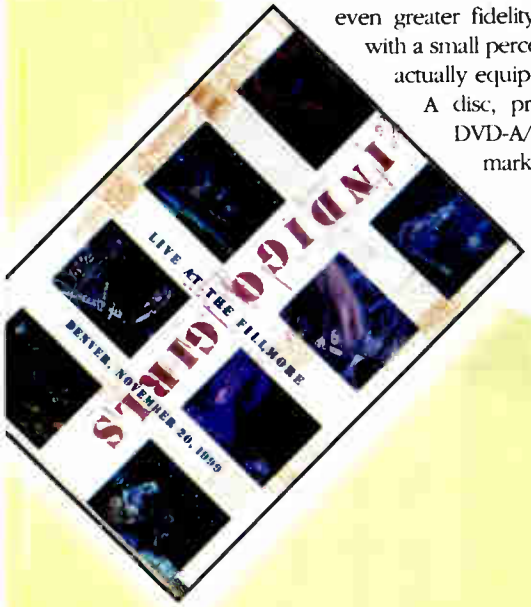
All of this adds up to *time* for production, especially for full-featured music DVDs. And time is money.

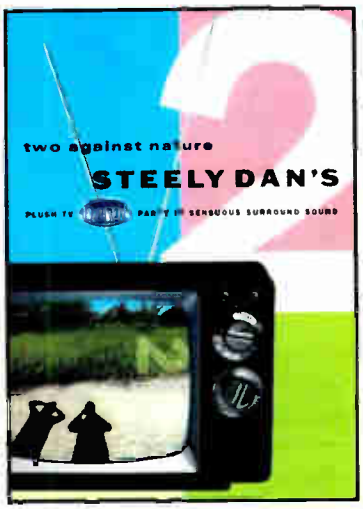
Some complexity in producing DVD is inherent, but the impact can be controlled using the (all too often ignored) principles of project planning. By identifying the elements that will take the most work and risk, one can take steps to reduce both. The result can be music DVD titles that knock the socks off the consumer, at costs that enable a decent return on investment.

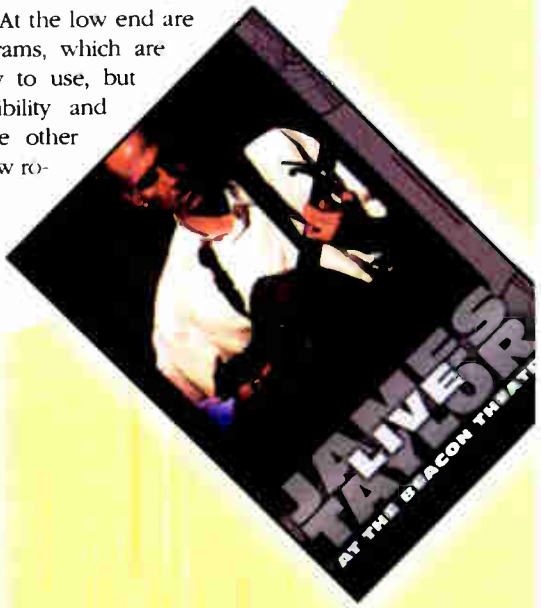
DVD PRODUCTION TOOLS

Until recently, most DVD work required expensive hardware and software. Now, there are relatively low-cost DVD recorders and much cheaper DVD authoring programs available, as well as less-expensive encoders for video and audio.

Basically, three kinds of tools are available today. At the low end are consumer programs, which are cheap and easy to use, but limited in flexibility and function. At the other extreme are a few ro-







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Designing the Music DVD

bust powerhouses that sell at five figures. In between, a tier of products for $1,000 or so offers substantial power. But a large gap remains between these products and the true high-end tools.

This matter requires consideration. Some midrange tools may appear fully professional, but don't actually support all features of interest for music. DTS-format audio, for example, is generally not supported by these programs. In other cases, a given feature may be listed in the product specs, but not be supported completely. And, at this writing, there are *no* low-cost tools that effectively support DVD-Audio.

As prices come down, more and more projects are being tackled using personal desktop tools. Such production is practical, as long as you know your toolset's limits. If you plan to produce DVD titles in this way, then carefully investigate your tools' capabilities.

MUSIC DVD TITLE DESIGN

Everything involved in a DVD project stems from the title design. Decisions about features and title flow determine the equipment, personnel and time needed. This is your chance to load up your title with goodies, but it also determines the cost floor.

DVD-V AND DVD-A FORMATS

When DVD was created, it was recognized that home video would be the "killer app," and the focus was placed mostly on the needs of video. But a vocal contingent argued for a form of DVD dedicated to sound, taking full advantage of the medium's capacity for increased fidelity. As a result, two different formats were defined, DVD-Video (DVD-V) and DVD-Audio (DVD-A). Driven by the need to get DVD moving in the market, the DVD-V definition was finished quickly, and we now have several years of DVD-V production experience, hundreds of players at every price point and tens of thousands of available titles.

DVD-A, considered less important to overall DVD success, took a back seat, left essentially to the audio community. Being a fractious lot, constituencies with different agendas asserted themselves, delaying the adoption of a final specification. To make matters worse, issues of copy-protection came to a head just as a spec was being finalized, causing a delay of another year to satisfy content holder's needs for protection more robust than that of CD or DVD-Video.

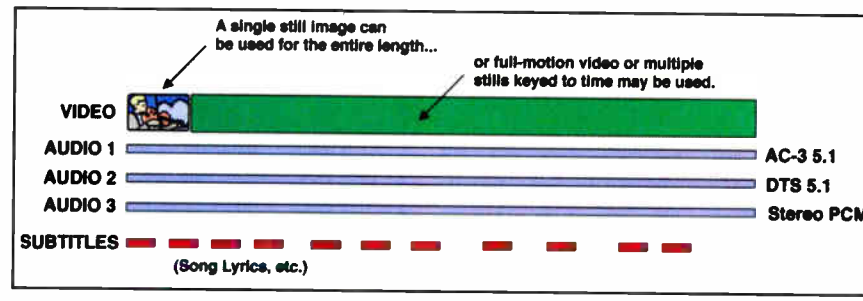

Figure 1: DVD-Video track construction. Typical structure of an audio/video clip in DVD-Video. All tracks must have at least a single still image in the video line, with up to eight alternate audio streams and as many as 32 subtitle streams. In DVD-Audio, visual content is not required, and only two audio streams are allowed.

The specification of DVD-A was finally approved late last year. In the end, the practical differences in the formats were less than originally anticipated (see Table 1). For the audiophile, the significant advantages of DVD-A are the availability of uncompressed 6-channel surround and 192kHz sample rate for stereo.

As of this writing, a handful of DVD-A-compatible players are available, all of which also play DVD-Video, and a few dozen DVD-A titles are on the shelves at selected retailers. The format is expected to receive a push this Christmas season. Eventually, the majority of players sold will be "universal" players capable of playing DVD-A or DVD-V. For the next couple of years, however, the player population in the field is going to be predominantly DVD-Video.

A first decision is whether or not to release in DVD-Audio at all. Affordable tools for commercial DVD-A authoring are not yet available, so going this route means extra expense. If you do go with DVD-A, then you will likely want to support DVD-Video playback for compatibility. Production of DVD-Audio/DVD-Video hybrid titles is an evolving art; most folks who do it now are experiencing a lot of difficulty. A few labels are releasing DVD-Audio-only discs, but for commercial reasons, this is a hard path to follow.

Sad to say, DVD-Audio remains stuck in a pioneering phase—as in "arrows in the back." This could still turn out to be the cool medium of tomorrow, but be aware that producing DVD-Audio will likely drive up your costs substantially.

AUDIO OPTIONS

DVD is a rich medium for audio. Fidelity for stereo ranges from that of a CD up to 24-bit resolution at 192kHz sample rate. Channel formats range from stereo to 5.1 or even 6.1 surround. It's an embarrassing amount of riches.

The availability and range of audio options creates issues in production. One must decide what options to support, and produce audio accordingly. Often, specific provisions must be made for the limitations of consumer playback systems.

Table 1: Comparing DVD-Video and DVD-Audio Capabilities

DVD-Video	DVD-Audio
Uncompressed stereo from 16-bit @ 48 kHz to 24-bit @ 96 kHz	Stereo up to 24-bit @ 192 kHz
Discrete surround compressed in Dolby AC-3 or DTS format	Uncompressed multichannel surround, up to six channels. Lossless compression for high-resolution multichannel surround
Full video capability, with high-resolution and surround sound options	Only still image with audio, with user selection possible
Extensive interactivity	Limited interactivity

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For commercial success, it's important to ensure that all listeners have the best experience with the playback system they have. This often means it is necessary to include the same material in two, three or more different formats. Audio production costs start to mount when it's necessary to mix separate stereo and surround versions and encode these in as many as three different data-compression schemes.

AUDIO FORMATS FOR DVD-VIDEO

If your title will be produced for DVD-Video only, then it would be nice to say that audio decisions were done. But that isn't the case.

For surround, DVD-Video requires Dolby AC-3, with DTS as an option. Many prefer DTS, but if you use DTS in your title, then you must provide an AC-3 track in parallel. Also, DTS audio is not supported by current low-cost authoring tools.

Many consumers do not have surround in any form. To satisfy the audiophile's distrust of data compression, stereo mixes in music DVD are often rendered as uncompressed linear PCM at high-sample rates and bit depth.

DVD-Video provides for up to eight audio soundtracks, with user selection, so it's straightforward enough to include multiple versions of audio. A well-equipped music DVD title may require a 5.1 mix separately encoded to Dolby and DTS formats, and a separate uncompressed stereo mix at anywhere from 16 to 24-bit resolution at a sample rate of 48 or 96 kHz.

DVD-Video titles with multiple audio versions usually include an audio selection menu, which can be presented to the viewer automatically on start up, or playback may start up with a default selection, leaving it up to the listener to make a switch if necessary.

You also must determine if all of the audio versions you want to provide will fit on one disc. DVD has a large—but not infinite—capacity (4.7 GB for single-layer and DVD-R; 8.54 GB for dual-layered DVD-9).

For a perspective on DVD bit-budgeting, take a look at Table 2. This lists several types of media (first column) and the typical bit rates (second column). The third column translates the bits-per-second figures. These are usually given as megabytes per minute, which may be more useful. The fourth and fifth columns indicate the maximum possible playtime if this were the only data type on the disc. That scenario may be unlikely, but this information is instructive.

To determine if your project will work, multiply the number of minutes of playtime with the MB per minute for each audio stream you want to include, then add video at the minimum acceptable quality (generally 3.5 mbps). If the result exceeds 4.7 GB, then you'll need to consider a dual-layer disc. If it goes beyond 8.54 GB, then you're sunk. For most projects, you can ignore the contribution of still pictures in this calculation: At approximately 250k a piece (five would fit on a floppy disk!), you would need to add a *lot* of pictures before storage requirements are an issue.

The instantaneous transfer rate for DVD tops out at 9.8 megabits per second (mbps). All audio tracks (with video) are read from the disc at the same time, though only one is actually decoded. If the total of the bit rates for all audio streams in a track, plus that of any video content, exceeds the magic number (9.8 mbps), then adjustments are required. In case of bit rate overload, one option may be to place different versions into separate clips.

Table 2: Media bit rates and playtimes for DVD-Video

Media Type	Bit Rate	MB Per Minute	Max Playtime, Single-Layer DVD-5 (4.7 GB)*	Max Playtime, Dual-Layer DVD-9 (8.54 GB)*
AC-3 stereo	224 kbps	1.66	46 hrs., 38 min.	84 hrs., 44 min.
AC-3 5.1 audio	448 kbps	3.36	23 hrs., 19 min.	42 hrs., 22 min.
DTS 5.1 audio	1,536 kbps	11.52	6 hrs., 48 min.	12 hrs., 21 min.
Linear PCM, 16 bits @ 48 kHz	1,536 kbps	11.52	6 hrs., 48 min.	12 hrs., 21 min.
Linear PCM, 24 bits @ 96 kHz	4,608 kbps	34.56	2 hrs., 16 min.	4 hrs., 7 min.
MPEG-2 Motion	3.5 to 9.6 mbps**	26.25 to 65.28	1 to 3 hours	2 to 6 hours
Still Pictures	Approx. 250 KB per picture	Four pictures per MB	Approx. 16,000 still images	Approx. 34,000 still images

* Playtime if this were the only type of media present
** Recommended range for acceptable video-quality video

VISUAL CONTENT

For most people, DVD means video, and DVD-Video does require visual content to accompany audio. DVD-Audio allows for sound without picture, CD-style, but selection menus, still images and/or music videos are part of most DVD-A titles.

Music titles divide up into those where visual content is central, such as concert video; those for which it is important but not constantly present; and those for which visuals are incidental. Each category drives the production process in a different way.

For concert video, where full-motion, full-resolution video exists throughout, the process becomes closer to that of a DVD movie title. Much of the bit budget will be occupied by video, which may constrain the range of audio options, and issues of video-encoding quality and audio-video sync will be important.

For this type of title, video content usually exists as a given. DVD does provide interesting options for video, including alternate "camera angles." These can be different views of the artist onstage or may be independent video.

DVD-Audio format is not really appropriate for the concert title. DVD-A allows for full-motion video *only* by jumping into a DVD-Video "zone." In this zone, the audio options are those of DVD-Video. For the "video-centric music DVD," there

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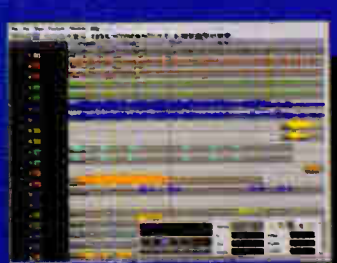

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is no advantage to DVD-Audio.

Many music titles consist of a music album with one or more videos, artist interviews or other material. For this type of title, music cuts can be accompanied by still images. You can elect to display a single still image throughout or display sequential images, "slide-show"-style.

An important difference exists in the way that DVD-Video and DVD-Audio display still images. In DVD-V, images are locked to sound, and it is impossible to jump stills forward or backward without also jumping audio. In DVD-A, a group of images are loaded into player memory, so the viewer can "surf" pictures while audio plays undisturbed. Transition effects such as wipes and dissolves can also be programmed.

For the true "music-only" title, the producer can decide to add a visual accompaniment. In general, video production is not cheap. Whether the additional costs are justified by the appeal of video to the audience is something only you can determine. Still images can be produced at much lower costs, and this may provide a reasonable alternative.

TITLE NAVIGATION

As with CD, DVD offers direct access to tracks. DVD's visual menus also allow for access to tracks by name. Compared to access by track number, this is convenient and attractive. Menu-driven navigation is also used to select playback setup, as well as value-adds.

In DVD movie titles, a main menu is often presented at startup, following an initial splash. Selection menus can also be displayed by the viewer during play, using the player remote and interrupting play. The main menu usually provides for jumping directly to the program, or to one or more secondary menus that offer scene selection, audio setup, bonus materials and so forth.

Secondary menus may lead to additional menus, in a hierarchy of arbitrary depth. Menu screens are sometimes used to present text or images such as production stills. In these cases, the number of such menus in a title can run into the dozens—or even thousands.

Selection menus can also be presented during play, with selection buttons overlaid on top of the picture. For DVD movie titles, this is the exception rather than the rule, as it detracts from enjoyment of the program. For music-only titles, however, this can be a good option, with a list of all tracks continuously displayed onscreen.

There are special considerations in the use of this kind of "button over track" function. For one, not all of the lower-cost DVD authoring programs support this feature effectively. Be sure to investigate the capabilities of your authoring environment before committing to this feature in your title.

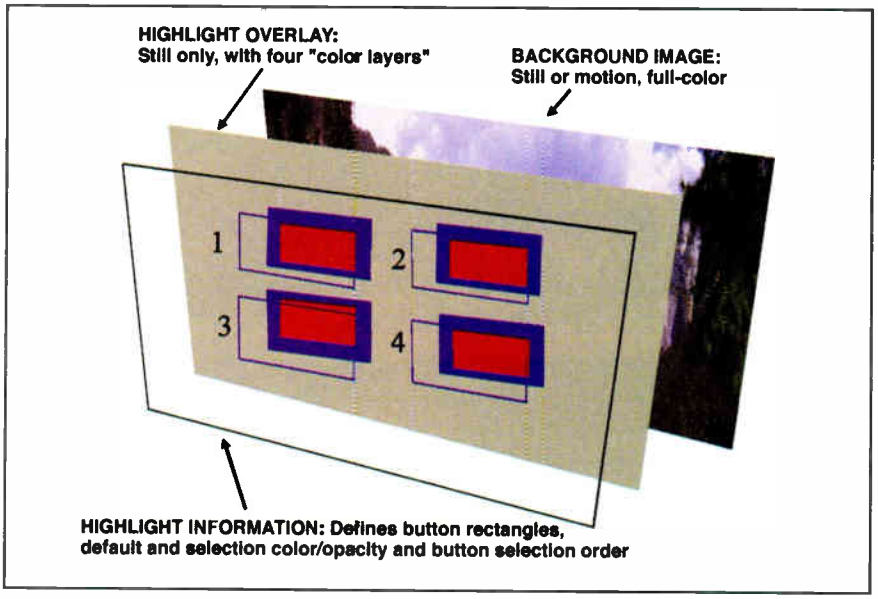

Figure 2: DVD menu construction. Menus in DVD consist of a still or motion background and a still overlay that defines four different "highlight layers." Highlight information defines rectangular areas onscreen that enclose each button, the colors and opacity of buttons when selected or activated, and the order of selection of buttons in response to the DVD remote's selection controls.

DVD MENU DESIGN

Selection menus consist of a background image, a graphic overlay, and "highlight information" that defines active button areas and their behaviors. Audio may accompany the menu. For every menu, these materials must be prepared and assembled in the authoring environment.

In many cases, graphics for selection menus are prepared by outside artists. Because DVD menus have special requirements, and because programs vary in how they map these to source graphics, close communication with the persons preparing menu art is important.

DVD Tools and Vendors

Apple Computer
www.apple.com
Products: DVD Studio Pro (Mac OS), Spruce DVDMaestro (Windows), iDVD (Mac OS)

Interactual Technologies
www.interactual.com
Products: PCFriendly (Windows), Interactual Player 2.0 (Mac and Windows)

Pinnacle Systems
www.pinnaclesys.com
Products: Impression DVD-Pro, Pinnacle Express, Pinnacle Express DV (Windows)

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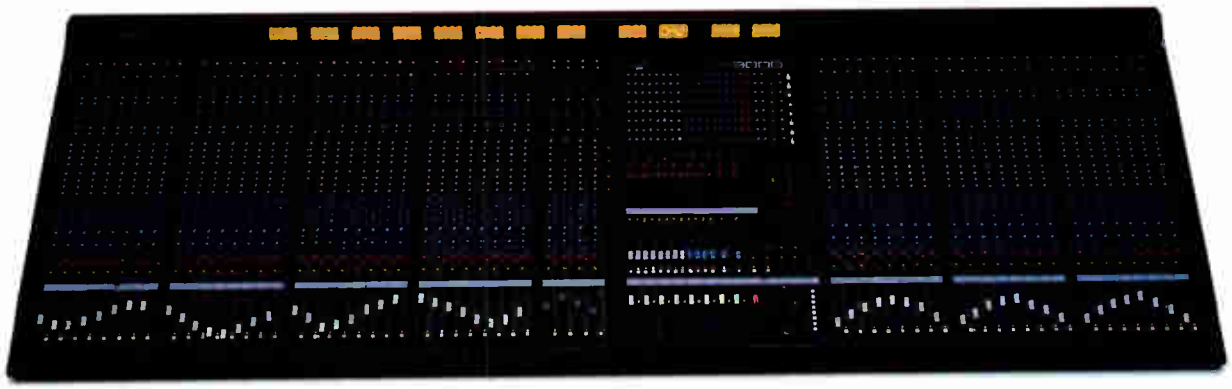

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MENU BACKGROUND

Backgrounds for DVD menus can be still images or video. Stills are easier to prepare, but moving menus can be compelling.

Still or motion, menu backgrounds are full color and to standard picture resolution (720x480 pixels for NTSC, and 720x576 for PAL). Most authoring programs accept common graphic formats such as bitmap, TIFF, JPEG, etc. Some also accept multilayer Photoshop files, but vary in how these are interpreted and used.

Moving backgrounds are prepared as short snippets of video that are looped. Desktop tools such as Adobe AfterEffects are useful for these, but the output must be converted to DVD-compliant MPEG-2. An increasing number of plug-ins and offline MPEG encoders are available for this purpose.

The overlays that indicate button highlighting in a DVD menu do *not* share motion capability, so the areas indicating buttons onscreen must remain static in placement and shape.

Moving menus may include an entry sequence, with button highlights appearing when video reaches a defined loop point. An "exit transition" can also be provided by jumping to a short clip that represents the desired effect. It is also not uncommon to see moving thumbnails in a selection menu. These effects are created by compositing video and stills beforehand. There is *no* other capability within DVD for this type of effect.

BUTTON OVERLAYS AND HIGHLIGHT INFORMATION

Typically, highlight overlays are prepared as still graphics. This overlay layer (also called a "subpicture") has stiff color constraints. DVD handles this in a non-intuitive manner that needs some explanation.

The overlay itself does not define colors to be displayed. Instead, each pixel of the overlay belongs to one of four "layers." In authoring, each layer is assigned a color from a palette of 16 choices associated with that menu, and an opacity value from 1 to 16. Button areas are rectangular, and only one button at a time can be "selected." When selected, the pixels enclosed by that rectangle are assigned another color and opacity value.

Commonly, default opacity values for the overlay are set to transparent (0), while "selection values" are somewhere between translucent and opaque (15). This way, button highlights stay invisible, except for the selected button, which appears with the highlight over the background. One or more layers may stay transparent so button highlights can appear to the viewer as arbitrarily non-rectangular shapes.

When Enter is pressed, a third set of values is assigned momentarily, followed by that button's action. Different buttons in the same menu can have different highlight colors, with up to three "button groups."

Authoring programs vary in how they determine the overlay layers. When preparing graphics for DVD menus, you must respect the conventions of the authoring system in use. A common convention in pro authoring programs is that pixels in the source graphic are assigned according to the color of that pixel in the source graphic. White, black, red and blue are commonly used as key colors. The source graphic is prepared in these colors (without aliasing), and display colors are defined in authoring.

TRICK MENUS, "COMPUTER-AIDED MENU CREATION"

Sometimes, DVD menus clearly don't con-

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Designing the Music DVD

form to the "background with overlay" highlighting scheme. A button may change to a completely different form when selected, or the entire background changes.

This is done by linking multiple menus together so that they appear as one menu with complex behavior. A parameter is assigned to each button that makes it "auto action," meaning that the assigned action is performed immediately on selection. The menu then jumps to a duplicate that has different background art.

This allows for graphic effects beyond those that are "native" to DVD menus. The difficulty is that each menu becomes many (one for every possible button state), and menu action in the final product slows down substantially. How slow depends on the player. For commercial DVD titles, such "trick menus" should be used sparingly.

Design and creation of navigation menus in general is one of the more difficult aspects of DVD authoring. The way that menus work is somewhat unintuitive, and not everyone possesses the art skills that are required. As DVD authoring penetrates consumer and desktop spaces, designers of authoring applications attempt to insulate the user from such complexities. In most of the truly consumer-level applications, menu design is reduced to selection of backgrounds and button images from a library. The result is a streamlined process, and the resulting menus can be slick and attractive, but with limited range for customization.

More subtle is the situation of authoring programs billed as "professional," which implement other kinds of simplification. Notable among these is Apple's DVD Studio Pro, a powerful program and a great value overall. In DVD Studio Pro, the default style of menu creation uses separate images (layers in a Photoshop file, actually) for every button state. The program builds multiple menus from these and links them together as required. Luckily, the program also allows for menu creation using a conventional background—overlay construction, but this is treated more as a special case.

The current version also restricts the user to a single-color palette defined by the developers, with no way to customize. This is an example of how programs intended to make DVD authoring easier may restrict the range of possibilities for professional title development.

TEXTUAL MATERIAL

Text, such as lyrics, biographies, etc., can be incorporated in DVD. Still menus can be used to display text, with buttons to step from one frame of text to the next. This is attractive, because text can be displayed in nice graphic layouts, but it does divorce text from content. You can watch the program or read the copy, but not both at once.

Text can also be incorporated as subtitles over picture. In DVD movies, this is used to subtitle dialog. DVD subtitles can be switched on and off by the viewer, or shown in different languages. For music titles, displaying lyrics as subtitles is an obvious application.

DVD subtitles are not burned into video as in VHS and Laser Disc. Instead, they are displayed by the same overlay mechanism used for menu highlights. Separate overlays are keyed to time to follow dialog or lyrics. Most authoring systems provide for entry of subtitles as text or as graphics prepared offline.

Subtitles can be defined one at a time, usually with selection of display font, size, color, etc. This kind of single-subti-

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tle entry is handy, but impossibly tedious for movie dialog. Subtitles can also be imported into most programs as time-coded lists defining text or source graphics. Specialized programs are available to facilitate the preparation of these lists, or may be included with the authoring system itself.

DVD INTERACTIVITY

Interactivity comprises menu-driven access, as compared to the linear access of videotape, or even CD track selection, but you can implement substantially greater degrees of interactivity if desired.

There are two kinds of interactivity available in DVD: those that can be accessed on any standard DVD player, and those that are restricted to playback on a computer.

"STANDARD" INTERACTIVITY

Every DVD player supports a set of low-level commands that can be embedded into the disc. These allow for storing values in memory in response to user actions such as entries from menus. Navigation decisions can be based on these stored values and/or on the current state of the player.

This makes it possible to implement games or other kinds of conditional interactivity into a DVD title. The command set is actually quite good, with functions for generating random values, for setting and checking individual bits, and a full set of arithmetic operations.

The greatest limit on built-in DVD interactivity is the amount of memory available. The spec defines 16 16-bit read/write registers. By shifting and masking, a programmer can get some extra mileage from these registers, but there is nothing the author can do to increase the amount of storage in standard players.

Authoring programs vary in how they support this built-in programming language. High-end systems include complete support as a matter of course, while the least expensive programs do not support it at all. In between, some programs support DVD's native codes quite well, while others do not. Be sure to check into the capabilities of the program you intend to use before you commit to these functions in your title.

COMPUTER-BASED DVD INTERACTIVITY

DVD can include programs and data that are readable by a computer but invisible to the consumer player. Unlike CD, the way this is done is straightforward, unambiguous, and recognized by every computer and player. This "data area" can include any type of content, including full-action computer games, screensavers, HTML pages, etc.

However, there are no standards for linking DVD-Video/Audio content with the computer data area. Applications that want to amplify the viewer's experience by linking with the Internet or DVD-ROM applications are forced to do so by custom means, leading to problems at times with compatibility.

Several vendors have attempted to establish standardized methods, but the grail of full compatibility and transparency have yet to be reached. The most successful of these, technically and in business, are Interactual's PCFriendly and Interactual Player applications. Interactual's technology relies on installing a custom DVD navigator on the host computer, one that will link the computer-specific content on the disc with generic consumer-DVD material.

It's an effective scheme, and the most recent version of the Interactual player supports Macs as well as PCs. However, the installation of the Interactual player on the viewer's computer may affect its operation with other non-Interactual titles.

WHERE TO LEARN MORE

The unparalleled resource for general information on DVD, both DVD-Video and DVD-Audio, is Jim Taylor's book *DVD Demystified, Second Edition* (McGraw-Hill, 2001). Be sure that you get the current edition, because it contains a lot more information on DVD production, as well as up-to-date info on DVD-Audio. The manufacturers listed in the sidebar also maintain Websites with lots of info on the medium itself. For a resource targeted at production issues, I recommend Mark Johnson's site, www.dvdmadeeasy.com.

DVD, in both video and audio formats, is an exciting development in music. This article aimed at making you aware of the range of capabilities available, particularly those relevant to titles that focus on music, and at some of the implications on the production process and costs. May you live long, prosper and make killer music DVD titles for the enjoyment of all. ■

An early specialist in DVD production tools, Gary S. Hall worked with companies such as Sonic Solutions, Daikin-Comtec Laboratories and Spruce Technologies to develop pro authoring systems. His current project is a complete, Internet-linked mobile environment for music, video and DVD production.

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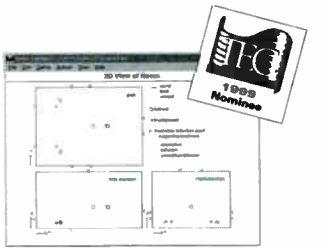

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BY ØYSTEIN EIDE

Bob Ludwig

Tools and Techniques From One of Mastering's Best

Bob Ludwig has long been one of the pre-eminent mastering engineers in the U.S., respected by both musicians and his peers. He's mastered albums by countless major (and minor) groups in every style. Though he was a fixture in the New York mastering scene for many years, for the past several, he's been working out of his own facility, Gateway Mastering, in beautiful Portland, Maine, and he's still attracting many of the best in the business.

Traveling to Portland to interview Ludwig, we drive through stunningly beautiful rural areas, where the highway exits are few and far between. The weather is typical New England extreme, changing from sun to rain in a split-second. The cobblestone streets of the old downtown lead to a picturesque harbor where people gather for lunch or stroll around looking at the many fishing boats that reside here. It's definitely a small-town feeling.

"You can even leave your car running while you step inside a store," Ludwig says once I arrive at his impressive studio complex, which consists of two immaculate control rooms, a room for DVD authoring, a DVD screening-room, a production room, a gear storage room, a recreation room with a pool and a 52-inch TV, and a few office spaces. A staff of 12 helps Ludwig maintain what is obviously a thriving business. "We have plans to build another mastering studio soon, in order to take on more independent artists at a lower rate," he says. The walls are covered with Platinum-selling albums, many of them considered classics. He has also received 14 TEC Awards, in addition to the Les Paul Award he was given in 1992. Despite all of the recognition and the extraordinary success he's had, Ludwig comes across as a regular guy, albeit one with a deep understanding of pro audio that extends well beyond his part of the process.

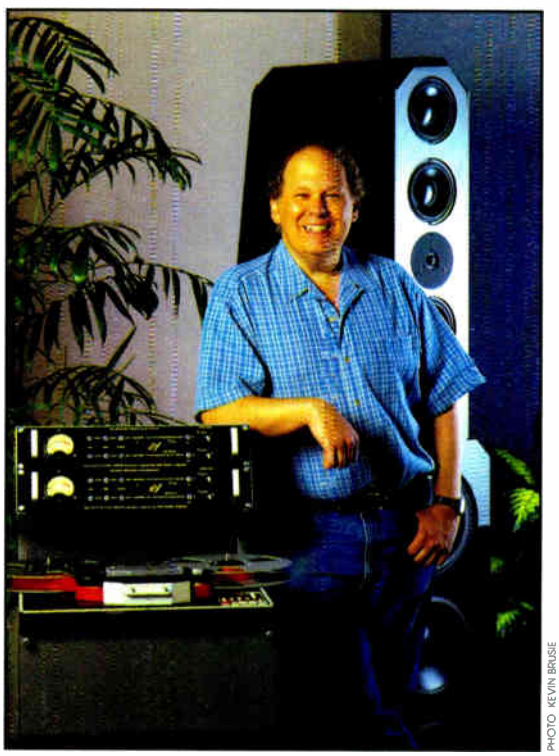

PHOTO: KEVIN BRUSE

Why did you move from New York to Portland?

I moved to Portland in 1993 for the simple reason that I have a family up here, and I figured if I were to invest that much money into my own recording studio, it better be at a place that I liked. After being VP at Sterling Sound and a long time at Masterdisk, I felt I didn't have a real influence over my career. There were a lot of limitations on what I could do, where I could live and so on. I realized it was time to start my own business. Not to mention the quality of life, which is much better here in Maine—less crime and a cleaner environment.

I have to admit, I was a bit skeptical about whether my clients would choose to travel several hundred miles north of New York, where a lot of my clients are based. However, most of my clients from my Masterdisk period are still with me, and, surprisingly enough, more often than before, we get people coming to sit in with us through the sessions. We've got clients coming from Europe, Russia, Japan, Argentina and London, and I think the reason is that people have heard about our control room and want to hear it for themselves. I don't think there are many mastering rooms like this one around the world.

In addition, Portland has a modern international airport, a prerequisite for being in the business we are in. We often work with short turnaround times due to the fact that we are last in the production chain. Most producers would like to have the job done by *yesterday*, so we are totally dependent on being able to deliver and receive material without delays.

How did you get into the mastering business originally?

I was about to finish my Master's at Eastman School of Music, where I also was involved in the sound department, when Phil Ramone came to teach a summer recording workshop and I worked as his assistant. Afterward, he contacted me and asked if I wanted to come to work for him in New York. Phil had just started A&R Recording at the time, so we started doing sessions together on projects with The Band, Peter, Paul & Mary, Neil Diamond, Frank Sinatra.

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After a few years with him, learning the art of mastering, I got an offer from Sterling Sound. They had an awful lot of nice gear. For instance, I remember their advanced Neumann cutting machine with the SX-68 cutter heads—a huge improvement over what we used to have. They also had some tape machines from Telefunken and Studer, and I always dreamt about working on world-class gear. I knew that no matter how good I got, I would never be able to compete with places that had that kind of gear, so leaving A&R wasn't too hard a decision to make. After seven years at Sterling, I was offered a position at Masterdisk, where I worked until I decided to start my own facility here in Portland.

How do you approach a new project?

The secret to being a good mastering engineer is to be able to listen to a mix to hear how it *could* sound, and finally be able to push the right buttons to achieve the sound you have in your head. When I start a new project, I first listen to find out if there is enough vocal in the mix and whether the EQ is correct. Too much vocal in a mix makes the music uninteresting, and too little is annoying to the listener. People want to hear the words. At one magical point, something happens that makes the vocal blend perfectly. I work pretty fast at finding the right EQ and compression that keep the vocal in place, and I spend longer time refining the settings.

It is important to set aside time to listen to parts of the whole album before starting to work. Very often, the A&R people have placed the hit songs at the beginning, and sometimes you get the impression it's a pop album you are about to work on, where as if you listen further, you'll find that the music is more artistic and deserves a different approach.

Usually, I master an album in one day, which, on average, gives me one-half to one hour per song. Under certain circumstances, I have to ask the song to be remixed. In cases where the vocal is too bright and the instrumental tracks are too dull, there is nothing I can do. I do not listen [to the track] loudly when I work, and by loud I mean more than 90dB SPL. I try to keep it around 85 dB if possible.

Can you tell me a little about the control room and how it was designed?

To me, the mastering stage is not the place for surprises, so my philosophy was to build an ideal listening environment, acoustically speaking, that would reveal any limitations with the source. Together,

GATEWAY OPENS SECOND MASTERING ROOM

By Paul Verna

In his two decades at New York mastering powerhouses Sterling Sound and Masterdisk, Bob Ludwig built a reputation as one of the world's most gifted engineers, and left an indelible impression on his peers. The six or seven engineers who worked with Ludwig at those studios used his priceless tutelage to help them build solid careers of their own.

PHOTO: KEVIN BRUISE

However, until he opened his own facility in 1993, Ludwig had never actually trained a protegé. His first such student was Brian Lee, a young engineer who joined Gateway soon after it opened.

With a mentor like Ludwig, Lee might have launched a career as a mastering engineer in his own right, if his graphic design skills hadn't proved so valuable to Gateway's ground-breaking DVD operation. As it turns out, Lee went on to head the studio's DVD-Audio and Video Authoring department, leaving an open slot for a new mastering trainee.

Adam Ayan answered that call in 1998 when he joined Gateway as a production engineer. Although his primary job consisted of cutting production parts for the studio, he also put in extra hours assisting Ludwig in the big mastering room. In a matter of months, Ayan was setting up Ludwig's room for him in the morning and mastering individual tracks, which Ludwig would oversee and approve. Soon, Ayan began doing his own album projects, working mornings, nights and weekends around Ludwig's hectic schedule.

When Ayan's clientele grew to the point where it became impractical for him to operate out of the big room, Ludwig decided to convert Gateway's second floating-floor studio—previously used for editing and quality control—into a full-fledged mastering suite.

"The new room is larger than most New York City rooms," says Ludwig. "It is based on the same magic ratios and acoustical design that make the bigger room so spectacular."

Ayan's suite features a Manley analog console; two Duntech Sovereign monitors; Sonic Solutions, SADiE and Pro Tools workstations; the Sony Sonoma Direct Stream Digital Editor; Manley Massive/Passive and Avalon AD2077 equalizers; Weiss digital EQs and compressors; the TC Electronic System 6000 and M5000 processors; and three Pacific Microsonics Model 2 AD/DA converters. Ayan couldn't be more thrilled with his new job and work environment.

"I love being here," he says. "I love working for Bob and Gail [Ludwig, Gateway's CFO]. I've gotten to learn so many great things from Bob, and I continue to learn on a daily basis. I'm the loading dock for all the new equipment that comes in." Among Ayan's credits are projects by Phish, José Carreras, Tracy Chapman and the band Jezebel, whose latest album was mixed by Mick Guzauski.

Having helped Ayan launch his career, Ludwig is now training a new engineer, Laurie Flannery, in the art and science of mastering. Could a third mastering room be far behind at Gateway? ■

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with Dr. Peter d'Antonio from RPG Diffusors, we designed the studio piece by piece. He has developed his own software to mathematically calculate room dimensions in order to minimize bass buildup due to standing waves. A standing wave is a wave whose half-wavelength is corresponding to one of the three room dimensions. The ratio we arrived at was based upon a complex relationship between height, length and width that gave the least bass accentuation. That same ratio also meant that our room had to be really big. Our room has the highest standing wave at 19 Hz, which, again, meant we needed 16-foot ceilings and 32-foot sidewalls front to back.

The control room is floating; it's a room within the room, completely isolated from the rest of the building, and we used seven layers of Sheetrock in walls and ceilings. D'Antonio's idea was to build a room with an acoustically absorptive wall at the speaker's side, and an active rear wall opposing the speakers. To prevent damaging reflections from the rear, we needed to spread the sound in random patterns. He made the world's first third-generation diffractal, which means that the geometrical patterns are being repeated in three different layers, from macro level to micro level, from the way the bigger elements are arranged on the wall, to the way the fibers are being organized. On the ceiling, we put in another RPG device called Flutter Free. The purpose is to disperse the ceiling reflections from the tweeter and throw them into the rear-wall diffractor. The room is otherwise like a regular control room. All noisy fans from equipment are securely kept behind glass doors in cabinets, and we have a low-velocity AC.

What does your monitoring system consist of?

The speakers are not mounted but are resting on spikes sitting on top of a concrete base, which, again, goes down to bedrock, deep down below the floor. This is for preventing resonance from the floor, [which would] compromise our listening environment. The placement of the speakers was calculated down to the very inch based upon the room dimensions in reference to the angles of the absorption and diffraction material, measured from an ideal listening placement. In a mastering environ-

LUDWIG ON SACD

Bob Ludwig was a pioneer of Super Audio CD and has been a major proponent of the format's widespread acceptance. We asked him to share his views on the fidelity and the merits of SACD.

"The Sony/Philips Super Audio CD is a relatively new [1999] format with a bandwidth up to 100 kHz, sampled at 2.822 MHz. The format is dual-layer, which means a 6-channel surround mix and a discrete SACD stereo mix are on one layer and a CD stereo mix reside on a different layer. Thus, the stereo PCM mix can be played back on a DVD player. All SACD channels can have full bandwidth [6.0], but the channel format is optional, being 6.0, 5.1, five channels, four channels, three channels or two channels. Unlike a PCM-encoded signal, the word length is only one bit, and because of the extreme sampling rate, the output of the converter yields a pulse close to an analog waveform.

"The output of the converter is called Direct Stream Digital [DSD], and is considered to be as close to analog as you can get in the digital domain. The format has a dynamic range of 120 dB, which corresponds to 20-bit in the PCM world, in theory. In order to fit on a disc, the signal is encoded using lossless encoding from Philips.

"The first DSD 6.0 surround pop album was done here at Gateway, the Guano Apes on BMG. We have great hopes that this will be a format for the future, and I really like the way it sounds. For SACD, there is no digital processing gear, which means that most DSD mastering has to take place in the analog domain. Sony is presently working on their digital editor, Sonoma, which will make us able to use Direct Stream Digital EQ, compression, limiting and mixing within SACD as well." [Editor's note: There are already a couple of Sonoma systems in use, and getting rave reviews from users.]

—Øystein Eide

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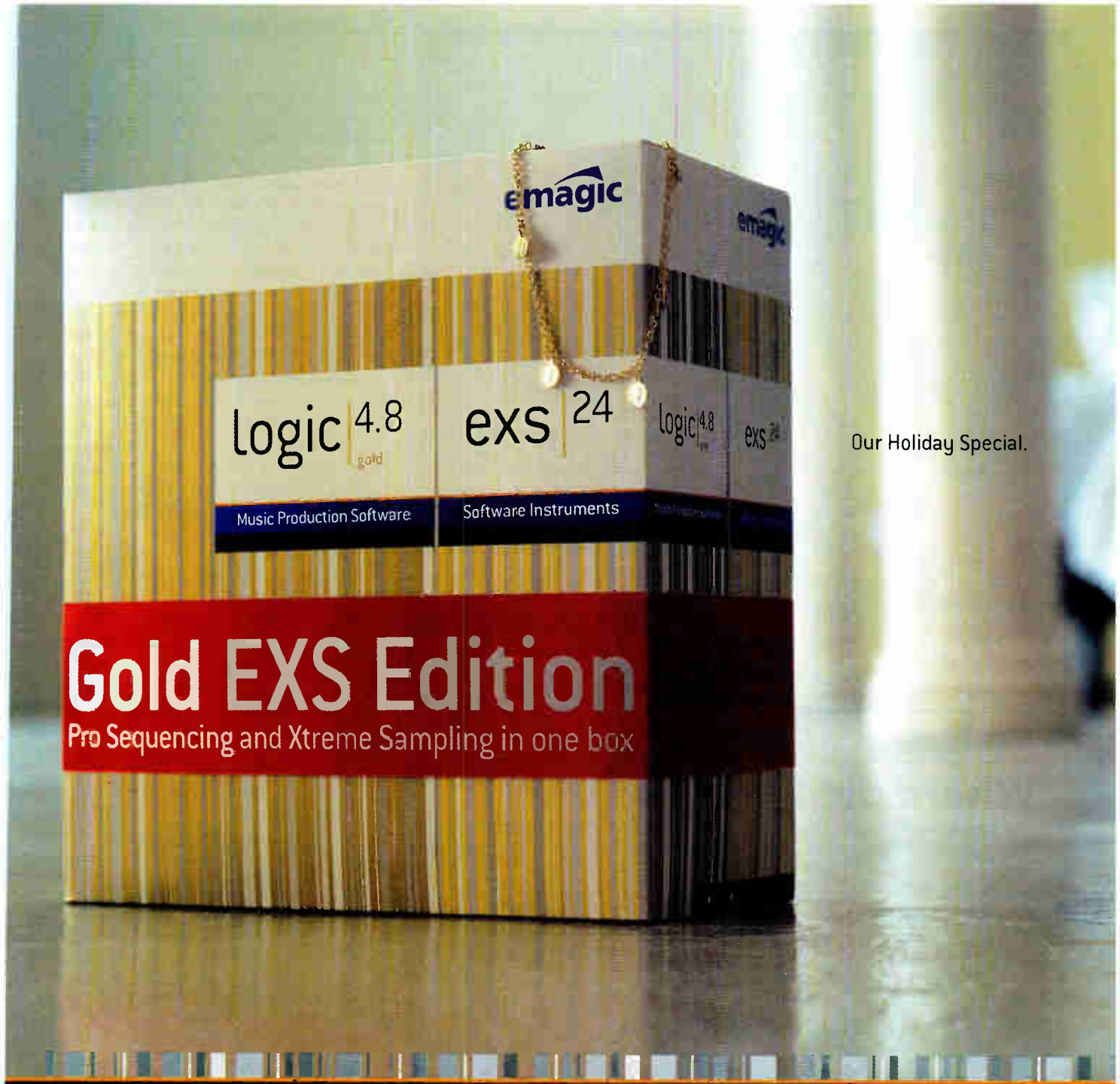

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ment, I believe in having the highest-resolution speakers possible. We settled on Eggleston Works "Ivy" speakers [www.egglestonworks.com/ivy.htm].

I don't claim to have listened to every speaker that's available, but for what I do, those were the best pair I've ever heard. The speakers are three-way with one tweeter. The physical dimensions are impressive: 6 feet in height and weighs 89 pounds each. The upper surface is solid granite. For powering the speakers, I use two bridged Cello Mark II amplifiers. One is connected to the positive pole of the speaker, and one is connected to the negative. We did this to increase the slew rate, which is the speaker's ability to reproduce high transients. In our case, we have 4,000W, although I don't think we are ever going to be listening that loud!

The mastering stage is not the place for surprises, so my philosophy was to build an ideal listening environment, acoustically speaking, that would reveal any limitations with the source.

Are there certain things mixing engineers can do in order to make sure you can achieve the best final result?

It is important to give us different versions of each song, especially where the vocal is at different levels. Some people, like Bob Clearmountain, give me final mixes with the vocal level at ± ½dB and +1dB. When you are in a mix and know the lyrics by heart, it is hard to objectively evaluate exactly where the vocal should go in the mix. Sometimes, the album producer decides which take I should go for, and other times I have the liberty of choosing myself. A lot of these people have worked with me for years, so there is always this element of trust involved.

One other thing to avoid is the excess use of compression. I am really glad that the new digital compressors weren't around when The Beatles were making

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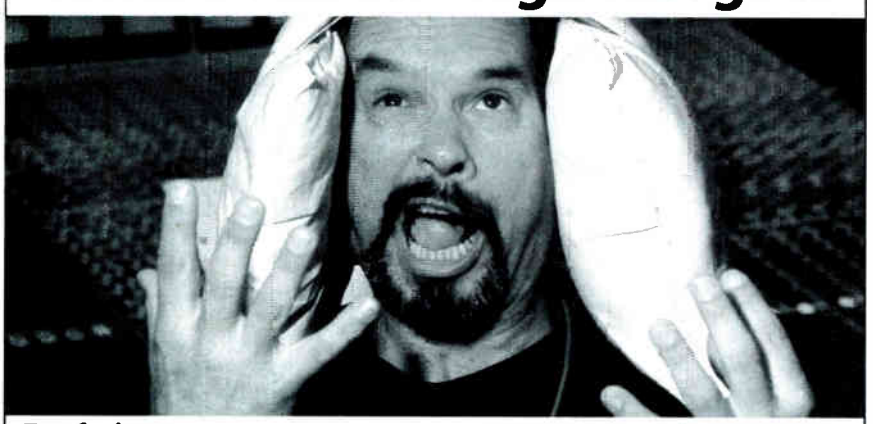

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records. It is a common belief that music that sounds louder sounds better and more exciting, especially when you are listening to it for shorter periods of time. However, it is my experience that a louder album will wear you out faster than an album that has greater dynamics, and it might make you not want to listen to it again.

Compression is also something that you can never undo, unlike EQ, which we always can tweak later. If you are in doubt about how much compression to use, the advice is to use less and to let us do the job. The studio monitors today are generally a lot better than what they used to be, and from a mixer's perspective, it is easier today to get the EQ right. The best thing is to get the EQ as close as possible in a mix environment, and let us only do some touch-ups. This obviously requires that you are familiar with your speakers and the room you are working in.

You started mastering vinyl. Is that something you are still doing?

Until recently, I had a DMM [Direct Metal Mastering, where the album is cut to a copper disc] system at Masterdisk, and at Gateway a lacquer-cutting lathe, a VMS-80. We sold our machine to Sony a few months ago, and the reason was that I was gradually getting more and more disappointed with the level of quality control that took place at the record companies. I realized that the A&R people didn't have record players anymore in their offices, and the amount of work we were getting was gradually decreasing to maybe one lacquer-cutting session a month.

The machine always needed a lot of calibrations and tweaking in order to perform at its best, so it wasn't really justifiable to keep the machine around any longer. Although we don't do vinyl mastering any more, we are still considering doing it again if there is a demand for it in the future. Masterdisk still has their DMM machine, and, as a side note, I can mention that Bruce Springsteen's *Live in New York City* was mixed by Bob Clearmountain on a DA-98 with Apogee PSX-100 converters and was mastered here at Gateway. Masterdisk, in turn, used our 24-bit master to master the LP using DMM. We often get mixes at higher resolutions: 88.2k, 96k, 176.4k, 24-bit, and for CD we work at high-resolution before converting to Red Book standard. We utilize Apogee UV22 or Pacific Microsonics HDCD dithering in order to reduce to 16-bit resolution.

It is customary to believe that the CD is superior to the LP in terms of bandwidth, but this is not the case. The CD is limited to 22,000 cycles, whereas the LP is able to reproduce frequencies up to 50,000 cycles, which in the PCM world equals a sampling rate at 100 kHz. The bottom line is that LPs mastered with DMM still sound really good.

Which platform are you presently working on?

We basically use Sonic Solutions [USP and HD]. The reason for landing on Sonic eight years ago was that it was the only viable machine at the time. Later, we acquired two SADiE Artemis systems and two Pro Tools|24 machines. A major part of our stereo productions takes place using Sonic, mainly because of the networking capabilities. All of our five Sonic USP machines are tied together using the MediaNet network, and we can access the projects and play or record to the disc drives from all machines.

On a project with Laurie Anderson that we recently worked on, we had some problems with mouth noises and had to work in parallel in two different studios. One of my staff was de-clicking the vocals using the manual de-click program,

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while I was working on EQ, compression, etc., in the main room. I could then go back and continue working, never leaving my mix environment, with the ticks removed. Sonic is the only system that lets you do that, and it makes for very efficient mastering.

We are also one of the few studios that does DVD-Audio authoring [192k]. Unlike DVD-Video, which has a graphic user interface, the authoring software for DVD-Audio is on code level, which makes it extremely difficult to do. One wrong spelling or an extra space between letters could introduce a functional error, so you have to be really careful and accurate during the process.

At the moment, Sonic is the only company selling authoring software for DVD-A, so we are totally depending on them to develop a more intuitive software in the future. Recently, there have been a few other companies that will offer simple DVD-A authoring, like SADiE, and soon one in Germany will offer a complete system. For recording 6-channel DVD-Audio 96k/24-bit, we are really happy with the SADiE software, which has proven to be rock-solid.

A lot of the projects come in on Pro Tools|24 on SCSI ultrawide discs. In terms of multichannel external processing gear, we purchased the TC Electronic System 6000. This unit has an extensive number of presets and is extremely flexible. It has five channels of reverbs, chorus, EQ and compression, in addition to 3-band compression/limiting, solo/mute, and the list goes on forever. Apart from a Pro Tools plug-in called RealVerb 5.1 from Kind of Loud, this is the only processor that allows five discrete reverbs from five dedicated inputs. Lexicon, Yamaha and Sony have only four for some reason.

For high-resolution audio, we use converters from dCS, Apogee and Pacific Microsonics, the latter for HDCD. These converters are able to handle 96k. The Pacific Microsonics and dCS can also do 192k, but the dCS is the only one able to handle Direct Stream Digital [DSD] for Super Audio CD [SACD].

Although you can get the impression that it's all about digital, we still have a huge collection of analog gear such as EQs from Manley, Massenburg, the Sontec 430C, Neumann, Avalon, in addition to Millennia, Manley and NTP compressors. We have digital and analog mixers such as the Harmonia Mundi 24-bit and a special George Massenburg/Sony Music level control. In terms of analog 2-track, I'm pretty proud of my 1-inch tape machine from Esoteric Audio Research [EAR] developed by Tim de Paravicini. In addition to the standard playback correction curves CCIR and NAB, Tim has included his own called "Tim's Curve" [TIMZ]. At 15 ips utilizing TIMZ, this machine has a flat frequency response from 8 to 28,000 Hz! Pretty impressive, if you ask me.

While we are in the analog domain, I would like to add that I think analog lends itself really well to pop music. The unlinearities added in terms of compression and harmonic distortion are, in many cases, desirable, unless you ask all-digital people like Bob Clearmountain, who doesn't at all like the fact that analog machines aren't reproducing what you are feeding them. [Laughs.]

With all this great gear around, how do you decide what to use on different projects?

If we receive an analog mix, we usually stay analog until we transfer ultimately to PCM 1630, so the receiving format by itself is a determining factor. Analog equalizers sound to my ears much better than most digital gear, because they have their own sound. I'm obviously not opposed to breaking my own rules if the project calls for it, and I sometimes run my digital signal into my analog devices for tweaking. The main rule, however, is to avoid more than one A/D or D/A conversion, which is the weakest link in the chain. The right placement of A/D in the chain is of great importance to the final result.

> MP3 has changed the production chain in the way that mastering no longer is the final stage before the consumers.

What is your relationship to MP3, and in what way has the advent of MP3 changed the way you are working?

We perform MP3 encoding at Gateway, usually to send a song to a producer to get his/her approval on a downfade, the spacing between songs, etc. We never use it for anything of master quality, however. The most important thing, regardless of format, is to work on high-quality monitors and to know how they sound.

When you're working on great equipment, making it sound as good as possible in that environment, it is my experience that your audio will translate well into cheaper playback systems such as boom boxes, computer speakers or MP3 players as well. The problem with MP3 is that you never really know how it's going to sound. On certain types of music, it sounds okay, whereas on other stuff it sounds disastrous. We did some MP3 encoding for the Paula Cole homepage, and even at the highest MP3 bit rate, her voice sounded harsh and unmusical. On the other hand, a very dynamic classical production we did was, to my surprise, acceptable.

MP3 has changed the production chain in the way that mastering no longer is the final stage before the consumers. Music distribution is now changing how the audio is sounding, and beyond the control of audio professionals, a lot of things can go wrong with the audio. There are a wide variety of encoders floating around on the Internet and they are all different in terms of quality, so it makes it impossible for us to take MP3 into account when we work on our mix. We focus on our job here and now, creating the best-sounding album possible without focusing on what's happening to it as soon as it hits the Internet. This is not a new phenomenon after all. Music-delivery channels like FM radio stations have always utilized heavy compression and EQ to create their own "sound," if you like. When I hear a song I have worked on, on the radio or in a shopping mall, it's hard to recognize the mix sometimes.

Is there a problem that the consumers are unwilling to change their playback systems in order to keep up with the demand for improved audio quality within the professional audio community?

It is always a problem that the consumers have a system they are sort of happy with and don't see the reason why they should buy something new and even better. Some people are even happy with Internet quality! However, the audio industry has a problem in conveying knowledge about the various formats that exist to the consumers.

Personally, I think consumers today are getting to be more concerned and familiar with the concept of surround sound, more so than increased resolution and higher bit rates. We see that surround decoders are starting to become more and more common in people's homes, and the sales of DVD players is rocketing. In

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hi-fi magazines like *Stereophile*, the Super Audio CD has gotten rave reviews, so this new audio format is probably going to be more common in the future, as well. At the moment, there aren't that many titles available for SACD—around 300 maybe—but as soon as we get more titles, the demand will increase, the same way it happened with DVD-Video

What are typical problems in the receiving material, and what are the most common formats?

Believe it or not, wrongful or the lack of labeling is a recurring problem. Correct labeling is particularly important for surround mixes. One should use the DTS standard: L, R, LS, RS, C, LFE, or ITU/SMPTE: L, R, C, LFE, LS, RS.

We also see a lot of timecode dropouts, timecode discontinuity, wrong reference tones, wrong sampling rates, etc. These things should not occur, but they do over and over again. Another problem we encounter is projects with distortion. You'd be surprised to find out how many of our projects contain distortion beyond what is considered acceptable—even major productions. My clients often come in and hear distortion they've never heard before when they take their projects to Gateway. The reason for this is that I think people are listening too loud and/or on low-resolution near-field monitors during mixing, such as the NS-10.

We also get projects where the EQ balance is all over the place. From listening to a mix where the bass is almost absent, and to having a mix with ridiculous amount of subsonic information, it's sometimes beyond me how some of this even got through the mix.

Sixty to 70 percent of the projects are still analog 2-track quarter-inch or half-inch. The new analog format 1-inch 2-track is also starting to pick up. The single "Arms Wide Open" by Creed was the first Number One single that was mixed to 1-inch. We also receive DATs, Pro Tools, SADiE and Sonic Solutions sessions.

For surround, we see a lot of DA-88/DA-98s, but also 2-inch 8-track. For stereo delivery to the CD-production plant, we still trust our Sony 1630, although we sometimes send a CD-R if demanded by the record company, but I always get very nervous when that happens. Another advantage with the 1630 is the automatic error-counter we have and that the glass mastering is taking place in real time, unlike the CD-Rs, which are glass-mastered at 4x. The Genex 8500 MO might become the new standard production format, since the 1630 is hard to maintain. We haven't acquired the Genex machine yet, but we are considering it in the future. The surround music is sent to the DVD plant by DLT.

Is there anything top engineers have in common that makes it easier to achieve maximum results during mastering?

It is hard to point out what my favorite engineers have in common. To name a few, Joseph Puig, Hugh Padgham, Tchad Blake and Bob Clearmountain are individuals with totally different approaches to audio, but they are all great engineers.

The way I see it, recording and mixing audio involves an indefinite amount of compromises, and the really good recordings are made by people who have evaluated every step in the recording process carefully, and have chosen the best compromises. What it all comes down to is everyone's ability to use his or her ears. ■

Øystein is an Oslo, Norway-based musician and recording engineer for the Norwegian Broadcasting Company and freelance music projects.

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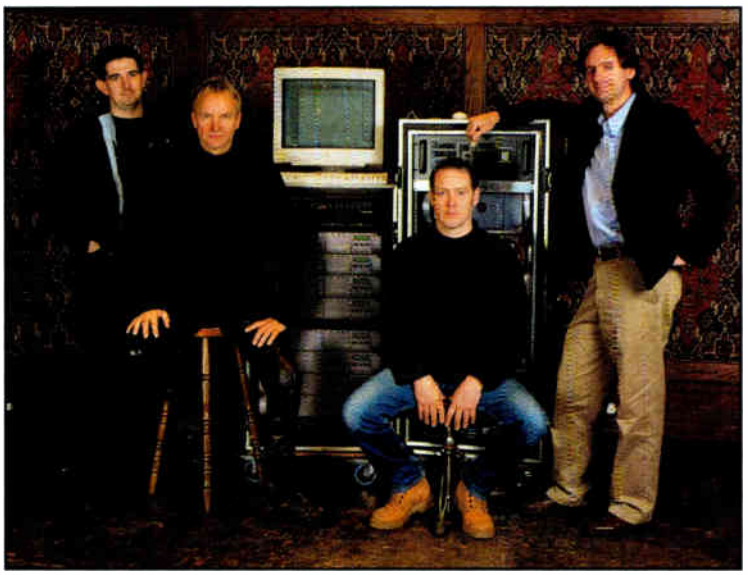
"All This Time"

OLD AND NEW TECHNOLOGIES MEET ON STING'S LATEST RELEASE



In Sting's control room with the new Pro Tools rack are Sting and engineer Simon Osborne (center), flanked by Jody Thorne (left) and Graham Boswell of converter supplier Prism Sound.

By George Petersen

FROM HIS EARLY DAYS WITH THE POLICE TO HIS ENORMOUSLY successful solo career, Sting has always been an artist who takes a different approach. This attitude is woven through his music, which combines textures of rock, jazz, blues and world genres, as well as breaking new ground in terms of recording technology.

In 1992, this consummate world citizen commissioned a custom Solid State Logic console built into flight cases, allowing the board to be easily transported anywhere on the globe. More recently, Sting's longtime engineer Simon Osborne assembled a complete 64-channel Digidesign Pro Tools rig in a rack for use anywhere, anytime.

"Sting's studio is actually the portable gear," says Osborne, "although we've got a small room in Sting's house that's been trapped and acoustically sorted out by Jonathan Flynn and Sam Toyoshima of AEG Acoustics, so it works like a proper control room, and we can mix in it. So we don't have a studio as such—we just have the gear, which we can move anywhere. It's a cool way of doing things."

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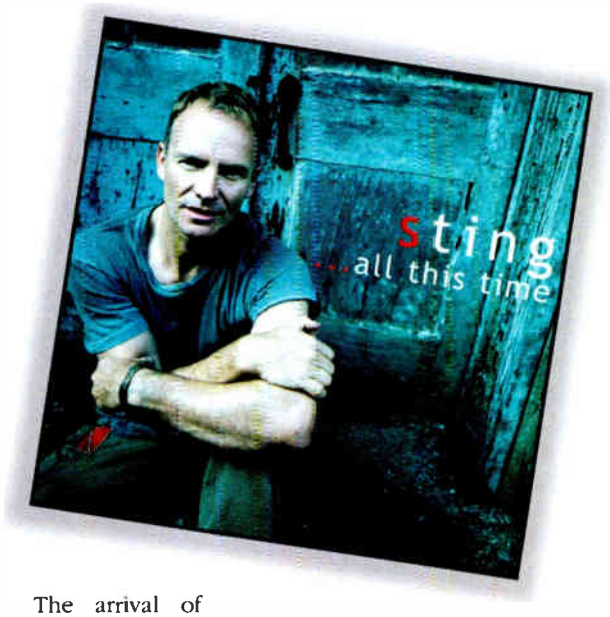
The new portable rig was brought into action for tracking and mixing Sting's latest project. Released on November 20, *All This Time* is a 17-track live album, with Sting and his band performing some of his most celebrated songs in an intimate setting. "It was recorded this [past] summer in Tuscany—a small, semi-acoustic live show with 200 invited guests," says Osborne. "We're using the whole system that Sting bought back in '92 for the *Ten Summoner's Tales* project. It's an SSL 4064 G+ console, with 64 channels. It's divided into three sections—all in flight cases, so it's off you go."

All This Time was also recorded direct to Pro Tools. "It's something I thought about when we did the last record, because we did a lot of editing," adds Osborne. "We've had two Sony PCM-3348s since about 1995, when we were doing Sting's greatest hits project. Sting likes to edit, putting something down and rearranging the song, and then starts writing more lyrics or putting another verse in there—that sort of thing. I've [developed] quite a technique editing on two 3348s, and while working on the last record [*Brand New Day*], I started thinking about Pro Tools, but I didn't want to change over halfway through the record. So when Sting went on tour, I started checking out the market to see what was around. In the end, we went with Pro Tools—just like everybody else," laughs Osborne.

"When it came to mixing *Brand New Day*, I did quite a bit of A/B testing between converter sets, and I singled out Prism converters as being very good. I placed an order for one 8-channel box then to feed the Genex recorder I bought for storing the surround mixes of *Brand New Day*. We later went with 64 channels of Prism converters for the front end of the Pro Tools system. The Prisms are a bit over-spec, because they can do 96 kHz, which Pro Tools doesn't do at the moment, but will eventually. I just wanted a front end that would last more than just a couple years and stay state-of-the-art."

***Sting and engineer Simon Osborne at Studio Mega in Paris in 1999, during the mix of Sting's* Brand New Day.**



The arrival of Pro Tools didn't completely change Osborne's recording/mixing style. "I've been mixing on the SSL for 15 years, and I'm used to it. I still use the SSL for the basic stuff, and if I need to get the microscope out and do an automated pan or automated filter sweep, I can do that in Pro Tools—I have both worlds at hand. Someday, I might go totally Pro Tools, but for now, it's mostly a tape machine with a lot of added edit features.

"The SSL is a great console and will be for a long time," Osborne continues. "It's like a lot of these old boxes; I still use the UREI 1176s—there's no reason to use anything else—or the Lexicon 224XL, a great reverb, although the new Lexicon 960L looks pretty handy. For Sting's vocals, we use a Sony valve mic—the C-800G—the one with the little radiator [Peltier cooling device] fitted on the back. It looks a little daft, but it works. I have some Shep preamps—the Neve copies—that are great on drums. I have a Summit and a couple Demeter valve preamps I use on vocals and bass. Most of the other sounds go through the Shep Neve copies. The design might be 25 or 30 years old, but the sound is state-of-the-art."

Even as a fan of vintage gear, Osborne is not afraid to embrace new technologies, such as mixing to 96 kHz. "If we're doing a video project, we mix into the Genex at 96 kHz—it divides well into 48 kHz. On *Brand New Day*, we mixed at 88.2 kHz. When we did the mastering at Abbey Road with Chris Blair, we came out of the Genex at 88.2 through a Prism D-to-A converter using the analog EQ in the mastering room, and then into a Sonic Solutions Sonic System at 44.1 kHz for CD."

Dependable near-fields are an essential part of the mixing process, especially when working in a variety of listening environments. "Quested have always been my favorite monitors," Osborne says. "I first came across them when I was the house engineer at Jacobs Studios [Surrey, UK] in the late '80s. More recently, I've been using the smaller 108s. A lot of monitors these days are too bright, but I find that when I'm working on Roger's [Quested's] speakers, I can produce a mix I enjoy, which also holds together on other speakers.

"I try to find out what the music is all about, and find out how it's supposed to work dynamically and emotionally,"

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says Osborne of his approach to mixing. "Of course, if it's something I've recorded, I've been setting up rough mixes—essentially rehearsals for the mix—for months during the recording process. That certainly happened with *Brand New Day*, which we worked on for a year and a half." But Osborne adds that the goal to mixing can be deceptively simple: "You need to bring the emotion out and make it sound posh."

In terms of surround mixing, Osborne already has the tools he needs. "The SSL is quadraphonic, which is all you probably need for music. If I want to bring in a center channel, I can just bleed it in with an aux send. Having done the fader automation on the SSL, I can then set up a mixing desk in Pro Tools with automated 5.1 panning and that sort of thing."

Unfortunately, the aesthetic aspects to surround mixing bring new complications. "The best thing about doing surround is trying wacky stuff," says Osborne, "but most home surround systems have two nice speakers that used to be part of their stereo, and three little speakers for the rest. It's difficult to know whether you're making too much use of the other speakers. With DVD's storage capacity, you could do two mixes—perhaps a stereo mix that bleeds a bit of reverb into the rear speakers and a full-on surround mix that's quadraphonic. Ideally, I'd like to mix as a surround thing—have stuff go all around and in the back, with diagonal pans—rather than just enhanced stereo. It could be really exciting, but it all depends on the end-user; you can't go blasting stuff into tiny little speakers in the back and expect it to work. It's like the early days of stereo mixing, where we had to worry about mono compatibility. Doing the DVD mixes for *All This Time*, I put the listener right up at the front of the stage, which is pretty exciting."

After all these years of creating memorable projects with Sting, Osborne remains humble about his contribution to these multi-Platinum successes. "Sting's not the most technical person and isn't overly interested in bits of gear. He's really looking at the overall project, writing songs, etc.," Osborne says. "My job is looking after the gear and pressing Record." ■

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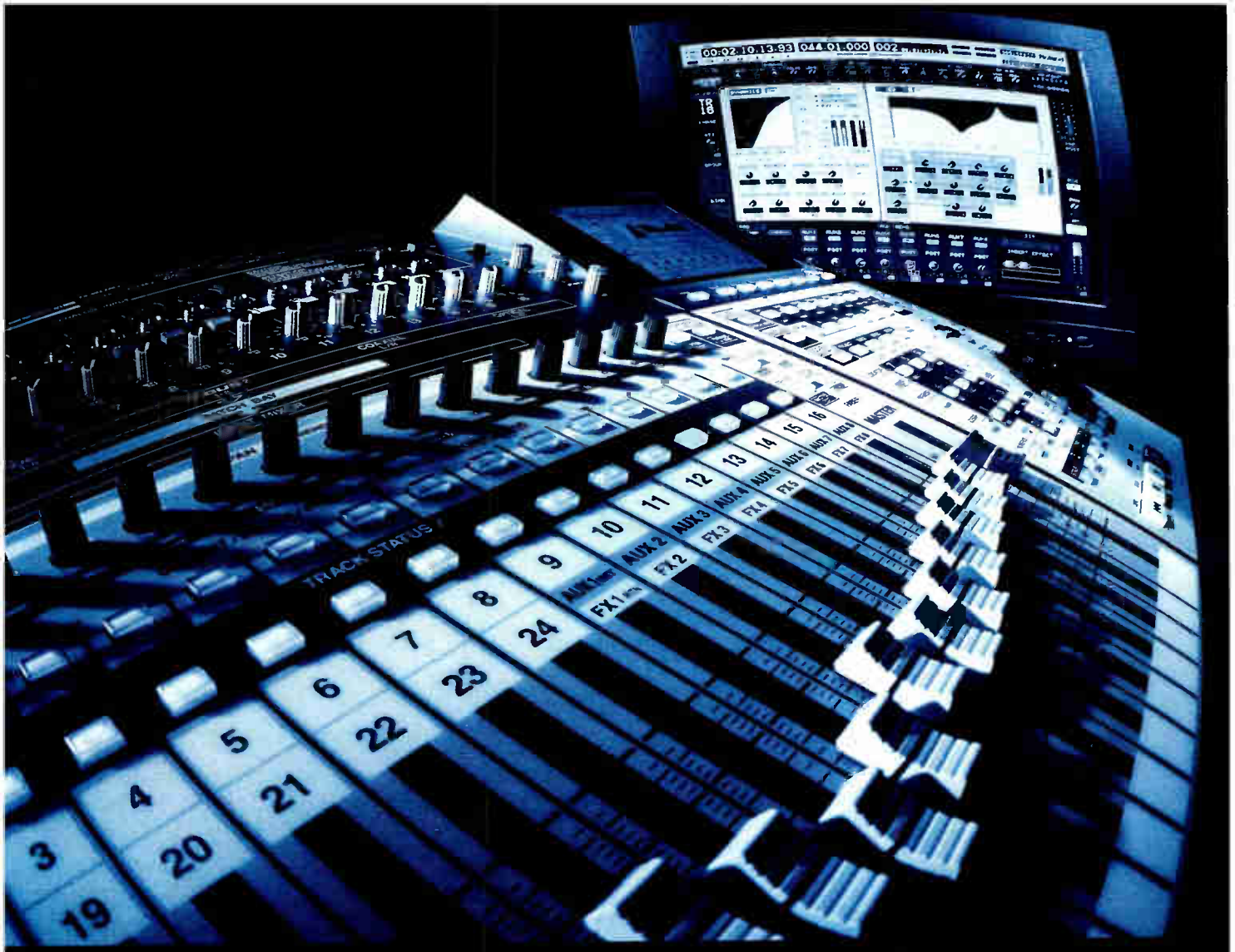

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BY MAUREEN DRONEY

Tony Maserati

High-Performance New York Hip Hop/R&B

Any definition of the "New York sound" that's front and center on so many of today's hits has to credit Tony Maserati with being one of its main authors; he's been seminal in the creation of a style sometimes described as "outhouse on the bottom, penthouse on the top." Big, powerful bass paired with smooth, classy high end is Maserati's trademark; you've heard variations on cuts by R. Kelly, Mary J. Blige, Lil' Kim and Faith Evans, as well as by more mainstream chart-toppers Mariah Carey, Destiny's Child, Brian McKnight, Jennifer Lopez, Ricky Martin and Alicia Keys.

Maserati started on the New York scene in the mid-'80s working with artists/producer Full Force, churning out records for the likes of Lisa Lisa and Cheryl "Pepsi" Reily. These days, he continues to be as busy as ever. Even in a field notoriously populated with dedicated workaholics, Maserati's especially focused and detail-oriented style attracts notice. His targeted approach to the job is evident in such hits as Ricky Martin's "She Bangs," Mark Anthony's "I Need To Know" and R. Kelly's "I Wish." Given his organized work habits and rather studious attitude toward technology, it's not too surprising to discover that, before left-turning into the studio world, the friendly and soft-spoken Maserati had decided to become a lawyer.

I spoke with him one Sunday afternoon in mid-September as he relaxed in his East Village apartment. He'd been up late the previous night mixing a new Alicia Keys release at Hit Factory's Studio 3, but after he made a quick run to the corner coffee shop for a double-strength cappuccino, we settled in for a chat.

I have to ask. Is Maserati your real name?

[Laughs.] Well, it's not the original spelling, but it's phonetically correct. It's how my Italian family name, Masciarotte, gets pronounced in English.

Let's go back to the beginning for a minute. You studied at Northeastern University in Boston, heading toward a law career, when you made a switch into music.

Yes. I was playing guitar and singing in a band while at school. When I realized I didn't want to be a lawyer, I switched to the Berklee College of Music and studied what was called "composition," which was, to me, just songwriting. At the same time, for money, I started doing live sound. I ended up doing sound and lights for a 10-piece R&B revue: three singers, horns, two guitars—a totally wild show. We traveled with a P.A., and we'd do three different venues a week.

So, early on, you had a feel for R&B.

I was always into it. I grew up listening to it because my sister was a big R&B head—Marvin Gaye, Diana Ross. When Berklee started their program for production and engineering, I signed up. I loved it, and that's when I started listening to guys like Bob Clearmountain, Neil Dorfsman, Roger Nichols, Steve Hodge, and Jimmy [Jam] and Terry [Lewis].

When I finished school, I went right to New York, to the Power Station, trying to get a job. They didn't need anybody, but it turned out that there was a guy working there that I'd played hockey against when I was a kid. He suggested that I try Sigma, which, at the time, had a studio in Manhattan upstairs from the Ed Sullivan Theater.

Kind of another R&B connection, considering Sigma's Philly history.

It was totally luck for me. A lot of the other studios were doing the '80s rock thing, and that was all cool, but it doesn't exist anymore. Sigma was doing a lot

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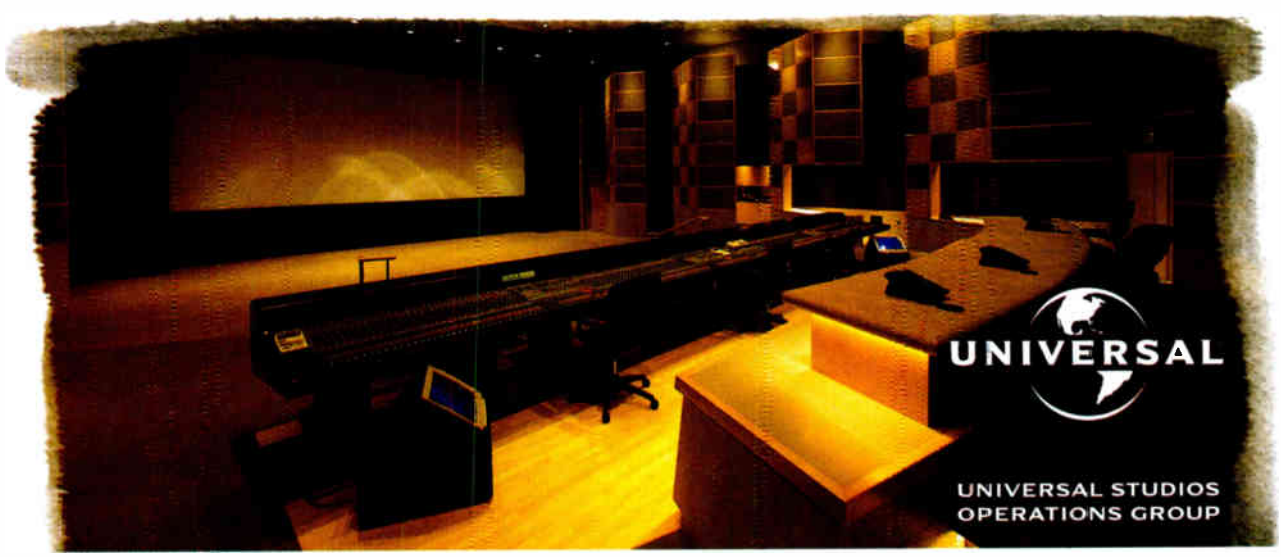

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of machine stuff, and a lot of remix stuff—Robert Palmer, Talking Heads, Steely Dan, Madonna; a lot of really cool music. We also did jingles in the morning. I got to work on everything from horns to strings, to vocals and mixing. Joe Tarsia was the owner and a great engineer from way back in the Philly days, so we all got really great training. And it was fun—Hank Meyer, the studio manager, would come up, on a whim, with things like "Margarita Day," and all the clients would participate.

How'd you move up to the engineer's seat?

Glen Rosenstein, who is now a good friend of mine, was engineering for the production team of Full Force. He'd started a Ziggy Marley record with Chris and Tina from the Talking Heads, and Full Force needed some work done, so he was nice enough to recommend me. One of the things we worked on was a Samantha Fox single, which I somehow also ended up mixing, that went to like Number 3. And when Glen continued to be busy with other things, I continued to work with Full Force.

What happened after Sigma closed?

One thing I did was to immediately get into the role of coordinator for the Full Force guys. And doing that, I started booking all my favorite studios, so I got to work at them. We went to Skyline and to Hit Factory and all over town, and I got to know all the studios and to become friends with the people who ran them. That saved me, because when Full Force created their own facility in Brooklyn, and started using the guy who built it for them to engineer, I called up all the managers I'd become friends with and said, "I need work."

And they all came through. Barbara Moutenot at Skyline, Laura King at Chung King, Troy and Danielle at Hit Factory—they'd call me with gigs. That's how I got hooked up with people like Heavy D, Brand Nubian, and Poke & Tone, who became some of my biggest clients.

It's an art: the way a talented studio manager can "cast" a session, pairing up clients with an engineer who will make the session go well and the studio look good.

That's absolutely right. Relationships are a lot of what this business is about.

Of course, you've also got to be good. I trained and worked the traditional 90-hour week, and I also studied very, very hard.

Studied how?

I would be on the subway every morning with my SSL manual, or whatever manual, reading it and marking it. I tell my assistants now: It's great to record your friends' bands, but don't just do that. Take a tape or a file and the manuals and work through a room's gear—the reverbs, the plug-ins. Keep working it over and over. I'd sit there with the gear for hours. I think that helped me become a mixer, and to be able to come up with things that were creative and new.

Tony Maserati with producer Bill Falcon and new artist Rose Falcon.

Where a lot of my counterparts were into getting a big "Power Station" drum sound, I was into looking for my own sounds. One of the conclusions I came to was that I couldn't do what Bob Clearmountain or Mick Guzauski does. To this day, if a client brings me something that I think someone else could do better, I'll tell them so. I'll say, "That sounds like a Mick Guzauski song; I think you should call him." I don't do the lush, beautiful thing.

My clients wanted a lot of bottom; they wanted it really heavy-sounding. And I wanted it to sound crystal-clear. The compromise is what I sound like now.

Okay, then, describe what you do do?

My stuff is harder, it's edgier, it's fat—more in line with the hip hop R&B thing. I worked with guys like Heavy and Puffy and D'vante and Poke & Tone. And because of what I had to do, I played a role in creating the modern R&B hip hop sound. My clients wanted a lot of bottom; they wanted it really heavy-sounding. And I wanted it to sound crystal-clear. The compromise is what I sound like now.

I got a lot of my ideas from others, of course, like Bruce Swedien and his Michael Jackson and Quincy Jones records. Bruce had the great top, and also some nice punch. He didn't have the crazy, heavy bottom that I needed for the hip hop stuff, but he knew how to make it pop. And Steve Hodge had a real ethereal spectrum and soundscape that I could never get but always tried to. And Mick [Guzauski] had [laughs]—I don't know what...Mick is a Martian, a genius from outer space. I cannot figure out what he does, and he's always using something that nobody else has.

Do you always work on SSL consoles?

Well, I used to say I could mix on a Mackie console in a bathroom. I think that's true of any good mixer. But now, the competition is really stiff and I use everything I can get, so I mix on an SSL J Series. I used to do a lot of work on the [Neve] VR—the Mary J. Blige stuff was on a VR—because I wasn't into the [SSL] G console with VCAs. I would gravitate toward anything that didn't have VCAs.

So the SSL J Series was a natural fit for you.

I jumped on it immediately because of its sonic difference and its flexibility. And its software worked really well. The automated EQ and dynamics in/out switching are especially useful when you've got a "difficult" vocal. I'll automate it to filter out low end on a talking part in the bridge, or to put a telephone sound in the intro. The in-

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sert in/out I'll use for the same thing, or maybe to add a different sound to an instrument to make it rise a bit in the hook.

I also have racks of Neve EQ. I own an old Neve 5316 console, a broadcast board that has 33114 EQs in it that I've rack-mounted. A 33114 is a mic pre, line amp and EQ, similar to a 1081 as far as frequencies. It has switchable top between 15 and 6k, plenty of frequencies in the mids—although there's no Q control—and a low and high shelf, as well. It's got a lot of flexibility for a Neve, and typically I have a rack of eight of them with me. Or, like last night on the Alicia Keys session, they wanted an old sound, so I had all three of my racks.

Are you always mixing off of Pro Tools now?

Yes, and it works great with the J, because I can clock the console to an Aardvark Aardsync and clock the Pro Tools as well. They're both getting the same clock source, which means I'm frame-accurate. You can change the SSL to read 29.97, and, of course, Pro Tools will read anything. I run the console as my master, which is great, and which you can't do that with other consoles.

What do you mix to?

I still mix to half-inch. I prefer a Studer 820, but I'll mix to an ATR, and even an MCI.

I've been using BASF 900 [tape]; it seems to stand up well. I don't hit tape that hard; I record at plus 6 over 185. When the new formulas came out, there was this whole thing about plus 9, plus 12, but I'm not into it. I recently got a tape

> I'll throw every trick in the book at a bad vocal. You don't stop until you've got something, because the vocal is the magic.

that was recorded at plus 12, and I called the engineer and yelled at him. It was flat, mushy and there were no dynamics. It was like, "What the hell were you thinking?" I understand the effort to reduce tape hiss, but I've got a gate on every channel here! Give me a break—you're supposed to be capturing the dynamic of a performance.

Actually, I do that a lot—call up engineers. [Laughs.] Mostly I give compliments, but sometimes it's, "Whataya doin' here?"

What are some of the techniques you use to get your bottom end the way you like it?

Early on, when I was working with Full Force, I started splitting things up; it's a way to compress the low frequency differently than the highs. I'll split the signal and EQ and shelf them each differently. I'll do that on kick drum, on bass and on vocals, and other things as well.

So, you'll do that on your main tracks, the ones in the center of the mix?

It doesn't matter where the sound is in the spectrum; it only matters what its job is. I'll take guitars and just nick bottom and top, or I'll nick all the bottom up to 2k—just to fit something in. I learned from listening to Roger Nichols and Steve Hodge—these guys place stuff, not just with level or pan, but with frequencies and phase. They would use EQ to move things front and back. Obviously, the

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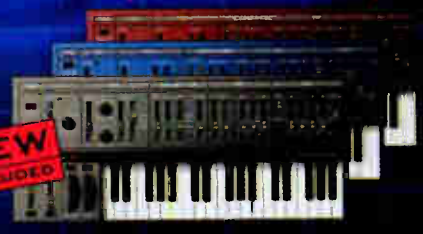

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brighter something is, the closer it is; the duller it is, the farther away. A bright reverb is present; a dull one takes you farther back in the hall.

Some of my clients bring in drums that just need a little tweaking; some of them need more work. Obviously, with a kick I need tons of bottom, so after I split it I might filter out all the top on one [split], pump the bottom with a Pultec or Neve, and compress it a little less. Then, on another kick, I'll nick off everything at the bottom, find the spot that ticks or knocks, and compress that differently. And all the while, I'm checking phase. That's the most important thing whenever you're combining two of the same signal that's been EQ'd and compressed differently.

What compressors might you use for your top split vs. the bottom?

On the top, I'll often use something that has less of a full-frequency response but gives me a quick release. Mostly the dbx 160, 160X, the [SSL] console compressor, Drawmer or Aphex—stuff I normally consider to be effects dynamics, because of the tendency to add a sound of its own to the signal. On the bottom, I'll generally use very little—with an 1176 or compression from the board—or nothing at all.

What EQs besides Neves and Pultecs do you like for bottom?

I also use a lot of Tube-Techs and Langs. And plug-ins work quite well for filtering. I use a lot of Focusrite, Renaissance and Filter Bank.

What about on vocals?

On vocals, I'll use two EQs: one before it hits the console and another on the insert point. I want the one that I use to hit the console to come with more of a sound of its own, like a Neve.

So you tailor your first EQ to the sound of the vocal, and use others to fine-tune?

Yes, like I'll use GML to notch things out or to add a little bit of top. I don't want to hear the GML, just the effect of it. Whereas with the Neve, I want to hear that sound that it adds and I'll choose the particular Neve model that I want. I have a set of 1066s that I just love. I'll often use those across the stereo bus, where they aren't doing much.

You just want the unique sound of the unit itself.

Yeah, there's just that color. That goes for compressors, as well. Depending on the frequency content of a signal, and what I want the outcome to be, I'll use everything from LA-2As and LA-3As—the optical stuff, which I like a lot—to a dbx 160X.

I used a dbx 160X on a Toni Braxton vocal once, just because, in that instance, I needed the control. Normally, I'd never do that, but it worked—it did the right thing. Today, I probably would have used an Empirical Labs Distressor for that.

I think quite a lot about how a piece of outboard gear works with the frequencies, and whether it's a transient sound or perhaps a bass, which is less transient. I wouldn't put a kick drum through a 160X and expect to retain a lot of the frequency spectrum that went in. I know that I would lose some of the brilliant top and a lot of my bottom, as well, because of the way the unit is made.

Obviously, this goes one step deeper when you start talking about the kinds of splits you're doing on an instrument.

I'm thinking about the kinds of compressors and EQs that work well for that frequency content that I'm splitting. I'm also very particular, especially with things like LA-3As and 2As, about which actual unit I'm using. I'll spend time on that. When I find a good one, I'll write

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the serial number down and make sure I rent that one all the time. It's the same with Fairchilds; I call the rental company, and I want a specific one or I don't want any. You have to, because they can sound totally different.

The first question I ask of the assistant when I plug in an LA-2A is, "Which one is the best?" A lot of times, they don't know. There's one room I work in that has two LA-2As. One does the job it was meant to—works perfectly, sounds great—and I'll use it on vocals quite often or I'll use it on bass. The other one sounds like crap, so when I want something to sound like crap, I'll put it in there. [Laughs.] It's not necessarily a bad thing; it's just another thing.

It doesn't really matter if you're using newer gear; a Distressor is going to pretty much sound the same, as do plug-ins, of course. Which I do—I use the Renaissance compressor on vocals all the time—it just depends on what I get. If something sounds terrific already, like with the Alicia Keys stuff I was working on yesterday, where you just need a little control, the Renaissance is good. Whereas, with something that's really bad, I'll have the Neve EQ, the Distressor, a GML, a de-esser, the board EQ, an old Dolby, an 1176 offline that I'm busing to...anything. I'll throw every trick in the book at a bad vocal. You don't stop until you've got something, because the vocal is the magic. If the vocal isn't doing its job, then you've not done yours.

A lot of mixers lately have commented on the poor quality of material that they often receive. What's your opinion on the subject?

It's not that everything is bad; I get lot of tracks that sound terrific. But it is a major issue. I'm used to getting tracks that are horribly recorded, whether it be analog or digital. Vocals that are punched terribly, with a mic choice that wasn't even thought about, a preamp choice that wasn't thought about—obviously not right for the vocalist. Everything, down to poor recording level. It's just something that we all deal with.

What monitors do you use?

I go through a million. I spent quite a long time with Tannoy DMT-12s. Mine are actually broken, and they buzz when you turn them up, but I still cart them around. I also own a pair of ProAc Studio 100s, and a pair of Dynaudio System 1s. I even have a pair of AR18s that I drag around.

I almost always have Yamaha NS-10s set up; my clients are used to them, and so am I. Then, most of the rooms I work in have George Augspurger mains. I'll change the smaller set, depending on the music style.

Which ones for which styles?

If I'm doing a straight-up, hip hop, heavy-duty bottom kind of thing, I'll use the DMT-12s; they give me clarity as well as bottom end. If I'm doing a more pop kind of song, I'll use the ProAcs. If I'm doing something more pop/rock, with a little more guitars, I'll use the Dynaudios or the AR18s. I play with the effect on my brain.

Back at Sigma, we had something called Big Reds—they were the worst-sounding speaker on Earth. But there was an engineer named Jim "Doc" Dougherty who used to do a lot of dance mixes, and he made them sound really good. I learned from that, that if you could get those Big Reds to sound good, the mix was amazing. I never did, but it made me realize that you could use the speaker to force your brain to do something it didn't want to.

I don't use something like Genelecs that make everything sound good, because I'll stop way before the mix is right, thinking, "Oh, that sounds nice." I want something that makes me work really hard. That's why I use Dynaudios for guitars. You can't hear guitars on them so you push guitars.

Do you listen at high levels?

I listen at quite a lot of different levels. I also listen a lot in mono on the Studer speaker, or, if I don't have an 820, I'll listen on a single Auratone. I do most of my EQ'ing on the ProAcs, Tannoys or Dynaudios, listening quite low. Then I'll do rough leveling on the NS-10s a bit louder. Then I'll go to the mono speaker and do the more intricate vocal levels and background levels. Then I'll go back to, say, the ProAcs and listen louder for fine EQ'ing, then I'll go to the NS-10s and listen lower for my fine leveling.

Sounds like a science. What do you listen on at home?

I have a pair of Snells; big, tall, orchestral speakers that go down to 20 Hz, with a Perreaux amplifier and a preamp that I think everyone should own, by a company in Norway called Electrocompaniet. I found it at the Stereo Exchange.

What's the ballpark time it takes you to do an average mix? Do you leave it up overnight?

If things are put together well, I don't necessarily leave things up overnight. But, if I've spent most of my energy fixing things all day long, then I definitely want to leave it up overnight. If I've spent all my time fixing problems, my creativity will be gone. I'll want to come back in the next day and say, "Okay, now what does this need to become a record?"

What motivates you and keeps you coming to work every day to make those records?

I've thought about how the projects that we do tend to blend into each other from day to day, and I've realized that really, it's about a day's work, and how you put yourself into it. I'm not a visual artist, but when you're doing several songs for an artist, it's almost like you're doing studies of that artist—studies in a particular emotion or sonic development. It really becomes your art, as well, and you go somewhere within yourself to create it. ■

Maureen Droney is Mix's L.A. editor.

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Marc Anthony: "I Need To Know"

James Brown: *JB (Best of the Best)*

Mariah Carey: "Honey," "The Roof"

Destiny's Child: "Survivor," "Bootylicious"

R. Kelly: "Like a Real Freak," "TP-2"

Jennifer Lopez: "Play," "Ain't It Funny," "I'm Real"

Ricky Martin and Christina Aguilera: "Nobody Wants To Be Lonely"

Maxwell: "Fortunate"

Mya: "Best of Me"

Notorious B.I.G.: "Mo Money Mo Problems"

Puff Daddy: "Been Around the World"

The Simpsons: *The Yellow Album*

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BY PATRICK KENNEDY

Steve Austin

Master of the Underground

"A lot of people who record with me are not necessarily the most together or stable, and the music they make is often disturbing and heavy," laughs noted underground sound sculptor Steve Austin. "In fact, during the first night of recording with one band, who had been on a major label and opened for Pantera, blood was spilled by two different people. Furthermore, my shirt was ripped off my back, and some of the heaviest music on the Earth was committed to tape, all in the space of a few hours."

Austin is a fearless, driven guitar player in the vein of John McLaughlin or Robert Fripp, with an added affinity for death metal. Experienced in both the touring circuit trenches and behind the console, this Tennessee native maintains both of the vitally important vantage points for a modern engineer.

"My live room tracking method is the same as how BBC Peel Sessions are recorded," says Austin, speaking from his home recording/mastering facility, Austin Enterprise, in placid Clinton, Mass. "I recorded at the BBC with Today Is the Day in the mid-1990s, and it was probably the most powerful recording experience I had ever had, and the most accurate recording of my music. It was set up more like an old-school recording, where everyone plays in the same room separated by acoustic dividers.

"At Austin Enterprise, I have a seven-foot-high mahogany barricade that wraps around the drum set. The guitar amps are put 10 feet ahead of the drums facing forward. This technique gets super separation but allows everyone to be in the same room at the same time. To me, recording is not based around the technicalities of numbers, digits, dBs and ratios, but around giving the artists a place where they feel super comfortable; and a place where they'll be able to hear themselves, hear the drummer, play accurately and enjoy a real experience."

The Trident 24 36x24x24 mixing console, like most of the gear at the studio, has been hot-rodded. "Stock gear just can't cut it," notes Austin. "Almost everything I have has been 'mod-ed' by Coleman Rodgers of Alactronics in Wellesley, Massachusetts. I consider Coleman a genius and personal guru."

Austin's prized gear includes a pair of silver-faced UREI LA4 optocompressors. All vocals are double-compressed with an early violet-shaded UREI 1176LN (D) and a Drawmer 1960 tube mic pre/limiter. A Neumann M147 tube condenser provides the up-close mic, while an STC 4038 ribbon mic soaks up the ambient room sound. Austin recently acquired a bronze STC 4038 mic—in fact, the second-earliest existing one, according to Wes Dooley of AEA.

"A lot of the stuff we cut here is through vintage preamps," Austin adds. "We have a pair of Neve 1272s that I use for guitar and vocals, and four Telefunken V72s for stereo room tracks, hi-hat and ride. For kick, snare and toms, I use four API 312s and a Drawmer 1960 dual-tube mic preamp, and Countryman 85 FET for bass."

The live room, which measures 16x32 feet with a 12-foot ceiling, features a floated, beech hardwood floor and 5-inch-thick walls, producing a formidable natural reverb.

Austin Enterprise hosts, naturally, both of Austin's bands: Today Is the Day is one of extreme music's most splenetic, progressive, technical outfits; and Taipan, Austin's newest foray, is a more direct, linear, avant-rock trio. Outside clients who venture into Austin Enterprise, including such notables as Metal Blade artists Lamb of God, New York City noise trio Unsane, Deadguy and the infamous A.C., are recorded to Austin's mint-condition Studer A80 Mark IV 2-inch tape machine.

"Steve Smith of Studer Nashville resurfaced and hot-rodded our capstan motor," notes Austin. "[The Studer] already had the Gizmo mod, which is the gold stabilizer pin that appears on the later Studer A827 tape path. I run the machine at 15 ips, which produces a 50Hz low-frequency response.

"The bottom line for me is that if I am getting off on the mix, and if it's good, I lose control," explains Austin. "I'll find myself flying out of my engineer's chair and completely freaking out because the music rocks me that hard. That's when I stop the song, prepare the mixdown deck and lay those songs down. Ultimately, it's about getting people to just let it fly without restrictions."

You can visit Austin Enterprise at www.austinenterprise.com. Also, check out Austin's band at www.todayistheday.org. ■

Patrick Kennedy is a freelance writer based in Baltimore.

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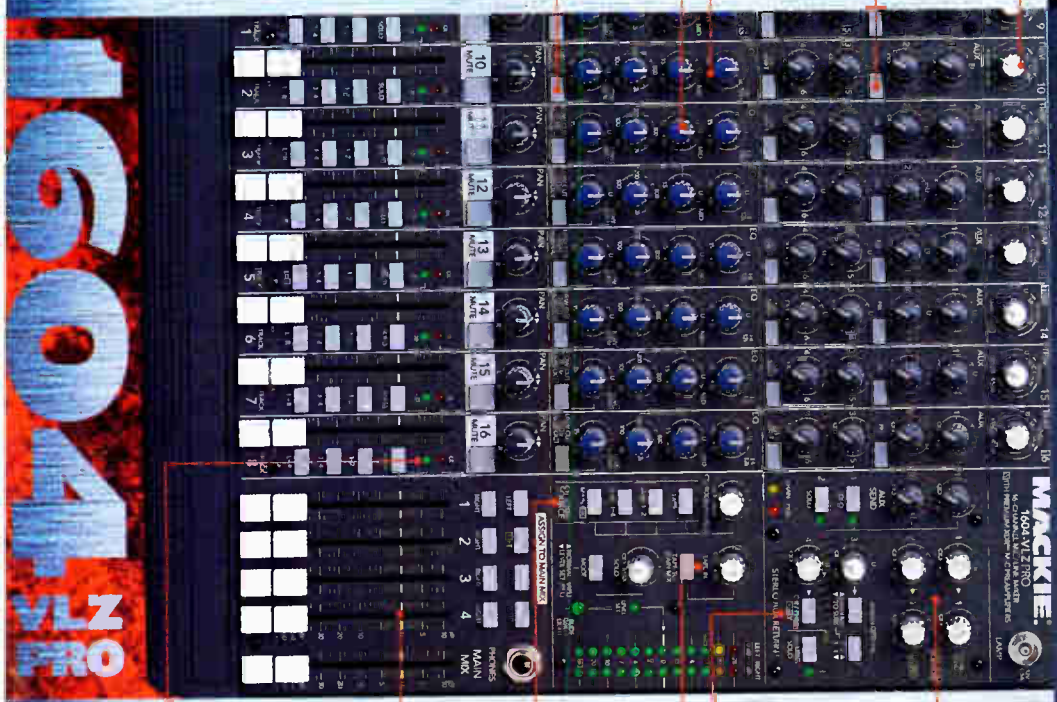

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"Harry Potter and the Sorcerer's Stone"

A Fantastic World of Sight and Sound

By Blair Jackson

PHOTO: PETER MOUNTAIN/WARNER BROS.

The adventurous trio of Hermione Granger (Emma Watson), Ron Weasley (Rupert Grint) and Harry Potter (Daniel Radcliffe) make their way through a living chess game on their way to a climactic encounter with He-Who-Shall-Not-Be-Named.

Few films in recent years have been as hotly anticipated as *Harry Potter and the Sorcerer's Stone*, the first movie to be made from J.K. Rowling's gazillion-selling children's fantasy book series. It sometimes seems as though every kid between the ages of 7 and 12 has read one (or all four!) of the Harry Potter books. And truth be told, millions of teenagers and adults have fallen into the series—some parents reading them to their kids (as we did in our household), others just enjoying it for themselves.

It's hard *not* to get swept up in this epic adventure, with its strange and memorable characters, magical action sequences and serpentine plot twists that have carried our heroes through thousands of pages of adventures in four separate books, with three more to come in the next decade or so. Why resist? Hop onboard! The Hogwarts Express is leaving platform 9¾ with a train-load of would-be wizards bound for the famous academy that has been training wizards for centuries. The first book—and film—merely lays down the groundwork for a saga that rivals the *Ramayana* for its sheer scope and wondrous revelations, but what a world we're plunged into—one populated by killer trolls, headless ghosts, blue-blooded unicorns, living chess pieces, a gargantuan three-headed dog, sinister and peculiar professors...actually, Harry Potter and the other kids at the Hogwarts School of Witchcraft and Wizardry are the most normal entities in the story, even with their magic wands and flying broomsticks (on which they play a fanciful organized sport called Quidditch, high up in the air).

PHOTO: PETER MOUNTAIN/WARNER BROS.

Best friends Ron and Harry arrive late to class.

It's never easy to make a film of a beloved book because, invariably, readers have painted their own mental pictures of the characters, settings and events, and a film necessarily concretizes *one* interpretation of those elements. To his credit, director Chris Columbus, whose rather light-fare resumé includes such films as *Home Alone*, *Mrs. Doubtfire*, *Stepmom* and *Bicentennial Man*, has tried to be as faithful to the books as is technologically possible. He hasn't Americanized it, thank goodness, or sanitized it. And he chose an exceptional team to help him realize his interpretation of the story. On the visual side, there are such notables as Oscar-winning production designer Stuart Craig (*Gandhi*, *Dangerous Liaisons*, *The English Patient* and *The Mission*) and director of photography John Seale (*The English Patient*, *Gorillas in the Mist*, *The Perfect Storm*), who, combined with visual effects supervisor Robert Legato and a talented crew of costume and set designers, really make Harry's world come alive—even the notoriously finicky Ms. Rowling was said to be blown away by how closely they captured her own notion of the book's look.

On the audio side, there is a big, booming John Williams score and, as you'd expect, *lots* of creative sound effects; after all, the sound team had to invent the world from scratch from *their* perspective, too, in coordination with the visual craftspeople. Heading the audio artisans was supervising sound editor Eddy Joseph, whose distinguished career has included work on such films as *Lost in Space*, *Michael Collins*, *Evita*, *Interview With a Vampire*, *Angela's Ashes*, *The Crying Game*, *Enemy at the Gates* and many others. ("It seems as though I do most of Alan Parker's and Neil Jordan's pictures," he says.)

We caught up with Joseph at Shepperton Studios in England in late October. He was ensconced in Theatre 4—with its Harrison MPC console, JBL 4675A speakers and plenty of other gear—

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PHOTO: PETER MOUNTAIN/WARNER BROS

Hundreds of wannabe wizards gather in the Great Hall for dinner.

still working on *Harry Potter*, just two weeks from its early November London premiere. "Yes, I'm still on it," he said with a laugh. "Always a little more to do. You know, there are two versions: In America, it's *Harry Potter and the Sorcerer's Stone*. In Britain, it's *Harry Potter and the Philosopher's Stone*. And it's also going to be in over 30 languages, as well. So there's still some work to be done before the beginning of November, getting everything finished and prints made and all." Still, he graciously took time out of his hectic schedule to talk to *Mix* about some of the sound aspects of Warner Bros.' holiday blockbuster.

Were you in on this project from the very beginning?

No, I started at the end of February, and they were about two-thirds of the way through the shoot at that point.

It was shot in England, wasn't it?

Yes, all the studio sets were at Leavesden Studios, which is where they did *Sleepy Hollow* and *Star Wars: The Phantom Menace*. It's not really a studio. It was the old Rolls Royce airplane engine plant. But there's plenty of room there, obviously, and it has become a popular place to shoot.

When you came onto the project, did you meet with Chris Columbus to discuss his vision of what the audio for the film should be like? Was there a master plan of what sorts of textures were going to be used?

Not initially, no. I got a call whilst I was completing *Enemy at the Gates*. They asked if I might be interested, and I had a few things to finish up, but then they called a few days later and offered me the job, so I took it. But at that point, I didn't get the opportunity to speak to Chris, nor he to me.

How would you define the sound supervisor's job? It seems to differ from film to film, and person to person.

It does. I like to get my fingers in every pie. I like to think there isn't much that happens on the sound that I don't know about. So in that, "supervisor" is correct, but I also like editing. I like to call myself supervising sound editor because the IMDB [Website] likes it. If you start altering your title, it can create problems of identity.

Are you involved with sound effects generation?

Oh, absolutely. I have a sound effects editor named Martin Cantwell, and we talked through everything over the course of two or three months. "Well, what on Earth are we going to do for *this*?" [Laughs.] So we went and recorded a few easy things like steam trains, and we went to a really old mansion house and recorded a lot of doors and atmospheres and creaks and things. And we also got a few of the kids who are in the film to leap up and down and run along stone steps and wooden corridors, that kind of thing, and to give us a few voices [for backgrounds], which was very helpful. We used a lot of that.

Did you do that field recording on DAT, or what?

Well, we were on HHB Portadat, the new HHB Portadisc system and my old Casio Datman as backup, and that worked out well. This was the first time we used the Portadisc. We were always backing ourselves up and using different microphones in different areas. So everything was recorded three times, it seems, which gave us lots of scope.

One of the interesting things about the Harry Potter story is that it's modern, yet it has certain medieval trappings. It must have been interesting to try to balance those elements in the sound design.

It was. When Chris Columbus and I discussed the concept, we decided we didn't want to have anything that

Eddy Joseph, center, and some of the Harry Potter sound team: (L-R) Simon Chase, Alex Joseph, Richard Fordham, Martin Cantwell and Colin Ritchie.

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PHOTO: PETER MOUNTAIN/WARNER BROS.

Harry finally receives the invitations to Hogwarts, which his evil relatives, the Dursleys, have been withholding.

sounded electronic or that sounded too modern or futuristic *Star Wars*-y. It's a much-hackneyed word these days, but we wanted to keep things "organic," which we did. It was hard to do, because it's very easy to take some normal effect and over-treat it so it becomes electronic-sounding.

And do you do that by starting with entirely organic sound sources?

Yes, almost always.

For example, how did you do the Quidditch balls or the Snitch? I would think those could almost have sounded electronic?

Yes, that's true, but that's what we were trying to avoid. The Snitch we did partly from wind chimes and a handkerchief speeded up, combined with other things. The Bludger is partly voice. It has to have a sort of an animal entity. Normally, of course, if you have a ball that flies through the air and it narrowly misses people, it would probably have mostly a whooshy sound. Well, that's not frightening at all, or even humorous, so by adding in the animal element you are aware of it more quickly. So when this thing roars past you—or past them, the players—it has a vocal element to it that is somewhat amusing and also menacing, because it really is dangerous: when it hits people, it can knock them out.

We had a preview in Chicago and the kids there thought what we did was absolutely right, so I guess that one passed the test. We have to set a precedent, I suppose, because there's *Harry Potter 2, 3, 4*, up to number 7 being talked about, so we had to lay the groundwork in this one for the effects, and they had to be "right," if you know what I mean. I suppose they could change them a bit over the other films, but not much.

Were you doing your sound combinations in the HHB system or Pro Tools?

Actually, when Martin was working on his side of it, he was working on an Avid AudioVision, but when he wanted to do interesting things, he'd move it into Pro Tools. Half of my team works on Avid, but will be moving across, unfortunately, to Pro Tools. I say "unfortunately" because the AudioVision is a great track-laying and editing piece of equipment. The Pro Tools is really clever, and you can add in all the software you like, and it works on higher grade and so on. But as a track-laying/editing machine, it isn't yet as good. I suppose it will be eventually. Over here, particularly, people have been using AudioVisions for a long time; we've been involved with it for over six years now and know the machine well.

The other half of the team has been working on the DAR Storm [workstation], which is something I've had for years. It is Pro Tools-compatible. What's great about the Storm is it's a workstation that was constructed for sound editors, rather than just a computer that was designed for other things mostly, or a mainly musical system—it was built as a sound editor's workstation. I like that it has a touch-screen, and it's a genuine 32 tracks you can play with and audition at any time. You can get to and from things very quickly; your directory is there with all the sound effects and reels, and you can move things around without having to open and close bins and move things across, and drag things and everything. It really is instant access. It is great onstage too—it locks quickly and plays backward, as well. The backup is on MO, which is also instant access.

Is it high bit rate?

Yes, you can work on any bit rate you want: 16, 20 or 24. We still work a lot on 16, because if you are taking things from CDs, they're 16-bit. If you're a purist and involved in music, I can see the validity for working in 24 and keeping it in 24. But when you think about production dialog and that sort of thing, there's so much background usually that there's hardly an occasion where it's worth being in a high bit rate. Others would argue, no doubt, and will. [Laughs.]

Did they use much production sound on this film?

It was difficult because so much of it is CGI. I mean, you can't record a three-headed dog, can you?

You mean "Fluffy"?

Right. Fluffy. [Laughs.] I think the Russians managed to make a two-headed dog, didn't they? But this is a genuine three-headed dog. We had to invent so much for this film—it has a troll, of course, the Devil's snare [an evil plant], the Chamber of Keys and the game Quidditch.

So I imagine there was a lot of bluescreen work.

Yes, all of Quidditch was done against bluescreen. I think somebody said that there are probably 20 superimpositions in

THE HARRY POTTER SOUND CREW

Eddy Joseph: supervising sound editor
Martin Cantwell: sound effects editor
Colin Ritchie: dialog editor
Nick Lowe: ADR editor
Peter Holt: Foley editor
Richard Fordham, Alex Joseph and Simon Chase: assistant sound editors
Ray Merrin, Graham Daniel: re-recording mixers
John Midgley and Ian Munro: production mixers

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some shots; just layers and layers. You've got 14 players in a Quidditch game and each of them have their own moves, so the computer has to deal with that, plus if the three balls are in the shot, there's another three, plus the backgrounds, plus the crowds. It goes on and on.

Where was the CGI done?

All over the place. Partly ILM, partly Sony, The Mill over here, Cinesite, Smoke and Mirrors, Rhythm and Hues...quite a lot of places.

So, there must have been a fair amount of ADR on this film.

Yes, we did record a lot of ADR. There was quite a bit that needed to be done because of noisy wind machines, especially in the flying sequences, although there's not a lot of dialog in those sequences. We used as little [ADR] as we could, because if you can use your production track, everyone's happier. Chris Columbus mentioned that he didn't like to use ADR unless it was absolutely necessary. He preferred to use the production when we could, and clean it up accordingly.

When you work on a film that has so much CGI, is it difficult from a sound perspective because you have to wait for the visual elements to be completed before you can fine-tune what your sound is going to be?

It *is* difficult, and there were a number of situations where we were told vaguely what we were going to get, and then the results were rather different.

What's an example?

Oh, mostly the positions of things. We'd be working to an animation, say, on a flying sequence, and then find that when the next stage comes through, everything's in a different place and the timing is different; and that can cause havoc. Also, no disrespect to visual effects houses, but they do like to do their own thing—as we do—and you suddenly find that the broom, for example, has got more twigs breaking off than was ever mentioned; or, in fact, it might not have been mentioned at all that the broom had breaking twigs!

So you don't have the appropriate cracking twigs...

Exactly. Except that we *do* have it there, because we're quite clever and we have these things up our sleeve, and we can do them on a moment's notice. That's a small example, but there really were a number of occasions where we didn't get the final shots until...well, a week ago! [Laughs.] We print-mastered half the film, and then we had to wait for the rest of the reels because we didn't have the shots. But now, it's all there. We've listened to all the sound negs and everything seems fine.

This is a John Williams score?

Yes. It's a full John Williams score, so I'm sure that you can imagine what that's like if you've seen *E.T.* or some of his others.

I've always thought that the prominence of his scores must make it tougher for sounds to cut through in the mix.

There are times that it gives us a little less room. But it wasn't really a problem, and there are a number of scenes where the music and the sound effects work really well together. Like in the chess match, he's given us a sort of military-sounding score, a little like Ravel's "Bolero." It's very effective. It works well on the rolling of the huge chess pieces, which is superb. The art direction and the production design, overall, are just stunning; really exciting. It's on a very grand scale.

I would think that there would be a number of scenes that would rely heavily on sound: I'm thinking of the third floor hallway with Fluffy, the three-headed monster dog. Then there are all those cavernous rooms...there are so many unique worlds. You have to convey foreboding and then excitement.

You're absolutely right. There was lots of room for us to try different atmospheres. The acid test is always to listen to the scene *without* any of the atmospheres, and it just becomes a studio set again. The sound *is* thick at times. There's lots of things going, but you know, with all the creative things you need to come up with, you still find yourself going back to the wind squeaking under doors and so on.

Hey, you don't mess with the classics! Those noises have been scaring people in films for 70 years!

They *are* the classics and they still work. [Laughs.]

From the sound design perspective, what would you say was the most chal-

PHOTO: PETER MOUNTAIN/WARNER BROS.

Flying instructor Madame Hooch (Zoe Wannamaker) prepares to scold Neville Longbottom (Matthew Lewis) for taking off before the lesson starts.

PHOTO: PETER MOUNTAIN/WARNER BROS.

Professor McGonagall (Maggie Smith) approaches Harry with the sorting hat, which tells him that he will be a member of Gryffindor House.

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lenging aspect?

I think trying to actually be true to the story. And that really required a lot of thought. What noise does someone on a flying broomstick make? No one really knows.

So what did you come up with?

Well, you'll have to hear it, but we think it's absolutely right for the flying broomsticks. [Laughs.] It's a combination of a wind-y sound, with flapping of the cloak, a little bit of the twig sound, but you can't have much. And, not to give too much away, there are a lot of little animal-y noises in there to try to give them a life of their own. A broomstick is only as good as its rider, and in this film it's like a horse in the end—not that we used any horse noises—but each is different, so we tried to make them a little different. No two are exactly the same.

Did you use sound effects libraries, or were they all generated by your team?

It was almost all generated. I have a lot of libraries, of course, and we often used them in a temp [mix], but we were always saying, "Hang on a second. I'm sure we could do better ourselves." So we recorded them both in the Foley and then Martin and I did a lot of recording. Every day, Martin would be out there banging bits of wood against the wall, or breaking eggs or whatever he could find on the lot. [Laughs.]

Did the mix pose any special challenge?

It's very difficult not to make it enormously loud. And it *is* loud; it has a lot of loud elements.

Yet, there aren't explosions or gunfire....

No, that's true. But when you think about it—something like Fluffy has to be pretty noisy. He's massive, as big as a house, a three-headed dog. When he barks, he's going to make a lot of noise, and there's music there as well. If there's music, people want to hear it. And dialog, too. So all of a sudden, you've got a really loud scene.

Is Fluffy one of those modern sound effects designer's combinations of dog and lion and tornado and wildebeest and whatever?

Actually, he's mostly dog. In fact, my own dog is in there, as well as the sound of my assistant Richard gnashing his teeth. There are a lot of elements in there.

You asked about the challenge of the mix. Well, the main one is to get all the elements in and give everything a chance and try to always be aware that you are somewhere that no one's been before. And it's already in every child's imagination. I don't know how many millions of children—and adults—have read this

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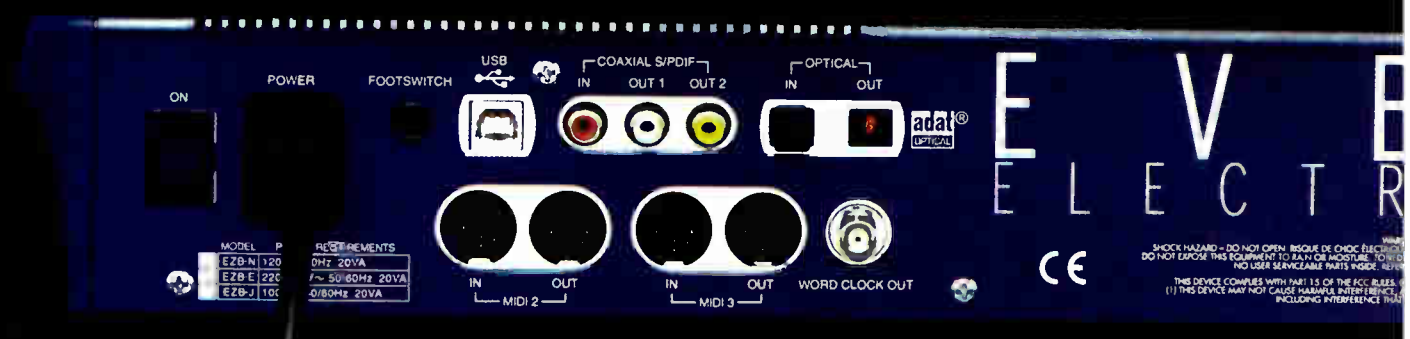

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book, but every one of them has a concept of what it looks and sounds like. So we're hoping to be true to that. But you do have huge problems, like, for instance, owls [wizards use owls to deliver letters and parcels]. If they made as much noise

AP-OTO PETER MOUNTAIN/WARNER BROS

Professor Dumbledore (Richard Harris), the head of Hogwarts School of Witchcraft and Wizardry.

as our owls did, they'd never, ever catch a mouse. [Laughs.] When you hear an owl flying by you, you really hear his wing flaps and more. We have to add in these extra effects because we're making movies. Our owls are noisy. It was great working with the owls. They're magnificent creatures.

Does the fact that everyone involved with film production now has one eye on the eventual DVD affect how you do the surround mix for the theater? I suppose there's automatically a separate DVD mix.

It will be done separately. I believe there will also be extra scenes going into it. Hopefully, we'll be involved in that, too. I don't think the DVD mix will be that different. We mixed in EX, as well. We did the SRD [Dolby Digital] with the extra surround. We did all the formats—the SDDS 8-track, the DTS and the SR [Dolby analog].

Were the rears used mainly for atmospheres and broom flyovers, that sort of thing?

Yes, for specific things like that. Brooms flying across, owls flying from back to front. There's a centaur who leaps front to back. There's [the main villain] Voldemort —whose name we cannot mention— who does a bit of business in the rears; I shouldn't go into it... [Laughs.]

There have been an awful lot of

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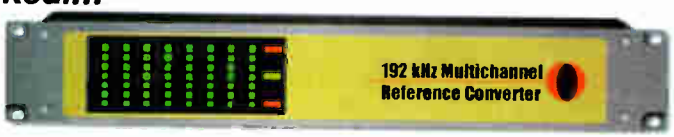

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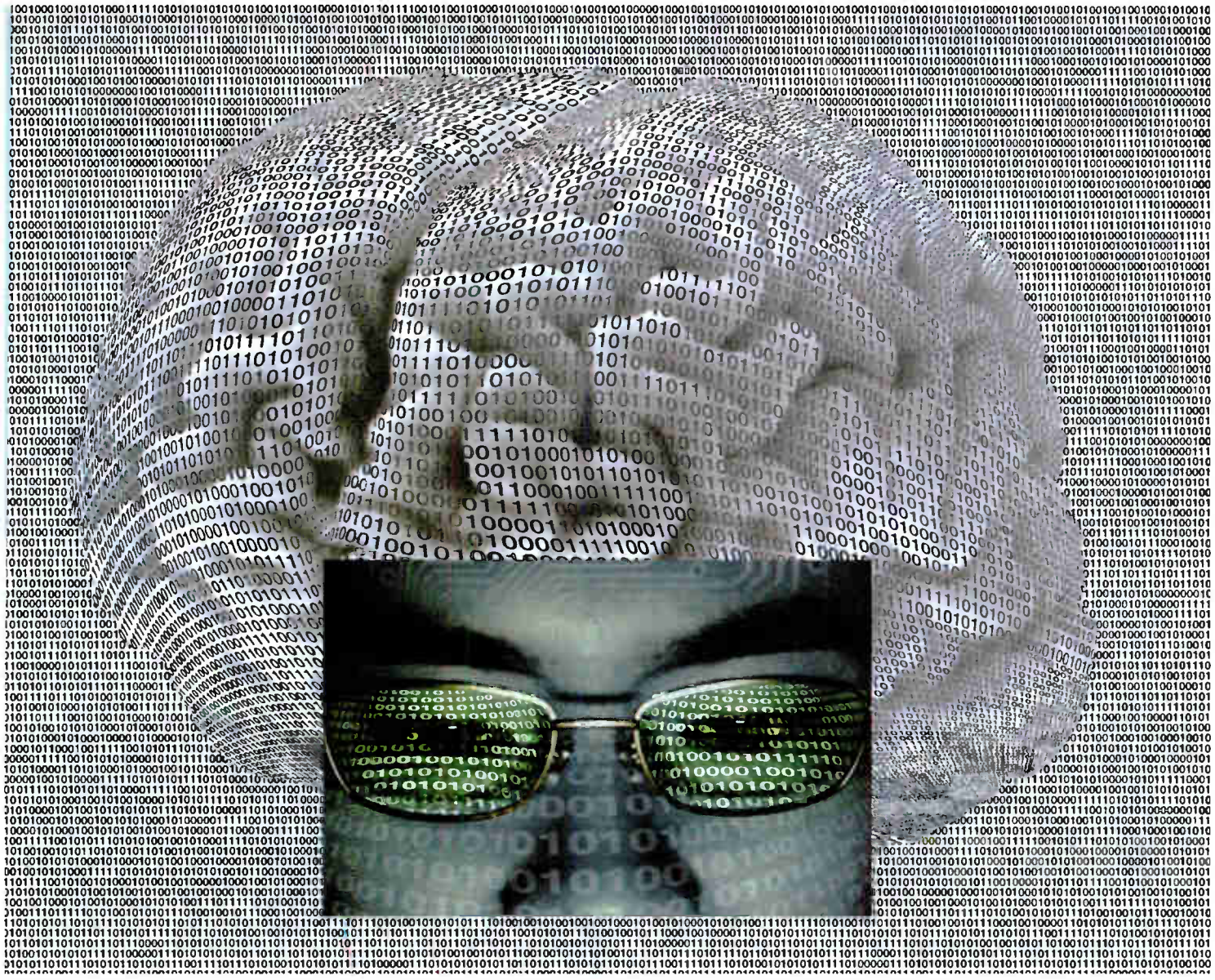

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DVD Picks

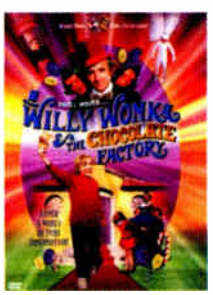
QUADROPHENIA
(Rhino Home Video)
Quadrophenia, The Who's all-time classic cinematic rumination on the teenage search for identity in the context of the mid-'60s British Mod scene, is out on DVD. And for fans of great rock 'n' roll movies, this is one to own. The soundtrack has been pumped with an enhanced restoration—from a 35mm positive Dolby A optical print, transferred in Pro Tools where it was remastered for Dolby Digital.

Not only is there the music from the album *Quadrophenia*, but there are a handful of early Who classics and period pop and rock hits by The Merseybeats, James Brown, The Crystals, The Orlons, The Supremes, Marvin Gaye, The Chiffons, The Ronettes, Manfred Mann and The Kingsmen.

For those who always wondered what "Mod" stood for, it was Mode of Dress—I've gleaned a lot from the many extra features Rhino has packed onto this release. The extras include commentary with director Franc Roddam, ongoing trivia that can be engaged to run at the bottom of the film screen, an interview with Sting, a Vespa motorcycle short, an extensive overview of great Mod films, and a "test" to see if the viewer is either a Mod or a Rocker. I tested out as neither. Maybe that makes me a "Mocker," as Ringo stated in *Hard Days Night*.

Producers: Roy Baird, Bill Curbishley (Who manager at the time). Director: Franc Roddam. Music directors: Roger Daltrey, John Entwistle, Pete Townshend. Music: John Entwistle. Sound recordist: Christian Wrangler. Sound editor: John Ireland. Dubbing mixer: Bill Rowe. Music remix engineer: Cy Langston. Music coordinator: Mike Shaw. Audio: Dolby Stereo and Dolby Digital.

—Rick Clark



WILLY WONKA AND THE CHOCOLATE FACTORY
(Warner Bros. Family Entertainment)
"Ladies and gentlemen, the chocolate room!" When we think of director Mel Stuart's marvelous adaptation of Roald Dahl's children's novel, we picture spectacular visions of whipped cream mushroom caps, chocolate waterfalls, and basketball-sized, pudding-filled jawbreakers, but the film is a sonic and musical feast as well. Forget "Candy Man" and give another listen to Gene Wilder's sweet performance of "Pure Imagination" or Jack Albertson's joyous "I've Got a Golden Ticket." Though the film was not initially conceived as a musical, the songs were ultimately completed before the screenplay, and they're a huge part of the movie's lighthearted fantastical quality, as are the cartoon mechanical effects. The sounds of the inventing room, the squeezing clean of the Wonkamobile, the sterile bleeps of Wonkavision, and the Wonkavator's rise and crash up into the atmosphere all keep this somewhat disturbing film (remember, the kids drop like flies) from going over to the dark side. *Willy Wonka* was made on a bit of a shoestring—with a limited budget put up by Quaker Oats, which then put out real-life Wonka Bars—so the sound job is not exactly seamless, but it is enormously inspired and fun. Special features on the DVD include a lightweight but entertaining making-of documentary, feature-length audio commentary by the Wonka actors, a behind-the-scenes 1971 featurette, and sing-along songs for the kids.

Re-recording: Dick Portman. Sound editor: Charles L. Campbell. Sound: Karsten Ullrich. Music supervisor: Walter Scharf. Music editor: Jack Tillar. Lyrics and music: Leslie Bricusse and Anthony Newley.

—Barbara Schultz

movies over the past few years, where you hear something in the surrounds and you look around the room and then you miss the action on the front screen. That's been a concern of mine.

You mentioned that before this you were working on* Enemy at the Gates. *From your perspective, is it different working on a heavy war film like that than it is on something so fanciful and lighthearted as* Harry Potter*? Or is the work the work, no matter the genre?

The work is the work, and the wonderful thing about it is that every film is both exactly the same and totally different. That may sound stupid, but what I mean is that you know you have to go through all the processes, but also every one is a challenge that requires new ways of thinking and of doing things. *Enemy at the Gates* was a lot of atmospheres and explosions, airplanes—all those sounds of war—but we also went to things of extreme quiet as well. Which is what we did in *Harry Potter*, too. Movies are movies. They're entertainment. We had a fabulous time making *Enemy at the Gates*, as we have had on this. This one has been a long haul and very difficult because of the visual effects and waiting for them. It's always difficult because until the film is edited, they don't want to order up all the visual effects, necessarily, because it costs an absolute fortune to redo things. So that slows everything down on our end, and it means we have to do more changes. This final mix was actually the fourth mix. We did a scratch mix, we did a temp, we did a preview and the final.

And you're still adding and taking out a lot at the fourth mix?

Oh, yes. Up to the last second.

So you bring everything down to the studio with you.

I have everything there. I have my Storm on the stage, and we had an Avid AudioVision, as well. How they work at Shepperton, though, is off Akai DD8. We used it as a backup for storage purposes and whatever else, but also for playing off when we did the predubbing—everything was put onto Akais in the first place, and they were mixed through the desk and predubbed onto other Akais. But we can add in from an Akai or from our own machines.

When we predubbed the flying sequences in Quidditch, before the final shots were in, we used a track-laying system that eliminated the use of complicated panning. This was to use 16 tracks: 1 to 6 for centers, 7 to 9 for left, 10 to 12 for right, 13 and 14 for left surround, and 15

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and 16 for right surround. You can, say, put a whoosh or a growly effect on 2 and a sub bass whoosh on 3; crossfade to 7, 8 and 9 for going left, then crossfade to 13 and 14 to continue on left surround. Tracks 4, 5 and 6 would be used for extra effects in the center. It sounds complicated, but if you dedicate 16 tracks on the Harrison, it is very accurate and easy to add in any additional broomsticks that the visual effects houses have unexpectedly given us. All the re-recording mixers have to do is check levels, EQs, etc.

You've been working on this for eight months; that seems like a long time.

It *is* a long time. It was never going to be much less, though. I think we're about two weeks over the original plan, which is pretty good these days.

Are they talking about the next one already?

Actually, Chris has already shot some of the visual effects for the next one. What they learned is that, particularly in flying sequences, they take a long time to do the composite, and you need to get as much done early instead of the way the first one was done. They begin shooting for real on November 19, which is only three days after the opening in America. I guess the plan is that one will open at the same time every year. It's like every year is the academic year [as in the book]. I don't know who will direct the third one, but I guess it will be done in the same way. And if they use the same kids, they'll be growing up at more or less the right rate.

So does that mean you know what you're doing for eight months next year?

Well, at this point, it's being talked about. It's not final. I'm actually doing Alan Parker's next film after this. It's called *The Life of David Gale*, which is shooting now in Austin, Texas. I'm starting at the end of the year.

And then it's back to Hogwarts...

I hope so. It's been a lot of fun. ■

PHOTO: PETER MOUNTAIN/WARNER BROS.

Harry and his schooldays nemesis Draco Malfoy (Tom Felton) find themselves alone in the forbidden Dark Forest.

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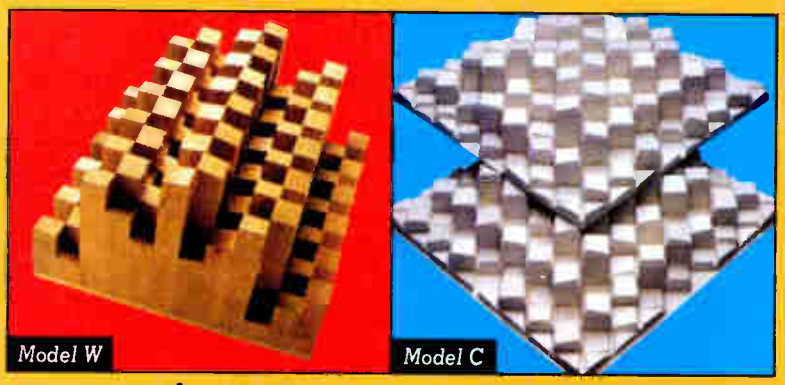

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BY OLIVER MASCIAROTTE

Turn, Turn, Turn Again

PCs Take the Quantum Leap

ILLUSTRATION: MAE LAROSE

Sometimes we each have an opportunity to participate in the proverbial "once in a lifetime" endeavor. For me, a grand adventure to Canyonlands that I enjoyed with a bunch of friends immediately comes to mind. But more to the point, this column affords another unique opportunity to exercise my foggy prevision as this is the last edition of "Bitstream" for the 20th century. I know, some of you think there are 99 years in a century, but I are an engineer and can count real good.

The coming 10 score years will be impacted most, I believe, by our understanding of biological processes rather than electronic ones. Ownership of intellectual property of biological advances is something I plan to follow closely. Anyway, I'll try to keep the sweeping predictions, such as matter transporters and a cure for cancer, out of the picture, while concentrating on forces affecting our biz. The most prominent is electronics, where revolutionary, fundamental improvements will slow. Innovation will continue, but only if corporations continue to invest in basic research.

A brief example about investing in patient inquiry illustrates my point. The folks at IBM's Almaden Research Center recently announced that they found that they can quadruple the storage capacity of magnetic coatings on their disk products, not through ever smaller heads and more sophisticated channel processing, but with applied materials science. Their "Pixie Dust" process, a coating of ruthenium, only a few atoms thick, dramatically improves magnetization density while reducing self-erasure. Basic research and long hours will yield most of the changes in store for us.

The integration of electronics and photonics will evolve to the point where, for an end-user, significant differentiation between either technology will be moot. This will, in turn, affect how we interact with, and our perception of, all things tech. The biggest impact will be in networking and computing. More on computers in a bit.

Networks: invisible, ubiquitous and fast enough for everything save time travel. Communication with each other and access to pertinent information will be immediate and effortless, though it still will not come cheap. It will take more than 100 years for us to wean ourselves from 20th-century ideologies.

The obvious changes will be in the areas of integration and interface. If voice- and visual-pattern recognition and synthesis advance along with heuristics, then machines, whether car or console, would operate with a level of autonomy presently unknown. This brings new meaning to the word "assistant." Our current notion of a robot is more akin to that of the concept's founder in the '20s than what researchers will produce 80 years from now. Besides, a machine needn't be anthropomorphic to assist in daily tasks, especially when we're bored or distracted. Think of

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MARK ISHAM, M-POWERED.

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If you go to the movies, you've heard his work. He's the man behind the scores for "Blade", "Kiss the Girls", "Quiz Show", "Nell", "A River Runs Through It", "The Moderns" and dozens of other films. Not one to be limited by genres, Mark's compositional palette includes orchestra, electronic, acoustic jazz, and everything in between.

Mark needs a digital audio card as flexible and diverse as his music. He uses Delta 1010's. The Delta 1010 has become a staple item in pro studios because of its ability to work well in so many environments. Mac or PC, from Gigastudio to Logic, from tracking to soft synth playback, the Delta 1010 is the card behind the scenes. To learn more about the Delta 1010 go to www.m-audio.com/mix

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the tedium of QC'ing copies. Several groups are working on repeatable mechanisms to meaningfully measure what has been considered "subjective" phenomenon, like audible and visual impairments resulting from lossy encoding—wish I had such a beast back in my dHouse days!

On other fronts, significant progress will be made in the acquisition and storage of power, a particularly sticky wicket for those working on "ubicomp," or ubiquitous computing. In truth, technological change comes from the results of hard work and serendipity, though I haven't a clue as to their ratio. A lucky coincidence revealed the wisdom of using room-temperature ionic liquids for advanced battery applications, whereas 150 years of dogged research is slowly yielding energy storage secrets of another kind. There's still a lot to be learned about batteries, but fuel cells are the energy darlings of the next decade. (Fuel cells are devices that generate electricity and heat by oxidizing or "burning" some sort of fuel.) Fuel examples are methane, hydrogen or gasoline, all derived primarily from nonrenewable resources, and ethanol, a more responsible alternative. The folks at Motorola, the company at the heart of DAWs and cell phones alike, have shown a prototype fuel cell, about two cubic inches in size, that provides 100 mW of continuous power when fed with ethanol. "Wait a minute, Jimmy, gotta give my cell phone a nip..."

Moto has also been slogging along in other areas. One in particular is relevant to my mention of the melding of photonics and electronics. They have finally been able to fabricate silicon and so-called III-V structures on the same substrate. III-V semiconductor materials include gallium arsenide, indium phosphide and other compounds that form the heart of both ultra-performance CPUs and light-emitting devices like LEDs. This work opens the door to high-performance, solid-state devices that will store, manipulate, modulate and transport data on light carriers, which makes the current crop of computers and storage look anemic in comparison. Sugar cube-sized "data cubes" with terabyte capacity along with a MiniDisc-sized recorder isn't a far-fetched idea, given present day research. Think of the multichannel mixes you could carry on that!

On to our current, "advanced" distribution formats. Audio tools will mature to the point where reproduction of an acoustic event will be indistinguishable from having been there in the flesh. The visual component will still lag behind, though only a slight suspension of disbelief will be required, as opposed to the deliberate shift in mood and perceptual state that is required today. With storage capacity no longer a factor in the equation, double- and quad-speed DSD becomes less mind-boggling for those stuck in the 48/24 paradigm. Cheap, fat parallel processors and memory mean that personal HRTFs, along with convincing 3-D audio, are not too far away.

Before you take too much of my opinion to heart, I'd like to provide a bit of perspective and give a brief look at what other thinkers have said about the future of technology. As you know, much of the world will be lolling about the evening of what I call December 31, 2001, because, in their view, it ain't all that special. By some folks' reckoning, we'll be passing through the year 5762, and by others it's 1422. As to deep thought about the future, here are a few that I'm sure you've seen,

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but are worth repeating nonetheless...

"I think there is a world market for about five computers." So said Thomas Watson, chairman of IBM, in 1943. *Popular Mechanics*, forecasting the development of computer technology in 1949, posited that "computers in the future may...perhaps only weigh 1.5 tons." Made sense at the time. June 14, 2001, was the 50th anniversary of Univac, the first commercial, electronic digital computer. Just like other disciplines well known to you, computers started life in the 1820s as mechanical contrivances, evolved into purely electronic devices operating in the analog domain, and only 50 years ago, adopted the binary approach we take for granted today. "There is no reason for any individual to have a computer in their home," said Kenneth Olsen, then president and founder of Digital Equipment Corporation in 1977. Now that's what I call shortsighted! By 1977, Ed Roberts had made a name for himself from the sale of his Altair 8800, the first successful, mass-market personal computer, and Apple, Commodore and Tandy were in the ascendant.

In closing, think back to the recent 20th anniversary of music television. Ah, yes, I remember watching that Buggles video. MTV rapidly moved from an exciting outlet for innovative pop to a bland, self-serving product that defines corporate-media programming. Whatever the future holds, I hope widespread data connectivity brings the content diversity that marked early radio and television. But more importantly, connectedness engenders communication, and communication breeds understanding of other people's cultures and self-image, world views and values. Lord knows we could use a lot more of that...Have a Happy New Year! ■

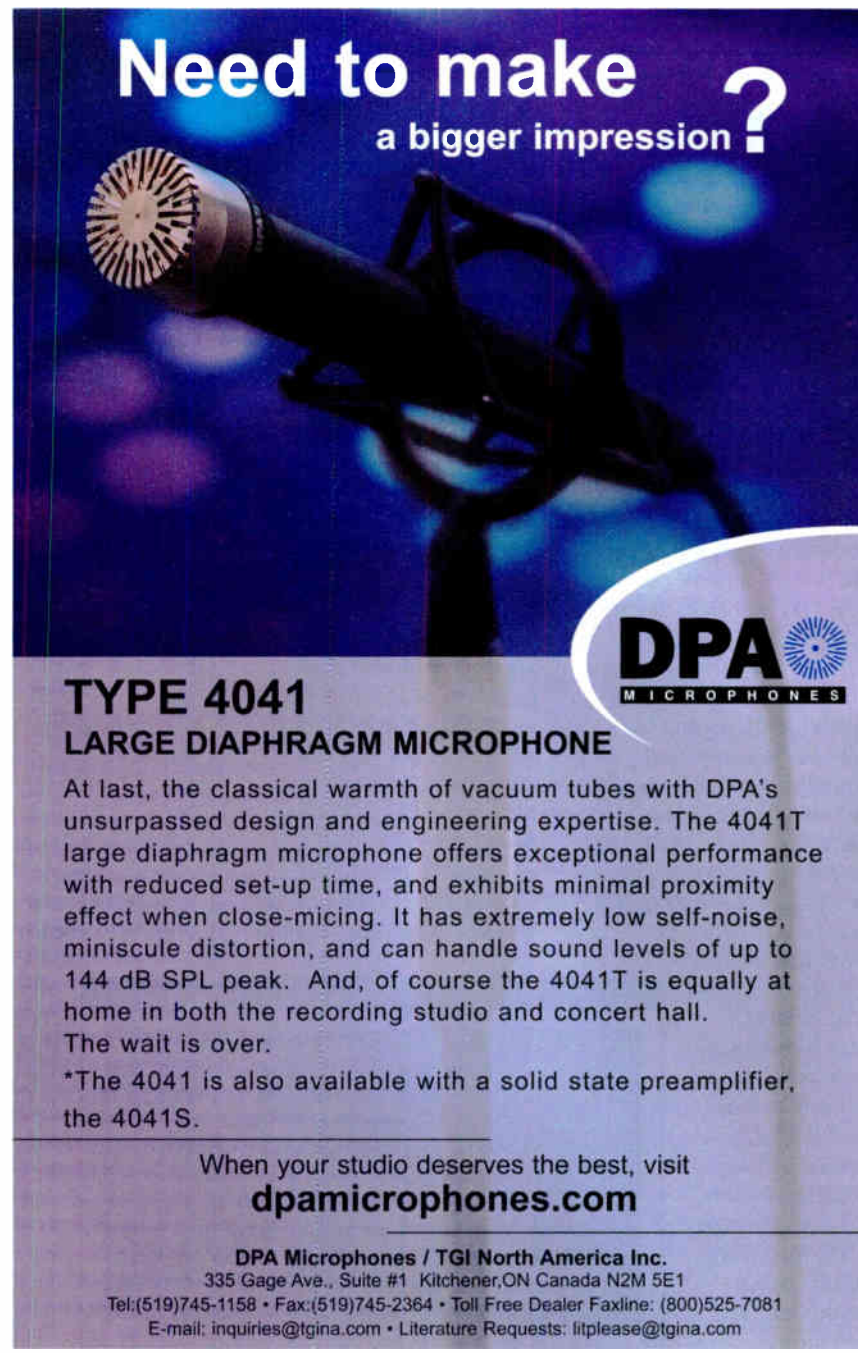
OMas is, at times, a senior consultant for Data Storage Technologies Inc., and during his day, marvels at the herd instinct of the pro audio community. For links, back issues and occasional commentary, check out http://seneschal.net.

PEDANT IN A BOX

The buzz phrase for this month is...**HRTF**. HRTFs, or Head-Related Transfer Functions, are mathematical models of the sound pressure that an arbitrary sound source produces at an eardrum, either real or synthetic. Microphones, along with a mannequin or "dummy head," make acceptable substitutes for the organic variety, but the real challenge comes in figuring out the effects of the pinne, those elaborate convolutions of our outer ear. A monaural sound, when reproduced via two transducers and passed through an HRTF, can provide varying degrees of "3-D" or phantom placement, also know as pseudostereophony.

Speaking of convolutions, the outer ear, along with our head and torso, acts as an acoustic filter, "convolving the data" that reaches our eardrums. Because each person's shape is different and each brain has adapted to that individuality, it's very difficult to create a single HRTF that produces convincing 3-D audio for a large sampling of people.

—*OMas*



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New Software/Hardware for Audio Production

WAVE DIGITAL MICROWAVE

MicroWave, from Wave Digital Systems (www.wavedigital.com), is a portable, Pentium III-based PC that's only 6.15x5.75x2.2 inches and 1.9 pounds. MicroWave

features four USB ports, two FireWire ports, Ethernet, audio I/O, A/V and S-Video, modem, parallel, serial, VGA, LAN and PS/2 ports, plus mic-in and line-out jacks. It also includes a CD-ROM/DVD-ROM CD-RW drive, and can run Windows 98 SE, 2000, NT and ME. The unit features 16-bit stereo audio (SoundBlaster/Adlib-compatible) with built-in speaker, a 56k V90 modem, and a 15-pin mini D-sub VGA connector with one S-Video port and one A/V-Video port. ATAPI-IDE interface, high-speed, DVD-ROM or CD-RW external hot-swappable units are optional. A 144-pin DIMM slot handles PC1000/133MHz SDRAM, and is upgradable to 256 MB. Wave Digital offers a custom plastic case for the MicroWave by Calzone Case Company, featuring a 15-inch, flat-panel LCD monitor mounted in the lid, 75GB external FireWire drive, keyboard, track pad, 8-channel snake and MOTU 828 FireWire audio interface. The system can be custom-configured for music applications, and weighs less than 14 pounds. The MicroWave CPU starts at $1,999. Complete systems, with case, MOTU 828, LCD, keyboard and 75GB drive, start at $3,399 (software is extra).

WAVES RESTORATION BUNDLE

Waves' (www.waves.com) Restoration processor bundle for native (PC and Macintosh) platforms is designed for noise removal and sound restoration. It features four new plug-ins, licensed from Germany's Algorithmix. X-Noise intelligently learns from a section of noise, and then applies broadband noise reduction to eliminate background noise from any source. X-Click removes clicks from 78 or vinyl records, as well as spikes from digital switching or crosstalk. X-Crackle is the second stage in the restoration of old records; it eliminates crackles and surface noise left after the X-Click process. X-Hum attenuates steady-pitched, low-frequency disturbances, such as ground loop hum and its harmonics, as well as reducing rumble, microphone pops and DC-offset.

MAGIX SAMPLITUDE 6.0

Samplitude 6.0 from MAGIX Entertainment (www.magix.com) is offered in three versions. Samplitude Producer 2496 ($799) is configured for multitrack recording, editing and high-end CD mastering; Samplitude Studio ($499), for multitrack recording and editing; and Samplitude Master ($359), for wave editing and CD production. New features of V. 6.0 include beginner-friendly settings with ergonomic design and Visualizer window, and mouse modes that help users view and work with the tools easily. Samplitude 6.0's Authoring Tool enables the creation of Personal Rich Media by integrating video, Internet, streaming media and interactive technology for sound media. Users can publish projects on the Web at www.magix.com and get downloads from the Internet directly to the program via FTP. Version 6.0 also provides more DSP power, an extended mixer and destructive/nondestructive editing—even for MP3s and other compressed files.

N.I. REAKTOR 3

Version 3 of Native Instruments' (www.nativeinstruments.net) Reaktor native, modular, real-time software for synthesis/sampling/effects has a new processing audio engine with increased performance on all CPUs, especially Pentium III/4 and G4 processors. An improved user interface offers new panel elements/layout options, selectable colors, and drag-and-drop features. A floating properties palette shows the properties of the currently selected object, and whole folders of samplers can be dragged/dropped into any sampler module. Audio can stream to/from the hard disk, and Akai samples can be imported from CD, while XY controller objects can control two parameters with one

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gesture. New modules include analog-modeled filters, granular synthesis and multitap delays. Reaktor 3 also features 32-bit floating-point precision, sample rates at 96 kHz and beyond, hundreds of instruments and thousands of presets.

EGO•SYS WAMI RACK 192X

The Ego-Sys (www.egosys.net) WaMi Rack 192X is a rackmountable, 192kHz, 24-bit, 8-channel audio interface. Inputs and outputs include S/PDIF and balanced and unbalanced analog (+4 and -10 dB), with four channels of mic pre's with +48V phantom power and a MIDI interface. It supports the DVD-Audio spec, and is compatible with Windows XP, 2000, ME and 98 SE; audio drivers include ASIO 2.0 and GSIF. The unit supports multiple sampling rates from 32-192 kHz. Stated latency is 1.5 ms, and dynamic range is 123 dB. The front panel also features a headphone amp. Retail is $799.

SURGEX AC CONDITIONER

The SX1120 RT from SurgeX® (www.surgex.com) offers surge protection/power conditioning for audio, video and computer gear. This 20-amp unit has a front outlet and eight rear panel, grounded AC receptacles (six switched, two always on). For integrated power distro, a Phoenix connector links to SurgeX's SX2120 SEQ or more RT units for sequential power-up/down of multiple systems. Patented Series Mode Pro technology provides reliable protection, stopping multiple surges of up to 6,000V—without ground contamination.

CREAMWARE PULSAR 3

Version 3 of CreamWare's (www.creamware.de) Pulsar software features new DSP effects, synthesizers, sample player, mixer and more. Many of

Version 3's 36 stereo and 21 mono effects plug-ins were adapted from CreamWare's high-end SCOPE/SP system, with new plug-ins such as the MasterVerb reverb, for driving up to eight reverbs simultaneously from a single Pulsar II board. Also new are the Vectron Player; Prisma, a virtual analog synth with a comprehensive modulation matrix; and the STS-2000P sample player, featuring up to 64 stereo voices and compatibility with Akai S1000/S3000 libraries. Also new are the Dynamic mixer and Micro mixers for submixing or as alternatives to the large mixers. Each offers up to 32 mono or 16 stereo channels, mixer presets, VU meters and long fader throws.

UPGRADES AND UPDATES

Fairlight (www.fairlightesp.com.au) announced the **incorporation of VST plug-ins** into its Fairlight Plug-ins Manager. Effective immediately, a wide selection of VST plug-ins may be accessed by Fairlight users at pro audio or MI retailers, or on the Internet at www.cubase.net...**Sonic Solutions** (www.sonic.com) announced **Sonic Studio Version 1.7**, which offers enhanced performance, new editing tools, expanded storage support and enhanced capabilities for new audio formats. Visit www.sonic.com for details...**Synchro Arts'** (www.synchroarts.com) **VocALign** automatic audio-alignment software is **now compatible with Digital Performer 3** from Mark of the Unicorn (www.motu.com). In other MOTU news, **Universal Audio** announced development of the SmartCode Pro line of software encoders for Digital Performer Version 3...**SpinAudio** Software (www.spinaudio.com) announced that **new versions of RoomVerb and SpinDelay VST/DX audio plug-ins** are available. The updated versions come with a new, completely redesigned and easier-to-use user interface, and an enhanced preset management system that includes new A/B setups, inter-instance presets, file presets and preset banks, improved reverb engine and more...**MIDIMAN/M-Audio** (www.m-audio.com) announced support in Macintosh OS 10.1 for its line of **Delta digital audio interfaces**. Latency for the OS 10.1 drivers is said to be as low as 40 samples (approximately 1 ms). M-Audio is also now shipping the USB AudioSport Quattro, a 4-in, 4-out USB audio device with added 1x1 MIDI operation ($349)...**JEMS Data** introduces the Jemini COR (Custom Options Track), a **3U rackmount storage unit** featuring dual 10,000 or 15,000 rpm disk drives, tape backup drive and CD-RW drive, with bundled audio mastering software. Visit www.jemsdata.com for more information. ■

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PREVIEW

Z-SYSTEMS SURROUND PROCESSOR

The z-K6 K-Surround Processor from Z-Systems Audio Engineering (www.z-sys.com) can create convincing 5.1-channel surround sound mixes direct from a stereo source. Targeted at DVD-Video production, DVD-Audio mastering, Digital Television broadcast and post-production applications, the system is designed to create a realistic 5.1 mix without having to remix the original multitrack elements. The z-K6 creates a dedicated center output and a 0.1-channel LFE output, and derives surround channel information based on the recording's existing, natural ambience. Unlike other processors that use room modeling or synthetic reverberation algorithms, the z-K6 K-Surround Processor uses psychoacoustic principles relating to ambience and sound-field perception to provide a natural-sounding 5.1 mix.

QUIK-LOK MONOLITH

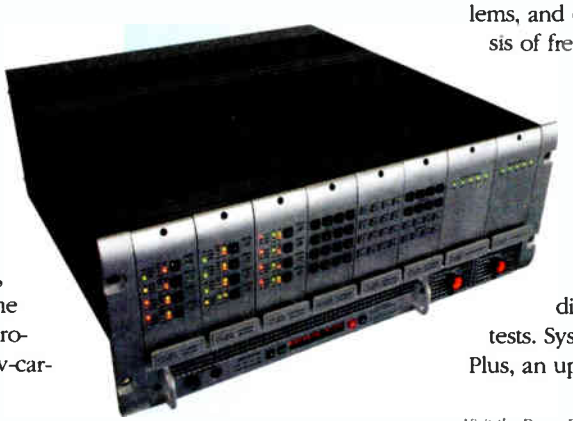
The M-91 Monolith Keyboard Structure from Quik-Lok (www.quiklok.com) provides nine height-adjustable settings (26.5 to 35.9 inches) and a 200-pound total load capacity. Tier depth is 14.5 inches, and its 34.25-inch width accommodates all 61-note keyboards. The unit folds flat, locking into a lightweight, easily transportable package. The M-92 is a two-tier version with angle- and height-adjustable upper tiers. The M-91 is $179.95; the M-92 is $279.95.

SHURE KSM27 STUDIO CARDIOID

Shure (www.shure.com) debuts the KSM27 Studio Microphone, an affordable, large-diaphragm, side-address cardioid model. Featuring Class-A, transformerless preamp circuitry, the KSM27 offers an extended 20-20k Hz frequency response and can handle high-SPL signals. Additional features include a 1-inch, ultra-thin Mylar diaphragm, internal shock-mount and low 14dBA self-noise. Housed in a durable, die-cast zinc body, the mic also features a protective, hardened low-carbon steel grille, and is supplied with a Velveteen pouch and a rubber-isolated, external shock-mount. Price: $575.

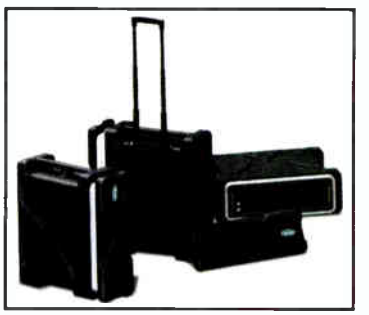
AMS NEVE 24/96 QUAD MIC PRE

AMS Neve (www.ams-neve.com) launches the Modular I/O System 96 (MIOS 96) with the first MIOS 96 module, a Quad Microphone Amplifier. MIOS 96 is a four-rackspace system housing up to six hot-pluggable modules that support a variety of analog and digital I/O formats. The MIOS 96 Quad Microphone Amplifier is based on the classic Neve mic input stage, coupled with precision 24-bit, 96kHz converters, and connects to other devices via MADI. Each mic amp can switch between one line and two mic inputs, and includes a remotely switchable analog limiter and a highpass filter. Other features include a headphone output for monitoring any input, dual redundant supplies, and a choice of dual-fiber or dual-co-ax MADI connections. Future modules include 16-channel line-level ADCs and DACs, and an eight-I/O AES/EBU module with onboard sample rate conversion.



SKB ROLL-X EQUIPMENT CASES

SKB (www.skbcases.com) offers the Roll-X Series of rack-mount equipment cases. Equipped with a pull handle and wheels, Roll-X cases are 17 inches deep and accommodate three, four, five and six rackspaces. Roll-X racks interlock with each other, stack to form larger configurations and are made of tough-molded polyethylene.



NEW AUDIO PRECISION TEST SYSTEMS

Audio Precision (http://audioprecision.com) intros two new PC-based audio test and measurement systems, the ATS-2 and System Two Cascade Plus, both offering new features to reduce setup/testing time. The ATS-2 includes both harmonic distortion and multitone analyzers, speeding identification of circuit problems, and enabling fast analysis of frequency response, crosstalk, noise and distortion. A performance option increases measurement bandwidth to 120 kHz and includes a complete suite of digital audio interface tests. System Two Cascade Plus, an upgrade to the Sys-

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PREVIEW

tem Two Cascade, features increased FFT acquisition memory, nth octave smoothing and a 6dB reduction in residual distortion. An optional Programmable Serial Interface Adapter will be available in January 2002. Prices for the ATS-2 begin at $9,995, with the performance option priced at $2,995. Cascade Plus (digital only) prices begin at $14,500; the Programmable SIA option is priced at $1,500.

TASCAM CD RECORDER/ DUPLICATOR

Tascam's (www.tascam.com) CD-RW402 dual-tray CD player/CD recorder/duplicator allows users to record/edit/duplicate CDs on the same device. The CD-RW402 can act as a 1:1 duplicator and is capable of duplicating at up to 4x speeds in both audio and data CD formats. CD player functions (available on both trays) include call, auto cue and auto ready. The player deck has pitch control capability and two locate points, and a Stutter Scrub function allows the user to set frame-accurate cue points. Recorder functions include record mute, digital gain adjustment, digital fade-in/out, Digital Direct mode and auto ID. CD-TEXT capability and track naming and editing functions are available via a PS/2 computer keyboard port. Connections include S/PDIF (optical and co-ax) I/O and unbalanced RCA/balanced XLR analog connectors. Price: $1,249, with wired remote control.

LUCID SYNC GENERATOR

The GENx6-96 studio sync from Lucid (www.lucidaudio.com) is a rackmount unit that provides an extremely low jitter clock source and also functions as a simple 1x6 clock distribution amp. The GENx6-96 generates 44.1/48/88.2/96kHz clocks, outputting in (individually switchable) wordclock or Digidesign superclock formats. The unit can reference an incoming word, superclock or AES sync signal via selectable AES and BNC inputs.

UA TUBE MIC PRE

Universal Audio's (www.uaudio.com) M610 is a mono tube preamp based on its 2-610 dual tube mic preamp. Both models are derived from the 610 console designed by Bill Putnam, the original founder of Universal Audio. The two-rackspace M610 uses the 2-610's circuitry, tube set and transformer design, and it includes direct inputs, phantom power and selectable boost/cut controls. Price is $1,295.

GOLD LINE TEF20 SOFTWARE

Gold Line (www.gold-line.com) has introduced Sound Lab Polar ETC software for Windows, a significant upgrade for the TEF20 acoustical analysis system. Polar ETC allows TEF users to identify the direction of origin for any reflection rapidly, aiding in the selection and placement of acoustical materials. The new software is compatible with all Windows 95 or later operating systems, including NT and Win2000, and may be ordered with a mic stand and positioning arm (SLPET50: $495), or as a deluxe $795 kit with stand, arm, cardioid mic, precision laser pointer and case.

BRYSTON 3-CHANNEL AMP

The 6B ST 3-channel power amp from Bryston (www.bryston.ca) includes three independent modules, each capable of delivering 250 watts into 8 ohms or 400 watts into 4 ohms. Though housed in a single chassis, each of the three modules has its own electronic circuitry, connections and power supply. The 6B ST features a three-position gain selector for balanced/unbalanced inputs, a polarity switch on each channel, a remote 12-volt power trigger input with a delayed output feature, and over 40,000 MFD of filter capacitance on each channel. A 20-year transferable parts/labor warranty is standard.

ADK AREA 51 CE MIC

The Area 51 Commemorative Edition mic from ADK (www.adkmic.com) is a multipattern condenser model featuring a hand-selected, NOS (New/Old Stock) GE 6072A vintage tube. The mic features nine polar patterns and handles SPLs of 125 dB (1% THD @ 1 kHz). A precision condenser element with 1-inch diameter, gold-sputtered dual diaphragms provides a 20-20k Hz frequency response. The Area 51 is $1,895, with foam windscreen, suspension mount, connecting cable, power supply and deluxe aluminum flight case.

CROWN XLS SERIES

Crown Audio (www.crownaudio.com) intros the cost-effective XLS Series with three 2-channel amps: the XLS 202, 402 and 602. All three feature linear optocoupler clip limiters and a selectable highpass filter (30 and 15 Hz) on each channel. Power ratings (per chan-

World Radio History

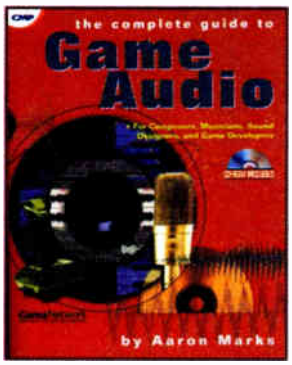
PREVIEW

nel) are: 250 watts into 2 ohms (200W/4 ohms, 145W/8 ohms) for the XLS 202; 570W/2 ohms, 400W/4 ohms and 260W/8 ohms for the XLS 402; and 840W/2 ohms, 600W/4 ohms and 370W/8 ohms for the XLS 602. Front panels offer detented level controls, and clip, power and fault LEDs for each channel. Rear panel connections include balanced XLR inputs and touch-proof binding post outs. All models feature three-rack-space, steel enclosures, forced air cooling and a transferable, three-year, no-fault warranty.

B.L.U.E. BABY BOTTLE CONDENSER

B.L.U.E. Microphones (www.bluemic.com) offers the Baby Bottle, a discrete, solid-state, Class-A cardioid condenser mic. The most affordable B.L.U.E. mic to date, the Baby Bottle features hand-selected components and a spherical "lollipop" grille enclosing a precision-machined, gold-sputtered capsule. Frequency response is 20-20k Hz, and the mic can withstand SPLs of 133 dB (0.5% THD). Packaged in a cherrywood storage box, the Baby Bottle is priced at $649.99.

HOT OFF THE SHELF



The Complete Guide to Game Audio **by Aaron Marks** teaches musicians and sound designers the technical and business skills needed to succeed in the computer and video game industry. The 318-page book (and companion CD-ROM) is $34.95. To order, call 800/788-3123 or visit www.cmpbooks.com/ct...**SmaartLive Version 4.10 from SIA Software**, a free update for current SmaartLive owners, can be downloaded at www.siasoft.com/support_downloads.html. Smaart AcousticTools V. 4.0 includes an updated interface and interconnect features for use with SmaartLive V. 4.1 and higher. Both SIA's Smaart Pro and SmaartLive analysis programs now support the 9022 2x2 DSP Engine from Symetrix, a 2-channel, 24-bit, multifunction DSP processor. When controlled by Smaart Pro or Live software, the 9022's processing functions are accessed as plug-ins within the Smaart graphical user interface. The new software drivers are available online at symetrixaudio.com and siasoft.com...**The latest software for Klark Teknik's DN9848 loudspeaker processor**, KT Kompressor Module V. 2.01, adds a full-function compressor to every output of the DN9848. Download it free at KT's Website, along with the Stardraw for Klark Teknik software control shell. Call 952/887-7444 or surf to www.klarkteknik.com... **Crown's IQ-PIP-USP2/CN** module provides direct CobraNet audio-networking compatibility for any of Crown's PIP2-compatible amplifiers, including Com-Tech 10 and Macro-Tech 02 Series models. Features of the new 24-bit signal processing module include up to 600 ms of output signal delay, input and output compressor/limiters, auto standby, plus eight independent, fully adjustable filters per channel. Call 219/294-8200 or visit www.crownaudio.com...**dbx adds the 240 and 241 DriveRack units to its line of system processors.** The 2-input/4-output 240 provides an extensive range of EQ, crossover, digital delay and compression/limiting, all editable via front panel controls or included PC software. The 241 offers similar functionality, but no front panel controls. dbx has also released upgraded Version 2.0 firmware for its 480 Series DriveRack units. Call 801/568-7660 or visit www.dbxpro.com...**Pomona's Test and Measurement Accessories** catalog has over 8,000 design and test products. The 100-page, full-color catalog is free. Call 909/469-2900 or visit www.pomonaelectronics.com before December 31 and earn a chance to win $100...**Valentino Production Music and Sound Effects Library announces the Evergreen Production Music Library.** Consisting of more than 113 CDs containing over 3,500 selections in 43 different categories, the Evergreen Library boosts the company's total production music and sound effects library to more than 275 CDs. Surf to www.tvmusic.com or call 800/223-6278...***Producing in the Home Studio with Pro Tools*** **by David Franz**, a collaboration between Berklee Press and Digidesign, explains a range of practical techniques and skills for producing professional-quality recordings in a home studio. Distributed by Digidesign and Hal Leonard, the $34.95 book includes a CD-ROM containing free Pro Tools software and examples of Pro Tools and MIDI file sessions. Call 617/266-1400 or visit www.berkleepress.com...**Jensen Tools' Master Sourcebook for Fall 2001** is a 300-page, color catalog with thousands of products from leading manufacturers, including over 400 new items. For your copy, call 800/426-1194 or surf to www.jensentools.com...**Zero International offers Sound Solutions from Zero: High-Performance Acoustical Gasketing Systems,** a 20-page brochure explaining the mechanics of sound transmission and the purpose of Sound Transmission Class (STC) ratings for acoustical door assemblies. For a free copy, call 800/635-5335 or surf to www.zero-international.com. ■

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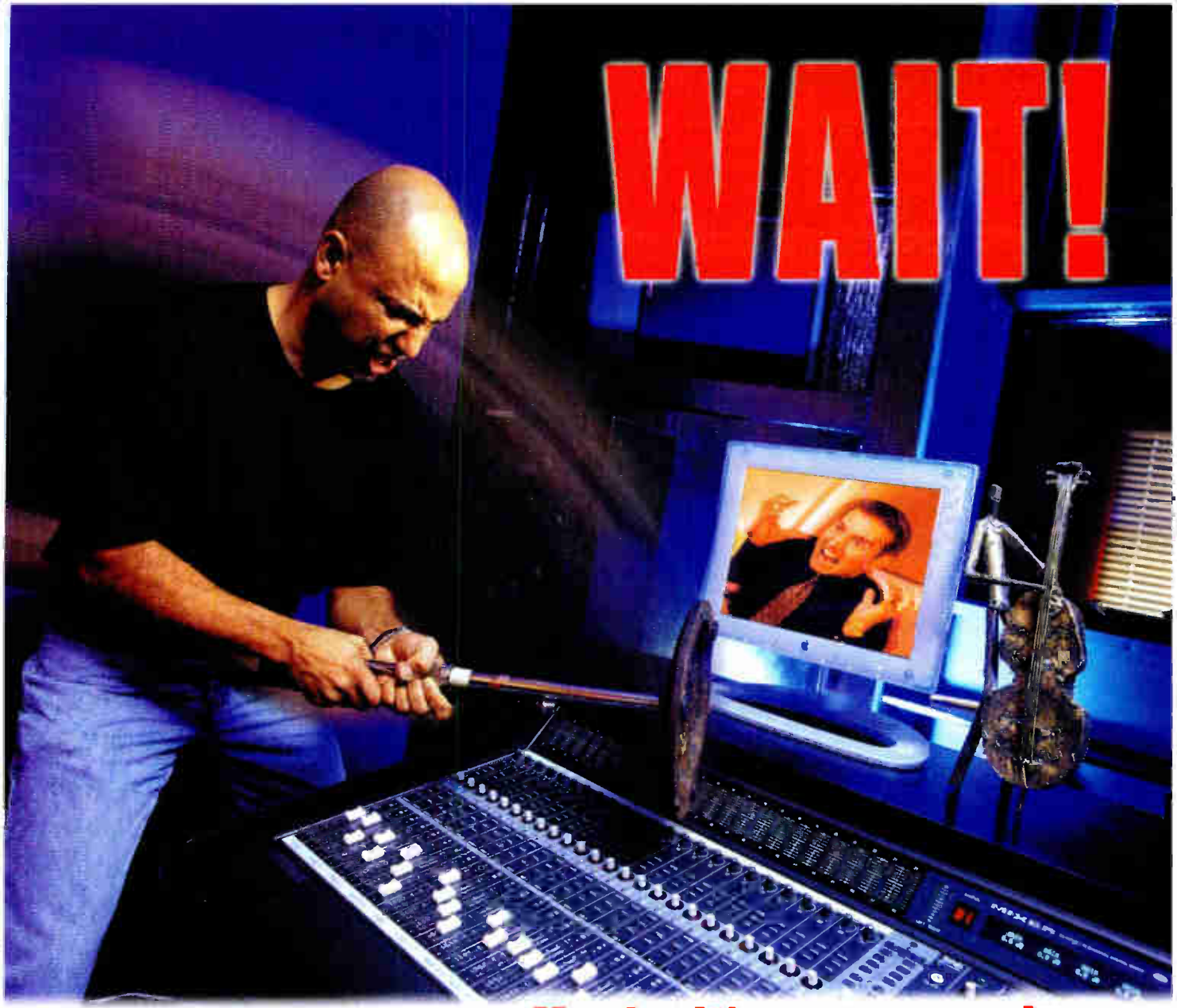

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FAIRLIGHT D.R.E.A.M.

DIGITAL RECORDING, EDITING AND MIXING SUITE

Just over a year ago, Fairlight began integrating its QDC (Quad Digital Channel) technology into its existing product line, enhancing the performance, speed, audio quality, graphics resolution and DSP power of its Merlin, MFX3-plus, Fame2 and Prodigy2 systems. Now, Fairlight has taken the power of QDC and combined it with Binnacle Editing—a revolutionary approach to high-speed workstation ergonomics.

Set for unveiling at this month's AES, the result is the D.R.E.A.M. (Digital Recording, Editing And Mixing) line of high-performance, multichannel/multiformat products. Components within the D.R.E.A.M. family include the D.R.E.A.M. Satellite (a stand-alone editor), the D.R.E.A.M. Station (an integrated editor/mixer with expandable fader modules) and the D.R.E.A.M. Console—an integrated mixer/editor presented as a large-format digital mixer. The D.R.E.A.M. family is designed to operate as a team or independently.

BINNACLE EDITING

Named after the housing of a ship's compass, Binnacle™ centralizes editing and transport functions around a jog wheel, offering a choice of one- or two-handed editing, reducing required editing keystrokes by 30% to 50%. According to the company's president, John Lancken, "Our goal was to make the technology an extension of the creative professional." Fairlight developed the Binnacle process by observing end-users in the real world, and then adapting their needs to make the editing process as natural as possible.

Binnacle has dedicated keys for transport and range, play/jog, jump, from/to, copy, cut, erase, trim/slip and fade. The controller's illuminated key switches, with tri-color LEDs, indicate the currently selected operating mode at a glance. Additionally, a BLUE function provides single-key shortcuts to frequent operations (such as doubling the speed of jog operations), while Binnacle's Finger Memory feature lets users "play" keystrokes like a musical instrument, using both hands for ultra-fast speeds.

BY GEORGE PETERSEN

D.R.E.A.M. SATELLITE

Although the D.R.E.A.M. Satellite is the entry-level product in the family, its feature set is far from stripped down. This 16, 32 or 48-track workstation offers 96kHz/24-bit audio quality with a choice of analog and/or digital I/Os, all compatible with both QDC-based and MFX3plus-based project formats. Standard features include 4-band EQ, built-in machine control, Media

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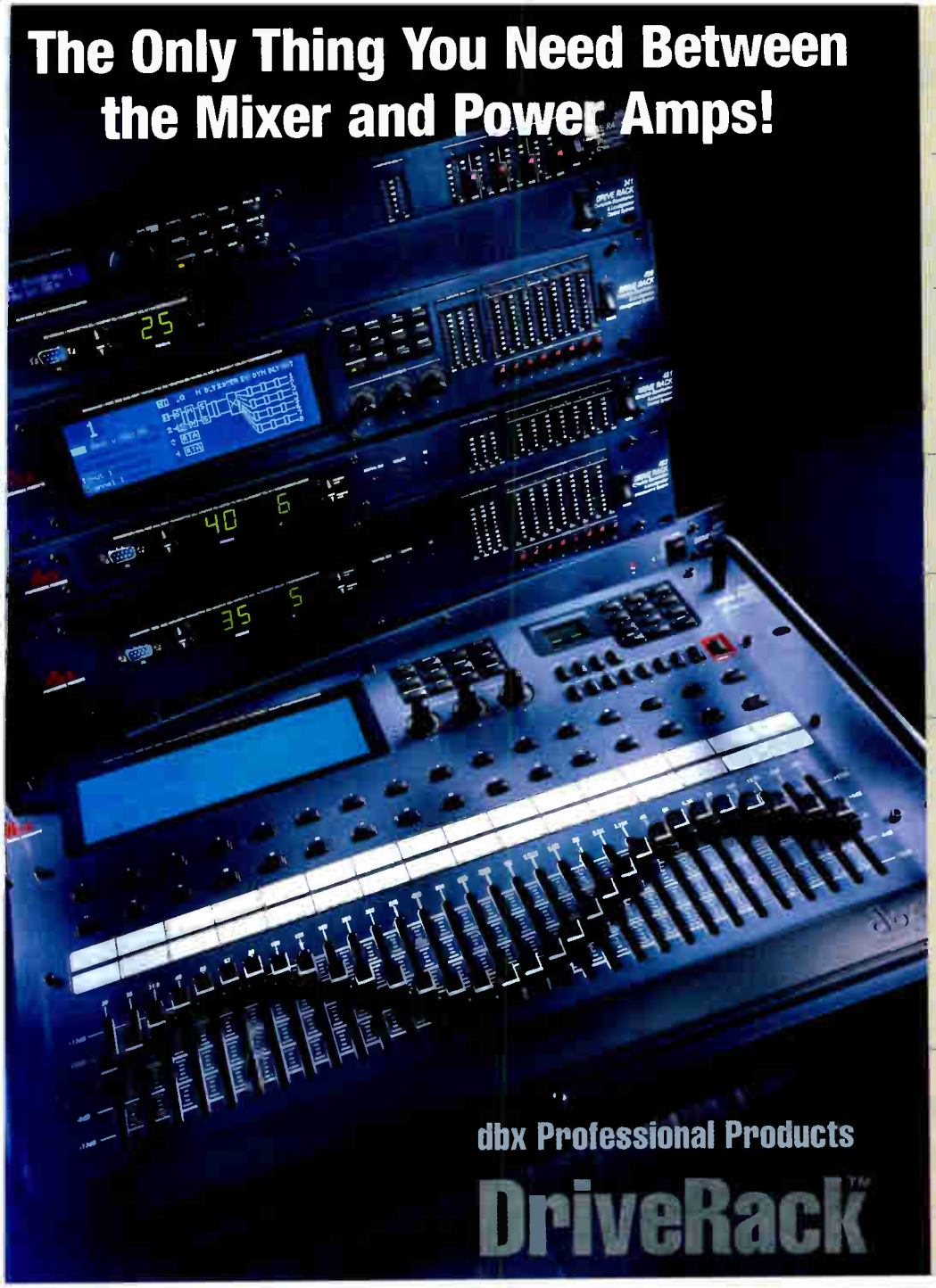
The Only Thing You Need Between the Mixer and Power Amps!



New! 240

The 240 offers a 2 input, 4 output configuration with switch closure inputs makes the 240 perfect for portable and fixed-install applications.

New! 241

The 241 offers the same features as the 240 with the addition of the tamper-resistant front panel, which makes the 241 ideal for fixed-install applications.

480

The 480 is the flagship piece in the DriveRack line. Its 4 Input, 8 Output XLR configuration and full network capabilities allows it to manage virtually any loudspeaker system.

481

The 481 offers the same features as the 480 but is offered in a single-space chassis with Euroblock connectors and a tamper-resistant front panel.

482

The 482 offers the same features as the 480 with a tamper-resistant front panel, making it ideal for permanent install applications.

480R

The 480R is the master remote controller for the 480 Series DriveRack products. All aspects of any 480, 481 or 482 can be controlled by the 480R.

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You name the application... We've got you covered. The **DriveRack™** Complete Equalization and Loudspeaker Management System from dbx Professional Products is the only all-inclusive toolbox required between the mixing console and the power amps. All aspects of loudspeaker management are now self-contained and have been optimized under the hood of a single **240**, **241**, **480**, **481** or **482** DriveRack unit. Regardless of the size and sophistication of the application, there is DriveRack product that can accommodate your needs. Contact your local authorized DriveRack dealer and take a DriveRack for a thorough test drive today.

480 Series DriveRack™ Features

- 4 Inputs and 8 Outputs
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- Dual Real Time Audio Analyzers (on inputs 3&4)
- Butterworth, Bessel or Linkwitz-Riley crossover filters
- Multiple Crossover Configurations
- Time Alignment and Transducer Alignment Delays
- Compressor/Limiter on every output
- Speaker Compensation EQ (post crossover)
- Multi-level Security System
- Separate House and Show EQ with individual lockouts
- Triple redundant back up of all parameters when running network, 480R or PC GUI
- TYPE IV™ A/D Conversion System

240 Series DriveRack™ Features

- 2 Inputs and 4 Outputs
- 31-band graphic or 9-band parametric equalizer on every input (pre-crossover)
- Butterworth, Bessel or Linkwitz-Riley crossover filters
- Multiple Crossover Configurations
- Time Alignment and Transducer Alignment Delays
- Compressor/Limiter on every output
- Speaker Compensation EQ (post crossover)
- Multi-level Security System
- TYPE IV™ A/D Conversion System
- Switch Closure Inputs

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The D.R.E.A.M. Station integrated editor/mixer offers up to 48-track recording and editing, and is expandable with fader modules.

Link Networking compatibility, full Binnacle editing, and support of 32, 44.1, 48 and 96kHz sample rates, along with pull-up/down of 44.056, 44.144, 47.952, 48.048, 95.904 and 96.096 kHz. An optional SRC I/O module has a 0.33x to 3.0x system range from 8k to 108k Hz.

Fairlight has taken the power of QDC and combined it with Binnacle Editing—a revolutionary approach to high-speed workstation ergonomics.

D.R.E.A.M. STATION

D.R.E.A.M. Station, a fully integrated editing/mixing system, offers up to 48-track recording/editing, plus eight live returns, mixing to any format up to 7.1, moving touch-sensitive controls and control surface expandability via customizable sidecars. Mix capabilities include full automation of all functions, 6-band channel EQ, comprehensive dynamics processing, full control room monitor switching and multi-destination talkback routing; every bus has full bus dynamics and EQ, as well as insertion capabilities. For surround production, users will appreciate panning facilities such as Diverge, Spread and Rotate; and sophisticated grouping functions for creating linked, multiformat audio sources and fader/bus groups. With third-party plug-ins rounding out the effects processing capability, a complete medium-scale editing and mixing facility can be equipped with a D.R.E.A.M. Station and a pair of powered monitors.

D.R.E.A.M. CONSOLE

The D.R.E.A.M. console consists of a range of control surface elements driving Fairlight's acclaimed QDC engine fitted with four QDC channel cards. The console is available in various chassis sizes, each of which may be configured with a choice of fader numbers, Central Assignment Panels and meter bridges. A fully configured D.R.E.A.M. Console has 48 tracks of Binnacle editing integrated to 96 audio channels, 6-band EQ, two-stage dynamics, 48 returns and 48 aux inputs (a total of 192 inputs), and comprehensive multiformat monitoring. Its multiformat busing structure allows simultaneous generation of multiple formats up to 7.1, with individual level trims for each independent mix; buses can be mixed for stem-based work. The console offers the same EQ, dynamics and plug-ins capabilities as Station, but on a much larger scale, with full compatibility between the platforms.

"D.R.E.A.M. is the result of years of technology development and monitoring the changing needs of the post-production and multimedia markets," Lancken concludes. "Our intent was to provide a flexible, scalable solution that works in any-sized facility, in virtually any audio post market."

Fairlight USA, 844 N. Seward Street, Hollywood, CA 90038; 323/465-0070; fax 323/465 0080; www.fairlightesp.com. ■

D.R.E.A.M.'s Binnacle editing offers a new approach to workstation ergonomics by centralizing editing and transport functions around a jog wheel, for one- or two-handed editing.

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Sure we charge a heckuva lot for the S500 15-INCH 2-WAY.

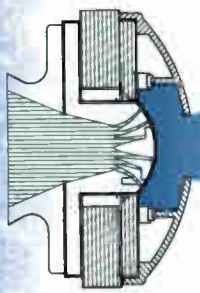
After you hear it, you may wonder why we SELL IT SO CHEAP.

Yeah, the S500 **looks** like a lot of other 15-inch 2-way SR loudspeakers but it sure doesn't **sound** like other 15-inch 2-way speakers. This one kicks so much butt you'd swear it was wearing army boots and is so accurate you can hear the tiny piece of roast beef stuck between the singer's teeth.

Walk into a music store and you'll encounter a whole wall of 15-inch, 2-way speakers — including our S500. Check out the price tags and your reaction may be, "Where does Mackie get off charging 20-25% more?"

Well, Greg Mackie figured the world didn't need yet another OK-sounding commodity-grade speaker. So instead of starting with a pricepoint, we started with a goal: make the best-sounding, widest-dispersion, highest-accuracy 15-inch 2-way loudspeaker yet.

Of course, owning RCF™, one of the world's most advanced transducer design and manufacturing facilities didn't hurt either.



The S500 uses a new RCF Precision™ titanium compression driver with a 3-slot optimized geometry phase plug that significantly smooths high-end frequency response and provides exceptional coupling with the 75°x65° exponential horn.

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The result is 500-watt RMS power handling and 127dB SPL output with smooth frequency response and superb horizontal and vertical dispersion — so all of your audience hears the same great sound.

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Get your ears pressure-washed at a Mackie dealer soon.

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INNOVASON SENSORY COMPACT LIVE

ALL-DIGITAL CONSOLE

So far, there has been some resistance to digital consoles in live sound, especially at the monitor mix position. However, after using an all-digital console—the InnovaSon Sensory Compact Live—at last summer's Britt Festival in Jacksonville, Ore., I can confidently predict that all-digital boards will soon become a familiar sight on major tours worldwide.

I would compare the move to a digital desk to trading up from a typewriter to a word processor; after a short familiarization period, I found that the Compact Live's range of digitally enabled functions vastly increased my productivity. The ability to reset the entire board at the press of a button, assign onboard dynamic control without patching and copy parameters at will are features that any audio engineer would appreciate. And the sound quality is exemplary—A/D conversion is at 20-bit/48 kHz, audio processing is carried out as 32-bit floating-point calculations, and the D/A output converters are 24-bit. An internal power supply works with any AC supply between 100 and 240 volts, a range that covers all of the international standards.

The Compact Live offers all of the features of the InnovaSon's larger digital consoles (which include the Sensory Grand Live and the Large Scale), and runs the same Sensoft software. All of the Sensory Live Series consoles are based on InnovaSon's Muxipair 64-channel digital snake system, which can be run on a pair of co-ax cables over distances of up to 1,000 feet. Versions of the Compact Live offer a remote 7U stage box that is connected via co-ax cable measuring 450 feet or longer, depending on the wire.

Though Sensoft control software is common to all Sensory Live Series consoles, hardware configurations depend on the model. Unlike the larger InnovaSon boards, the Compact Live can have its input and output cards mounted in the back, making it a one-piece desk. The basic version houses four 8-channel input and two 8-channel output cards in the doghouse, for a total of 32 inputs and 16 outputs. Each XLR input has an LED that indicates signal present (green) or overload (red).

In addition, a 25-pin D-connector on the signal processing card can accomodate eight line inputs. There is also a phantom-powered XLR talkback mic input on the back.

For larger stage setups, two Compact Live boards can be linked to create a 64-channel console. A 7-pin XLR cable links the mix buses from the first Compact Live to a second. That, in turn, can be linked to a third, for a total of 96 channels.

To provide digital control and automation features, the Compact Live has an internal Pentium CPU and includes a 3.5-inch floppy disk drive. The board can also be run from an outboard PC running Sensoft under MS-DOS. A keyboard with a built-in trackball pulls out from under the right side of the desk. This might temporarily unnerve a hands-on "analog guy," but it is only needed during setup. All pre-production can also be done offline on another computer and copied over to the Compact Live, so there is rarely a need to use the keyboard during a show. The built-in, 12-inch, color LCD screen conveniently flips down for storage.

The Compact Live is aptly named—it is only 44 inches long and weighs 77 pounds. Although all of its electronics are built-in, the Compact Live only weighs about half as much as its bigger siblings, the Grand Live and the Large Scale, and is about two-thirds the length. My wife and I were easily able to load the board into the back of my van for the trip to the Britt Festival in southern Oregon, where I served as "house" monitor engineer.

When faced with a digital console for the first time, most of us are hesitant, to say the least, and Britt Festival sound vendor George Relles had sensibly provided a Yamaha PM4000M for the monitor mix position for several years. The 4k not only provided a familiar tool for visiting engineers, but it also acted as a good benchmark for the purposes of this review. Using a second split out of the stage box, I patched the first 32 stage inputs to the Compact Live and routed its 12 aux outputs to the 4k's subgroup inserts. Artists who brought their own monitor engineers used the 4k, while I practiced putting up mixes off to the side on a pair of JBL LSR25s. When I mixed monitors using the Compact Live, the 4k's subgroup inserts provided con-

BY MARK FRINK

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2 BUTTONS?

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"As far as I'm concerned, the Sabine GRQ-3102 is a technological masterpiece!"
— Edward J. Foster
Pro Audio Review, On the Bench, March 2001

Sabine's all-digital GRAPHI-Q gives you a choice that no other product can give: 91 sliders, knobs and buttons for the ultimate in hands-on control – or the simplicity of using just two buttons on your computer mouse with our new Version 3.3 software. User-friendly and highly intuitive, this interface provides off-line editing, report printing, snapshot memory and Auto FBX Setup for up to 16 channels of audio.

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venient access to all 12 monitor mixes.

Due to the high demand for the Compact Live, our demo board arrived with a French manual, which proved a blessing when the English version finally arrived. Anyone who has suffered through the English "translations" of Roland documents will not be surprised to learn that the InnovaSon manual is similarly taxing. However, any moderately computer-literate user will find the Compact Live intuitive and easy to operate. I had to refer to the manual only for the most complicated operations. After one day, I felt as if I'd been mixing on the Compact Live for months, and I used it for weeks without consulting the manual.

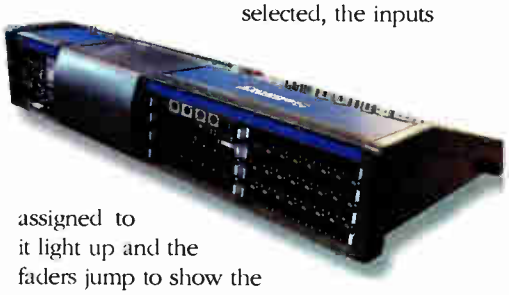
Much of the Compact Live's operating surface is immediately familiar. There are 32 input and 15 output motorized 100mm faders. Above each fader is a Cue button, a Channel Select switch and a 4-digit display, where a short name associated with the physical input or output patched to each fader is displayed. Above these are mute switches and LED meters for each channel.

The desk initially powers up with the physical inputs and outputs patched to the faders sequentially—input 1 appears on channel fader 1, output bus 1 appears at output fader 1, and so on. Inputs are labeled with the names that correspond to the card's slot letter and the XLR number on the card. These can easily be renamed by selecting each channel, hitting the F3 command key and typing in a meaningful (4-digit) name.

Above the inputs, on the left side of the console, are the controls for the processing functions of whichever input or output is selected: gain, highpass, compressor, gate, parametric EQ and delay. The compressor and gate functions are double-mapped and share controls. The outputs are provided with 8-band parametric EQ; their controls show up as two "pages" of 4-band EQ. This is where an engineer has to make the biggest adjustment from operating an analog console; using the same knobs to adjust parameters for each channel calls for a new pattern of eye-hand coordination. Not moving from one end of the desk to the other to "tweak" takes getting used to, but after a while, I found it possible to work quickly without taking my eyes off the stage.

One of InnovaSon's tag lines for the Sensory digital consoles is "The new way to watch sound," and it is true that the Compact Live offers a lot of visual information that's not available with analog desks. Changes to processing parameters are instantaneously displayed on the 12-inch color LCD screen. Graphical representations of changes' effects in dynamics and EQ parameters are displayed along with the control positions and values. This visual feedback is both comforting and interesting.

The motorized faders also provide immediate feedback. Select an input and the mix buses that that input is assigned to light up, and their motorized faders move to indicate the input's level in each mix. Likewise, when a mix bus is selected, the inputs



assigned to it light up and the faders jump to show the entire mix. It's much easier to scan a row of faders than a row of pots to check relative send levels to an effects send bus or a monitor mix.

The console offers several types of linking functions. Simply linking fader levels makes one fader follow another, with or without a level offset, a feature more or less equivalent to a VCA on an analog desk. Mutes can also be linked so that en-

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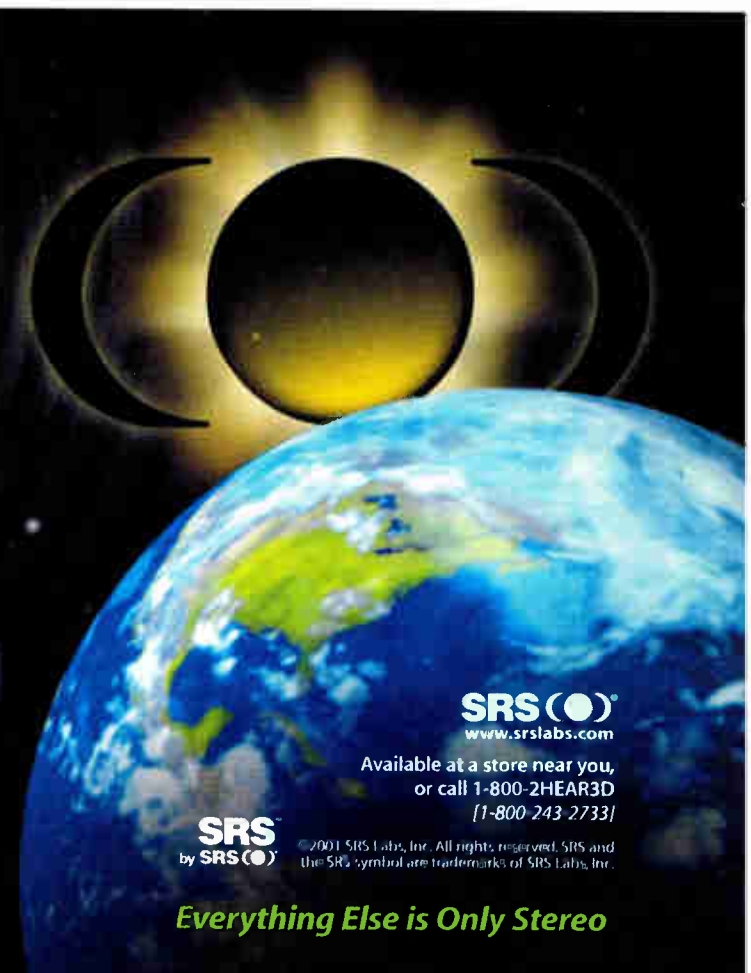

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tire sections of the desk can be switched on or off at once. Channel strips can be linked to make stereo or multichannel controls operate in tandem.

Processing can also be linked across multiple input channels. The processing functions to be linked—gain, gate, compressor, EQ, delay—are simply selected via onscreen check boxes, and links are then made by means of a grid that can accommodate up to 40 links. These links can be made from the keyboard or by pressing the corresponding controls on the console surface. Only one link group per channel is permitted. Output processing can be similarly linked.

Copying one input (or output) to another (or several) is a simple 4-button process: Select, Copy, Select, OK. The range of parameters to be copied is confirmed in a Preferences screen with a check box for each type of control, so that only a particular section of the channel, such as the compressor or EQ, will be copied. The entire channel, including its patch and label, can be duplicated to another strip. The Request key allows the various functions to be visualized for the entire desk; for example, all channels that have phantom power turned on.

A function called OverRam allows changes made to a channel in one memory scene to be written to every song in the set list, useful for tweaking EQ during a song in soundcheck that you want changed for all the songs in the show that day. The system of files and scenes makes it easy to create a scene for each song in rehearsal and then assemble the scenes into a performance order. The desk is equipped for chasing or driving MIDI.

Because the Compact Live is a digital console, the values of the various parameters are not fully adjustable, but are somewhat quantized over the range of operation. For example, the low-cut choices are 40, 80, 120, 140, 160, 200, 240, 280, 300, 340 and 380 Hz, rather than the entire range of frequencies below 400 Hz. In the same way, the fully parametric EQ has a finite set of choices for frequency, cut/boost and width. At first, this seems limiting, but after getting used to it, it makes it easier to quickly make a decision and move on.

A headphone jack appears both on the back and under the armrest, and a flexible monitoring scheme allows the operator several cueing choices. Depending on the mode selected, the monitoring of individual channels can be "piled on" (cumulative AFL and PFL) or not (with Solo engaged or APL). The cue bus can be chosen to either follow the channel currently being operated on, or work independently of the Select function. Another feature is the ability to take the 16th output XLR and assign it to follow the mono master fader, allowing one to send the cue output to a reference wedge. This makes adjustment of a mono mix unavailable from the control surface, but this is an insignificant sacrifice for most stage monitoring applications.

Most Compact Live users will find little need for outboard gear; a few effects and crossovers for the speakers will be enough in most situations, due to onboard EQ, delay, gates and comps. The only drawback is a lack of sidechain EQ on the gate's key. Multi-act venues, especially clubs and houses of worship, will benefit from the ease of operation and resetability. List price of the basic Compact Live is $46,000; a version with the digital stage box option adds $14,000.

InnovaSon is distributed in the U.S. by Sennheiser, 1 Enterprise Drive, Old Lyme, CT 06371; 860/434-9190; www.innovason.com. ■

Mark Frink is Mix*'s sound reinforcement editor.*

World Radio History

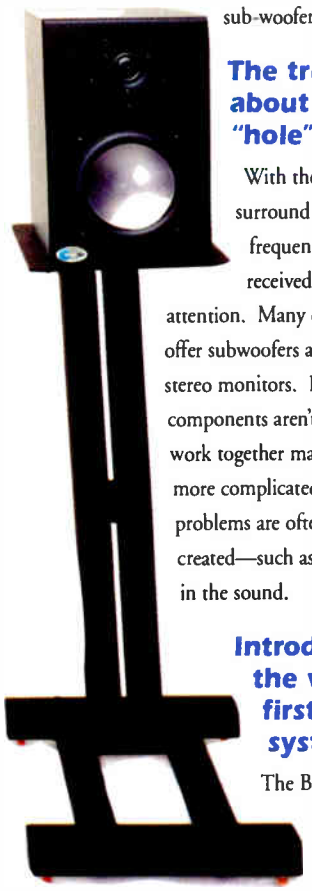
Truth is the most valuable thing we have. Let us economize it — *Mark Twain*

The truth about nothing but the truth.

The problem with most so called reference monitors is they simply can't reproduce the full range of audio frequencies needed for true representation of the sound, especially low frequencies. Today's most common monitors use a 2-way design with 8" woofers to cover the low frequencies, but they can't go down low enough to give you the lowest octaves that are essential to the character of so many instruments, like bass and drums.

Ported v sealed boxes.

Some designs use ported cabinets to help do the job woofers can't do on their own. While a port can extend low frequency capabilities, it can't deliver the transient response of a sealed box. At high levels, airflow through the port produces turbulence that reduces efficiency and actually causes high frequency noise. There's no getting around it—If you want a true reference, you need a sub-woofer.



The truth about the "hole" truth.

With the advent of 5.1 surround sound, the low frequencies have received much more attention. Many companies now offer subwoofers as add-ons for stereo monitors. But when components aren't designed to work together matters can get more complicated, and new problems are often created—such as an audible hole in the sound.

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STEINBERG HALION 1.1

VST STREAMING SAMPLER

HALion is a professional, 32-bit streaming sampler that runs under any VST 2.0-compatible host application on either Mac or PC computers. HALion supports all of the popular digital audio file formats such as .AIFF, .WAV, .AIFC, LM4/LM9/.TXT, .REX, SDII (only on Mac), Akai S1000, S2000, S3000, E-mu 3/3X/ESI/4/4k, E64/E6400, ESynth/Ultra and SoundFonts 2.x; the new 1.1 update adds support for GigaSampler files. A major breakthrough, HALion is the first streaming sampler on the Mac. Tascam's GigaSampler is PC-only and usually requires a dedicated computer.

HALion's WaveLoop window sets sample loop points.

GETTING STARTED

For my review, I used Emagic Logic Audio 4.73 running on a G4/400 Mac with 704 MB of RAM and 9.1 OS. I also installed the program without any problems on a Dell Inspiron 8000 laptop—there are both PC and Mac versions on the same installer CD-ROM. There is no copy-protect scheme evident, but it has not yet been 30 days either. After both installations, I went to steinberg.net to download the Version 1.1 update. Besides GigaSampler support, 1.1 adds the MegaTRIGG feature, which allows you to use controllers or keys to trigger samples with Note Off or pedal MIDI messages.

If you are a Cubase VST user, then you can have up to 12 virtual outputs (four stereo pairs and four monos) with up to eight HALion VST instruments playing. Logic Audio is not fully VST implemented and will only allow stereo outputs of VST instruments. Each HALion sampler instrument can have up to 256 voices and 16-channel multi-timbrality. In HALion parlance, a program holds any number of samples and parameters to make up a single instrument. A program bank allows you to have any one of 128 instruments online and ready to play by pulling down and selecting its program. HALion "sees" all MIDI channels at the same time, so once you've assigned a MIDI channel and, if you need to, a separate output, you're rockin'.

Because HALion is a streaming sampler, only the initial portion of the sample is loaded into the computer's RAM, while the rest of the sample plays or "streams" from your hard drive. You can adjust the ratio of how much of the sample plays from RAM vs. from the hard drive. You should obey the digital audio cardinal rule: Use a second hard drive for all digital audio files. Extra RAM is essential if you plan to have many HALion instruments running at once.

To get you off to a great start, HALion comes with four "Content" CD-ROMs featuring Wizoo Sample Instruments and eLabs sounds from Sweden. Sounds and loops (1,600 MB) include: XXL Acoustic Piano, XXL Nylon Guitar, XXL Bass, XXL Drums & Percussion, Clavinets, Clean Guitar, Electric Pianos, Electronic Drums, Synth Basses, Analog Chords, Digital Decays, Pads, House Organ, Osc Toolbox, Erazor FX, Organs, DrumTools, LoopTools 65 bpm to 170 bpm, MusicLoops 90 bpm to 170 bpm, SoundTools Samples and SoundTools Vox. It is recommended that you copy these CDs to your hard drive, although it is possible to stream directly from your CD-ROM drive, depending on your system's configuration and CD-ROM speed. I tried this on the PC, and it does work!

GETTING AROUND HALION'S INTERFACE

HALion uses multiple edit screens or views. Common to all views are buttons to toggle over to other views, a program output selector, a MIDI channel selector, a hard disk access indicator and 16 MIDI activity lights. There is a virtual keyboard for quick, "mouse-click" access to sounds. This keyboard also echoes any external MIDI controller keyboard/sequencer activity. Navigating through HALion is made easier with the Navigation Controller, a virtual trackball used for scrolling and zooming. Depending on which edit view you have selected, the Navigation Controller's Edit and List buttons indicate whether the page or the list you have in view are affected. Getting the hang of the Navigation Controller is essential to becoming a HALion power user!

The main default screen is called Macro view. This looks like an analog synthesizer panel with master fader controls for real-time tweaking

BY BARRY RUDOLPH

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of global parameters and all samples in a program. The digital-controlled filter has lowpass, highpass, bandpass and notch types, 12 or 24dB per octave curves, and control over resonance, cut-off frequency and filter envelope. The envelope generator has attack, decay, sustain and release faders, and a Macro Amplifier section controls amplifier amount, amp volume and amp velocity (i.e., how much volume is affected by your keyboard dynamics). The Macro view finishes with a Tune section, Glide and two LFOs. There is also a pull-down menu to select and constrain the quality of the sample's playback to conserve CPU power.

Next is the Channel/Program view. This is where you can assign any program in a bank to any of 16 channel slots and then select outputs. Starting with the Channel/Program view, and with all subsequent Edit views, a program list (bin) displays all programs with typical folder hierarchy used to locate the individual samples.

The Keyzone view graphically displays a sample's keyboard span. Vertical strips representing the relative velocity range for each sample and the horizontal width of each strip indicate the key span. Like most items in HALion, clicking on the sample strip selects it. One quick and easy way to load samples into HALion is to simply "drag and drop" them directly into the Keyzone window.

WaveLoop view is used for setting sample loop points. You can set up sustain loops and control which portion of the sample should loop when a key is held down. Release loop governs a separate loop activated after a key is released. A Crossfade function helps to set the optimum loop. Zero-crossings are automatically identified, and nondestructive editing will rescue you from faulty editing steps. Samples can be pitched, modulated or reversed. I liked the way WaveLoop handles looping.

HALion has the ability to modify each sample individually in the Envelope/Filter view. There are two envelope generators with up to eight stages each, a multi-mode Filter section (DCF) and an Amplifier section (DCA) available for *each* sample. This feature works especially well for loops and drum programs where different filter settings and envelopes are desired for kicks and snares.

The Mod/Tune view is a very com-

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SYSTEM REQUIREMENTS

Mac
G3 or better
RAM (Cache): 512 MB
Hard disk: fast SCSI
Free disk space: 1.6 GB
Operating system: Mac OS 9.1
Soundcard: approved ASIO-compliant
Host application: Cubase VST 5.0 R1 or higher (update on HALion CD), Nuendo (1.5 or higher) or other VST 2.0-compatible host software

PC
Pentium III
Processor speed: 450 MHz
RAM (Cache): 512 MB
Hard disk: fast SCSI
Free disk space: 1.6 GB
Operating system: Windows 98 or 2000
Soundcard: approved MME or ASIO-compliant
Graphic: 256 colors @ 640x480 pixels
Host application: Cubase VST (5.0 R5 or higher), Nuendo (1.5 or higher) or other VST instrument-compatible host software

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prehensive modulation matrix where you can pick the source modulator *and* modify the source with other signals (think FM). There are also two LFOs, a Tune section for individual sample tuning and a Voice Grouping section.

The Options view is used for importing external audio file formats to conform for use in HALion. New samples can be merged into existing programs or replace current programs and samples. Here is where you can adjust how much of the sample is loaded into RAM vs. streamed from disk. The Browse pull-down is used to navigate and load Giga or SoundFont files. The Import External Format mode is used to load Akai or E-mu samples. Imported GigaSampler files are automatically remapped into HALion instruments after they are loaded.

USING HALION

HALion is a godsend; it's a great alternative to RAM-based virtual samplers such as SampleCell or Emagic's EXS24. I found HALion especially useful on the Dell laptop: I could be anywhere and have sounds all ready to go for building songs. The supplied CD-ROMs worked well to get some cool little tracks going right away. Latency was the same as I usually experience with VST instruments; it depends totally on your audio card's ASIO driver and software. Because my laptop is faster than the Mac, I noticed a lot less CPU load (with the built-in gauge)—actually, quite low compared to some other VST instruments and also because I was streaming from the CD-ROM. I compared CPU loads for two other popular virtual samplers—Native Instruments' Battery and Emagic's EXS24 sampler—to HALion. HALion was about the same as these other instruments—minimal.

Bug count and "quirks" were low, and there are some non-intuitive ways to accomplish tasks in HALion that took some getting used to. For example, even though you can stream from CD-ROM, you cannot always load straight from the CD-ROM—you'll get an error message; you'll have to use the Browse function in the Options view, and sometimes you will have to re-navigate to the drive where you have the samples stored. Essentially, once the program knows what kind of file it is, it can quickly convert it to HALion format.

Editing in the intuitive WaveLoop view is very easy and a welcome feature if you've ever had to do the trench work of building a usable instrument from raw samples. You just select the sample from the bin (program list) and tweak away. HALion uses "handles" on the waveform to move start or end points.

Be aware of CPU resources when making precision-oriented music—read this as super-tight rhythmic grooves. To keep the virtual instrument count down, I usually record (make into audio tracks) as soon as the part and/or arrangement is solid. HALion remembered all of my tweaks and sounds perfectly, if I had to go back and re-record an instrument when the arrangement did change later. The great manual is a little more oriented toward Cubase users, but hey, it's Steinberg—why shouldn't it be?

The entire HALion package is $399 MSRP and sets the bar high for all future samplers—virtual or hardware-based. It would make a great gift, especially for Mac users who now don't have to buy a separate PC for Tascam's GigaSampler.

Steinberg North America, 9200 Eton Ave., Chatsworth, CA 91311; 818/678-5100; fax 818/678-5199; www.steinberg.net. ■

Barry Rudolph is an L.A.-based recording engineer. Visit his Website at www.barryrudolph.com.

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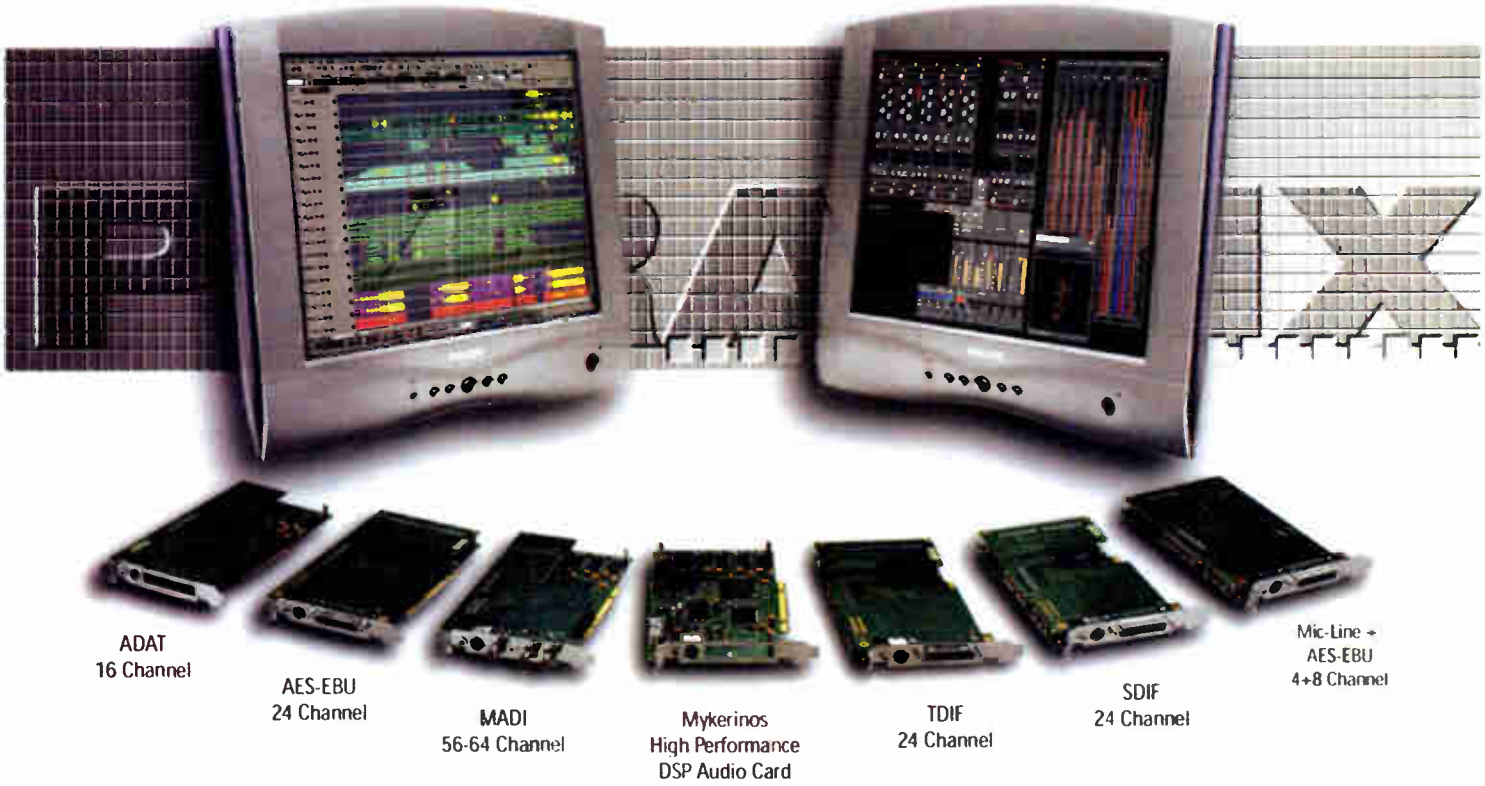

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World Radio History

UNIVERSAL AUDIO MODEL 2-610

MICROPHONE PREAMPLIFIER

Bill and James Putnam brought smiles to a lot of studio engineers in 1999, when they announced the relaunch of Universal Audio, which had shut down 30 years prior. The first two projects the new company undertook were the production of virtually exact replicas of the seminal Teletronix LA-2A and UREI 1176 LN, two of the most highly sought-after vintage compressors of all time. With the introduction of their Model 2-610 Microphone Preamplifier ($2,295 list), Universal Audio has ventured into new territory. The 2-610 is the new company's first original analog design.

That's not to say that the 2-610 doesn't possess vintage heritage. This new tube mic pre was inspired by the mic preamp section of the '60s-era Universal Audio 610 recording console. That board—the first modular console design—left its indelible sonic imprint on many recordings by Frank Sinatra and Sarah Vaughan, as well as the Beach Boys' *Pet Sounds*, The Doors' *L.A. Woman* and Van Halen's debut album. In fact, the console is still in use at Ocean Way Studios, where it lends its distinctive sound to projects by the Goo Goo Dolls, No Doubt, Green Day and others.

The 2-channel 2-610 attempts to preserve what is timeless about the 610 console's mic pre section, but it updates components and features to bring the mic pre up to today's standards. The same 12AX7A and 6072A tubes (one per channel) are used, as are identical componentry values and many of the legacy module's features. Modern updates include a higher-quality power supply, polypropylene caps, metal film resistors, custom-wound I/O transformers with double-sized alloy cores, and newly added features such as switchable polarity inversion, phantom power, high-impedance inputs and an enhanced EQ section.

Even considering Universal Audio's unequivocal success with prior product releases and the glowing legacy of the 610 console, I could not have anticipated the impact the 2-610 would have on my recording session. What I heard blew me away like a hurricane. But before I gush volumes of praise for this amazing product, let's take a tour of its feature set.

DOUBLE FEATURES

The two-rackspace 2-610's generous allotment of mic, line and instrument I/Os encourage creative uses beyond mic signal preamplification. The rear panel has a line input for each channel in addition to the expected mic in/line out—all transformer-balanced on XLRs. Besides the detachable AC cable socket, the only other connectors are ¼-inch, high-impedance jacks on the front panel for patching in guitar, bass or other electronic instruments.

The control layout for both channels is identical. All knobs and switches have a smooth feel and positive action. You choose which input you want to use—mic/line/DI—via a 5-position rotary switch. Mic and DI inputs are each allocated two switch positions, each presenting a different input impedance. You can choose between 500-ohm and 2.0-kilohm impedance for the mic input, and either 47 kilohms or 2.2 megohms for DI.

Changing the impedance results in a different sound, of course. For example, active basses and guitars might sound best on the 47-kilohm setting, whereas passive instruments with magnetic or piezo pickups will benefit from the reduced loading that the 2.2-megohm setting affords. The optimal mic impedance setting varied according to which mic I was using, with the best setting resulting in a more open and focused sound. My Demeter VTDB-2b Tube Direct and Aguilar DB 900 tube DI boxes both sounded best using the 500-ohm mic input setting. It's really great having the flexibility to match the 2-610's impedance to various sources to sculpt the sound.

You'll notice two different gain controls for each channel on the 2-610's front panel, one marked Gain and the other Level. These each serve a separate, single-ended, Class-A, dual-triode gain stage inside the unit. Variable negative feedback is applied to both gain stages. Total maximum gain is 61 dB, ample for most situations.

The Gain control is a 5-position rotary switch that adjusts the gain of the input stage in 5dB increments. As you turn this switch clockwise, negative feedback is reduced and gain increases, along with pleasing harmonic distortion. Conversely, turning this switch counterclockwise decreases the gain and yields a cleaner sound.

The Level control is a large, continuously variable rotary knob that determines how much level is sent from the preamp stage to the output stage; a master volume control, if you will. I got some really smooth and musical distortion effects on electric guitar, bass and drums by lowering this control and cranking the Gain switch. Generally, for the cleanest sounds, the level control should be set between 7 and 10 (full clockwise) while adjusting the Gain switch for optimal output level.

Both channels feature independent high- and low-shelving EQ facilities. Two three-way toggle switches select a fixed-corner frequency for each band (70/100/200 Hz for the lows and 4.5/7/10 kHz for the highs) with up to 9dB boost/cut available via

BY MICHAEL COOPER

World Radio History

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Want to make sure that your computer and software are compatible with the US-428? Go to www.tascam.com and check out the "US-428 Compatibility Chart", or learn all about computer recording from our "PC Recording Guide".

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Here are a few of the innovative software developers who offer support for the US-428. Cakewalk, Sonar and more virtual synth support coming soon. See the TASCAM web site for the latest info.

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11-position rotary switches. With all EQ nulled, the 2-610's frequency response is 20 to 20k Hz ±1 dB.

Each channel has switches for 48-volt phantom power and polarity reversal, with the latter switching the rear panel line out (normally pin 2 hot) to pin 3 hot when the polarity is set to Out, or inverted. A beefy power switch on the front panel is accompanied by a lamp with a huge purple lens, a nice aesthetic touch. In fact, the entire unit oozes retro-cosmetic appeal. All gain/level, EQ and impedance settings were easy to see in low light.

IN SESSION

My first session using the 2-610 was on a country music production. I stuck an AKG TL-II mic in front of the male lead singer, patched it to the 2-610, brought up my fader and was *floored*. The 2-610 is the richest, fattest and sweetest mic preamp I've ever heard on vocals. Bigger than life and possessing astounding depth, the sound made all other mic preamps I've used sound somewhat 2-D by comparison. The bottom end was big and tight, mids incredibly clear, yet warm as hot fudge, and the sweet highs ultra-smooth. And this was *before* I patched in my Universal Audio LA-2A, which took the sound to new heights. I almost never EQ vocals (or anything else except for drums) while tracking, but the unit's high-shelving EQ at 10 kHz was so flattering to this track that I just couldn't resist.

I got equally stunning results recording a female pop vocalist with a Lawson L47MP tube mic. Setting the gain switch to the +5 setting produced a velvety texture that is to die for. The tonal balance was perfect and the depth dramatically superior to that of previous tracks I'd recorded with this vocalist.

Next, I miked an acoustic guitar with a spaced pair of B&K 4011s and made stereo recordings with first the 2-610 and then a Pendulum Audio MDP-1 tube mic preamp, for an A/B comparison. The 2-610's uncanny resolution in the midrange frequencies gave it a bit more depth than the MDP-1, and the overall sound was full and very lush. However, Pendulum's mic pre exhibited noticeably superior transient response, a wider stereo image, and a clearer, more balanced tone. Both preamps have different merits for tracking acoustic guitar, depending on what kind of sound you're after.

I next recorded my '62 Strat, using first my Demeter Tube Direct and then the 2-610's DI input. This is an admittedly unfair comparison, as I've never heard a DI input on a mic preamp stand up to the best purpose-built DI boxes. But the comparison is useful to describe the 2-610's tonal character. As expected, the Demeter DI sounded sparklier, and the 2-610 produced warmer mids. Patching the Tube Direct's balanced out to the 2-610's mic input was the best of both worlds, allowing me to add some hair to the sound that I couldn't get using the Demeter Tube Direct alone. Cranking the 2-610's gain to +10 gave a slight bark that was perfect for country lead guitar fills.

Next up was an electric bass guitar track, recorded through the 2-610's DI input with the preamp's gain set to +10 and its output patched to an LA-2A. The sound was gorgeous—round, warm, lush and deep. But I could go one step better by patching the bass through my Aguilar DB 900 tube DI box and patching the Aguilar's balanced output into the 2-610's mic input. The sound became even more lush, and the overall tone more open and balanced—a great combination!

Running a stereo, full-band mix from my 02R's analog outputs through the 2-610's line inputs produced interesting results. The 2-610 could take the 02R's hot levels and the sound was bolder, but the bottom end wasn't as tight. Overall, I felt that the 2-610 changed the sound too much to use for mastering purposes. But patching individual ADAT tracks through the 2-610's line inputs was an entirely different matter. With its Gain switch set to +10, Universal Audio's bad boy fattened up kick drum and bass tracks very nicely, and the preamp's EQ added flattering touches.

SOLD!

The Universal Audio 2-610 is, hands-down, the most dimensional mic preamp I've ever heard for recording vocals. The depth, clarity, lushness and tight bottom end it imparts on vocal tracks will astound you. This feature-packed tube preamp also sounds outstanding on a wide variety of instruments.

The two gain stage controls, impedance-matching capabilities and flexible shelving EQ facilities—not to mention the line and DI inputs and other bells and whistles—make the 2-610 one of the most versatile mic preamps available and an unbelievable bargain at $2,295 list. Universal Audio will have to send a SWAT Team to my studio to get this unit back. Call off the troops—I'm buying.

Universal Audio, Box 3800, Santa Cruz, CA 95063; 831/466-3737; fax 831/466-3775; www.uaudio.com. ■

Michael Cooper is a Mix *contributing editor and owner of Michael Cooper Recording in beautiful Sisters, Ore.*

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CRANE SONG HEDD 192

HARMONICALLY ENHANCED DIGITAL DEVICE

Recording engineers need a full-spectrum sonic palette. Sometimes, this means going against the ingrained instinct of "accuracy first." Yes, there are times when transparently clean is the best and only choice. Other times, a little grunge helps bring a more aggressive "street" feel to overly sterile studio tracks, especially now that analog tape has become more a piece of outboard gear than a standard part of the recording process.

Just as television and print exaggerate the warmth of flesh tones (think distressed furniture, acid-washed jeans and a broken-in pair of sneakers), analog's artifacts saturate sonic colors to a level more vivid than reality. Designed to provide analog nuances when working in the digital domain, the first Crane Song HEDD (Harmonically Enhanced Digital Device) was previewed at AES five years ago, and it was an instant hit with producers, recording engineers and mastering studios.

Now, designer Dave Hill offers HEDD 192, the second generation of his brainchild, which now offers dither that's exclusively Crane Song's and, as its name suggests, 192kHz capability at 24-bit resolution.

However, more than just a stereo AD/DA converter, HEDD 192's built-in DSP includes three analog emulation controls (Triode, Pentode and Tape) with a common Bypass switch. The unit can operate as an effects device or as a separate AD/DA converter with the sound enhancement applied to either the A/D or D/A process. Just rotate the knobs clockwise and enjoy. It couldn't be easier. There are no menus, LCD screens or secret keystrokes.

HEDD 192 currently ships with 96kHz converters: The upgrade path is waiting for acceptable parts and communications standards, and its modular design will facilitate the transition. Each time a major setting, like sample rate, is changed, the converters recalibrate themselves. Outside, a front panel switch resets the meter's peak hold feature. Inside, two peak hold options can be selected via an internal jumper.

Among HEDD 192's front panel knobs are controls for selecting sample rate, bit depth (also inserts DSP in the correct signal path), AES or S/PDIF output, internal/external clock source, and DSP bypass. The rear panel has XLR balanced analog inputs and outputs, XLR AES and coaxial S/PDIF digital I/O, and wordclock in/out on BNCs.

The single-rackspace device lists for $3,495.

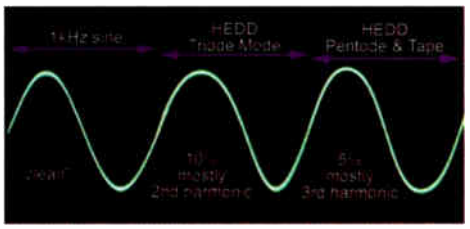

Figure 1: From left to right are three sine waves that depict what controlled distortion looks like as delivered by HEDD 192.

IN SESSION

For the first test, the output of my Soundscape workstation was routed through HEDD to "warm up" a mix in progress. There's nothing subtle about HEDD processing, and everyone who heard the process was impressed with the results. Turn the Tape knob clockwise and the track gets larger without increasing "overs," yet simultaneously adding richness to the bottom and mids.

I also used HEDD to emulate an Ampeg B-15 bass amp by routing an electric bass track through it, and cranked the Pentode knob to increase the "spectral content." By adding a sweet bit o' distortion, a nice round bass guitar turned into a more robust version that could sit in the mix through verse and chorus without getting lost in the sauce. That's deep—with or without the pun.

From left to right on the front panel, each of the three controls—Triode, Pentode and Tape—become progressively more responsive. Triode generates the type of even-order (octave) harmonics associated with single-ended vacuum tube circuits. The effect is easier to hear when processing at higher sample rates. The emulation makes astounding visuals starting with Fig. 1, a family of sine waves from clean to mean. In Fig. 2, the arrow points to 1 kHz, and to the immediate right is the second harmonic, 2 kHz, one octave above. What is amazing about HEDD 192 is that the distortion is so controlled: There's no thin, shrill, hard clipping at all.

A completely different effect is available by combining the Pentode and Tape modes to generate odd harmonics, as the 3kHz and 5kHz spikes show in Fig. 3.

What is amazing about HEDD is the level of control that each knob has over its respective area of expertise. No analog product can deliver such controlled and desirable distortion. No digital product is as easy to use. If you've been putting off buying an outboard converter, then HEDD 192 may be the best reason to do so.

Recording was done at 88.2 kHz,

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via Alesis Masterlink, with the sample rate chosen to minimize the math for future comparison at 44.1 kHz. It should also be noted that the reason for using square waves is that they consist of all odd harmonics—essentially, sine waves ripped through a fuzzbox, clipped symmetrically top and bottom.

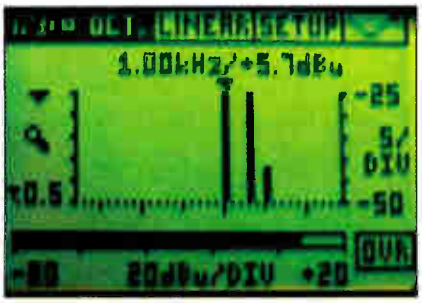

Figure 2: The third-octave display of the Neutrik Minilyzer shows how Triode mode generates even-order harmonics. In this case, 2 kHz is one octave above the fundamental.

What you never see is the effect digitizing has on square waves; Fig. 4 shows just that. Via HEDD 192, notice how much more sedate the "ringing" is at higher sampling rates. Also note how tape emulation affects the wave. Of course, tape saturation is a dynamic process that cannot be depicted in print. Tape saturates at high frequencies because of the record EQ boost and at low frequencies due to head limitations. That's two different idiosyncrasies plus low-frequency head bumps, a complex bit of DSP made easy.

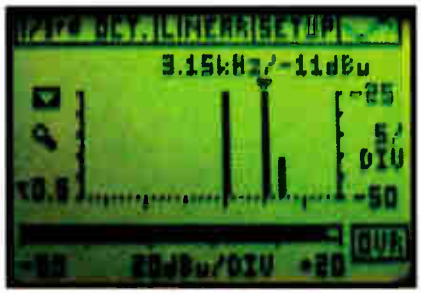

Figure 3: Using the Pentode and Tape modes together generates plenty of odd harmonics, the third and fifth here being 3 kHz and 5 kHz, respectively.

FINAL STAGE

HEDD 192 is Crane Song's second-generation stereo digital converter, adding higher sample rates as well as tape emulation. (The original version featured only vacuum tube emulation.) Next to an LA-2A, HEDD is the simplest signal processor you'll ever use. Providing a remarkable level of sonic versatility with ease of use, HEDD 192 is a sonic crayon that can paint a whole rainbow.

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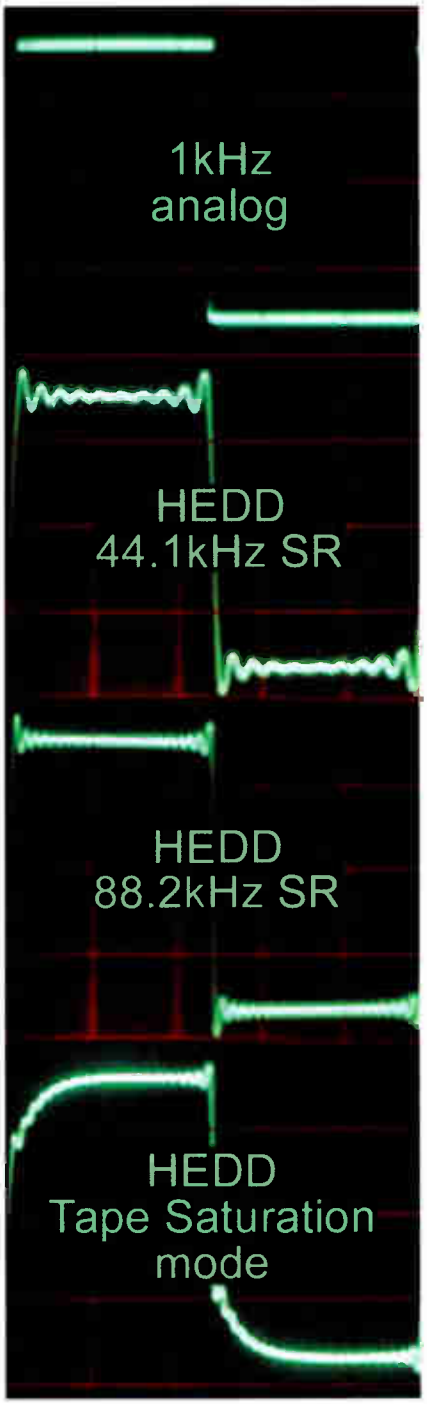

Figure 4: The effect of sample rate on bandwidth and filtering is easily seen when a square wave runs through the conversion process. Note how doubling the sample rate reduces the ringing caused by anti-aliasing filters. Analog tape emulation is more difficult to capture in a single image, but at the bottom, the high frequencies have been slowed down a bit.

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WAVES L2 ULTRAMAXIMIZER

TDM MASTERING PLUG-IN

The newest installment in Waves' Ultramaximizer signal processing series is the L2 plug-in for TDM, the software re-creation of the critically acclaimed L2 hardware unit. But wait, wasn't the L2 hardware unit the physical manifestation of the L1 Ultramaximizer plug-in?

Waves has never followed the pack. The typical route of developing plug-ins that are straight copies of vintage hardware units just isn't this company's style. So, instead, the company has designed a product that resulted from software that was developed into hardware, and then turned back into software again. Got that?

The L2 plug-in fulfills a niche market; it's for Pro Tools TDM-based mastering and recording engineers who want the sound of the L2 without the inconvenience of installing a new piece of outboard gear.

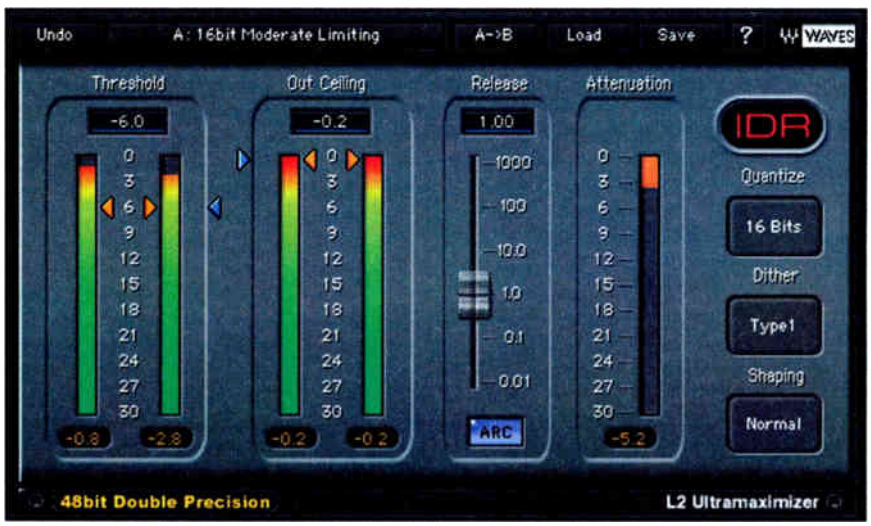
L1, MEET L2

The differences between the L1 and L2 plug-ins are subtle but important. The two plug-ins look strikingly similar at first glance, though the L1 is light gray and the L2 has a dark gray face. The L1 comes in a wide variety of plug-in formats, from the most popular native ones to TDM. The L2 is only available in the TDM format.

The L1 has some controls that are missing from the L2. The L2 doesn't have integrated stereo input level faders. However, lacking this control is not a big deal if you're using the L2 by itself, because you can use the fader on the channel where the L2 is inserted for an attenuation. But when the L2 falls after several other inserts (such as post-EQ and a de-esser), the lack of attenuation control on the plug-in itself can be a pain. Changing the channel's fader level in such a situation affects not only how you are hitting the L2, but all the other effects, as well.

The L1 features a Domain key, which gives you added control over peaks. There are two settings: Digital doesn't allow any samples over the Out Ceiling value, and Analog gives you total control over any peak that occurs in both the analog and digital domains. I've never made good use of this parameter on the L1, and so I didn't miss it in the L2. If this is an L1 function you count on, be forewarned that it's been omitted from the L2.

The L1 has a slightly wider range of Quantize bit depths—24, 20, 16, 12 and 8—vs. the L2's 24, 20, 18 and 16.



The L2's 16-bit Moderate Limiting preset.

And the L1 has a couple more presets than the L2, though this is not a problem because the L2's presets all sound fine (see sidebar for list). In fact, the L2's presets are reminiscent of the L1's presets, and even the Track Slammer patch (which is part of the L1's presets) is among the L2's presets. The L2 is stereo only, because it is a mastering tool.

MAKING ITS ARC

L2 especially differs from the L1 because it packs Waves' excellent Auto Release Control (ARC). This feature was originally found on the Waves Renaissance Compressor, and later was added to the L2 hardware unit. The ARC feature is really what sets the L2 apart: It increases the overall clarity of the plug-in's processed signal by dynamically controlling release times. This algorithm is far superior to setting the Release parameter manually, at a static value, because the ARC is continually selecting the optimum release value for the incoming material.

Turn ARC off and there is no perceptible difference between the sound of the L2 and the L1. Turn ARC on, and the magic happens (the ARC-enable key lies just beneath the Release control and disables the manual release fader): The algorithm treats the source material with kid gloves, creating a more open, translucent and clear sound without sacrificing loudness and presence. The effect is subtle to be sure, but it is a definite improvement over the L1. It's the kind of difference that is most apparent with the delicate nuances and wide dynamic ranges of a classical piece, rather than with the pounding beat of electronic dance music. But because the algorithm does such a great job of tailoring release times to the source,

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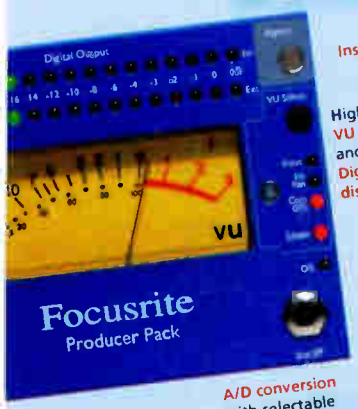

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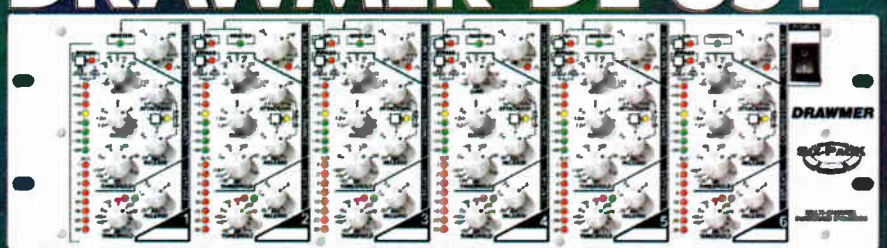

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SIMILARITIES

The L1 and the L2 are identical in some respects. Threshold and Out Ceiling parameters range from 0 to -30 dB, Release is from .01 to 1,000 ms, and there is an easy-to-read meter that registers up to -30 dB of attenuation. The IDR section includes the usual Quantize, Dither (Type 1 and 2) and Shaping (Moderate, Ultra or Normal); the L2 IDR features 9th-order filters, as opposed to the L1's 2nd order. The convenient Setup A and Setup B feature is still active. (I love this system for comparing alternate settings.) And I'm happy to report that the L2's parameters were easily tweaked from my Mackie HUI. (Most of the plug-ins associated with WaveShell-DAE 3.0 have parameters that are improperly mapped for HUI control.)

Compared to the L2 hardware unit, the L2 plug-in is virtually (no pun intended) the same. Of course, the sound quality—in terms of coloration—that you hear through your TDM system's converters will undoubtedly be different from what you hear through the L2 hardware unit's converters. Also, the L2 hardware unit has input level controls. Otherwise, the same controls found on the hardware unit can be found on the plug-in.

THE BIG PICTURE

Combining the front end of the L1 and the back end of the Renaissance Compressor—two incredible plug-ins on their own—the L2 can't lose. It sounds great and is a wonderful improvement over the L1. But, most importantly, it doesn't trade a single iota of gain-pumping muscle for the additional sonic clarity gained through the ARC algorithm. But with a price tag of $800, it is a specialized product. For general home studio use, the L1 is probably fine. However, if you are a Pro Tools TDM user who craves that fantastic L2 sound but doesn't want to buy the hardware unit, this plug-in is just the ticket. And, at a third of the price of the hardware unit, you can't go wrong.

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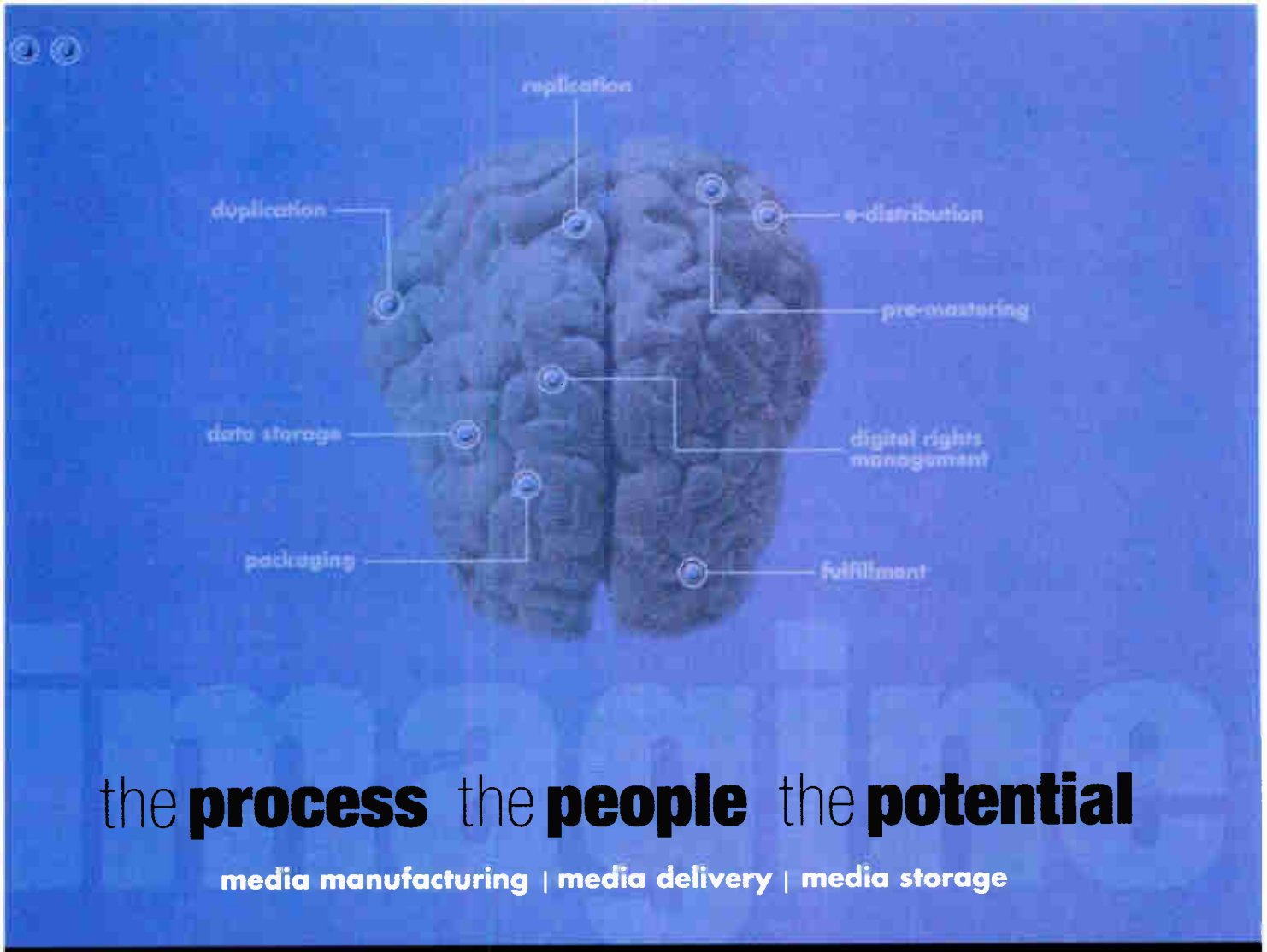

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MIC PRE/STEREO COMPRESSOR/EFFECTS PROCESSOR

The Focusrite Penta, the fifth product in the Platinum range, is a stereo compressor with 16 editable preset settings housed in a two-rackspace chassis. Penta is actually five products in one (hence, its name): a single-channel, Class-A, discrete mic preamp (the same as is used in VoiceMaster and Digidesign's Control|24 console/surface); stereo compressor; tube emulator; stereo width controller; and A/D converter via an optional upgrade.

Preset compressors date back to early audio times, when compressor settings were internally set with few options available to broadcast stations and disc mastering engineers. Penta is ideal for the project/home enthusiasts who would like to use a compressor properly, but are baffled by dynamics controls and operation. Penta's design is purpose-built for two main tasks in a studio: tracking a single mic or instrument to tape, or hard disk and stereo track compression for mixdowns. The unit was conceived only as a stereo compressor, but Focusrite found that they could add the single mic pre and still make its $495 price point.

The discrete preamp circuit is a compound, differential pair made up of a FET/bipolar transistor hybrid. The FET's high-input impedance allows any type of mic or instrument to be connected to the unit. The bipolar output transistor acts as a very low-noise, constant-current, buffer amplifier. The XLR mic and ¼-inch hi-Z instrument inputs are on the front panel only. The rear panel line input/output jacks are ¼-inch TRS—not XLRs, but switchable between -10 dB and +4 dB. Focusrite decided to keep Penta's costs down, so I had to quit asking myself those "How come they didn't?" questions that come with my "totally pro" expectations. At $495 MSRP for a decent mic pre and stereo compressor, you gotta tighten the belt somewhere! Having said that, you still get the pro touches like +48 phantom power, phase flip, highpass filter, a hard-wired gold-contact bypass relay, and a mic/line switch that routes the mic preamp output to the left input channel of the stereo compressor. Mic gain and line-level input gain are set by a ganged pot. Mic gain ranges from 0 to 60 dB; line-level gain ranges from -10 dB to +10 dB with a center 0dB position.

The compressor section uses an optical gain-reduction element rather than a VCA chip—a clever design choice because this smoother type of compression tends to be forgiving even when set improperly. There is no way to unlink the left and right compressor channels, so there will never be image shifting if you like to squash hard. The 16 presets, named for their intended use, are said to be optimized for: kick, snare, ambient (a way to pull more out of room mics and reverb returns), loop (good for squashing drum loops), bass guitar, synth bass, percussion, acoustic picked, acoustic strum, electric guitar, piano, keyboards, vocals, crunch (an extreme setting), mix [pump] (a sort of big mastering squash) and limit (a peak-limiter setting). All of these presets are selected with the left/right reset-selection buttons that are on either side of the row of 16 LED preset indicators. It would have made more sense to place these left/right buttons next to each other for fast, two-finger operation.

Manual adjustment of the compressor's presets is via six controls with center detent positions equal to the values of the currently selected preset. This method is a far better way to tweeze presets than, say, the original HHB FatMan, where you would first have to match the knob setting manually against the values listed in the owner's manual before switching from Preset mode to Manual mode where further adjustments are possible. With the Penta presets, all the knobs are always active for on-the-fly changes. The six controls are called: Compression (it's really a threshold control), Make-Up Gain, Ratio, Attack, Release, and Tube Sound, which ranges between "cool" and "warm." There is both soft knee and hard knee compression styles. Soft knee provides a smoother start of compression, great for any voice or instrument where you want less strict control over dynamics.

Using the Penta is simple, although I do wish there was a mic pre output jack or insert points for using it independently of the compressor—a good after-market mod! The mic pre is clean, quiet and has plenty of gain. It's better than most preamps in small consoles, and I actually preferred it for certain tracking instruments where I wanted a straight-ahead sound—*sans* glorification and coloring.

The Penta is a colorful unit with stereo input and output LED metering trees, gain reduction meter, input and output clip LEDs, and an "ADC

BY BARRY RUDOLPH

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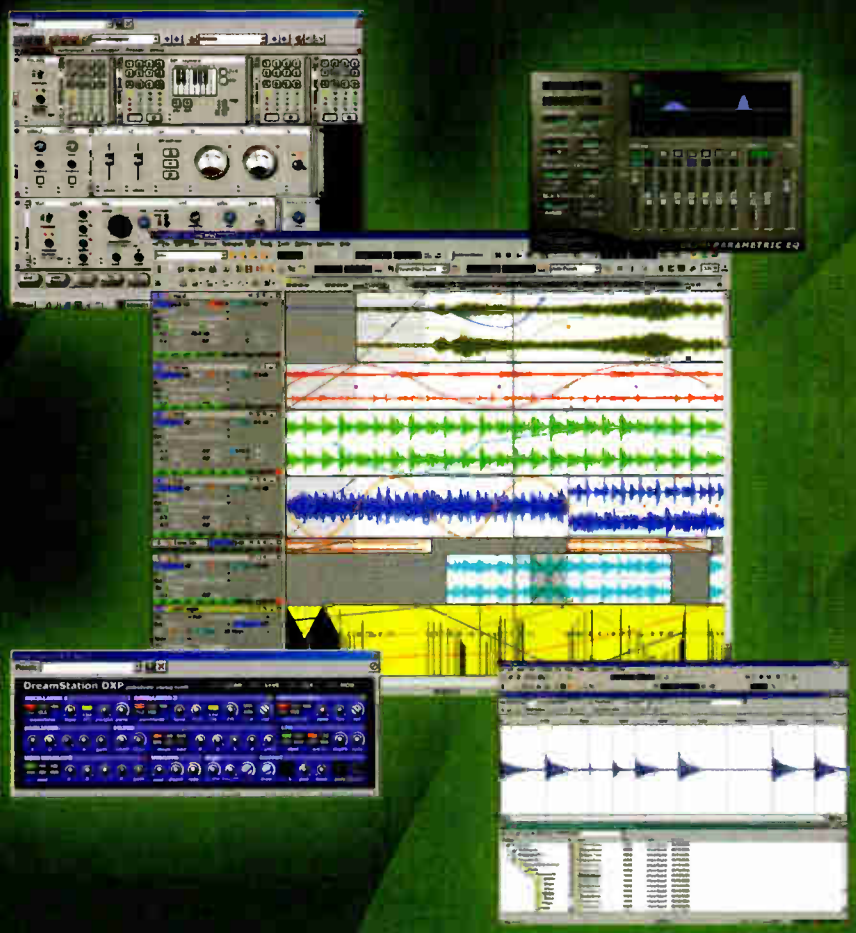

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Lock" LED to indicate that the optional A/D converter is happily in sync. (My review unit did not have the A/D option.) Also, the Compressor In/Out, Soft/Hard Knee, Tube Sound and Image Width buttons all light when active. Image width controls the level of the sum (L+R) and difference (R-L+L-R) components of stereo audio. You can go from "tiny" or nearly mono-sounding output, to "huge" for greatly amplified difference information and a very wide stereo sound.

I liked the preset compressor, with the caution that all of the presets are predicated on a 0dB nominal input level. Pushing more or less level into the Penta causes more or less compression. I always found myself adjusting both input level (which is *not* part of the preset) and compression threshold to get it right. So if your level is around the nominal, then operation is simply picking which preset you like. Preset attack and release settings within the various individual instrument presets were all good choices. They all worked fine for their designated tasks or were very close—within a quick manual adjustment. I wish there were a few more track-compression choices, because I didn't care much for the crunch or mix [pump] presets, although they are nice to have for a quick clamp.

Toggling through the presets, you'll hear a relay clicking as the tube-sound circuit switches in and out (depending on the preset). The tube-sound can be added to any preset, and it's remembered if you change presets and come back. The tube-sound circuit has three FET-based blocks, each biased to generate a specific harmonic. The overall circuit generates second, third and fifth harmonic distortion in amounts dependent upon the rotary control's position. At low settings, it's mostly second, and advancing the knob cranks more third and fifth. Second-order harmonic distortion emulates the softness of a tube compressor. Turning the control more toward warm, I got more of a tube-like "blooming" sound, great for rounding out bright harshness.

Penta has an MSRP of $495, and the optional 24-bit/96kHz A/D board is $250. If you are into value-oriented project/home studio gear, then go get Penta!

Focusrite, dist. by Digidesign, 2001 Junipero Serra Blvd., Daly City, CA 94014; 650/731-6300; www.digidesign.com or www.focusrite.com. ■

Barry Rudolph is an L.A.-based recording engineer. Visit his Website at www.barryrudolph.com.

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SNAPSHOT PRODUCT REVIEWS

BLUE SKY INTL. SKY SYSTEM ONE Studio Monitoring System

There are a lot of me-too studio monitors on the market, so it was refreshing to check out

something that's truly different—at least from outward appearances. With their shiny, hemispheric, mica-filled, polypropylene LF cones, the Sky System One from Blue Sky International are some serious near-field reference monitors.

Touted as a "2.1 system," the Sky System One consists of two Blue Sky SAT 6.5 bi-amplified satellite speakers and a companion Sub 12 powered subwoofer. All are mag-shielded for use near video and computer displays, and they are approved for use in THX pm3-certified studios.

Weighing 28 pounds each, the SAT 6.5 powered speakers include ¼-inchx20-threaded inserts for OmniMount Series 100 hardware. Inside each of the 12x8x12-inch (HxWxD, with heatsink and tweeter waveguide) cabinets is a 6.5-inch, long-excursion woofer crossing over at 1.5 kHz to a 1-inch, dual-diaphragm tweeter with an integral waveguide and a high-output neodymium motor structure, powered by internal 100 +100-watt bi-amplification.

The ".1" part of the system, the 62-pound Sub 12, has a built-in 2.1 bass management system with a fourth-order, 80Hz Linkwitz-Riley lowpass filter and a second-order, 80Hz highpass filter for the satellites. Under the hood of the 18x16x22-inch (HxWxD, with heatsink and grille) sub enclosure is a 12-inch, cast-frame, long-throw woofer with on-board 200-watt power amp.

Hookup is easy enough, although without detents on the input-level pots, balancing the sub-to-satellite ratio takes a bit of time; it's somewhat easier if you leave both satellites in the full-on "reference" setting, and then tweak the subwoofer pot to your liking. In a fairly small 12x12-foot room, the main problem was too much—rather than not enough—sub, so by starting with the woofer at max and moving downward, the exact balance can be reached via one knob. The sub also has a dedicated subwoofer input, for use as a stand-alone sub or as a second sub in a stereo LF install. All connections are via balanced XLR connectors at +4 dB. Each speaker has an IEC power cable and AC switch, but unfortunately, the power-on LED is on the back of all the speakers—a second LED, paralleled to the rear one, would have been nice.

In the studio, the Sky System One proved impressive. The top end was non-hyped and linear, well beyond 15 kHz, providing for a non-fatiguing listening experience. The mids were well-defined, with no edginess present around the 1.5kHz crossover at all, which is a critical slice in the vocal range. At the lower end, the sub had plenty of punch with no signs of slowing down, providing an ideal match for the satellites, especially in a small- to medium-sized control room—these are near-fields, after all.

What really wowed me about Sky System One was the imaging and overall soundstage, which offered excellent localization as well as a reach-out-and-grab-it phantom center channel effect. Yeah!

A Sky System One 2.1 system retails at $1,595; a 5.1 system is $3,720.

Blue Sky International; 631/249-1399; www.abluesky.com.

BY GEORGE PETERSEN

SCHOEPS CMXY 4V X/Y Stereo Microphone

For more than 50 years, Schoeps has delivered high-quality, versatile tools for recording and broadcast professionals. A compact (4-inch long) and versatile X/Y stereo microphone, the CMXY 4V is an excellent continuation of that tradition.

The CMXY 4V—it's available in versions with either 5-pin XLR or miniature connectors—is based on two CCM (Compact Condenser Microphone) Series cardioid capsules.

The mic has a retail price of $3,900, which does include a wood storage box and a stereo 5-pin to left/right standard 3-pin XLR adapter. Small colored dots on either side of the mic mount correspond to the left-

and right-side outputs. A recommended option is the A20S shock-mount, a compact elastic suspension clip with two small clamps that grip onto either side of the split-output cable, offering some help in decoupling the cable from the suspension.

The two capsules use a clever,

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When Al Schmitt, 10 Grammy Award winning engineer and John Oram get together, they often talk equipment. The product they refer to as "The Piece" is the combination of their respective design and engineering talents combining years of experience into a mic-pre, equaliser and optical compressor of the highest technical and sonic quality.
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geared swivel offering more than 180° of outward rotation, for very tight to ultra-wide stereo separation. Unlike typical adjustable-splay stereo mics, which combine one rotatable and one set capsule, the angle between the CMXY 4V's two capsules can be adjusted without altering the central stereo axis. The capsules always rotate equally and in opposite directions via a slick gear arrangement in the base of the mic. The capsules are about as close to each other as physically possible—the centers are spaced less than an inch apart.

In the studio, the CMXY 4V offered just what I expected of a Schoeps CCM: smooth, natural response with a slightly rising—but never overpowering—HF emphasis. The proximity effect is fairly mild until you get in closer than 3 inches or so; combined with the ease of adjusting the angle of capsule splay, it was great for close-miking mandola, mandolin and bazouki. On acoustic guitar, about 16 inches back from the sound hole with the capsules set about 80° apart, the effect was rich and full—yet present—with a nice stereo effect.

The mic handles SPLs in excess of 132 dB, and was right at home on drum overheads, timbales and even left/right rack toms, although you really want to be sure about the drummer's accuracy before putting a $3,900 mic in the line of fire.

The CMXY 4V's coincident-swivel design also opens up some new possibilities, such as setting the two capsules back to back, and throwing one side out-of-phase at the mixer to create a makeshift figure-8 pattern. In more mundane studio duties, such as piano miking, the CMXY 4V excelled and offered fast, single-stand placement. Its small profile and inconspicuous gray finish should also appeal to users in live theater, broadcast or film/ENG applications, or anybody needing a solid, high-performance stereo mic.

Schoeps Microphones, www.schoeps.de, dist. by Redding Audio; 203/270-1808; www.reddingaudio.com.

SRS LABS PRO 220
Spatial Enhancer

About a decade ago, a number of studios became aware of a consumer hi-fi processor made by SRS and marketed to home users by Hughes Audio. Even in a non-rackmount, non-standard height chassis that offered only RCA jacks and decidedly non-pro features like hi-fi tape loop connections, the system did provide spatial enhancement at a rock-bottom $299 price.

Now, SRS offers the SRS Pro 220—a similarly priced, single-rackspace processor designed to restore the original 3-D sound field to any stereo music mix. Interfacing is similar to the original—the tape loop jacks are gone—and the I/O (still -10dBu analog unbalanced) now offers both ¼-inch and phono jacks.

Incorporating patented Sound Retrieval System (SRS) technology, the Pro 220 can also convert mono material to stereo, and may be used to create additional width and depth in any stereo recording or sound reinforcement application. The process works by looking for "difference" (left-right or right-left) information and "direct" (signals that appear in

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Features
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both left *and* right channels) in a stereo recording, and offers the user the ability to manipulate each element to create a wider, more spacious effect.

Besides a process-in/out bypass switch, the front panel has controls for space (adjustment of the width/depth of non-centered instruments or vocals); center (for tweaking the level of center panned signals); and SRS level, which essentially acts as a wet/dry (processed/bypassed) signal mix. Used for creating stereo from a mono source, a fourth knob—3-D Mono Level—determines the ratio of processed-to-unprocessed signals coming through the rear panel mono-in/stereo-out jacks, which are independent of the main L/R stereo I/Os.

In the studio, the Pro 220 can be an extraordinarily powerful tool, with a few caveats. As with anything else in the studio, it's easy to overdo the effect and ruin the track. Here, a light touch goes a long way. One thing to keep an ear on is the fact that in the production stage, SRS is not a set-and-forget process, especially as your knob settings become more radical (closer to 11). Also, depending on the source material and your SRS settings, mono compatibility (level and/or frequency losses when stereo material is played in mono) can be a problem, so as you tweak your SRS settings, hit the console's Mono button every once in a while to make sure everything's okay. You never know when or where one of your mixes will show up, and mono (TV, computers, Internet, AM radio, etc.) is still with us, and is something to check for on *all* your mixes.

That said, in truly live situations—clubs, sound reinforcement, theme parks, etc.—where you have total control over the playback environment, you can get as wild as you want. Back in the studio, I found the Center control—which operates as minus or plus from a 12:00 position—to be highly useful in salvaging all types of material where solo instruments or lead vocals were recorded either too hot or too soft. The Mono spread circuit was particularly useful with mono synth pads, samples and other mono sources, but as mentioned before, go easy on the processing.

Overall, SRS Pro 220 is a highly useful tool. The -10dBu interfacing might be a pain for some, but at $299, most of us could put up with an inconvenience or two.

SRS Labs; 949/442-1070; www.srslabs.com.

PEAVEY KOSMOS
Subharmonic Generator

Unveiled at the Summer NAMM 2001 show, the Peavey kosmos™ is a single-rackspace processor designed to enhance LF energy, HF articulation and stereo-image enhancement on recorded or live tracks. Retail is $300.

Essentially, kosmos generates bass subharmonics combined with an Xpanse control that simultaneously adjusts HF boost and stereo width. A separate crossover feeds a subwoofer output, or the unit can be switched to operate in standard two-speaker mode. With con-

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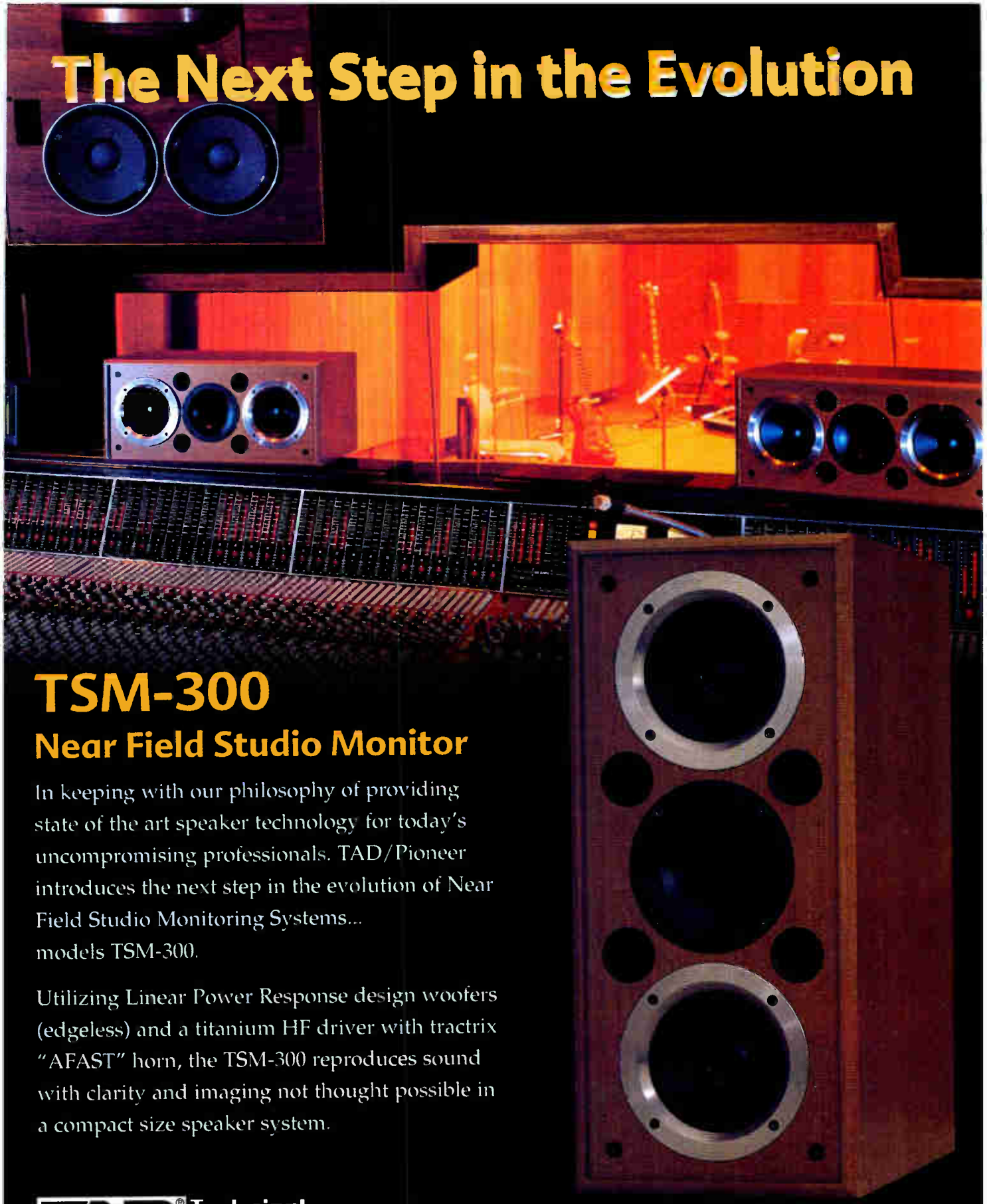

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trols marked Seismic Activity, Quake and Subterranean, I had to check it out.

The kosmos subharmonic (Quake) processor tracks the source material, analyzes the bass, and then generates additional low frequencies an octave below the source material. A Subterranean shift button can shift the center frequency of the bass generation to match the speakers you're using, hopefully to avoid blowing drivers, which it can and will if used improperly or to excess. Thud, an additional bass-boost circuit tuned an octave above the subharmonic range, can fill in and fatten out the low end. The left/right stereo image can also be tweaked with the Xpanse control, offering improved separation and clarity ("air" boost).

All I/Os are balanced and are offered on both XLR and ¼-inch TRS jacks, although the system also worked fine on unbalanced signals. Besides the main level control (and bypasses on each stage), the mono TRS subwoofer out has its own crossover and level control, supplying an equalized bass signal for systems with subs.

Overall, kosmos rocks—sometimes quite literally! It's great, either in the studio or live, and clean enough to use in mastering. At $300, it is one of the major studio bargains of the year—whether you're doing hard rock, reggae, hip hop, soca, rap, country or sound effects. This one slams!

Peavey Electronics; 601/483-5365; www.peavey.com.

STORCASE DATA SILO DS320
SCSI Expansion Chassis

When you're working with digital audio files, you can never have enough storage, whether you're a single user or on a networked system. StorCase Technology—a Kingston Technology company

—offers a wide range of SCSI storage solutions ranging from single-drive enclosures to large 14-bay systems in desktop, rackmount and freestanding tower formats.

The Data Silo family of expansion chassis can house 3.5-inch and 5.25-inch full- or half-height SCSI devices, and can accomodate StorCase's Data Express removable drive carriers. Enhanced power supplies and forced-air cooling fans are built into the enclosures, although no drives are provided, leaving the user free to select drives most appropriate to their needs. Various SCSI external cables, several terminators, a slide-out rack kit and numerous external SCSI connectors are optional.

Available in white or black, the two-rackspace Data Silo DS320 is a rugged-steel enclosure housing two 3.5-inch or 5.25-inch half-height CD-ROM, optical disk, tape or hard drives, including the StorCase Data Express removable drive systems. The chassis is prewired for single or dual-host interfaces, and features either 50-pin HD, 68-pin HD or 68-pin VHDCI rear panel connections. All Data Silos include a seven-year warranty and free tech support.

The front panel has an AC switch and power, drive activity and drive-fault LED indicators, along with two SCSI ID selection switches—one drive-mounting bracket per bay, for adapting 3.5-inch drives.

With its tough steel and aluminum construction and 16-pound heft (less drives and carriers), it's clear that the DS320 is built for serious use. Not including the rack handles, the unit itself is 14 inches deep, much larger than one would imagine. The DE100 drive carriers are built like tanks and include front key locks, which provide additional security and functions as a DC power switch to that drive. Each drive carrier can be assigned an identifying unit number (not SCSI number) that is displayed on an LED readout whenever the drive is on, so in the process of moving drives around, you always know what you have. It's a nice—and much appreciated—touch.

The documentation accompanying the system was detailed and complete, making for a no-hassle installation. Over a period of months, the DS320 worked flawlessly with my Pro Tools system. The DS320 has very efficient, forced-air cooling fans, and the fan speed is set via a rear panel switch; even at the lowest setting, fan noise was noticeable in a quiet control room. As a solution, I recommend remoting the entire system, drives, CPU, etc., in a closet/machine room using something like Gefen's Ex•ten•dit (www.gefen.com). Priced from $357, less drivers and carriers, the DS320 is a rugged, pro solution to SCSI storage needs, and if you need more than two bays, larger—including some *much* larger—systems are available.

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JBC/ROD2954bEM/MIX

BY EDDIE CILETTI

This Old Tape Machine

The Alesis ADAT

In June 1997, Alesis built its 100,000th ADAT, a special-edition, gold-plated Model XT. Today, with tens of thousands more units worldwide, it remains the most prolific digital multitrack format.

Welcome to another thrilling installment of This Old Tape Machine. Today's *deck du jour* is the Alesis ADAT. As always, the mission is to familiarize users with "device normality" *before* disaster strikes. Too often, I receive frantic e-mails about stuck tapes or machines clearly displaying error messages—reason enough to take the machine in for service—yet, somehow the message doesn't get through. Don't punch in on a digital multitrack that is regularly suffering from a lunar influence.

For most tape machines, a #2 Phillips screwdriver should be used for the cover screws. Figure 1 shows the most common mistake: An undersized driver can damage both the screw and the driver tip. Figure 1 also shows the necessary "snug" fit. Do not use damaged tips. Buy good tools once and treat them well. So it won't slip out, firmly press the driver into the screw. Some screws are so tight that a wimpy grip can cause damage.

With the exception of the M20, all Alesis transports are essentially the same. For the original "black face" model, access is obvious. The cover and main circuit board are secured with SAE-type screws—referenced to the American (Society of Automotive Engineers) system of measurement. The top cover screws are number "6-32," six being the diameter designation with 32 threads per inch. The transport is foreign-built—its screws have ISO metric threads. Don't mix 'em up. Pay attention, and you'll see the different thread pitches. Put loose screws in a clean tray, bowl or coffee cup. For XT, XT-20 and LX-20, remove the cover and the rack ear screws.

Assuming that the machine is functional, the tape should smoothly thread around the rotating head assembly (aka, the "drum") with no excess slack anywhere. Sloppiness around the drum is a sign of poor brake calibration. On the right is the rubber pinch roller and chrome capstan shaft. These parts govern the tape speed. Inside the cassette shell are two "reels" that sit on the mechanism's "reel tables." If tape starts to fill up in the transport area, then either the pinch roller is not disengaging (see "A La Mode") or the take-up reel table is not moving (see "Fast-Wind").

CLEAN, CLEAN, CLEAN!

Hopefully, you're familiar with manual head cleaning—a simple procedure with the ADAT. Figure 2 shows how to apply an alcohol-dampened cloth to the side of the head drum. (I use Twillwipes from Chemtronics, with either 99% alcohol or denatured alcohol. These are slow-drying, environmentally friendly chemicals—compared to some rather toxic alternatives from the past—so allow at least five minutes of drying time.) While holding the cloth in place, rotate the drum counterclockwise. You may feel the four tiny head chips under the cloth as the drum is turned. Do not move the cloth in *any* direction, except to place it against the drum or to remove it. If the cloth gets dirty, then alternate from wet to dry until you are satisfied. End with a dry cloth. And just like in ye olde analog daze, use a standard cotton swab to clean the linear head located just before the capstan shaft.

Inspect and clean all rubber parts—pinch roller, reel table idler (Fig. 3, tire color will vary), and the thin, "motion-sensing" belt on the take-up reel table. Use water-based cleaners like Windex, Fantastic or Formula 409. Do not use alcohol or any other cleaner designated for use on rubber parts except those sold via www.athan.com—they make pinch rollers, so their cleaner is the safest. The idler tire sub assembly is the most common ADAT wear item. On the

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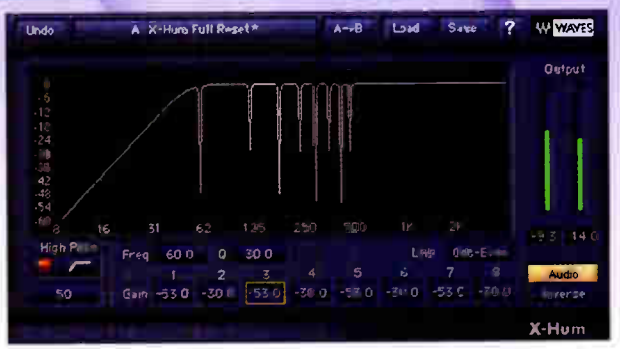

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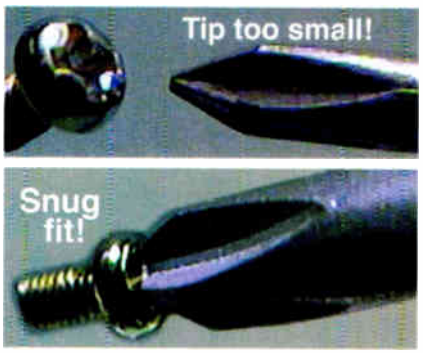

Figure 1: Bad and good screwdriver hygiene

Figure 2: Cleaning the ADAT head assembly is easy.

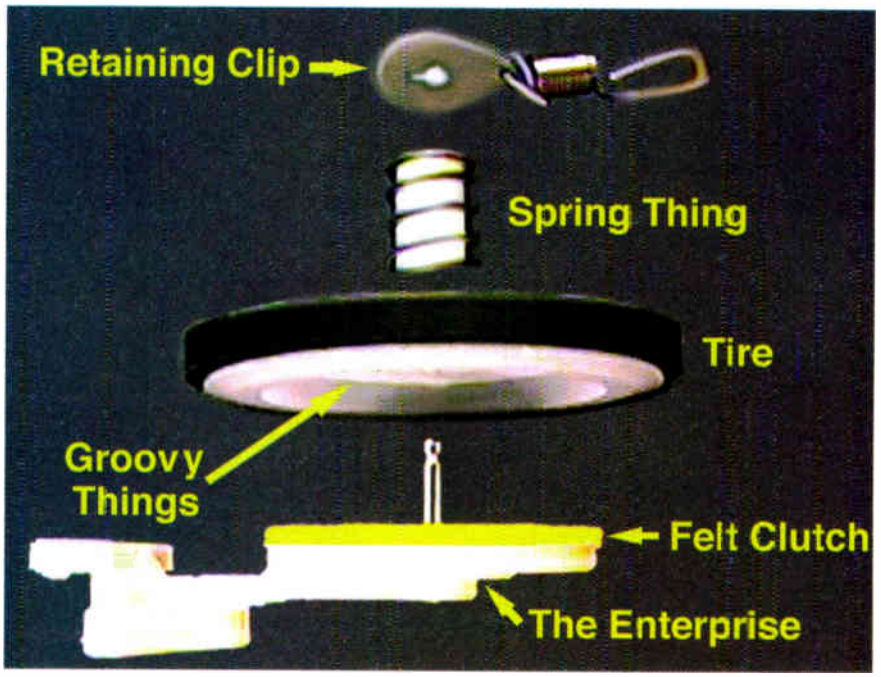

Figure 3: Correct reassembly of the idler tire

black face, the tire was originally black-mounted on white plastic. New versions are cream-colored "Santoprene" on baby-blue plastic. (I sure know a lot about babies now!) For XT, XT-20 and LX-20, the Santoprene is on a smaller diameter, white plastic hub. It cleans up pretty well with a water-based cleaner, only if no "rubber" cleaners have ever been used.

Rubber parts that can be accessed from the top of the machine include the pinch roller, reversing idler, motion belt and load belt. The capstan and thread belts are accessed from the ADAT's underside. The idler should be regularly cleaned and replaced more often than the others. It's best to order a complete rubber kit with extra idlers. (See "Under New Management.")

FAST-WIND

If your fast-wind is not very fast, check both reel tables for vertical play, as indicated by the orange arrow in Fig. 4a. If there is no movement, press down on the top (double yellow arrows) until a "pop" is felt. This *might* get you through a session, but the table should be replaced. XT owners should check the supply-side reel table for the spring and pad, designated by the yellow arrows in Fig. 4b. This spring should be removed; however, any changes to the reel tables will necessitate a brake re-calibration (see sidebar).

A LA MODE

Strange, inconsistent behavior can be traced to the Mode switch, which reports transport status to the microprocessor. On all models (except the M20), this is a black, plastic switch located on the underside of the transport near the take-up brake solenoid. The black face, XT and XT-20 allow easy access to this area, the LX does not. If the machine goes for long periods without use, or has not had routine service, then the Mode switch will

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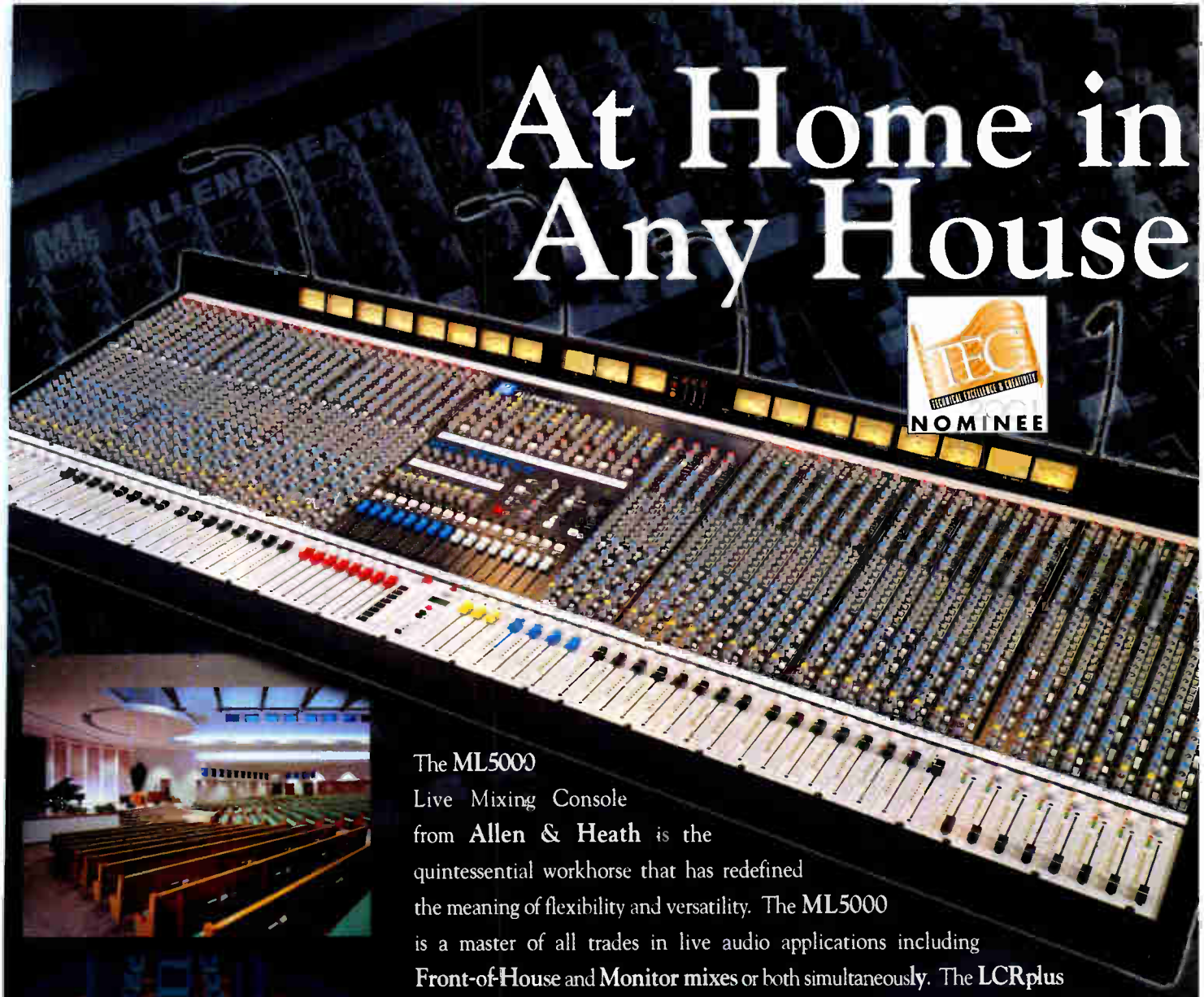

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most likely act up the first time a tape is inserted. Always start with a non-critical tape and cycle through the modes—insert & eject, play & stop, stop/threaded, stop/unthreaded and fast-wind. As a short-term solution, repeat these cycles to self-clean the switch, but replace ASAP.

DRY WEATHER WOES

During cold, dry weather, static electricity can plague many products. If you've got an old black face or XT, then check Fig. 5 and note the ground wire highlighted by the blue arrow (wire color may vary). The symptom is "random stopping for no apparent reason." Static electricity is generated as the capstan belt runs from motor to flywheel and back; the occasional spark is misinterpreted as a Stop command. This flat belt is clearly visible from the underside of all models but the LX. The added wire attaches from the motor case to ground (pin 2 in the photo).

ERROR-7

Error-7 messages typically indicate a condition such as dirty rotary heads or defective/low-quality tapes with excessive dropouts. However, error messages don't always translate into one obvious problem. For example, XT, XT-20, LX and M20 users should pay attention to the error rate (Press Set, Locate & Record Enable-3). If your ADAT displays block error rates in the 3,000 range, then this can indicate a failed head preamp (rather than an actual "head" problem) and may be a likely cause of Error-7 displays. The head drum has four head "chips" (two for record, two for playback) mated with a preamp IC called the RP1. Not all shops have the expertise to disassemble the head assembly and replace the IC, so prices vary. I prefer not to mate a price for each ailment, because most machines need "routine maintenance" anyway; most service ballparks at $250 to $350, unless a new head assembly or other major parts are needed.

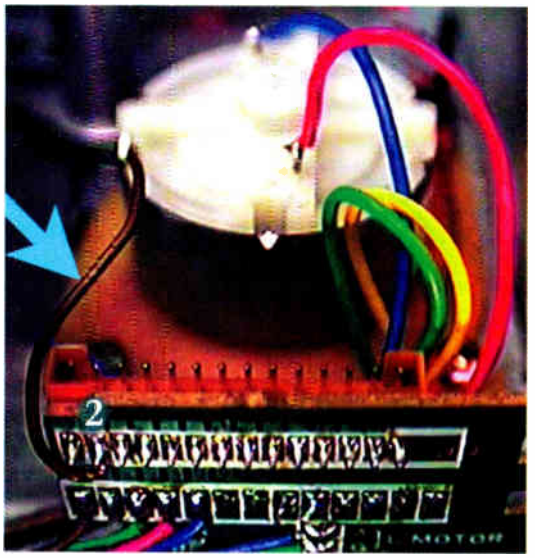

Figure 5: Check all black face and early XTs for this dry weather capstan motor modification.

UNDER NEW MANAGEMENT

Earlier this year, Numark owner Jack O'Donnell purchased Alesis. At the time of this writing, the company is moving forward and restructuring is still going on. By the time this issue hits the stands, the dust should have settled. Contact www.alesis.com and www.advancedmusical.com for official press releases and parts availability, respectively. ■

Eddie Ciletti maintains a comprehensive list of tape machine tips at his Website: www.tangible-technology.com.

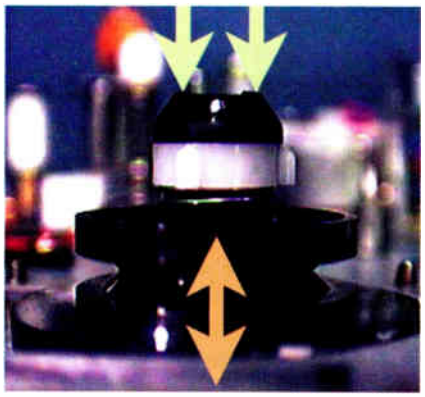

Figure 4a: Check both reel tables for vertical movement. If there's no movement, then press down until the pieces "pop" back together.

Figure 4b: Check older XTs. This spring should be removed.

ADAT BRAKE CALIBRATION CHECK FOR LX AND XT SERIES RECORDERS

If your ADAT indicates "CAl brAC," what do you do? "CAl brAC" stands for "calibrate brakes." Like any motorized vehicle, brakes need to be adjusted from time to time. Brake calibration on XT and LX models is accomplished through software and does not require a trip to a service center. Follow the 7-step procedure below.

1. Use a standard ST-120 (40-minute) tape that has been completely formatted from beginning to end. Use a non-essential tape. Do not use ST-180 or ST-60 lengths.
2. With the power off, press Rewind and Fast Forward during power-up. The display will read "CALIbrAt." (For the LX, power must be applied from the cable.)
3. Insert the formatted ST-120 tape into the transport. The XT or LX will then fast forward the tape to the end and begin its routine.
4. The XT or LX will shuttle the tape back and forth for about five minutes. During this procedure, the tape will half-eject twice. This is normal.
5. Assuming the tape, the reel motor and the brake solenoids are operational, the display should briefly read "PaSS" before fully ejecting the tape and returning to the Start Up screen. If so, then the brakes have now been re-calibrated.
6. If the "CAl brAC" message re-appears, check operation with another tape. If the message persists, then the unit must be professionally serviced.
7. If the brake calibration fails, then it's service time.

Failure to pass brake calibration indicates trouble with one or more of the following items: the brake solenoids (located under the reel tables); the reel tables (if popped); the motion-sensing belt; the idler tire; or the reel motor and/or its driver circuitry, especially if the reel tables have popped and error messages are ignored. —*Eddie Ciletti*

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THE SONY PRO AUDIO

FALL 2001
ISSUE #13

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Legendary audio producer/ engineer/ composer Bruce Swedien at his home studio with the Sony DRE-S777 Digital Sampling Reverb.

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Sound On Sound Recording
Selects Sony Oxford

"We needed a console that is engineered for the future," stated Dave Amlen, owner of Manhattan-based Sound on Sound Recording. To meet that need Amlen has installed a Sony Oxford digital console in Studio C.

[illegible] Mark Pa[illegible] Migal [illegible] manager Chris Bubacz and produc[illegible] Guttman.

"Record labels are beginning to see the viability of surround sound and the Oxford is geared for 5.1 mixing," Amlen said. "It's a growing business for us, and we want to better serve our clients' needs. The Oxford sounds incredible. Sony really stands behind its products with impressively strong tech and sales support."

"We are pleased that a studio with Sound on Sound's pedigree has joined the expanding Oxford client family," commented Paul Foschino, marketing manager of professional audio products at Sony Electronics' Broadcast and Professional Company. "Dave Amlen is one of the industry's most respected studio owners. His Oxford choice speaks volumes for the console."

The OXF-R3 is a highly flexible, easy-to-operate digital recording console capable of delivering vast processing power. Oxfords are being used for a wide range of audio production applications including music production, film scoring, DVD soundtrack production and live broadcasts. Sony works closely with every Oxford client to optimize (and customize) individual console configurations.

Dreamhire Adds
Sony DMX-R100 and PCM-3348HR

Dreamhire, one of the world's largest professional audio rental companies, has purchased a Sony DMX-R100 digital console and a second PCM-3348HR digital audio multitrack recorder. The R100 will provide clients with a sophisticated and cost-effective mobile and/or studio recording console option. Both units were purchased to accommodate growing client demand reported Dreamhire vice president/general manager Chris Dunn.

"We are very committed to high-end Sony products," stated Dunn. "The DMX-R100 has quickly built a reputation as an excellent board with a wonderful sound. As the first east coast rental operation to take delivery of the board, we plan to make it available in both our New York and Nashville locations. Our first DMX-R100 client is engineer Frank Filipetti, who is currently working on an upcoming album from hard-rockers Korn."

Dreamhire's second Sony PCM-3348HR will be based at their Nashville location. "It's a popular request, and at the moment, there is no unit available for rent in the area," Dunn explained. "Our New York unit is always busy – mostly for music recording projects, but also for occasional post-production jobs. We have a high-profile repeat customer for that unit because of its 24-bit high-resolution recording capability. Other Dreamhire clients include David Bowie, Bjork, Christina Aguilera, Electric Lady Studios, Virgin Records, ABC TV, and Coca-Cola."

Dreamhire's Chris Dunn (right) with [illegible] and the Sony DMX-R100

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Cathy Richardson Picks Sony CDR-W33 Compact Disc Recorder

Currently starring in the off-Broadway hit musical "Love, Janis," singer/songwriter/musician/producer Cathy Richardson released five independent CDs prior to being cast in the role of Janis Joplin. She's recorded dozens of self-penned songs with the wildly popular Chicago-based Cathy Richardson Band and she's burned hundreds of CDs on a variety of CD-Rs. This summer Cathy began working with Sony's CDR-W33 compact disc recorder.

"My first experience with the W33 was right out of the box," she says. "I had a chance to perform the National Anthem acapella at Madison Square Garden and needed a good demo immediately. I cut a track on my hard disk recorder, burned a CD on the W33 without even cracking open the manual, sent it off and got the gig.

"Programming a fade on my hard disk recorder is a somewhat time consuming and complicated process. With the W33 you just push a button and it fades out perfectly, exactly where you want it to. I'd experienced compatibility problems with other CD recorders, but the CDs I've made with the W33 have worked with everything from my boom box to a five disc-changer on my stereo to my computer."

Cathy has also been experimenting with the W33's Super Bit Mapping, onboard equalization and limiting features. "I burned three different versions of a demo I did at home on my hard disk recorder," she explains. "One, straight from digital to digital, a second with only Super Bit Mapping, the third with EQ and limiting. The digital-to-digital CD sounded exactly like the original. I used the analog inputs for the Super Bit Mapping and it sounded as good as the digital. With most CD-Rs the levels are never as hot as commercially released CDs. I've spent a lot of money in mastering houses just to get my demos to volume levels that people are used to hearing on CD. The W33 has already paid for itself with the money I've saved mastering my demos at home.

Musician Cathy Richardson with the Sony CDR-W33 CD Recorder.

"Being a big Sony MiniDisc user, I'm already familiar with the AMS controls," she concludes. "Text labeling is one of the things I've always loved about MiniDisc, and with the W33 I can now text label my CD-Rs. This box rocks."

Hit Factory's Jason Groucott: "The Oxford Gets You Excited"

"The Oxford gets you excited. It's easy to work on, everything is accessible, and you sit in one place most of the time since the board actually moves around you," says Hit Factory engineer Jason Groucott. Groucott began working as an assistant on the 120-channel Oxford when it was first installed in 1997. Apprenticing under the talented hands and ears of such mixers as Mick Guzauski and Joel Moss, he has evolved into a first-call engineer. With an extensive knowledge of the console, acquired during the course of countless high-end sessions, Groucott has matured into the principal Hit Factory Oxford engineer.

Hit Factory's Jason Groucott at the Sony Oxford console.

Well grounded in both analog tape machines and consoles, Groucott demonstrated an instinctive understanding of the power and flexibility of the cutting-edge Oxford digital board. "A regular analog console may have its channels spread out, say from one to 120," he says. "With a traditional inline desk, you've got EQ, compressors, and sends on that narrow strip of console, and that's what you have to work with. On the Oxford, the entire desk becomes that channel or fader. It's just so much more comprehensive a process."

The Hit Factory affords Groucott the opportunity to work on many high-profile projects for artists such as Ricky Martin, 'N Sync and Gloria Estefan. Recalling a Mick Guzauski mix he engineered recently, he was able to follow the entire process through from final output to airplay. "Listening to that mix on the radio, knowing that it was done in the Oxford room and being there from start to wrap, made me appreciate why it sounded the way it did," he said. While you're working on these songs in the studio they obviously sound great. You're on an Oxford and you're mixing with one of the great engineers," he said. "However, a song you've been a part of comes on the radio, you can really pick up on the finer details of the Oxford influence."

"When you mix records, you're aware of the muscle that you can flex with this board," says Groucott. "The automation remembers everything that you've done. The desk is always there with you; you're never waking it up to get it into automation mode. If there is something you want to hear or do—EQ, a pan, a send, a reverb trail—you just think of it, do it, and the desk remembers it. That's the beauty of it."

World Radio History

George Massenburg Speaks His Mind

Those who know George Massenburg realize that he is never afraid to speak his mind. When your work has won the respect of musicians, stars, peers and manufacturers alike, your words and actions tend to speak for themselves. His stellar multichannel and stereo recordings with Bonnie Raitt, Little Feat, Linda Ronstadt and Lyle Lovett complemented by his development of the acclaimed GML line of equalizers and compressors, confirm his position as a true visionary. With a track record like that, Massenburg can work with any console he likes. His choice? The Sony Oxford. In this interview he shares some insights behind his commitment to the Oxford.

What recent projects have you been working on with your Oxford?

> Regarding the Sony Oxford... "I have been doing all of my projects on this console."
>
> — George Massenburg

I have been doing all my projects on this console. In the past few weeks I've done a 5.1 mix for a DVD-Video, which was taken from a Sessions on West 54th Show. It looks and sounds great, and it's all John with no overdubs. I'm continuing a Robin English project for Sony Nashville which I'm co-producing with Kyle Lenning. I'm also doing an Amanda Marshall record produced by Peter Asher and Billy Mann for Sony Music Canada; this is definitely a smash. Linda Ronstadt and I just finished a 5.1 DVD mix of a collection of standards she did with Nelson Riddle for Elektra, in 1982. I'm also finishing some mixes on the new Jennifer Warren Sin-Drome CD.

You've had your console for how long?

We've had it since last December.

What attracted you to the board?

Well, that's kind of a long story. I go back to 1987 with the Oxford Group, when Roger Lagadec invited me to take a look at them. I have been tracking the development of this board ever since, watching the progress and contributing occasionally in small bits and pieces (they might call it 'interfering'). Recently Paul Frindle and I have done GML dynamics and EQ for it. I feel right at home working on it. The compressor expands what Paul did with the basic Oxford processors, and is significantly better than anything else you find out there. And, the EQ feels and sounds great. I listened to these at great length against an analog chain and they're pretty honest. That being said there are just a lot of things in the console that are extraordinarily well thought out...from essential processing (like dither throughout the console) to just plain good ideas. Eventually I feel all consoles will feel and look like this. Many of these internal processing ideas are way ahead of their time. That has been difficult for the Oxford Group up until recently. By now, people seem ready for something new.

George Massenburg

Now that they're working on ProTools and other DAWs and having to mix digitally anyway. The urban contemporary community (a.k.a. the market segment that's still selling a lot of records) has embraced the Oxford because it makes louder, bigger, fatter mixes than any other analog or digital console. People now accept the emerging reality that there is a high end in digital processing - that all digital processors are not created equal, and that this console is crafting hits like other consoles simply cannot.

What makes you feel that it is that superior to other consoles?

The only thing that recommends a console in this business is crafting hits, and this console makes hits. Quickly and efficiently. Period.

What are your thoughts on the automation?

It's utterly and completely reliable. Sessions come back exactly as they are saved. I can't say that for any other consoles.

How about the processing and depth of research behind this board?

The dithering algorithm that the guys came up with is fundamental, original and unbeatable. The quality of the conversion and signal handling is not apparent until you hear how much better a mix done on another console sounds when redone on an Oxford. I just redid Jennifer Warren mixes done on another console and it makes that older mix sound like @##%%!.

How do you feel about Paul Frindle's converter designs compared to others currently on the market?

Brilliant.

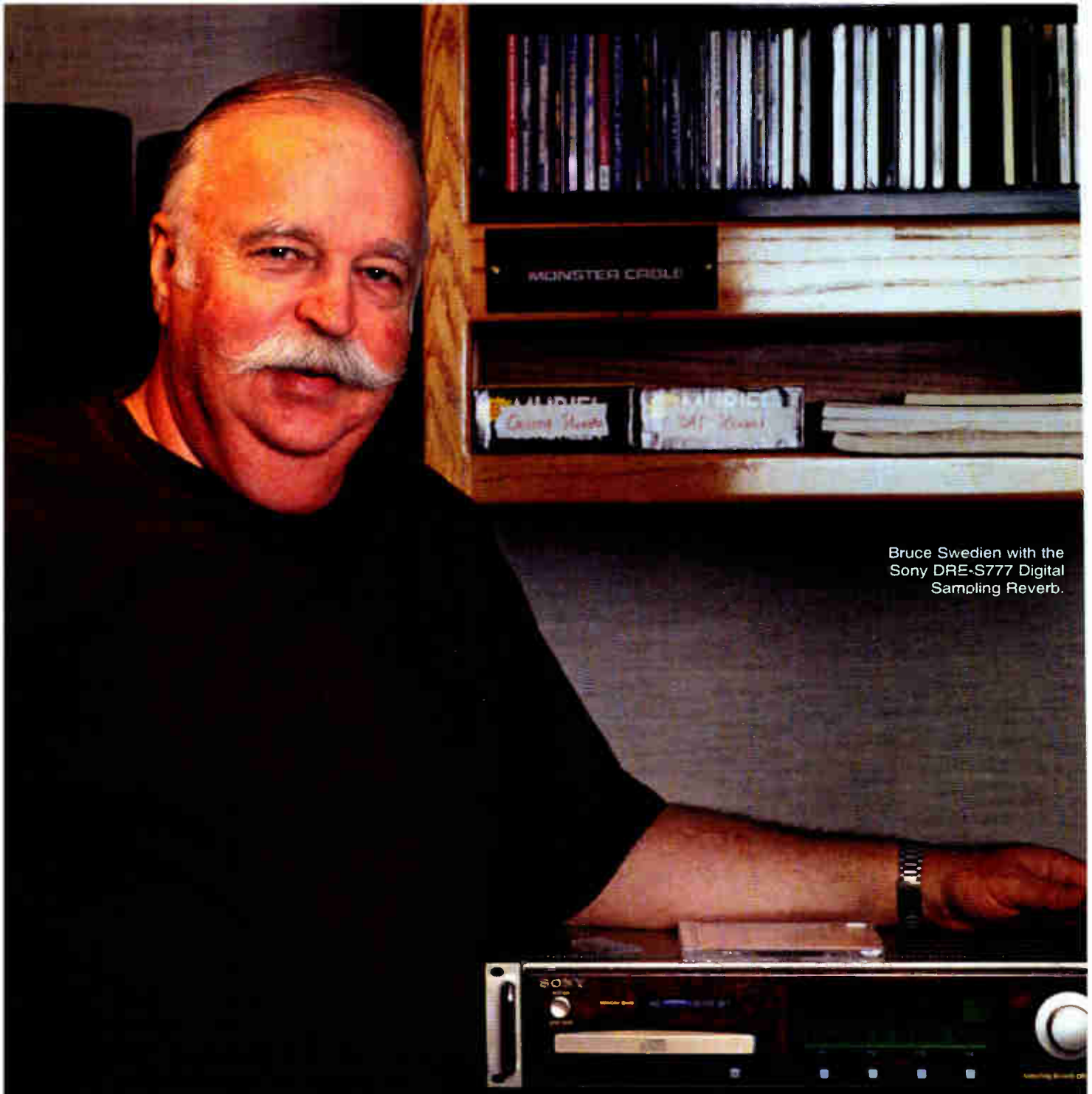
Can you detect an improvement from the microphone to final output of the Oxford in comparison to other boards?

Absolutely. Warmth, clarity...presence...loudness.

What makes the Oxford great for multichannel work?

Support. Everything that you need is built into the monitor section under Version 3.0.

World Radio History



Bruce Swedien with the Sony DRE-S777 Digital Sampling Reverb.

Bruce Swedien

Photo by Dave King

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By Steve La Cerra
and Rich Tozzoli

Why He's All Excited About The Sony DRE-S777 Digital Sampling Reverb

Bruce Swedien is excited like a kid with a new toy. Speaking with him recently at New York's Hit Factory on a break from recording Michael Jackson's upcoming release, he was literally bursting with delight about his most recent acquisition, a new Sony DRE-S777 Digital Sampling Reverb. This is a man who can use any piece of gear he wants, and who's services as a legendary engineer/producer/mixer have been called upon by the likes of Duke Ellington, Barbra Streisand, Quincy Jones and of course, Michael Jackson. History aside on this rainy Friday night, Swedien was focused on one thing: his new reverb.

Is the forthcoming Michael Jackson record the first one on which you used the Sony DRE-S777 Digital Sampling Reverb?

Yes it is and I'm very excited about it for two reasons: First, the sound is just phenomenal. And the second thing that knocked my socks off is the fact that I can capture my own personal spaces with the early reflections in their natural order. In my work with Michael Jackson, we 'recorded' some small spaces like bathrooms and small workshops. I hate to say 'sampled' because that doesn't do justice to what the S777 is capable of doing. Essentially the S777 listens to a space and puts that acoustic space into the machine. You can buy the S777 without the recording option - but you know that wouldn't be enough for me. I want my own spaces! (Bruce laughs). I have a case that travels with me and holds all of the software CD-ROM's I need for the S777. I love the "Japanese Acoustic Spaces" disc, especially the Yokohama Nohgaku-dou program, which is a small drama hall. In addition to the CD-ROM's, I have these little Memory Sticks® which hold my programs. They're the same Memory Sticks that you'd use in a Sony digital camera so they're easy to find. Each stick holds 64 MB of data, and then you use the software on one of the CD-ROM's to access the data on the Memory Stick.

This is one of the first truly new concepts in reverberation and acoustical support to come along since the beginning of the industry.

The S777 takes a minimum of 16 recordings of the space using a wide swept frequency. This machine is so smart that if a car were to go past during one of the samples and cause a rumble, it would recognize the rumble as an anomaly and take it out of the program. I'd love to bring the S777 up to the Equine Center near my home to capture the acoustics of one of the operating rooms there. This particular room has an absolutely fabulous sounding character. But I'm afraid that the sound of the S777 recording process would upset the horses. I'll have to find out if there's a time when the place might be empty of horses...

And you 'sampled' your EMT reverbs as well...

Yes. I love my EMT 250 and EMT 252, especially for any sound that truly needs a lot of space around it. They have algorithms that have never been duplicated. I would refer to them as 'classic' digital reverbs - but they do have their limitations. I was a little skeptical at first because the character of a device like a 250 or 252 is almost ephemeral...very difficult to describe. And I thought "oh, I'm going to put the EMT inside this box and it's going to change the sound." But it did not! I recorded both EMT's at a short decay time and a longer one as well. Now here's where it gets interesting: once I have the EMT's inside the S777, I can add predelay - which you couldn't do with the original unit.

Unless you patched a separate delay before the input of the 250 or 252...

...which might change the quality of the sound. But with the programs in the S777 I can change the predelay, the reverb time - anything I want. The EMT's do have adjustable decay time, but the 777 gives me much more precise adjustment.

What is your concept of reverb for a Michael Jackson mix?

I try not to pre-think any of these things with him, or any other artist for that matter. It's purely intuitive. With the type of records I do, if you have a formula you're dead in the water before you start. You'll notice on the new Michael CD that each song has its own character, and that's not accidental. I think that's important on all the records I have done with Michael. If you listen to "Thriller" there's a lot of natural acoustic sounds, like that creaking door at the beginning of the song. Michael is more willing to experiment than a lot of other artists. If I want to try something different, he's like "Yeah, let's do it!" He loves the experimentation aspect, coming up with new sounds.

What else makes you excited about the S777?

I've literally been waiting for something like this since I started. This is one of the first truly new concepts in the capturing and manipulation of reverberation and acoustical support to come along since the beginning of the industry. I think it's much more important than most people realize, especially for someone like me who loves to be able to capture unique acoustic spaces. To be able to capture those spaces with their early reflections in their natural order to me is really the cat's pajamas.

What is your favorite sound so far?

I love Concertgebouw, and whoever sampled that room did a gorgeous job. It is lovely, but my real use for this box is going to be in personal spaces. We're going to Michael's ranch, my farm in Connecticut, and I'm going to sample some sounds in the forest. There's also some wonderful reverbs and single, very simple reverbs between buildings that I want to capture. I've got a lot of plans for this box. Now for the first time we can capture these spaces, I can bring them into the control room, hook up the input and the output, and away we go. I'm really excited about it. It's unlike any other reverb, but the real deal is the quality of it. It's gorgeous, absolutely gorgeous.

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World Radio History

Console Fit For a King

"I'm cranky when I don't get to mix on an Oxford," states engineer/producer extrordinaire Julian King.

Having recently mixed Toby Keith's #1 Billboard chart topper "I'm Just Talkin' About Tonight" as well as the rest of Toby's #1 selling album "Pull My Chain" on an Oxford at Loud Recording in Nashville, King was in understandably good spirits when discussing the virtues of this world-class console.

"I love the Oxford," says King. "I'll work weekends, or find any sort of way to get into Loud to get on that console. I have trouble going back to anything else." Powerful statements from a man whose client list includes many of the top names in country music.

Julian King with the Sony Oxford console at Loud Recording in Nashville.

Emigrating to Nashville in 1987 with a music degree from James Madison University, King first wrangled an internship at Soundstage Studios and has resided in the country music capital ever since. "I worked as an assistant for a lot of great engineers during those years," he continues. "People like John Guess, Chuck Ainlay and Lynn Peterzell really helped me along." "At the time he (Peterzell) was mixing everything from Clint Black, to Charlie Daniels, to Shania. It got to the point where he mixed exclusively, and I got to record for some of these big acts," says King.

King then began engineering more high-level projects, building up a strong client base. "I work for Byron Gallimore, James Stroud and Blake Chancey who are all prominent producers here in Nashville," he states. "I am fortunate enough to work with some great artists like Tim McGraw, Faith Hill, Jessica Andrews, Randy Travis, and Alabama." King won a Grammy for his work on the popular album "Breathe" by Faith Hill, and also recorded her self-titled album "Faith."

He also has mixed projects by Clint Black, Brooks and Dunn and The Neville Brothers. King has recently begun producing, currently working with a band on DreamWorks called Emerson Drive, with James Stroud. Commenting further on the Oxford, King noted that he is impressed with the almost limitless power of the board. "Once you grasp a couple of concepts, it's really awesome and simple. You don't have all those inline modules like everyone is used to seeing on large-format consoles." King continues, "On those big boards, you only have one EQ and one compressor on each strip, rather than several choices per channel on an Oxford. Having the choice of a GML compressor and/or EQ on every channel is something that no other console can offer. I hear people argue that a digital console doesn't have that "oomph." I would argue otherwise and explain that the Oxford can be anything that you make it!"

Reflecting on the Oxford mixes of the Toby Keith single, King notes "I was really happy with how nice and clear it was while still sounding aggressive. The ability to automate anything and everything gives me so much flexibility and creates a very musical environment. It's just an awesome board." King points out that it is increasingly difficult to get on the Oxford at Loud.

We asked King to quickly "sum up" his thoughts on the Oxford and he said, "This thing is sheer power and versatility! I can have a huge power ballad up on the board and in seconds switch over and recall a nice

World Radio History

Hot Picks: AES 2001

OXFORD VERSION 3.0

Sony Electronics has unveiled the next generation Oxford OXF-R3 digital audio console, version 3.0.

A key 3.0 feature is a new monitor panel that supports convenient monitoring of stereo, LCRS, 5.1 and 7.1 formats. An innovative "fold-down" capability allows users to execute quick down mixes from one program format to another, or to check for compatibility.

Version 3.0 also features the addition of Super Send Groups that allow for flexible grouping into mono, stereo, LCRS, 5.1, and 7.1. Each group send can have its own independent fader and joystick to facilitate simultaneous 5.1, 7.1, LCRS, and stereo mixes. The Super Send Groups supplement the existing 24 auxiliary sends on each channel.

Sony Oxford console

Reinforcing the Oxford's flexibility and assignability, the board has a comprehensive internal digital patch bay that allows input and output signals to be easily assigned to the processing channels as needed. On a session-by-session basis, this routing can be called up instantaneously.

The Oxford also comes standard with features such as four types of 5-band EQ per channel; a comprehensive dynamics section, including three types of compressors on every channel; 1.2 seconds of programmable delay per channel; multi-stem recording and monitoring; and 48 multi-track busses.

"Virtually everything about an Oxford — all routing and every setting for every channel — gets recalled in a quarter-of-a-second," said Paul Foschino, marketing manager of professional audio products at Sony Electronics' Broadcast and Professional Company. "In a live television broadcast setting, for example, the entire setup for a guest band could be recalled instantly with the engineers ready and waiting for the commercial break to end."

Foschino said that Sony works closely with every Oxford client to optimize (and customize) their individual console configurations. The I/O racks that house the interface cards for these consoles allow each facility to load in their unique A/D, D/A and AES/EBU requirements.

There are two control panel options. Facilities seeking to keep the console size to a minimum could use the smaller control surface, which offers 24 addressable channel faders and 17 master section faders, all in a compact package. The larger configurations all feature 48 addressable channel faders in conjunction with the master section.

DMX-R100 2.0 SOFTWARE

Sony Electronics is introducing version 2.0 software for the popular DMX-R100 digital console.

Foschino said that DMX-R100 V2.0 software will enable surround sound processing at double sample rates (88.2 and 96kHz); and will feature enhancement such as sub level control on each channel in conjunction with five-channel panning. New dynamic automation functions include enhanced Trim and Audition modes.

Additional primary features include:

- Fader naming on Channel GUI; Equalizer and Dynamic library function;
- Access follow solo function; Dither mode for PGM output; and
- DOS compatible floppy disk automation storage.

DMBK-R109 MADI CARD

Sony is also introducing a forthcoming DMX-R100 MADI card. This new hardware expansion option will greatly increase the number of audio channels that can be connected to the mixer. The card supports 48 input and 48 output channels of audio I/O, providing an ideal method of directly interfacing the console with MADI-capable recorders such as the Sony PCM-3348HR DASH recorder. The MADI option board will also incorporate the ability to link or 'cascade' dual mixers (both boards will require MADI cards to be fitted).

SRP-X700P DIGITAL POWERED MIXER

Sony Professional Audio is previewing the SRP-X700P digital powered mixer at the 111th AES Convention. The SRP-X700P (pictured below) is designed for a wide range of multimedia applications for sophisticated boardrooms, conference rooms, and houses of worship. The versatile unit combines a flexible mixer/router and a stereo digital power amp, with a wireless tuner frame and antenna divider (for two optional wireless mic systems), and an RGB/S-Video/composite video switcher. This 'Boardroom-in-a-Box' is easy to use and offers high-end audio and video quality in a lightweight and compact (3U-size) unit with a simple front panel layout.

The digital mixer section provides powerful DSP functions including feedback reducer, parametric EQ, low-cut filter, compressor/limiter, delay, automatic mixing, flexible signal routing, and scene memory.

The SRP-X700P features a built-in 6x1 A/V switcher including: three-RGB/component, and three-composite/S-Video inputs, and outputs to either RGB/component, composite, or S-Video. Audio inputs which follow the video source are also provided, including four stereo and two 5.1 inputs. The switcher can handle high-resolution component video signals such as 480p or 1080i, and RGB signals with bandwidths up to 150 MHz.

Additional key features are:

- Digital power amplifier with 200W+200W(4Ω), 150W+150W(8Ω), Max. 150W(70V Line);
- PC-based GUI-interface software (for setup/operation) is supplied;
- Mounting slots built for two Sony Wireless Microphone tuners;
- Inputs include: four microphone (with 48 V phantom power), two microphone/line, and one stereo line, plus four stereo and two 5.1 surround sound inputs linked to the video switcher.

SRP-X700P

www.americanradiohistory.com

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Mannheim Steamroller Christmas Album Uses DRE-S777

Listeners to the forthcoming Mannheim Steamroller *Christmas Extraordinaire* CD may recognize the rich, resonant and inspirational sound of New York City-based Cathedral of St. John the Divine. Musician, composer and producer Chip Davis and American Gramaphone put their new Sony DRE-S777 sampling digital reverb to good use throughout production of the CD. The Mannheim Steamroller *Christmas Extraordinaire* is the label's first Christmas project recorded in 24-bit surround sound, reports Brian Ackley, director of production and chief engineer at American Gramaphone.

"Our goal here is to keep the technology bar as high as possible," Ackley said. "We wanted a reverb unit capable of handling 24-bit/96kHz. The S777 was a perfect fit for us. The sampling reverb CD-ROM library of European, American and Japanese acoustic spaces offered us a tremendous amount of flexibility, and the pre-sampled rooms, spaces and environments are amazing."

Another sampled space used on the production of the new Mannheim Steamroller CD is Austria's renowned Vienna Grosser Musikvereinssaal.

"With both stereo and multi-channel surround sound capabilities, the DRE-S777 is a world-class production tool for use in high-end music studios, film, television, and post-production facilities," said Paul Foschino, marketing manager of professional audio products at Sony Electronics' Broadcast and Professional Company. "Mannheim Steamroller CDs are a staple of American culture, and we are delighted that the S777 could contribute to such a high-profile project."

Mannheim Steamroller *Christmas Extraordinaire* features a combination of holiday arrangements of Handel's Hallelujah Chorus and Tchaikovsky's Dance of the Sugar Plum Fairies along with traditional favorites such as White Christmas, Winter Wonderland and Silver Bells. A "double hub" CD/5.1 DVD-Audio/DVD Video package will be available exclusively through a network of high-end home entertainment dealers around the country.

"We travel the world to work with various musicians, and the opportunity to accurately sample our own spaces is incredible," adds Ackley who is assisted by second engineer Dave Cwirko on Mannheim Steamroller projects. "The S777 is now our primary reverb unit. The sound quality is natural and clean. We're looking forward to using it in the future."

Plus Four Marketing 2000 Rep Of The Year

Sony Electronics recently presented Jim Matthews (center), principal of Plus Four Marketing, a Northern California rep firm, with Sony Pro Audio's "Rep of the Year" award for 2000. "Plus Four Marketing has done a great job growing Sony Pro Audio's business," says Paul Foschino (right), marketing manager. Also pictured, Jeremy Stappard, regional audio manager, West Coast.

Dave Christenson Western Regional Audio Mgr.

Sony Electronics has named Dave Christenson (pictured) western regional audio manager for the professional audio division of its Broadcast and Professional Company. Christenson is responsible for sales and support of Sony Pro Audio high-end audio products, including the Oxford and DMX-R100 digital recording consoles, and the DRE-S777 digital reverb.

Editorial Director: Anthony P. Montesano; **Managing Editor:** Anthony Savona; **Art Director:** Marshall Moseley; **Associate Art Director:** Greg Gennaro; **Design Associate:** Brian Jackson. **Cover Photo:** Dave King; **Photo Credits:** pg 4 (top), Howard Sherman; pg 5, David Goggin; pg 6, Dave King. Entire contents Copyright©2001 Sony Electronics Inc. unless otherwise noted. The opinions expressed in bylined articles herein represent those of the author alone and not of Sony. No part of the publication may be reproduced without the written permission of Sony Electronics Inc. Sony is a trademark of Sony. For more information on any of the Sony products mentioned in this magazine, please contact: Sony Pro Audio at 1-800-686-SONY. Product features and specifications subject to change without notice.

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Sony DRE-S777

See an exciting video on how Sony captured the sound of some of the most perfect acoustic spaces in the world for the DRE-S777 Digital Sampling reverb.

Digidesign Control|24

An analog front-end/ergonomic surface for Pro Tools, Control|24 features 24 moving faders, 16 Focusrite preamps, 5.1 monitoring control and dedicated transport/editing/DSP controls.

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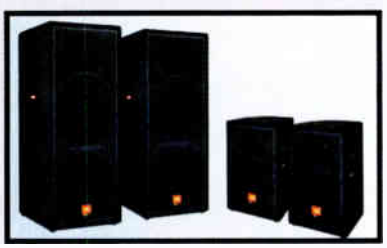
The new 1.1, 2.1 and 3.1 Power-Tech models deliver up to 760w/channel @ 4 ohms stereo (or 1,525 watts bridged mono) from a 2-rackspace chassis.

QSC RAVE/s-24

This digital audio transport system provides 24-bit/48kHz ADCs, and reconfigures CobraNet networks to transmit seven channels of 24-bit audio instead of eight channels of 20-bit audio.



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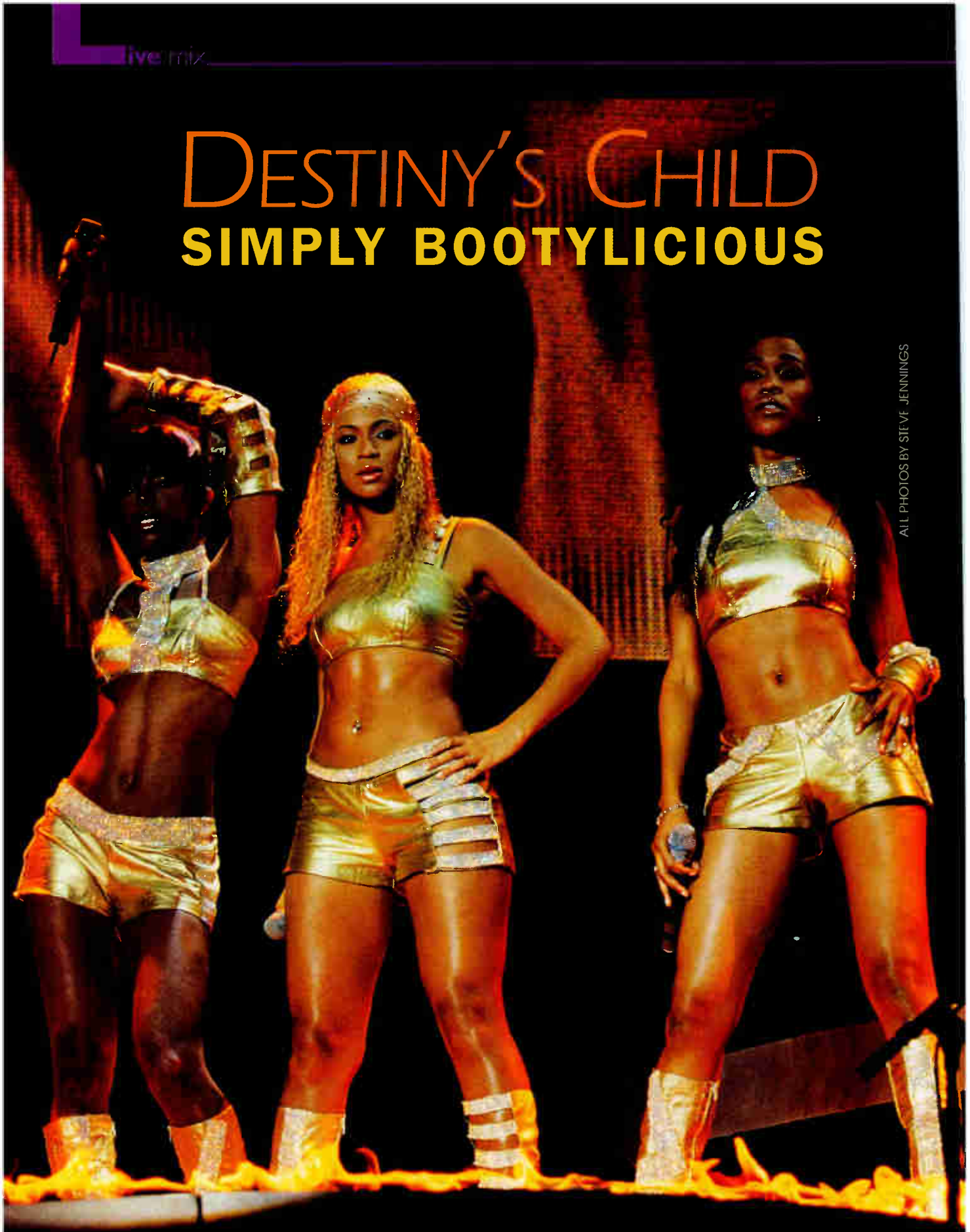

ALL PHOTOS BY STEVE JENNINGS

by Blair Jackson

World Radio History

As this issue of *Mix* hits the street, Destiny's Child has finished a touring year that has seen the popular R&B trio go from being an opening act singing entirely to prerecorded tracks, to headliners with a full band playing in large sheds and arenas. They've criss-crossed the United States topping MTV's *TRL* Tour (which also featured 3LW, Dream, Eve and Nelly rapping and singing to tracks) and have developed a huge following around the world. No doubt about it, Destiny's Child is a worldwide phenomenon at this point, with sales of their latest CD, *Survivor*, approaching the five million mark worldwide, and still spawning one hit single after another: "Independent Women Part 1," "Survivor," "Happy Face" and "Bootylicious."

These hard-working young women deserve their success, too. They are excellent singers; their material is an appealing blend of contemporary pop and R&B styles with gospel and traditional soul flavors mixed in; they put on a visually exciting, very well-paced show with just enough pyrotechnics and costume changes to keep their mostly teenaged, female audience enthralled every second; and they are, reportedly, excellent role models for their fans—their lives and their lyrics are both clean. When I saw them perform this summer at the Chronicle Pavilion in Concord, Calif., they kept the sold-out, racially mixed audience blissfully on its feet for nearly all of their 70-minute set, and everyone seemed to know the words to every song and happily sang along. It was, in short, a triumph.

Sonically, it was an outstanding show, as well, with loud but crystal-clear sound filling the covered shed and the surrounding lawn seats. Concord can be a somewhat difficult venue soundwise, but this time around, FOH engineer Ramon Morales won the battle. "I was a little worried going into Concord," he says, "because when we were there last year [Destiny's Child opened for Christina Aguilera there in 2000], I didn't think it sounded that good, so I was afraid maybe I was going to have a tough night. But this year, it sounded fine; I liked it."

Morales, who is based in the group's hometown of Houston, has been working with Destiny's Child for more than two years, and besides doing their FOH sound, he also did some engineering on *Survivor* and on about half the songs on their upcoming CD of Christmas songs. He credits the tour's Clair Brothers sound system—dominated by hanging stacks of the company's proprietary I-4 speakers, 14 on each side and six S-4 subs on the ground per side—for the presence and clarity of the overall sound. "I'd used [the I-4 system] before, but it was never a situation where it was there for me; we were the opening act. On this tour, the first day I walked into rehearsals and heard it, I thought 'Wow!' I was afraid that maybe I was going to have to work it a lot to make it sound good in all these different places, but it did really well; all I had to do was a couple of things here and there with the frequencies in each room, but that was it. It was always ready to go and sounded clean. Ever since I've used the I-4s on this tour, I don't want to use anything else. I'm really happy with them."

Programmer and Roland VS-2480 operator Allan "Sparky" Starks

Though Morales says he's "itching to try" the Clair/Showco Showconsole, on this outing he used his favorite Midas board, an XL-4, and an XL-3 sidecar (which was used mostly for the opening acts, each of which had its own engineer). "I love the EQs on the XL-4," Morales says. "I've used so many different consoles, and on some you have to kill the EQ to hear anything, but the XL-4 is so transparent, and it's got a warm sound to it. To me, it's a great console."

Morales says that because the three singers—leader Beyonce Knowles, cofounder Kelly Rowland and newest member Michelle Williams—are so strong, he doesn't like to add too much to their vocals, which are sung through Shure SM87 mics. "On most songs, I'll use some compression and maybe a little reverb, but I try to keep it simple and let their voices stay out front, because everybody wants to hear them sing! They're such good singers; they amaze me." Morales' principal reverb is a Lexicon 480, and he uses Manley Variable-Mu compressors on the vocals.

The *TRL* Tour is the first Destiny's Child tour to feature a backing band, and a good one it is, with the very talented lead guitarist Rob Bacon acting as musical director for a unit that also includes drums, bass and

FOH engineer Ramon Morales at the Midas XL-4

World Radio History

two keyboards. Like many of the younger pop and R&B acts, Destiny's Child also augments their sound with some prerecorded tracks.

"The objective, according to Matthew Knowles, who is Beyonce's father and their manager, was to retain a lot of elements from the record and still have the aesthetics and feel of a real band," comments Allan Starks (known to one and all as "Sparky"), the programmer who was assigned the task of collecting those extra prerecorded tracks and then inserting them into the show. The first part of that proposition was a little harder than anyone had anticipated: "What we decided to do was go back in and get all the elements from the record so they could actually have them at will, if they needed them," explains Sparky. That entailed sorting through dozens, even hundreds, of Pro Tools sessions, some of them on unlabeled CD-ROMS, in search of appropriate vocals, instrumental and effects elements to flesh out the sound and provide familiar elements from the albums.

"What I did was come up with 24 categories that everything would fall into, and then I worked from there," says Sparky. He first loaded all the tracks into a Roland VS-2480 24-track, 24-bit/96kHz digital workstation, submixed them further, and then took his rig on the road and operated it from the offstage-right position. Eye and in-ear contact with musical director Rob Bacon was critical for anticipating cues and any potential problems. "I feel it is very important to be able to 'read' the musical director and the artist, and be able to compensate for anything that might not feel right to them, and be able to fix it before they try to communicate it to me," notes Sparky. He already had extensive experience in this area, having used the earlier Roland VS-1680 on tours with Tyrese, Kenny Loggins, Mary J. Blige, Toni Braxton and others.

In this case, "I had a kick and snare and then each of the girls' channels; I came up with six channels of background vocals—three pairs. One pair would be the main background hook, another would be a softer, whisper-type background and the other would be verse harmony. I had each of those on a pair of faders, so if they needed more at the FOH, I could do it from those faders." He and Morales communicated through Clearcom headsets.

Sparky continues, "I sent a click to the drummer and seven other channels to the house: a pair of vocals, because I had the other six vocals on my own, a stereo mix of what I call the metal mix—hi-hats, tambourines and things like that—an effects channel, a single 808 kick and strings." Sparky used four 2480s over the course of each show, two for each half of the concert. One would play the tracks for one song, another the tracks for the next one, and it would go back and forth that way. All four were routed through a Roland VM-7200 digital mixer.

"The reason I picked this whole rig," Sparky says, "was, not only would it run the show efficiently, but when Destiny's Child does spot dates or tracks dates, they can take one of those boxes and do the show without the band. Also, they're great for recording. Beyonce's getting quite a bit into writing, so I'm showing her how to work it so she can take a box with her and arrange her vocals.

"When they go into the studio now, I've got everyone backing everything up in the proper format so I can dump it into the box and we've got it ready, so I don't have to go through the nightmare I went through at the beginning of the tour."

Both Sparky and Morales say that as the tour went on and the band got stronger, they relied a little less on some of the prerecorded elements. "I don't think it takes away from the show at all to have the tracks," Sparky says. "Actually, they put a nice blanket on the sound." The keyboard setup was also quite substantial and added much to the group's sound; tech Terry Fox worked with 16 channels of keys going through a pair of Mackie mixers.

Monitor duties for the tour fell to

Destiny's Child's sound crew (L-R): Jason Vrabel, system tech; Jacob Mann, system engineer/crew chief; Doug Deems, monitor engineer; and Ramon Morales, FOH engineer

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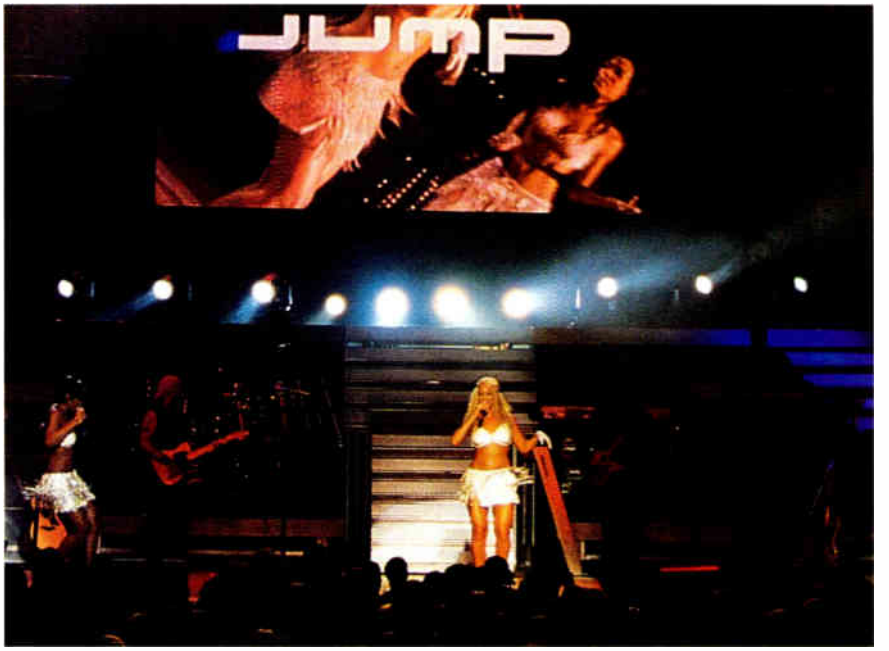

Pittsburgh-based engineer Doug Deems, who has extensive experience over the past decade-plus, working with such diverse clients as David Sanborn, Julio Iglesias and Kid Rock (with whom he was working right before Destiny's Child). Like Morales, Deems likes to use Midas consoles whenever he can; for this tour, he had a pair of Heritage 3000s, "using all 34 outputs on the first console and 10 or 12 on the second one," he says. "There was also a lot of communication going. Me and the house guy [Morales] and the sampler guy [Sparks] and the music director [Bacon] had live mics that went into our own ears."

The entire band used in-ear systems—the brand-new Future Sonics EM3 models, which worked flawlessly and were supplemented with Clair subs for only the drums and the keyboard positions. The singers, however, used a combination of Clair 12AM and 12AMII wedges and HL-15 sidefills; both are necessary because the singers move around a lot. "I'd like to get the girls on ears," Deems says. "And I'm sure eventually we will. But they had an experience a while ago where they were going to try [in-ears] on this television show, and they ended up getting only about a five-minute soundcheck, and then they went on live TV having never used ears before, and it didn't work out too well, so they've been a little hesitant ever since. On this tour, between having a new band and a big set and dancers, I didn't want to come in and say, 'By the way, we're also going to change the way you've heard everything in your life onstage—here, stick these in your ears.' That might have been a little too much right off the bat."

Deems says that early in the tour, the wedges and sidefills were dominated by the women's vocals and some rhythm tracks—after all, they were used to singing to tracks—but now that the band has gotten so strong and become such an important element in the sound of the show, the singers decided that they need to be able to hear more of the live musicians in their onstage mix. In his mix of the three of them, Deems will occasionally use some PCM 70 reverb on lead vocals and H3000 to thicken backgrounds, but mostly he keeps the sound clean and simple, and so far that has been enough—it's a testament to the singers' level of comfort with their onstage sound that they rarely come to soundcheck anymore. "They've been really easy to work with," Deems comments.

"They're *so* nice," adds Ramon Morales, "some of the nicest people I've ever met. I've worked with them a long time and they're just really nice girls. They're very family-oriented, they don't have the star mind at all; none of that stuff. They're nice to each other. They care about their audience. And they work hard. They just want to make it better."

Destiny's Child will be headlining a U.S. arena tour this winter.

Blair Jackson is senior editor of Mix.

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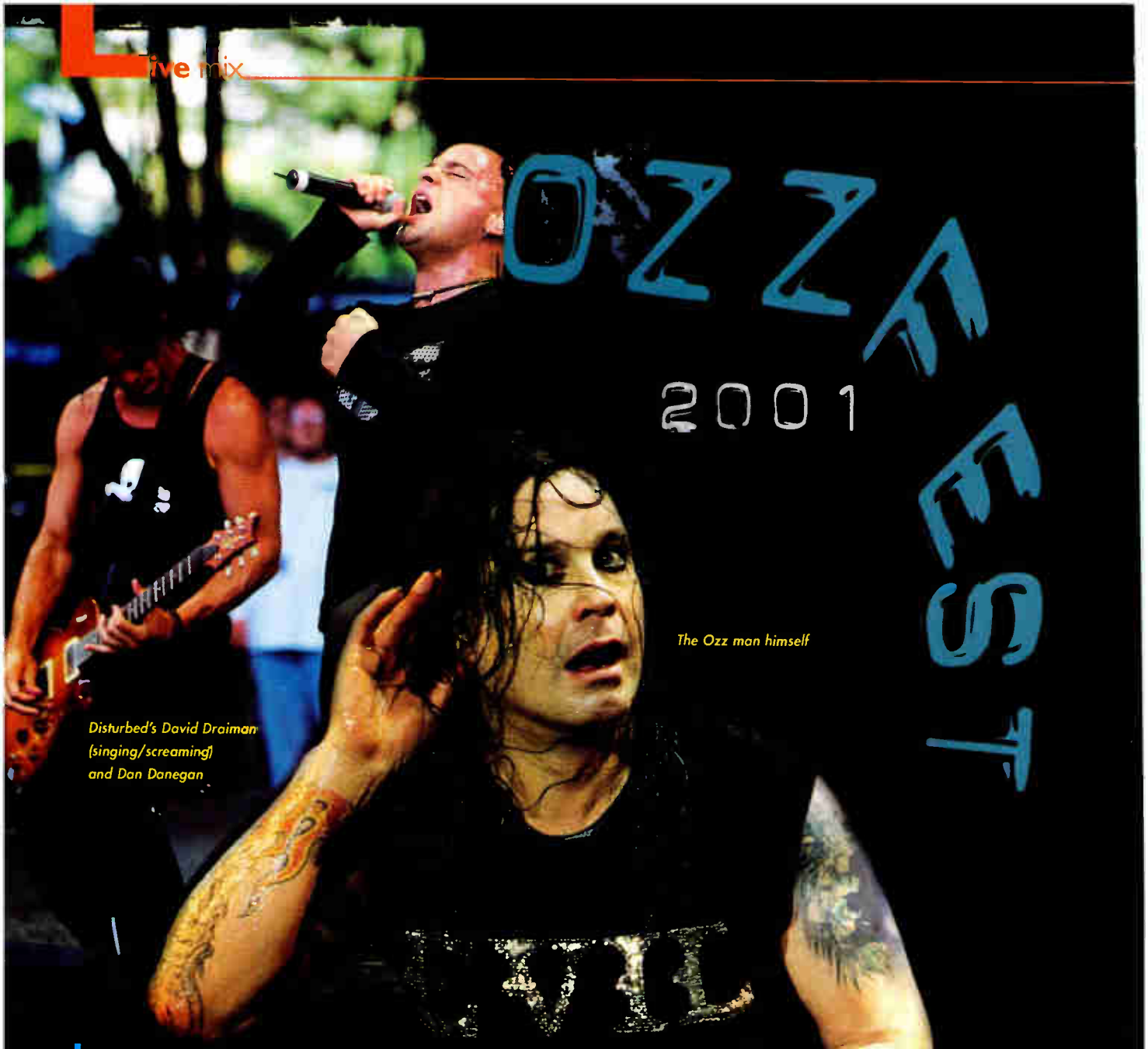

Disturbed's David Draiman (singing/screaming) and Dan Donegan

The Ozz man himself

Bath Ozzy Osbourne and Marilyn Mansan use Shure Beta 58 vocal mics, which are well-known far their ability to withstand even the warst onstage tantrums.

Last summer, the sixth incarnation of Ozzy Osbourne's wildly successful Ozzfest tour slithered its way across the country. The main stage lineup included a reunited Black Sabbath, Marilyn Manson, Slipknot, Papa Roach, Linkin Park, Disturbed, Crazy Town and Zakk Wylde's Black Label Society. The show also featured a slew of second-stage performers, and with the exception of a few pouts and whimpers from some "concerned" parents, the tour went off without a hitch.

World Radio History

PHOTOS BY STEVE JENNINGS
TEXT BY ROBERT HANSON

Zakk Wylde

FOH engineers: front row, L to R: Brad Divens (Linkin Park), Brendon Brown (Papa Roach), Greg Price (Black Sabbath), Brad Madix (Marilyn Manson) and Eddie Mapp (Zakk Wylde's Black Label Society). Back row, L to R: John Steigerwald (Disturbed), and ShowCo system engineers Randy Willie and Seth Kendall.

ShowCo was again tapped to outfit the festival. The main P.A. was a Crown-powered Prism system. Chief sound engineer Greg Price oversaw the tour as well as handling FOH duties for headliner Black Sabbath. The main console was ShowCo's fully automated, proprietary 80-input ShawConsole. The digitally controlled analog board proved indispensable for both its scene recall abilities and ease of use. "We want the very first band to sound as good as the very last band," Price explains. "And to achieve that, you have to take into consideration everyone's skill level, and with this set up, that was a breeze."

Marilyn Manson

Manitor and stage engineers: front row, L to R: Ron Hurt (Disturbed), Bruce Pendleton (Disturbed), Chris Pole (Slipknot), Bruce Dan (Slipknot), Kevin Murand (Slipknot), Maxie Williams (Marilyn Manson), James Bump (Papa Roach), Mike Adams (Black Sabbath), Patrick Murphy, John Sheldon and Roger Pagman (Linkin Park). Back row, L to R: Scott Kennedy (Disturbed) and Chris Worndal (Crazy Town).

Things were quite different on the stage where each act required a separate desk for monitoring. The tour also used a rotating stage, allowing one act to perform line checks while another was performing. Mike Adams managed Black Sabbath's hefty input list with a Yamaha PM4000 and an array of SRM wedges.

Marilyn Manson's monitor engineer, Maxie Williams, summed up the festival experience: "We got one soundcheck and that was in Chicago. Other than that, it's been balls-to-the-wall. Your first song of the night is your soundcheck."

World Radio History

ROBBIE WILLIAMS ON TOUR WITH V-DOSC

PHOTOS: MIKE MANN

International star/personality Robbie Williams embarked on a run of 13 stadium shows around the UK, Ireland and Germany this past summer. Britannia Row Productions supplied a V-DOSC system with BSS OmniDrive units performing system control chores. "Because of the different sizes and shapes of each venue, we used a very different V-DOSC arrangement in each city," explained FOH engineer Dave Bracey. "We're using the same basic system as on Robbie's last arena tour, but on a much grander scale." The line array rig was designed and tweaked by V-DOSC system engineer Sherif El Barbari. "We are tailoring the system not just for the venue's width and length, but also for its height," noted El Barbari, who added that the accuracy of the system's coverage for an extra 5dB SPL in levels inside each venue, despite strict noise-pollution limits. FOH control was provided by a Midas XL4 and XL3 stretch, while support band Toploader was mixed on a Sony DMX-R100 digital console. Onstage monitors included Turbosound's new TFM-450 wedges powered by C-Audio Pulse amps; processing functions were performed by BSS FDS-334 MiniDrive units.

—Mike Mann

ATI FOR GIRLS NIGHT OUT

MD/Clair's Rob Bull (right) has been using an ATI Paragon II monitor console on the Girls Night Out tour, which featured Country powerhouses Martina McBride and Reba McEntire. Martina McBride's husband, John McBride (left), mixed FOH and served as tour manager.

AXIA COVERS THE BIG TEN

A MacPherson AXIA rig, supplied by T.C. Furlong Inc., provided sound reinforcement at Northwestern University's Commencement Ceremony and indoors at the Rosemont Convention Center for the Pri Med Midwest Convention. The Northwestern event, which was attended by 17,000 people at Ryan Field football stadium, featured eight AXIAs, flown in two line arrays of four cabinets each. For the Pri Med Midwest Convention, a ninth AXIA was added for a distributed configuration that included LCR and delay systems.

QSC + ACE = COMPOSOLITE

QSC Audio Products Inc. and Audio Composite Engineering Inc. (ACE) have formed a strategic alliance to manufacture loudspeaker systems using ACE's patented Composilite core-composite technology. Composilite uses multiple skins of carbon fiber layered over a Nomex® honeycomb core to form a rigid, seamless enclosure. Under terms of the agreement, the companies will jointly develop a variety of speaker systems that will be sold in both passive and active (powered) configurations. According to Barry Andrews, CEO of QSC Audio, QSC's amplifier, DSP and signal transport technologies will be integrated with ACE's advanced enclosure technology.

SALES AND INSTALLATIONS

Sound companies that have recently taken delivery of Yamaha PM-1D Digital Audio Mixing Systems include: Audio West of Burbank, CA; MD/Clair Brothers and Spectrum Sound of Nashville; Hi-Tech Audio Systems and Ultra Sound/Pro Media of San Francisco; and PRG ProMix, NYC. New York City's Carnegie Hall has also installed a Yamaha PM-1D in the renovated 2,800-seat Isaac Stern Hall...Seattle Symphony's Benaroya Hall has taken delivery of a new JBL Custom Shop speech reinforcement system, which was installed by Capital Communications. The center cluster system features an unusually slim profile—only three feet deep—and moves out of sight for acoustic events. The Aerial Theater in Houston, a Clear Channel venue, has revamped its sound system. The configuration now includes JBL's VerTec VT4889s and Custom Shop loudspeakers, dbx DriveRack units and Crown amps... Sound Central, a Superior, Wisconsin sound rental company, has purchased a NEXO Alpha System as its primary tour rig. Sound Central provides production support for conventions, music tours, theater, outdoor festivals and corporate events throughout the northern Midwest, and is the first production company north of Chicago to offer the NEXO Alpha system. The company's new NEXO inventory consists of four S2 sub-bass units, 10 B1s and six M3 cabinets, two NX241 digital controllers and a Crossbow flying system...The Alliance Theater Company, the South's largest regional theater, has purchased an InnovaSon Compact Live console for its 800-seat Alliance Stage. Resident sound designer Clay Benning revamped the house sound system, adding six BSS SoundWeb 9088s to accept the digital LCR outputs from the InnovaSon Compact. Other system components include Sennheiser SK 50/EM 3032 wireless microphones, Crown amplifiers and Meyer loudspeakers.

ON TOUR

Detroit-based Thunder Audio provided a 48-stack NEXO system for the Pledge of Allegiance tour, which featured Slipknot, System of a Down, Mudvayne and Rammstein, among others. In addition to 24 NEXO subwoofers, the system also included two Midas XL4s and two Midas Heritage 3000s, plus one AMEK Langley recall for FOH. Monitor boards were all Midas, including an XL4, two XL3s with XL3 wings, and one XL250. Also out with a Thunder Audio/NEXO system was Disturbed, who trucked 24 NEXO cabinets plus 16 subs...Toronto-based Audio Video Methods recently purchased an InnovaSon Sensory Grand Live digital console specifically for cross-rental to other sound companies. The board was used by Jason Sound for a recent North American tour of the Barenaked Ladies, while a second InnovaSon Compact Live board was used to mix monitors for opening act Vertical Horizon. ■

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Community Professional Loudspeakers (www.loudspeakers.net) adds the CPL26 and CPL28 to its CPL family of loudspeakers. The CPL28 has a pair of 8-inch LF drivers; the CPL26 houses dual 6.5-inch woofers. Both two-way units include a Community UC-1 compression driver coupled with a 120°x60° high-frequency horn that's rotatable 90° for vertical or horizontal coverage. At 8 ohms, both units can handle 300-watts RMS. Bandwidth of the CPL28 is 60-18k Hz; the CPL26 ranges from 70-18k Hz. The speakers include IntelliSense™ driver protection, threaded ¼x20 rigging inserts, a 70/100V transformer and a five-year warranty. They are constructed from ¾-inch MDF in white or black finishes with matching steel grilles. The CPL28 is $1,194; the CPL26 is $1,085.

D.A.S. ACTIVE SUB

D.A.S. Audio (www.dasaudio.com) adds the Sub 118A self-powered subwoofer to the ACtive Power product line. Incorporating a Bang & Olufsen PowerHouse 500-watt ICEpower amp module, the Sub 118A houses a D.A.S. 18-inch P-18 woofer with 3-inch voice coil. On-axis frequency response is 35-150 Hz; max output is 131dB SPL at 1 meter. Additional features include a soft start-up function, "soft clip," full protection circuitry for amp and speaker, and a steel grille. The compact 29x20x16-inch enclosure is finished in weather-resistant, catalyzed, polyurethane paint.

SLS ADVANCED LINE RIBBON DRIVER

SLS International (www.slsloudspeakers.com) debuts a line of high-temperature, Kapton®-diaphragm ribbon drivers. The PRD 500 Pro Line ribbon driver may be used instead of a 1-inch dome tweeter or 1-inch exit compression driver; the PRD 1000 replaces a 1.5- to 2-inch exit compression driver. Common features of the PRD 500 and PRD 1000 include Neodymium magnet structures and a high-temperature, thin-film, Kapton diaphragm. SLS ribbon driver diaphragms are 100x lighter than dome tweeter elements, have flat impedance and a linear response up to 40 kHz. Additionally, phase response and transient repro is said to be better than dome tweeters and compression drivers, with a greater dynamic range for clarity and detail at high output levels.

GARWOOD SYSTEM 24

Garwood's (www.garwood-radio.com) System 24 is a low-cost, multiple-frequency in-ear monitoring system. The system includes a transmitter, beltpack receiver, Garwood IEMI-II earpieces, and offers stereo transmission on one of 24 user-selectable UHF frequencies within a 100MHz band between 510 and 900 MHz, factory set to territory or customer specs. Controls include input level, frequency select, bar graph indicators and headphone monitoring. The rear panel has a stereo/mono switch, power, BNC antenna jacks and balanced/unbalanced inputs. The beltpack receiver has mono and stereo configurations, low-battery indicator, screw-in flexible antenna and an output jack for the supplied earpieces. A 9V battery offers up to six hours of operation and an approximate 300-foot range. Price: $1,899.

FUTURE SONICS EARS

Future Sonics (www.earmonitors.com) offers a new "universal fit" in-ear monitor system under the brand name "Future Sonics Ears." The new EM3 is priced to be an affordable alternative to the company's Ear Monitors® brand custom-molded models. Future Sonics Ears feature precision dynamics with outstanding low frequency response (40-20k Hz) and a comfortable fit. The EM3, which is also packaged with Sennheiser's Evolution 300 Series wireless system, features a standard size, ⅛-inch, gold stereo connector. Price: $198, with case and foam sleeves.

KLIPSCH KSM-8 MONITOR

The KSM-8 high-performance stage monitor from Klipsch Audio Technologies (www.klipsch.com) is a compact, two-way, passive design with a single 8-inch woofer and a 1-inch, titanium-diaphragm HF compression driver on a 90°x90°, hybrid Tractrix® horn. Its birch wood cabinet uses dado "lock-joint" and rabbet construction on CNC-fabricated panels for resonance-free response. Available in black, the texture-coated, radiused enclosure features 65° and 45° side angles, two NL-4 Speakon connectors, a curved perforated metal grille, socket cup for standmount applications and a five-year warranty.

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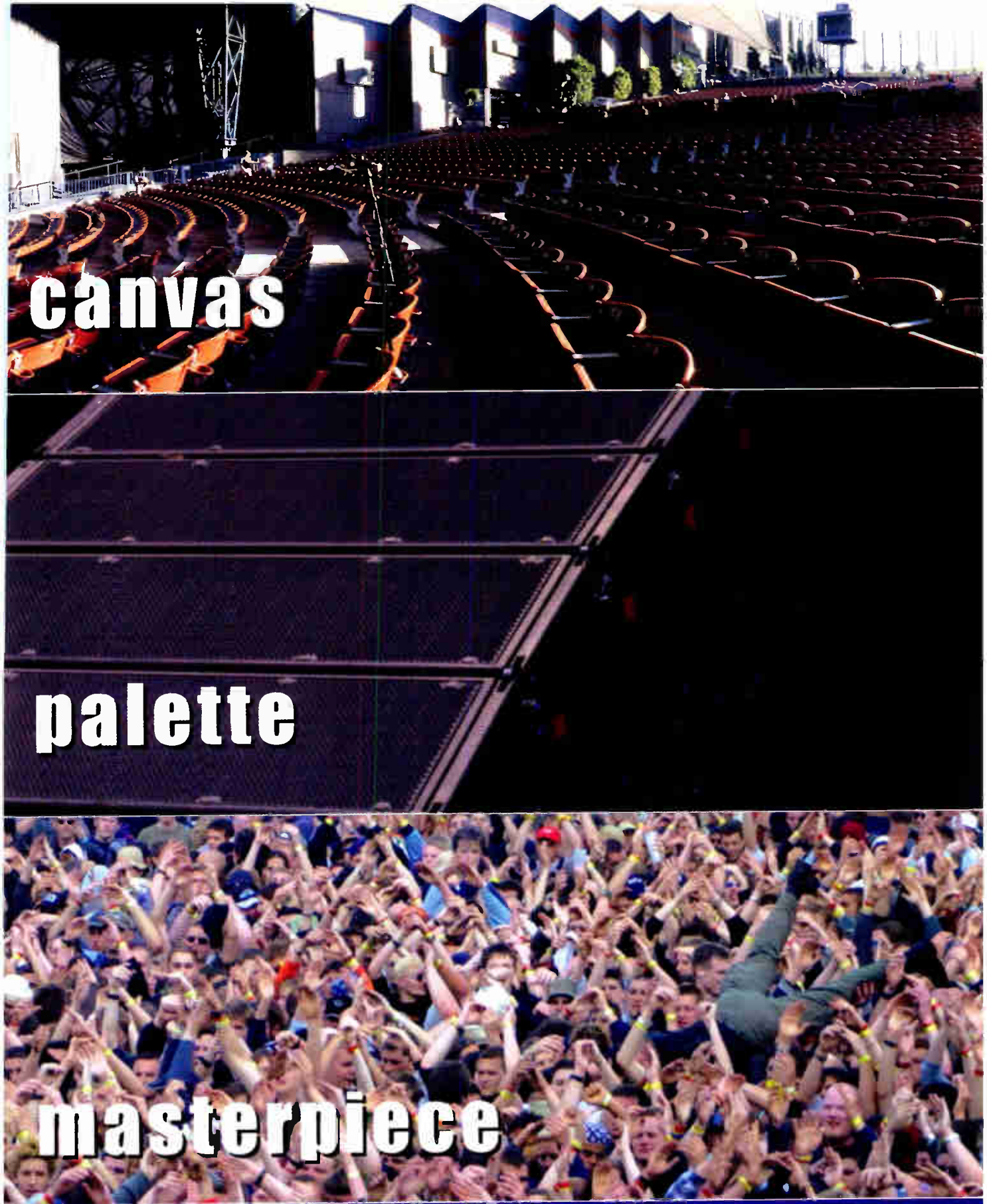

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MANY MOODS OF NICK LOWE

TELARC PAYS TRIBUTE

by Barbara Schultz

When the tribute album trend hits its stride on the heels of Hal Wilner's eclectic, breakthrough *Stay Awake: Various Interpretations of Music From Vintage Disney Films*, I thought to myself, "How I'd love to put together a Nick Lowe tribute." I used to fantasize about my track/artist list the way some people think about how they'd spend their lottery winnings. It turns out a real producer, Randy Labbe, who has worked on numerous Telarc releases, had the same brainstorm.

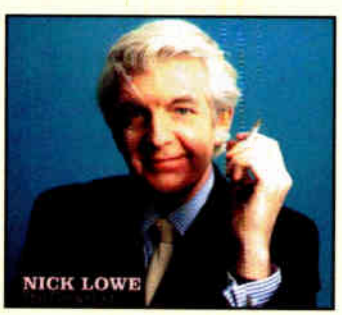
"It was an idea that grew out of a record I produced last year, *Rollin into Memphis: Songs of John Hiatt*," Labbe explains. "The sales director at Telarc, Adrian Mills, was a big Nick Lowe fan—I mean, since he was 18 years old, working in a record shop in London when 'So It Goes' came out. We started talking about Little Village [the short-lived 'supergroup' that included Hiatt, Lowe, Ry Cooder, Larry Waronker and Jim Keltner], and I guess a light went on at some point."

Lowe's work has spanned many genres and phases, including the power pop of "Cruel To Be Kind," the rockabilly-influenced *Seconds of Pleasure* by Rockpile, roots on *Party of One*, soul on *The Impossible Bird* and the torch songs of *Dig My Mood*. Labbe and Mills spent a few weeks enjoying the job of revisiting tracks from throughout Lowe's career, trying to arrive at a short list of songs to cover. Then Labbe began approaching the artists—a unique grouping of blues, rock and singer/songwriter types, some of whom came up with Lowe.

"I first heard Nick some time after The Rumour had been formed and my career was in full swing," explains Graham Parker, who sings "The Rose of England" on the album. "[Back then], I thought Nick was a novelty songwriter,

—CONTINUED ON PAGE 182

NEW SONGS: "THE CONVINCER"



Somebody will need to record another Nick Lowe tribute album at some point, because he's not done making wonderful albums. His latest, *The Convincer* (Yeproc Records), is a soulful, jazz-influenced album, on which Lowe's voice absolutely shines. His songwriting just keeps getting better, but more importantly, in recent years, he's found new ways to sing and arrange that get him almost painfully close to the feelings he conveys. Though, as usual, Lowe pokes fun at himself even when he's most sincere—hence, the title. The album was produced by Lowe with his longtime collaborator, producer/engineer Neil Brockbank. Recorded at RAK Studios (London) and The Barge (Twickenham, Middlesex), *The Convincer* includes the same core musicians who appeared on Lowe's past two albums: Robert Treherne (drums), Garaint Watkins (organ, piano) and Steve Donnelly (lead guitar). Don't expect "Cruel To Be Kind," but expect to be charmed. —*Barbara Schultz*

World Radio History

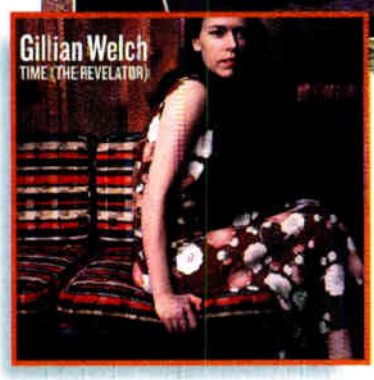
GILLIAN WELCH

STEEPED IN HISTORY

by Blair Jackson

Gillian Welch has carved a very interesting niche for herself. Over the course of three superb albums, the L.A.-bred but Nashville-based singer/songwriter has proven to be adept at penning new songs that sound like traditional folk, country and bluegrass tunes from the first half of the 20th century. Yet, she has also developed a distinctive songwriting voice that is at once confessional, impressionistic and highly original. The ghosts of Mississippi John Hurt, Hank Williams, the Stanley Brothers, and many other famous and forgotten musicians from America's past drift through Welch's songs like fond friends passing through town. Her latest CD, *Time (The Revelator)*, the first record she and her partner David Rawlings have put out on their own Acony Records label, relies a bit less on older styles; it's a more modern and original vision from beginning to end, though certainly there are still the voices of the past ringing through the material. Welch has developed a large and devoted following over the past several years, with each of her first two albums selling more than 100,000 copies—a huge number for acoustic country music—and her new one selling faster than the first two so far. Her visibility has increased, too, by her presence on a few cuts of the double-Platinum *O Brother, Where Art Thou* soundtrack, which has suddenly made traditional country music "hot" again.

PHOTO: MARK SELIGER



David Rawlings and Gillian Welch recording in RCA Studio B, Nashville

The *O Brother* soundtrack was produced by T-Bone Burnett, who also produced Welch's first two albums. For *Time (The Revelator)*, however, Welch and Rawlings opted to produce themselves for the first time, cutting the album entirely live, with no overdubs, in Nashville's historic RCA Studio B, site of legendary sessions by everyone from the Everly Brothers to Elvis to Willie Nelson. "We worked with T-Bone on and off for six years,"

—CONTINUED ON PAGE 186

MARCUS MILLER

ON PRODUCING AND PLAYING

by David John Farinella

Marcus Miller is taking a breather. It won't last long, though, because his calendar is already full. He's in the midst of mixing the upcoming Take 6 release, which he also produced. After that, he hits the road to support his latest solo album, *M2*, a typically nifty mix of jazz and R&B. And no doubt he'll be hunkered down at his own Hannibal Studios writing, producing and polishing a new collection of music after that.

The Marcus Miller run—and we do mean *run*—began in earnest 25 years ago, when he got back from a tour with drummer Lenny White. The young bassist was a studio veteran by the time he was 20 and has since played on well over 400 releases. His production career began in 1980 with jazz saxophonist David Sanborn's Grammy award-winning *Voyeur*.

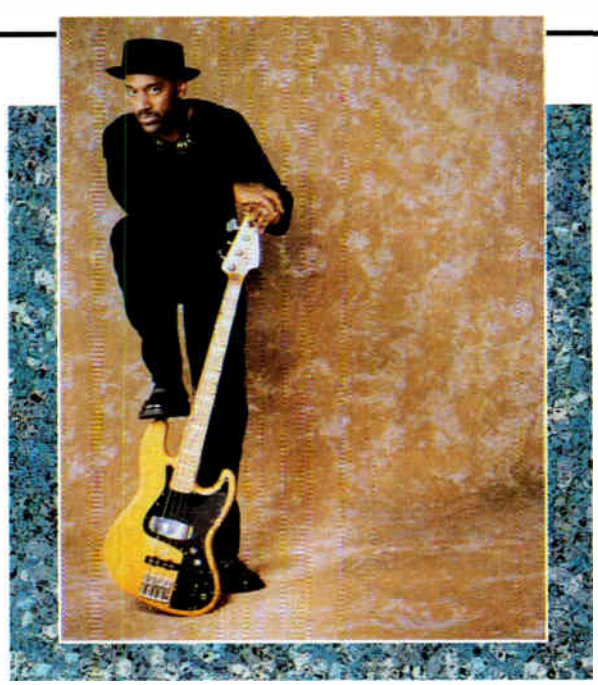


PHOTO: KUMIKO HIGO

The Sanborn collaboration was just one of many that Miller remembers fondly. His own greatest hits list include dates with Luther Vandross, McCoy Tyner, George Benson, Earl Klugh, Aretha Franklin, Roberta Flack, Grover Washington Jr. and Miles Davis. "I remember sessions where the musicianship was high," he says. "Those sessions also featured an artist

—CONTINUED ON PAGE 188

World Radio History

TONY BENNETT'S "I LEFT MY HEART IN SAN FRANCISCO"

PHOTO ©MICHAEL OCHS ARCHIVES.COM

by Dan Daley

It was a time when men still wore hats. The Beatles hadn't yet looked across the Atlantic Ocean, and a revolution in music and fashion was still a year or two away. The Cuban missile crisis would loom later in the year, but in the spring of 1962, America looked pretty much like it had since Eisenhower became president. The zoot suits of post-war urban centers had given way to the proto-punks of early rock 'n' roll. But glamor, not grunge, was what the entertainment business was still seeking. Jack Paar was the king of late-night television, and the Rat Pack ruled Las Vegas. Singers wore tuxes onstage, or at least a nice suit. Juke boxes came pre-emphasized at around 60 Hz, perfect for the double bass and a raspy croon.

Tony Bennett (aka Anthony Dominick Benedetto, of Queens, N.Y.) was already a staple of the 1950s entertainment landscape. Signed in 1954 to Columbia by the label's A&R chief, Mitch Miller, who produced him with Ernie Altschuler, the singer had put together a string of hit singles such as "Because of You," "Rags to Riches" and a pop cover of Hank Williams' "Cold, Cold Heart," which was his first Number One record. It's not that "I Left My Heart in San Francisco" was any better than any of the other 57 sides Bennett cut for Columbia. But it has become the signature song of a career that's already in its second half-century, and is emblematic of the way records were made in its time.

In 1962, Frank Laico was already 44, a veteran of the old regime at Columbia Records, an engineer at the label's studios at 799 Seventh Ave. since July, 1946; he later moved to the new studios at 49 East 52nd St., originally the CBS radio network building.

But Laico preferred working at Columbia's studios on East 30th Street, just off Third Avenue. Away from the centralized office and studio combination that Columbia's "Black Rock" building was intended to be, it was such a magical room that Laico basically left his heart there, too. "The day they knocked that studio down, in 1982, was the saddest day of my life," the 82-year-old Laico recalls somberly. "That was the day I decided to get out of Columbia."

Mitch Miller liked 30th Street, too; Laico remembers that Miller issued a fiat that nothing about the building was to be changed—that included not scraping the grimy hardwood floors, lest it scrape away the aural magic, as well. "Don't even paint it, he told them." Laico says. "But sure enough, a month after Mitch resigned years later, they were in there cleaning it up."

The building on 30th Street was square and contained a square studio, which Columbia brought online in 1949. The former Armenian church offered a 100-foot-square recording room, with space enough for an elevated 8x14-foot control room, with the custom console made by Columbia's technical maintenance team; it was an 8-channel affair that had been expanded to 12 by 1962, to accommodate the Scully 8-track recorder Laico was working on. The room's natural resonance was moderated by drapes on the walls that reached toward the soaring ceiling. It was certainly big enough for the 38-piece orchestra that was tuning up at 10 p.m. that night when Bennett's session was scheduled to start, with Laico engineering and Miller producing. "That's when the musicians were available," says Laico. "You wanted them late at night, when they were at their best. We usually got four tunes out of every session, they were so good."

"I Left My Heart in San Francisco" had excited Miller, who thought it would be a hit for Bennett. According to Laico and Mike Figlio, another Columbia engineer who mixed the track, Bennett was less than thrilled with the song, so it was left till the end of the session. Laico had set up what was a pretty standard microphone configuration for the time. He preferred to give each component of the orchestra its own microphone and track, vs. the classical approach of blending overhead mics above the entire orchestra. Thus, the strings, the horns and the woodwinds on the record each had their own track, as did the rhythm section of bass, drums and piano. "No one was worried about isolation or any of that horseshit back then," says Laico. "The only isolation I went for was a baffle around Tony as he sang, and it was low enough that he could see the conductor."

Laico recorded Bennett's vocals with a Neumann U49, the result of a series of experiments over the years to find the right mic for the singer. "When Mitch and I worked on a new singer, we'd usually spend the first session just developing a sound for them, including which microphone, as well as EQ settings and echo," he explains. "Once we got that, it went into my log book, and Mitch always said not to change anything. Same thing for Andy Williams, Johnny Mathis, Barbra Streisand, and anyone else we did."

Laico never did learn why Bennett didn't feel a rapport with the song, but it didn't seem to affect his performance. In fact, says the engineer, pushing it to the end of the session probably worked in its favor, allowing Bennett's voice to loosen up and some subtle, but powerful, late-night voodoo to infect the delivery. "The first two takes of it were for levels and for everyone to find an approach to the song, including Tony," he recalls. "On the third take, Tony says, 'That's it, let's not do any more.' A

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while earlier, Mitch had left because he had an early appointment the next morning. So, I had to make a decision. So I says, 'Tony, we're still looking for the one we need. We've gone this long, let's do one more.' That next one was the one."

Laico had been tapping into the 30th Street studio's remarkable pair of live echo chambers during the session, sending signal through an aux into a speaker in the chamber and returning it via a Neumann U67. Bennett heard it in his headphones, though the track was recorded dry with only a touch of EQ and some compression from a Columbia-built compressor.

After the session folded at around 3 a.m., Laico made a rough mix for Miller to hear the next day. The multitrack master, on a reel of Ampex tape, went to the studios at 799 Seventh Avenue, where Mike Figlio would do the final mix. Figlio, who had started work at Columbia in 1959 and today runs a well-known and eponymously named restaurant at the top of Music Row in Nashville, remembers that the studio in the 799 building was on the top floor, and would, in a few years, be vacated by Columbia and become A&R Studios, owned in part by Phil Ramone.

The tracks presented to Figlio were meticulous, characteristic of Laico's recordings, he says. "Frank had a good habit of keeping different elements on separate tracks, like strings and horns, and keeping the rhythm section grouped together," he says.

As might have been expected, Figlio says he mixed the record with Bennett's vocal fairly well up front. However, he also notes that mixers had certain biases that crept through and marked their mixes. "You can always tell a mixer's background," Figlio says. "Nine times out of 10, he'll favor his own instrument. If he was drummer when he was younger, the drums will be louder. I was a vocalist."

The mix was fast; Figlio estimates that he spent about an hour on the first song of the session, getting sounds and balances, with each successive mix going by more quickly, and "I Left My Heart..." was the last song on the reel. Figlio says he put virtually no EQ on the track, but did run the vocal and the strings through the 799 studio's famous stairwell echo chamber, seven stories tall.

Like many of Tony Bennett's hits, "I Left My Heart In San Francisco" went to the Top 10. This one stayed on the charts for three years, won the Grammy for Record of the Year in 1962 and helped Bennett win another Grammy for Best Solo Vocal Performance, Male, that same year. And not surprisingly, Bennett came to love the song, just like everyone else. ■

Cool Spins

The Mix Staff Members Pick Their Current Favorites

Laurie Anderson: *Life on a String* (Nonesuch)

There's no one I'd rather hear doing a spoken-word piece over music than Laurie Anderson. Her speaking voice is so rich and evocative, full of nuance. It soothes and seduces. What I sometimes forget when I don't hear her for a while, though, is that Anderson is also a very effective singer, with a simple and lovely voice that also conveys meaning beautifully. Anderson's latest is typically bold and experimental, combining tracks of ethereal beauty ("One White Whale," "Dark Angel," "Washington Street") with noisier avant musings. There's nothing at all conventional about the instrumentation from song to song—some are mostly electronic, others feature sumptuous strings (Anderson plays violin on a number of songs), sampled elements, mellotron, guitar...it's quite a backdrop for Anderson's always intriguing layered vocal performances. And though this is her show from beginning to end, she's assembled quite a cast of characters to help her out, including guitarists Bill Frisell and Lou Reed (her paramour), keyboardist Mitchell Froom, drummer Joey Baron, bassist Skuli Sverrisson and arranger Van Dyke Parks. Lyrically, it's all over the map, too, with a couple of pieces apparently derived from her *Moby Dick* touring show, and others on themes relating to New York and various personal ruminations rendered in a dreamy and confessional style. This is my favorite L.A. album since *Strange Angels* more than a decade ago, but her music is *always* worth checking out.

Producers: Hal Willner and Laurie Anderson. Engineers: Martin Brumbach (tracking, some mixing), Bob Brockman (mixing). Additional engineering: Laurie Anderson, Dante DeSole, Josiah Gluck. Studio: The Lobby (NYC). Additional studios: The Magic Shop, Edison Recording, NuMedia (all in NYC). Mastering: Bob Ludwig/Gateway Mastering (Portland, ME).

—Blair Jackson

Queensryche: *Live Evolution* (Sanctuary Records)

Taken from two shows at the Moore Theatre (Seattle) in mid-July 2001, *Live Evolution*, a 2-CD live album, documents the astounding success that Queensryche has enjoyed over the years. With a career spanning eight studio releases, this progressive hard rock band has now put out a disc that spans their entire output and captures the essence of a live Queensryche show—with its explosive highs and soul-wrenching

—CONTINUED ON PAGE 192

—FROM PAGE 178, NICK LOWE

actually...Nick produced my first album, *Howlin' Wind*, but I didn't hire him as producer because I admired his work; I hired him because my manager told me he was the man for the job. It took me a long time to realize that Nick could really write some great stuff; it was the album *The Rose of England* that turned me around, in fact."

Parker was given a choice between "Rose" and "All Men Are Liars." "After listening to them both, I plumped for 'Rose,'" he recalls. "Because I was in the studio at the time that this idea was broached to me, recording my own new album, I cut the Lowe song with the rhythm section I had on hand and recorded in Dreamland Studios in West Hurley, New York."

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Other performers who signed on include Dar Williams, Tom Petty & The Heartbreakers, Sleepy LaBeef, Marshall Crenshaw, Joe Louis Walker and Elvis Costello. Tom Petty's track is a little-known, previously released version of "Cracking Up," and Costello's performance of "Egypt" was recorded in Dublin and delivered complete. For the rest of the songs, Labbe hired a core group of musicians to lay down tracks in The Studio in Portland, Maine.

"It's hard to make it sound like a 'record' when you have a different headliner on each song, but it does give it a little bit more cohesiveness, I think, to keep the band pretty much the same," Labbe explains. "It's definitely a multi-genre approach, but the foundation is consistent."

With G.E. Smith on guitars, T-Bone Wolk on bass, Steve Holley on drums, Labbe and engineer Steve Drown recorded direct-to-disk to Labbe's E-mu/Ensoniq

Recording engineer Steve Drown in The Studio

Nick Lowe

Paris system. Monitors were the facility's Genelec 1030s.

"We record going through mostly Millennia mic preamps and the Drawmer 1960, which is one of the tools I use a lot," says Drown, who has worked on 12 album projects with Labbe. "We go straight into the computer, and then monitor straight out of the computer. There's no crap in the way—just good mic preamps, good microphones, right into an A-to-D converter. The objective is to keep things clean and simple and neat, rather than creating something that is not real, which I would do on rock or pop records."

The microphones Drown used for the basic tracks were pretty basic, as well: Drum miking was with a Neumann TLM 170 on kick, two Shure SM57s on snare top and bottom, a Neumann KM84 on hi-hat and Sennheiser 421s on tom-toms. Overheads were AKG 451s.

"T-Bone Wolk has an ADL tube direct box that I've been using on almost all of his stuff," Drown says. "He and G.E. both have such great collections of instruments and amps. So, in T-Bone's case, we went directly through his ADL tube direct box into a Millennia mic preamp.

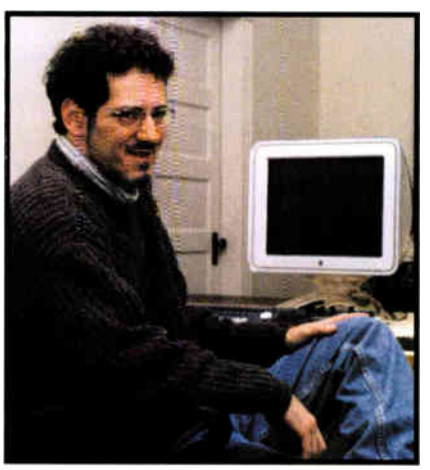
"On guitar, I used a variety of things. G.E. has such an incredible sound that you can almost use anything. But, mostly, I used a combination of a Coles 4038, SM57 and AKG 414, and in a variety of positions. A guy like G.E. has made a million records, has a million guitars and amps, and if he's not hearing what he's imagining, we switch something out.

"There's the same rhythm section on the majority of these songs, but the songs are different and they have different feels to them," Drown continues. "Some have acoustic guitar, and some are mostly electric. And, in fact, some of the guitars were recorded direct. On the first tune, [Dar Williams'] 'All Men Are Liars,' we went back to the '80s and recorded direct through a Rockman to get that kind of twangy guitar. He had an old Gretsch for that, and it's really bright and clean."

"As a producer, trying to make natural-sounding records, I rely heavily on the core band," Labbe says. "I've worked with G.E. Smith on several projects now and have come to rely on him as much for his skills at on-the-spot arranging as well as his guitar playing. The same can be said of T-Bone and Steve. They're all world-class players with great ideas. That's very important to me, because 'we'll fix it in the mix' isn't part of our vocabulary."

Labbe took the completed recordings to his own studio, Deluge Entertainment, to mix with engineer Lincoln Clapp. It's a formula that Labbe has become very comfortable with: recording with Drown and mixing with Clapp, who began his audio career in the '70s, when he was on staff at New York City's legendary Mediasound.

Labbe's studio is also outfitted with the Paris Pro System and various outboard gear. "The Paris probably isn't fancy enough and doesn't cost enough, but I think it sounds great," Labbe says. "I just really like the converters. I think it was probably a defining moment for us to settle on this system."



Producer Randy Labbe

Deluge is equipped with ATC Active 20 speakers, and Clapp brings his own Yamaha NS-10 near-fields. "It's a fairly simple setup," Clapp says. "We use a lot of the internal effects of the Paris system, different types of reverb, compression,

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etc., and I used some of my own little doodads—some homemade direct boxes. Randy and I have mixed a lot of traditional blues albums together, and he likes to keep things sounding as though they're coming from the same performance, so I try to keep the sounds the same."

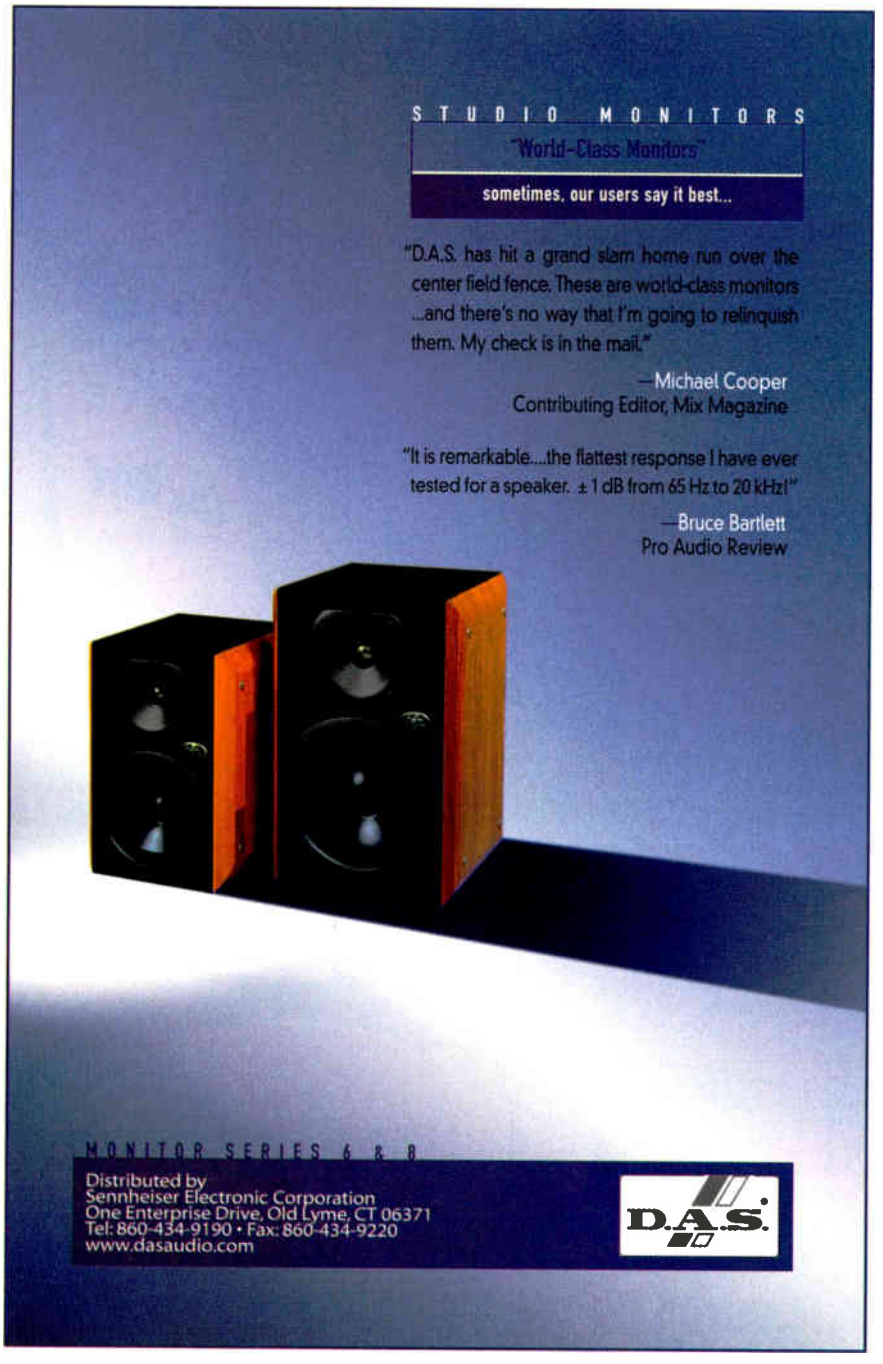
The tracks recorded by Drown didn't need much "help" in the mix, but Clapp did spend a bit of time fitting in the songs that came to the production team complete. "Some of those tunes I ran through analog processing to make them match the other tunes," Clapp says. "That's one of the reasons Randy got the Paris system; the analog-to-digital converters will take a track that maybe sounds a little brittle and warm it right up.

"Another example the Paris was good for was the song 'Television' [sung by Marshall Crenshaw]. I wanted it to have a beefier sound. The Paris has three different reverbs built into it. One is a plate, one's a room, and one's a nonlinear reverb. And I used the nonlinear on the 'Television' track. It sounds like a gated reverb. It's something that is big, but then stops quickly. And I adjusted that within the track to give the snare a little bit of presence within the track."

"We're producing for a label with a strong audiophile history, Telarc," adds Labbe. "They come out of a respected position, first with classical recordings, then jazz and more recently blues. So, we're just looking for really clean sounds—clean signals, honest performances, without a lot of glitter."

Mixing engineer Lincoln Clapp

Labour of Love is an honest album all 'round, made by performers and technicians who truly admire Nick Lowe and his work. "To me, Nick Lowe is a hero of musicians," says Drown. "As a songwriter, a producer, a bass player, a performer, he's just done so many things, and everybody likes his work in some way or another. The fact that his name is not a household word is a shame. Maybe this will help." ■



—FROM PAGE 179, GILLIAN WELCH

Welch says, "and when you work so much with somebody, you start to see things through their eyes and hear things the way they hear things. Which was helpful, actually. We had that leg up. But in a way, I think so highly of T-Bone's abilities that part of what was going on this time around was it was time for me to assess what I could do without him. It's good to see if you can stand on your own two feet and then manage to walk. Was it scary? Absolutely. I've never made a record without T-Bone. I didn't know if we'd be able to play and then assess a good performance. There's a big difference between one outside party and none. This was all David and me.

"That thread of self-sufficiency and independence is part of the theme of the album," she continues. "There was no outside finance. We played on it, we produced it, we paid for it. And if, for some reason, we'd been unable to complete it, or if we'd put it out and no one had bought it, I'd be bankrupt. Not to be over-

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ly melodramatic about it, but I basically pawned the farm."

Welch says it had long been a dream of hers to record in Studio B, adding, "When you're in there, you can see how that room shaped the history of country music. All those great songs...and it even still has the piano that shaped country music—the piano that every song cut in there was arranged on, where the singers found their part, where Floyd Cramer invented country piano. I learned a lot about country music working in that room. It opened up all the records that were cut in there for me. Now when I hear those records on the radio, I hear that room."

These days, Studio B is both a museum for tourists and a space-for-hire, where groups can bring in their own equipment and put it alongside the ancient gear that is part of the exhibit. "That room wouldn't work for everybody," Welch comments. "There's no isolation; it's very old-school. And it does not react well to high volume levels, so it might not work that well for some bands. But it's very nice for vocals. It responds very well to major keys. Something very interesting happens to the overtones."

Time (The Revelator) was recorded by Matt Andrews, using vintage mics through a Neve BCM 10 broadcast console, with its 1073 preamps, to 2-inch 16-track. "We used Dave's and Gill's gear," Andrews says. "The basic setup for most of the record was a pair of M-49s as vocal mics on the two of them and then a Neumann 582 on Gillian's guitar and a Sony C-37 on Dave's guitar. Then we did some stuff on one mic—an old Altec dynamic. We also did a couple of things with just the Altec and just the U47. There was one that we used all dynamics, some 57s and a 58 and a Beta 57. But six or seven were the basic four-mic setup.

"We'd have to tear down every once in a while, because they had tours going through and we didn't want people wandering into our stuff. People were there posing for pictures and leaning across microphones, so we decided pretty early we'd just tear down. One track was recorded while people were getting a tour."

> Independence is part of the theme of the album. There was no outside finance. We played on it, we produced it, we paid for it.
>
> —Gillian Welch

In all, the album was recorded and mixed in a little more than a month. "It was a very simple record in a lot of ways," Andrews says. "They'd work up a song in their living room and then come over to the studio and we record it, with the two of them facing each other. Everything was live, no overdubs, and some of the songs on there are first and second takes. Having it just be the three of us made it a little easier, I think. We all knew what we were going for with this album."

And now, it's a part of Studio B's bright new history. ■

—FROM PAGE 179, MARCUS MILLER

with an unmistakable sound—a sound that I'd been listening to on a record all my life. Then to sit there in the studio and hear it coming out of a real person, that was always a trip."

For the young Miller, playing Miles Davis' band was a key formative experience. In fact, Miller says it was during

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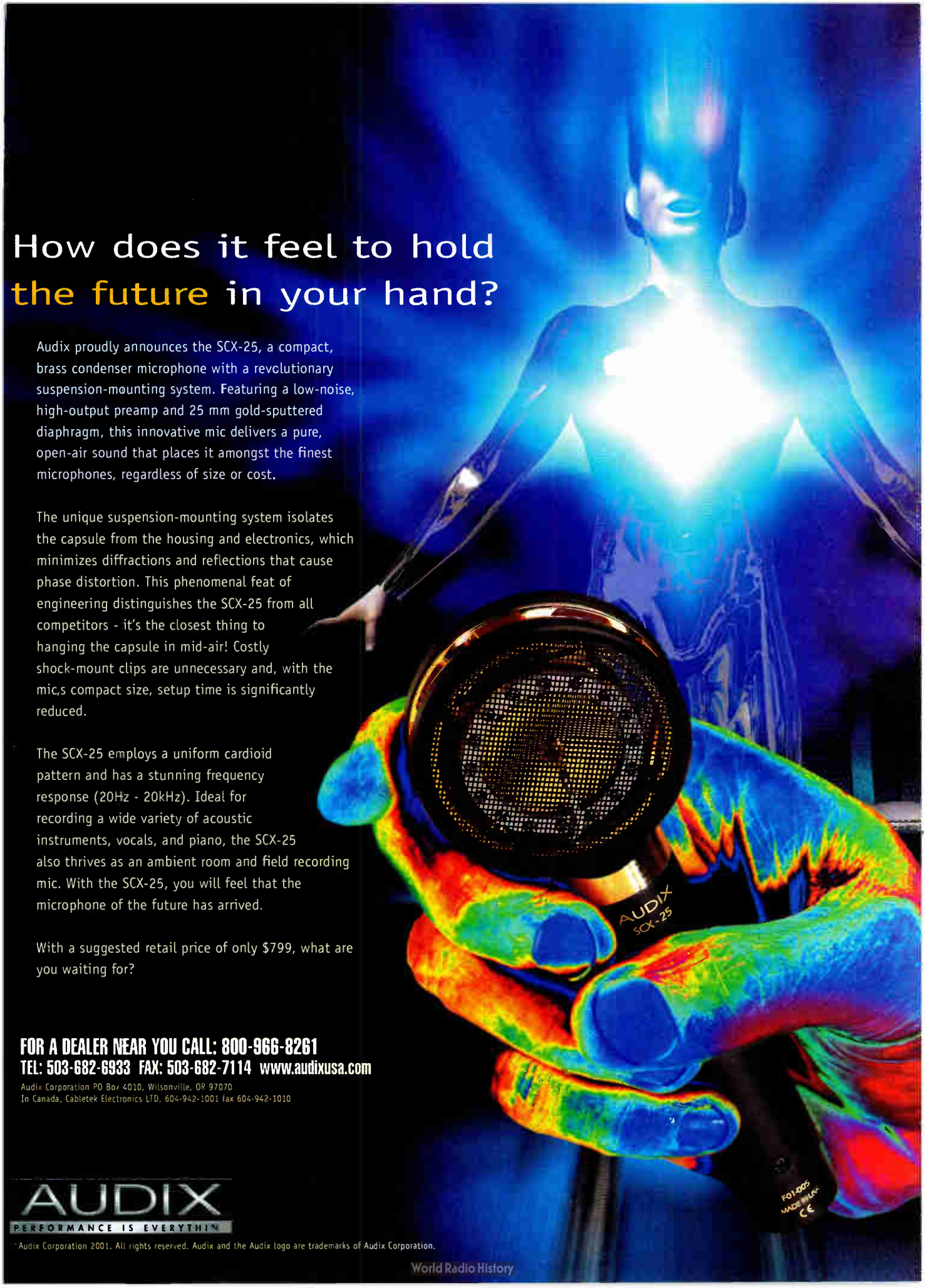

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his first sessions with Miles when he found his own sound. "It was a place where I really didn't feel comfortable playing like anybody else, because it was Miles," he recalls. "Why would you waste an opportunity playing with Miles playing like somebody else or playing somebody else's licks? So, I was really closing my eyes and trying to dig deep and find things that were right for the music."

After playing bass in Davis' band, Miller got a chance to produce the legend, which was, not surprisingly, a bit intimidating for a young man. "Oh yeah, especially at the beginning," he admits. Miller had written some songs for Davis' 1986 Warner Bros. "comeback" debut and started to overdub the tracks in the studio. "Miles ended up coming in three days later, and I was wondering if he was going to dig it," Miller recalls. "This was going to be pretty intense, but he came in and loved it. He said, 'Keep going. I'll come in tomorrow and play.' When he came in to play, it was a little tough for me at first, because I wasn't that willing to give him direction. Halfway through, he said, 'Look, you have to tell me what to do. You wrote this, you know how it's supposed to sound. Don't hesitate.' So I began to gingerly give him some direction."

The duo continued working together for the Davis releases, *Music From Siesta* and *Amandla*. Miller grew more confident as the sessions progressed: "I was really taking charge by the end," he says. "After a couple albums, he began to trust me, and I began to feel comfortable about it. So we went in, and it became a lot of fun."

It was during those sessions with Miles that Miller discovered his production philosophy, which he now brings along into any session he produces. "For me, in producing you basically fill in whatever needs to be filled in," he adds. "If I'm producing an artist and all they do is sing, then I'm in charge of finding the songs, performing the songs, or getting musicians to perform the songs, picking the studio, getting the background singers. If I'm working with someone like Luther Vandross, who has so many talents himself, I just basically fill in whatever is necessary."

During sessions with Vandross, they will discuss songs and approaches, though Vandross usually has a clear idea of how a song should sound. "So I'm basically another ear for him to bounce ideas off of," Miller explains. "Since we've been working together for so long, I have a pretty good idea of what he likes. We both like the same things, so it makes it easier. I'm his secondary ears, and in terms of the arrangements, I'll do that and I'll help pull the musicians together. Basically whatever talents you have, you use to get the record done. Based on who the artist is, you'll have more or less responsibility."

The a cappella group Take 6 was more of a head-scratcher: "The challenge was how to preserve what they've built up over all these years in terms of their sound, but maybe add some instruments and give them something a little bit different. So the arrangement was really important, making sure that things were full enough to add some interest, but sparse enough to not detract from what makes them great. With Take 6, I was also concerned with just making sure that I added just the right amount of instruments so that you still get the sense that it's a vocal group and there are six guys, not just a lead singer and background singers. There's an equality in their approach that I wanted to come through. In order to preserve that, I had to be careful with the instruments."

> Now that I have a really clear picture of what I want an album to sound like even before I begin, it's a lot easier to produce any artist, including myself.
>
> —Marcus Miller

While every project is different, Miller finds himself involved from beginning to end. "The main thing that you want to do is decide on what you want to get done," he reports. "That's not just producing, that's on everything. It always helps if you have an idea of where you want to go, and the clearer the idea of where you want to go, the easier all your choices are. So I spend a lot of time thinking and talking about what we want to do and where we want to go and the sound that we're going for." It's a lesson he learned the hard way, because early on he would go into the studio and just start recording. "Then every time you come to a decision about whether to go this way or that way, there's nothing to guide you. But if you have an overview, it really makes those decisions easier," he says.

Most of the session he produces, he'll play bass, but it's not because he wants to put his own stamp on the track. "I know the bass will be the way that I like it," he says with a laugh. "It's pretty simple. It's not a sense of involvement or anything; I want to get the bass the way I dig it. And I know I can get it just by playing it."

The multi-instrumentalist had a chance to play every instrument the way he likes it on his *M2* release. "I play a gang of instruments," he says. "I play most of the keyboards, except for when Herbie Hancock came in. I'll let him play a couple of bars—he knows a couple more chords than I do," he says with a laugh. "I play the keyboards, guitars, tenor sax. My second instrument is the bass clarinet, but after that, I play piano and guitars. I can't get a sound out of brass, but most of the other instruments I can find my way around."

At first, he admits, it was a challenge to produce himself. "But now that I feel very comfortable about who I am as an artist and my sound, it's almost like producing somebody else," he says. "The only thing I don't really get is that back and forth, but [co-producer and engineer] David Isaac was there to help me, and I kind of back and forth'd with him. It's a lot easier now than it was at first. Like I was saying before, now that I have a really clear picture of what I want an album to sound like even before I begin, it's a lot easier to produce any artist, including myself. I know what I want to sound like and what I need to do to get it. Now it's just trying to stay creative."

Isaac actually fills a handful of roles for Miller, including co-producer, engineer and mixer. Isaac was also instrumental during the design, construction and equipping of Miller's Hannibal Studios. "He would come to me with suggestions based on how I work," Miller says. The studio was built around a pair of E-mu/Ensoniq Paris digital audio workstations, a Euphonix CS2000 console, a pair of Mackie D8B consoles and two Tascam MX-2424 hard disk recorders. In addition to his collection of signature Fender Jazz basses, Miller owns a host of new and old electronic keyboards by Korg, Roland, Ensoniq and others; his list of samplers include models by Akai, Ensoniq and Roland, and the well-stocked outboard racks boast top equipment from TC Elec-

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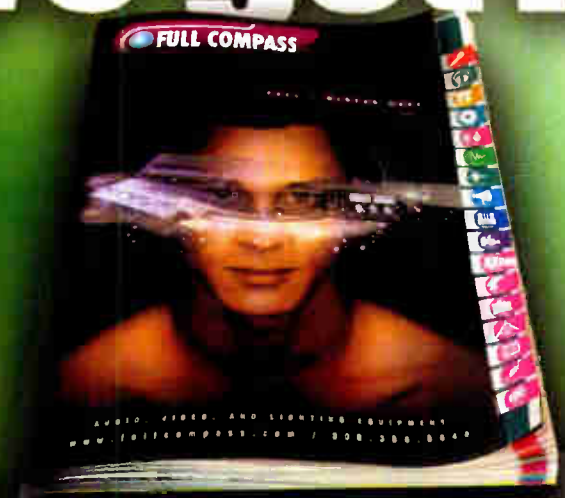

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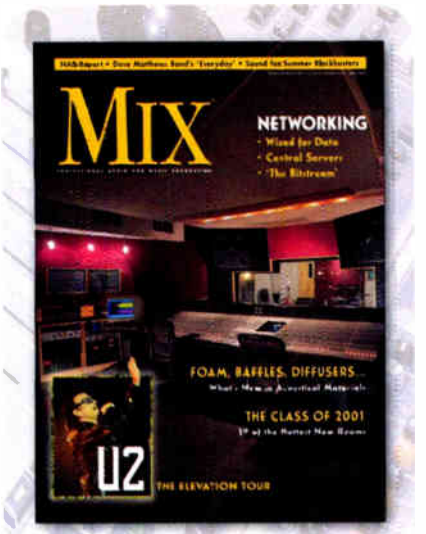

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Miller says that building the studio was a way for him to control his sessions better, "particularly because we started a label that my record was the first release on," he explains. "So it gave us a facility that we could use to make the music, and have control over the sound and the budget and time. It makes a big difference."

Miller's breadth of experience and talent, starting with his earliest sessions, has made him a first-call sideman, songwriter, composer and producer. Still, the reason he is called to produce differs for each session, he says. "I do so many different things and people latch on to different aspects of what I do well," he explains. "So one of the tricks for me is to figure out who they actually asked to produce. Was it the guy who produces Luther? Was it the guy who produced Miles? Or is it the guy who does the Marcus Miller records? Or the guy who does movies? I have to figure out what it was they are looking for from me. It's pretty easy to find; one conversation usually tells me what they are trying to accomplish."

Artists with what he calls "an identifiable sound" frequently look to him for an updated sound or to add a wrinkle to what they do without sacrificing their sound. "That's the thing I really try to make sure I *don't* do: compromise the artist so that it sounds like they have a suit that doesn't fit them very well. I always try to make it sound very natural. Even when we were doing the Miles stuff, a lot of people reacted pretty strongly to it because it was Miles in a pretty contemporary setting. But to me, Miles always sounded very comfortable in that environment. It didn't sound like he was trying to be hip. It sounded like he made a decision to go in that direction and he's doing it very well. It's up to you whether you dig it or not."

It's a different story for younger artists. "If they're new artists who are really trying to find themselves, then it's really getting in there and working with them and being sensitive to a developing artist. I think when people call me, they are trying to get that kind of stuff from me," he says.

The key, he says, is for an artist to find that identifiable sound. "Like Luther or David Sanborn or Chaka Khan—people who after three notes you know who they are," he says. "I think *that's* what music is all about and that's what really excites me—to know that I have an instrument like that to work with, a voice like that to work with. That's what really gets me going." ■

—FROM PAGE 182, COOL SPINS

lows. It offers a fine selection of representative songs from each of the band's releases, providing some of the character and personality of the different albums. But the true soul of this release is found in how well the songs meld into each other, from disc one's opening track "NM 156," right through to *Mindcrime Suite*'s "Suite Sister Mary." The only break you get from this Queensryche extravaganza is having to physically change discs; otherwise, the transition between tracks is seamless. I like the second disc more than the first; not surprising, because I started listening to them when *Empire* came out. But this double-disc CD is a really great promotional kick to get us kiddies to listen to their older stuff, while pleasing the much more devoted Queensryche fans.

Producers: Queensryche. Recorded by Kelly Gray at the Moore Theatre. Mastering: Eddy Schreyer and Gene Grimaldi. *—Sarah Benzuly*

***Sing Along With Los Straitjackets* (Cavalcade/Yeproc)**

What a great time to be a music fan. Only in these days of low-cost indie recording could a retro surf/rockabilly instrumental quartet wearing Mexican wrestling masks put out an album featuring more a dozen great performers from the roots, Americana and punkabilly scenes. Fans can sing along, too, because they cover some real classics: Raul Malo (Mavericks) sings

"Black Is Black," and the Reverend Horton Heat does "Down the Line." Dave Alvin doesn't sound like a surfer, but he rocks hard on "California Sun." By far my favorite is "Chica Alborotada"—"Tallahassee Lassie" sung *en Espanol* by alterna-swing's consummate crooner, Big Sandy. If this is your kind of music, then it's worth noting that the new Yeproc label seems to be behind a lot of cool releases. Personally, I love old-fashioned, sweaty rock 'n' roll with real drums, and screaming guitar solos and vocals, and this is possibly my favorite album of 2001.

Producers: R.S. Field, Mark Linett, Los Straitjackets. Engineers: Jim DeMain, Mark

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StorCase InfoStation
Behind the Scenes

NAB 2001
Las Vegas

The making of a "real-world" cinema

"We wanted to show the NAB audience a truly affordable high-definition production solution that they could depend on in the "real-world."

– Steve Waskul
Waskul Entertainment

This year at the National Association of Broadcasters (NAB) Conference and Trade Show, Waskul Entertainment, a leading content creation company based in Southern California, created a high-definition electronic cinema that received rave reviews. The theater was packed with standing room only during all performances. When it came to choosing a storage solution for the cinema, Waskul Entertainment relied on the StorCase InfoStation™, a rugged and versatile 9-bay back-plane RAID-ready enclosure.

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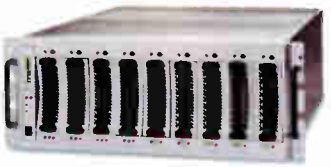

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Linett, Rich Mattson. Studios: The White House, Hum Depot (both in Nashville), Your Place or Mine (Glendale, CA), The Flower Pot (Minneapolis). Mastering: Jim DeMain/Yes Master and Mark Linett/Your Place or Mine.

—Barbara Schultz

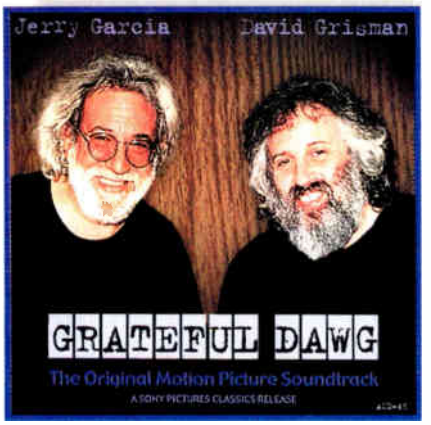
Le Tigre: *Feminist Sweepstakes* (Mr. Lady Records)

Sorry, you're just not cool enough to listen to Le Tigre. Sure, that's kind of harsh, and that's kind of elitist. But that's also the point. All in all, *Feminist Sweepstakes* is a perfect "one-fingered" salute to the sophomore jinx. Here's the skinny: Former Bikini Kill singer/songwriter Kathleen Hanna and multi-instrumentalists Johanna Fateman and JD Samson deliver another slick, hook-laden, post-*everything* mix of lo-fi new wave and punk served up on a delicious platter of sampled beats and cut 'n' paste grooves. And Hanna certainly hasn't forgotten what got her here, but she's managed to mature her approach just a bit. Where Bikini Kill were infamous for driving their politics down the throats of anyone who would listen, Le Tigre destroys the opposition with scathing sarcasm and sickly sweet melodies. And sure, she still turns in lyrics like, "Ten short years of progressive change. Fifty f—-in' years of calling of names." But this time around, you can dance to it!

Producers/engineers: Chris Stamey and Le Tigre. Studio: Modern Recording (Chapel Hill, NC). Mastering: Brent Lambert/Kitchen Mastering (Chapel Hill, NC). *—Robert Hanson*

Jerry Garcia and David Grisman: *Grateful Dawg* (Acoustic Disc)

This is actually a soundtrack album for a documentary film of the same name made by mandolinist/"Dawg music" pioneer David Grisman's daughter, Gillian, tracing the long and fruitful musical relationship between her father and the late Grateful Dead guitarist. It contains a few choice tracks from previous Garcia/Grisman CDs, one from their early '70s bluegrass band Old & In the Way, a pair of songs by folk influences Bill Monroe and Ewan MacColl, and the real motherlode for their many fans: seven previously unreleased live recordings by their excellent quartet (Jim Kerwin plays bass, Joe Craven percussion and violin), including the spry title tune, a lilting version of Jimmy Cliff's "Sitting Here in Limbo," the Dead favorite "Friend of the Devil" and Grisman's epic instrumental "Arabia," which came out originally around the time of the Gulf War in '91, and is suddenly eerily appropriate once again. It all adds up to a wonderful portrait of a fond and enduring friendship that encompassed so many different acoustic music styles.



Producer: David Grisman. Engineers: Dave Dennison (studio and some live), John Cutler (live), Owsley Stanley (live Old & In the Way).

—Blair Jackson ■

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COAST TO

PHOTO: MAUREEN DRONEY

Three wise men inside Studio D at The Village (L-R): CEO Jeff Greenberg, assistant engineer Dan Monti and engineer Caram Constanzo.

L.A. GRAPEVINE

by Maureen Droney

Things of classic and enduring value are increasingly difficult to find. One change evident in the past few years has been the closing of many once-great recording studios. Ironically, in Los Angeles—a city often reviled for its lack of interest in historical preservation—there are more historically important recording studios than anywhere else in the world. Recently, I revisited three of them: Henson (previously A&M), The Village and Record Plant; all in business for over 30 years and all going strong, making the welcome statement that there's still a place for quality in this world.

Back in 1998, A&M Records' studio complex—the site of classic recordings by Herb Alpert, The Carpenters and Burt Bacharach, among many others—was in danger of disappearing. As the record company was enveloped first by PolyGram, and then by the IGA/Universal umbrella, the studio was jettisoned and up for grabs, but there were few players capable of taking on the five-room facility. A dark period ensued; almost the whole staff was laid off and the studio went quiet, while, upstairs in his office, manager Ron Rutledge kept working the phone and keeping the faith. When the Jim Henson Company purchased the entire A&M lot, a decision was made to reopen. Now, as the facility heads into its third year as Henson Recording Studios, the good vibes are back.

On the September morning that Rutledge and studio administrator Faryal Ganjehei showed me around, the joint was definitely jumping. In Studio B, or "The Crystal Room" as it's known, thanks to a large geode on prominent display, David Lee Roth was recording new material (along with a very interesting remake) on the SSL 6056 E Series with G computer that Rutledge says, with a laugh, "has been here forever and sounds great—our clients love it." Alex Gibson was engineering, and Rutledge notes that, in the grand old tradition, Gibson had started out assisting the project and had been bumped up to engineer.

In Studio A, on the SSL 9080 J that was installed when

—CONTINUED ON PAGE 198

NY METRO REPORT

by Paul Verna

In New York and throughout the world, the shock following the terrorist attacks of September 11 gave way to helplessness. People who wanted to contribute to the rescue operation, or help relieve the suffering of the relatives and friends of the victims, found there was little they could do. Studio owners, engineers, producers, manufacturers and other members of the audio profession were no exception. Their jobs seemed suddenly insignificant in light of the massive tragedy around them.

Once the shock wore off, however, the ever-resourceful leaders of our industry found ways to make a difference. Most of these efforts took the form of donations of studio time, services, equipment, etc. In some cases, companies donated portions of their proceeds for a certain period of time. And, in a few rare instances, brave members of the recording community took part in the actual rescue/recovery operation.

Two of the most high-profile, post-attack events involved studios, pro audio manufacturers, service companies, musicians and other individuals. The live telethon, *America: A Tribute to Heroes*, raised approximately $150 million toward the United Way's September 11 Fund, while a remake of Nile Rodgers' 1979 hit "We Are Family" (originally performed by Sister Sledge) contributed proceeds to the American Red Cross, the NYC Firefighter's Relief Fund, and other entities concerned with the aftermath of the terrorist attacks on New York, Washington, D.C., and Pennsylvania.

In New York, telethon performances were held September 21 at Sony Music Studios, with live mixes handled by *Saturday Night Live* engineer Jay Vicari in the Effanel Music L7 truck and Effanel chief engineer John Harris in Sony's Mix Room B. Effanel owner Randy Ezratty says, "The client allowed Effanel to bill them at our normal rate and then, with check in hand, we could donate 100 percent of our billing—a five-figure check—to September 11 charities." Besides Effanel, other vendors included Firehouse Sound, S.I.R. and Sennheiser, according to sources.

—CONTINUED ON PAGE 200

Pop diva Diana Ross recording her contribution to Nile Rodgers' remake of "We Are Family" at New York's Avatar Studios. Proceeds from the sale of the record will go to charities associated with the September 11 terrorist attacks.

World Radio History

COAST

NASHVILLE SKYLINE

by Dan Daley

The first half of October was most turbulent on the Nashville studio industry's already storm-tossed seas. On October 17, Belmont University announced that it had purchased Ocean Way Studios from owners Gary Belz and Allen Sides. The school further announced that it would continue to operate the studio complex as a commercial facility, as well as use it to offer students access to a world-class training facility. All of Ocean Way's employees would be retained as Belmont employees. Belmont music program head Pam Browne estimated that the studio would be commercially available 40% to 50% of the time; the rest used for instruction.

The deal was announced with little advance notice. However, former Ocean Way co-owner Gary Belz confirmed that the deal had been in progress for several months, instigated, ironically, by the mortgage broker he and Sides had enlisted to refinance the facility's reported $1.2 million debt load in light of significantly lower lending rates.

No sale price was announced at the time, but the deal will be a combination of a cash transaction and a tax-deductible donation to the Christian Baptist-based school, which is tax-exempt. The final sale price will be deducted from a fair-market valuation of the facility, expected to be somewhere roughly between $6 million and $7 million. The difference between the two numbers will be considered a tax-deductible donation, which could offset any sales and capital gains taxes assessed on the transaction itself. (While the real estate transaction was closed earlier in the week, Belz also confirmed that there is a six-month window in which the school and the former owners will decide which equipment will be sold to the school and which is retained by Belz and Sides, both of whom own other studio operations in Nashville and Los Angeles.)

Belmont is home to one of the industry's leading academic audio production and engineering programs, and over the years has heavily seeded Nashville's music and studio community with graduates, including Vince Gill and Trisha Yearwood. The school has also been the beneficiary of return largess by its luminous alumni corps, as well as from a $10 million grant three years ago from Mike Curb, president of Curb Records, which led to the creation of the Mike Curb School of Music Business on campus.

But there is concern among some in the Nashville studio community that a tax-exempt entity, such as Belmont, operating a commercial enterprise is problematic. Andrew Kautz, a Belmont music business alumni and president of Emerald, which filed for Chapter 11 bankruptcy protection earlier in the year, says that while it was a good financial move for both Belmont and Ocean Way, he believes it has the potential to tilt an already uneven playing field. "They say they'll operate it as a commercial facility only in order to offset its oper-

—CONTINUED ON PAGE 204

It's Christmas time in the city at Sound on Sound (L-R): engineer Mark Partis, assistant engineer Bart Migal, artist David Clayton-Thomas, studio manager Chris Bubacz and producer Steve Gutman at the new Oxford.

SESSIONS & STUDIO NEWS

NORTHEAST

David Clayton-Thomas got the rare treat of taking the plastic wrap off the new Sony Oxford at Sound on Sound (NYC). He was in working on a new Christmas album with producer Steve Gutman and engineers Mark Partis and Bart Migal...Producer Arto Lindsay and engineer Pat Dillet were in Studio C at Kampo (NYC) with Brazilian superstar Marisa Monte, mixing the DVD *Memories, Chronicles and Declarations of Love*, a live two-hour concert from the hit album of the same name. The DVD is set for release this winter on Phonometer/EMI...Ben Folds stopped in at Indre (Philadelphia) to play a solo session on the studio's Baldwin piano, recording performances for both Live at the World Cafe and Y100 radio broadcasts. Folds ran through a number of old favorites as well as songs from his new album *Rocking the Suburbs*, and he even had the audience singing background vocals. As always, the session was engineered by Michael Comstock.

NORTH CENTRAL

At Pogo Studio (Champaign, IL), producer Mark Rubel tracked Chicago's own Morris Minors with engineer Travis Grimes assisting...September was another busy month at ARS (Alsip, IL), with engineer Larry Schara tracking some new songs with singer/songwriter Mary-Ann Cariosia and her band. Schara also finished mixing the latest release from local rockers Parade of Fools, along with getting some tracking done with producer Mike Brown and his outfit Grin.

SOUTHEAST

Atlantic Recording artist Willa Ford stepped into Spring Theatre Studio (Tampa, FL) to work on a new remix of "Did Ya' Understand That." In the studio with Ford were producers Lamar Young, Dre Lewis and engineer Danny Blaszczak ...New band Nickel Creek have been camped out in the Neve room at Seventeen Grand (Nashville), tracking for their sophomore album. Alison Krauss is back as producer with engineer Gary Paczosa and assistant engineer Thomas Johnson. Paczosa was also in with Nashville session gui-

—CONTINUED ON PAGE 206

World Radio History

—FROM PAGE 196, L.A. GRAPEVINE

the facility became Henson, the lovely Vonda Shepherd, a longtime client, was cutting tracks for her own project, as well as for her regular gig as *Ally McBeal* chanteuse and pianist—which speaks well for the quality of Henson's Steinway and Yamaha pianos.

Meanwhile, Studio D was playing host to songwriter/producer Matthew Wilder (No Doubt, 98°, Electrasy), who, with engineer Csaba Petocz behind the board, was cutting a David Campbell-arranged horn section for Dreamworks artist Dana Glover. Studio D now boasts an SSL 4072 G Plus with Ultimation, replacing the 4072 G formerly housed in the room.

In "The Mix Room," producer Bob Marlette (Saliva, Full Devil Jacket, Alice Cooper) was camped out working with Boston-based Heidi, a four-woman band polishing their debut Warner Bros. release.

Studio C, Henson's only non-SSL room, is a 5.1 surround suite fitted with a 96-channel Euphonix CS3000M, where producer Jude Cole and new Warner Bros. artist Lindsay Pagano were just finishing a long stretch. Cole is one of several producers and songwriters—including Rupert Hine, Tony Hoffer, John Shanks and David Kahne—who have set up production suites at Henson in what were previously mastering and copy rooms. "It works out well," comments Rutledge. "We rent the rooms to the producers, who also book our main rooms when they need to."

In an example of the cool kind of cross-pollination that sometimes occurs at the complex these days, administrator Ganjehei informs us that Sir Paul McCartney, while recording in Studio A with producer/Warner A&R exec Kahne, met up with Pagano, working in C with Cole. The result: Pagano cut a version of McCartney's "So Bad," with the gentleman from Liverpool himself contributing backing vocals.

Obviously, key to Henson's success is the eclectic variety of musicians who feel at home there. Other recent projects have included Metallica with Jah Rule and Swiss Beats, DJ Quik and J Dub, as well as Mariah Carey, Ozzy Osbourne and Alanis Morissette. Another element in the studio's renewed success is round-the-clock maintenance, by a team that includes Danny Buchanan, Mark Tindle, Gary Mannon and Dave Bright.

The Village has always had a great Westside location and a great history; on the day I dropped in, it also had a great energy buzz going—a regular occurrence at the venerable facility, due to a bustling business that combines high-profile rock and pop projects like Bush, The Wallflowers, 'N Sync and Aerosmith with work for film and television scores including *Something About Mary*, *Moulin Rouge*, *Ali* and HBO's *Six Feet Under*. Part of that day's buzz, however, was something very new: the installation of a Neve 88R analog console into Studio D. The 72-channel, 152-automated-input desk features remote-controlled 1081 mic preamps and a VSP film mixing section that allows up to 7.1 mixing and monitoring.

PHOTO: MAUREEN DRONEY

Getting all cozy on the console at Henson Recording (L-R): engineer Csaba Petocz, artist Dana Glover and producer Matthew Wilder.

"Believe me, this was not an easy decision," comments The Village CEO Jeff Greenberg. "I chose the 88R because I had clients, like Rick Rubin, who work in Studio A and who love the sound of our vintage Neve 8048. They didn't feel that the Neve VR, which was in D, or even a new SSL sounded as good. So, when I found out a year-and-a-half ago that Neve was working on a desk, I called them. They sent us some preliminary modules, and I had clients like Steve Kempster and Al Schmitt do listening tests. The reports we got were that it was going to be an extraordinary-sounding console."

Studio D, of course, is the legendary suite rebuilt in 1978 for Fleetwood Mac's *Tusk*. It boasts a large control room, a capacious recording space with four iso rooms, and audio and video tielines to The Village's second floor and its approximately 3,000-square-foot performance space, complete with stage, drapes, chandeliers and 30-foot ceilings. For several months prior to the new install, Guns N' Roses had been locked in D with producer Roy Thomas Baker, and there was only a one-week window to pull the existing Neve VR SP and commission the 88R. A heroic effort by Neve, Village chief tech Mitch Berger and their respective crews pulled off the feat; on the day I visited, the band was loading back in for more tracking.

GNR isn't the first band to take advantage of the upstairs theater; it was also used by Eurythmics and Fleetwood Mac. This time around, though, the space had been newly soundproofed, with insulated ceilings and walls shot with cellulose, allowing for loud recording, while business as usual went on in the other production suites that inhabit The Village's second floor.

While the 88R was being put through its paces in D, the compact Studio F was given a redo, with a design by Vincent Van Haaff that includes a floated ceiling, floor and walls, and, according to Greenberg, "about 50,000 pounds of sand in the floor!" Studio F, now outfitted for 5.1 surround and equipped with a Sony DMX-R100 console, was the site of the bulk of the recording for Melissa Etheridge's *Skin*, as well as for recent projects by Master P and Missy Elliott.

Back downstairs, Studio A, with its Neve 72-in 8048, had Korn recording with producer Michael Beinhorn and engineer Frank Filipetti. Studio B, which houses a Neve VR Legend, remains a favorite of Billy Corgan and LeAnn Rimes, as well as urban artists such as New York-based producer/engineers Jimmy Douglass and Claude Achille. All of The Village's studios are now fitted with Pro Tools systems, which are linked with a Fibre channel SAN system.

The only studio in town in the same location and the same owner since 1968, The Village has learned the secret of reinvention and continues to attract a top clientele. "It's simple," says Greenberg. "We're just absolutely trying to be the best we can be for our clients."

For today's top-echelon studios, providing an artist-friendly environment that also features state-of-the-art equipment is pretty much the norm. But even its competitors will admit that the concept of client service in a recording studio originated with Record Plant. Back in the late '60s, when RP founders Chris Stone and Gary Kellgren went into business, studios were sterile, utilitarian places. Engineers wore jackets and ties (or even lab coats!), and musicians performed under fluorescent lights and acoustical tile ceilings while seated on folding chairs. Amenities—if any—consisted of bad coffee and a few ashtrays. Record Plant broke that mold in a style that is now the stuff of legend: think Sly Stone's "Pit" at Record Plant Sausalito, and the "Bedroom" at the Third Street/L.A. location (rumored to be put to

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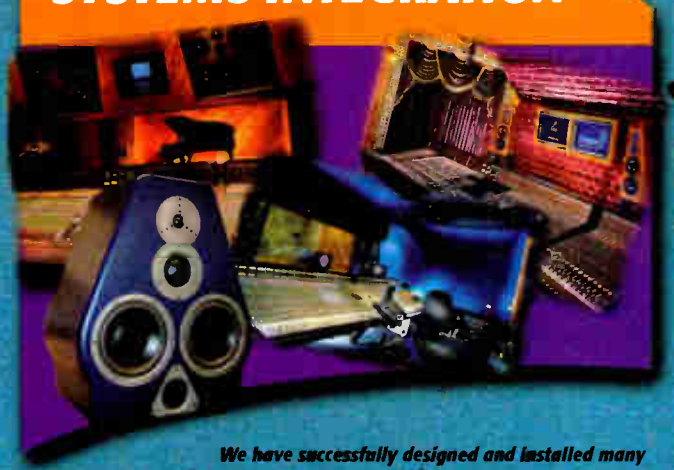

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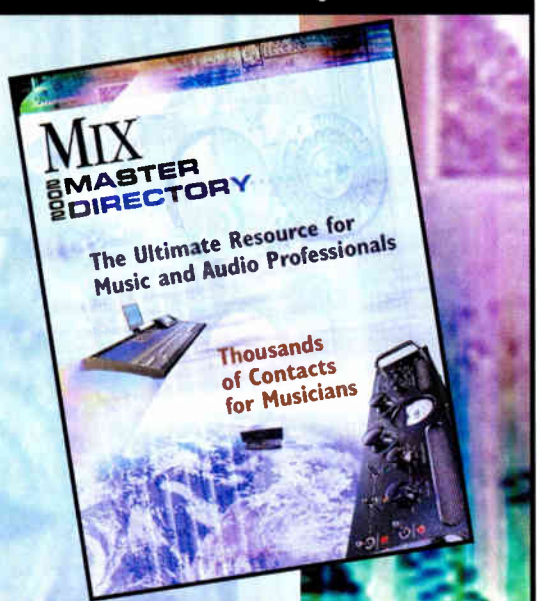

MIX 2002 MASTER DIRECTORY

good use by The Eagles). Back in those days, the studio had three branches and was famous for taking technological leaps, tolerating wild lifestyles, and most of all, for making hits, from Fleetwood Mac's *Rumours* and The Eagles' *Hotel California* to Stevie Wonder's *Songs in the Key of Life*.

Although Record Plant has changed owners and locations over the years, it hasn't changed philosophies. There's still a concierge service to address clients' needs, plenty of well-trained runners and even an on-site chef. Record Plant president Rose Mann Cherney started working for the facility 25 years ago; it's under her direction that the "family" vibe of the now four-room, all-SSL facility thrives. That family environment was particularly evident one Sunday in September when two major benefit recordings were happening at the Hollywood complex on the same day. In the SSL 8096 G Series-equipped Studio 1, Limp Bizkit's Fred Durst was orchestrating a rock mix for the "What's Going On?" all-star CD *Artists Against AIDS Worldwide*; Perry Farrell, Jennifer Lopez and Scott Weiland had also dropped by to contribute vocals. And, up front in Studio 4, with engineers Richard Hilton and Ed Cherney behind the SSL 9080 J, writer/producer/guitarist Nile Rodgers had assembled another celebrity cast for a redo of Sister Sledge's "We Are Family," with proceeds earmarked for the Red Cross and several organizations dedicated to promoting racial tolerance.

"In this case, we just wanted to do something to help," Mann Cherney comments. "But even in ordinary times, Record Plant always tries to give something back. We believe in being good citizens of the music community and of the community at large." ■

E-mail L.A. news to MsMDK@aol.com.

—FROM PAGE 196, NEW YORK METRO REPORT

In Los Angeles, CBS Studios hosted the telethon performances, also donating studio and staff time. Westwood One provided the remote recording facility, while AudioTek, Design FX and others supplied equipment. From stars like Neil Young and Bruce Springsteen, to the assistant engineers at the various studios, every participant in the telethon donated his or her services.

"Nobody had any qualms about donating equipment or time," says Firehouse principal Bryan Olsen. "Our attitude was, 'Whatever you need.' It was all

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available. This was the only way people could help, and we were more than happy to be there. It was a good feeling to be able to do something."

Production costs for the telethon—which also included performances broadcast from a London studio—were paid by ABC, CBS, NBC and Fox, according to published reports.

The day after the telethon, stars streamed into the legendary New York studio Avatar (formerly Power Station) to record an updated version of the 1979 hit "We Are Family," again overseen by Rodgers, and again recorded in Studio A. Rodgers was joined by film director Spike Lee, who shot footage for a music video, and some 90 musicians, including Sister Sledge, Dionne Warwick, Patti LaBelle, Diana Ross, Roberta Flack, Eartha Kitt, Fred Schneider, Darius Rucker, Deborah Gibson, Ashford & Simpson, Phoebe Snow, Steve Van Zandt, Bernadette Peters and tennis great John McEnroe (who had previously recorded at Avatar).

"We got the call from Nile the night before the session," says Avatar studio manager Tino Passante. "It was all very last-minute. Nile wanted to do it in Studio A, where the original version of 'We Are Family' was cut in 1979, so I checked the schedule and figured out we'd be able to make it work."

With so many musicians in the large tracking room for Studio A and engineer Richard Hilton manning the Neve 8068 in the control room, there was no extra room for guests, journalists or other interested parties. Fortunately, Avatar was also able to make Studio B available, using the tracking area for 75 guests who could listen to a live feed of the session, and the Studio B control room for artist interviews. In addition, the Unitel facility, just down the street from Avatar, was used as a holding area for representatives of such media outlets as VH-1 and *Entertainment Tonight*.

"It was an incredible experience having all these artists here at the same time," says Passante. "Most of them had worked here before, so it was like coming home to them. But they had never all been here at one time." As far as the studio time was concerned, it never crossed Passante's mind that it wouldn't be gratis. "We didn't even discuss whether we were donating the time or not," he says. "It was automatic. The question of billing didn't even come up."

Kampo Studios also helped out with the remake; Rodgers and Hilton mixed the track in Studio C on the SSL Axiom-MT console. On hand for overdubs at Kampo were Vandross, Springsteen and Van Zandt.

The following day, the Record Plant in L.A. hosted members of Limp Bizkit and Orgy, the Pointer Sisters, All-4-One, Queen Latifah, Deniece Williams, Jackson Browne, Sophie B. Hawkins and Taylor Dayne for their contributions to "We Are Family." (Rodgers himself flew out for that session, as well.)

The "We Are Family" remake was released by Tommy Boy Records, with proceeds going to the American Red Cross, the NYC Firefighter's Relief Fund and other entities with ties to the World Trade Center tragedy.

While studios sought ways to help those affected by the terrorist attacks, at Ground Zero at least one member of the audio business took as hands-on an approach as anyone could. David Crafa, owner of the Cutting Room recording studio on Lower Broadway, put his welding experience to good use by assisting in the rescue and recovery effort. He saw harrowing sights, but kept his cool and worked hard during the weekend immediately following the tragedy. As he cut large pieces of steel to try to open up areas that might contain survivors, the famous bucket brigades carted away piles of debris pound by pound.

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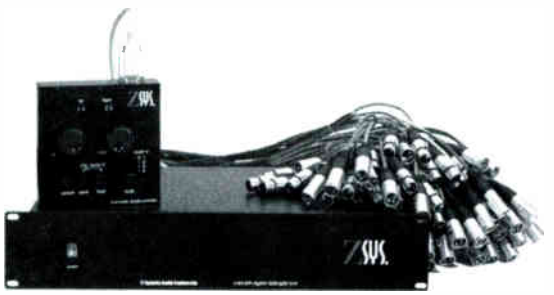

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Sadly, neither Crafa nor any other rescuer found anyone alive after Wednesday, September 12. However, the experience of helping out left Crafa feeling like he had made a real contribution to the post-attack recovery.

"It was definitely an experience," says Crafa, who witnessed the second plane crash and the collapse of both towers from his 34th floor apartment in Greenwich Village. "After seeeing all that and having some friends in the business asking me to go down, it was the only place I wanted to be."

Like many studio owners whose facilities are located below 14th Street, Crafa saw bookings disappear in the aftermath of the tragedy. However, by mid-October, he was happy to report that business was starting to pick up again.

At the Magic Shop in Soho—a mere 10 blocks from the World Trade Center—two staff members lost relatives and friends in the attacks, and one of the studio's technical gurus, Nat Priest, narrowly escaped death as he and his girlfriend fled their apartment across the street from the Twin Towers just before the collapse. Miraculously, business went on at the Magic Shop, despite the dust clouds, the security checkpoints and the surreal atmosphere.

Another session that went on as planned, against unbelievable odds, was a unique project by Peruvian artist Susana Baca at Globe Studios, on West 13th Street. The session was to have been a live recording in front of a studio audience of journalists—including members of the European press who were scheduled to be in town for the *College Music Journal* (*CMJ*) Conference—as well as representatives from the artist's label, David Byrne's Luaka Bop Records. The first three days—September 10, 11 and 12—were booked for rehearsals, with tape rolling "just in case," according to Globe owner Bob FitzSimons. Following the rehearsals, three days of recording were slated, with John Medeski and Marc Ribot augmenting Baca's band.

The September 10 rehearsal went on as planned, with the musicians getting a feel for each other, the studio, and the production and engineering team of Craig Street and Danny Kopelson, respectively. A Belgian film crew that had been hired to film a documentary of the project was on hand, as scheduled.

Then, on September 11, things got interesting. With fear and uncertainty in the air and a lockdown state all over Manhattan—especially south of 14th Street—no one knew what to expect from that day's session. However, according to FitzSimons, when Baca and her bandmates arrived, they told him, "Look, we live in political terrorism. We're sad, but we must work, and you must work."

With that, the six-day project proceeded, despite difficulties by Globe staffers in getting to the studio, as well as concerns on the part of Ribot and Medeski about the air quality in lower Manhattan.

"It was the perfect distraction," says FitzSimons. "That's what we did for the next several days—we just worked. Even though I saw the attacks from the street as they were unfolding, I didn't fully really realize what had happened until 10 days later. That's when it really struck me." ■

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—FROM PAGE 197, NASHVILLE SKYLINE

ating cost," he says. "But you can't do that for the same reason you can't advertise on college radio—commercial radio stations would demand that college stations pay fees and taxes and everything else. There's another irony here: How would you like to have your employees paying you to work at your studio?"

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Kautz was also skeptical about the motives of some Belmont alumni, noting that Vince Gill, a graduate of the program, was at the press conference at which the sale was announced. "The artists who are donating money to the program are the same ones who are demanding that studios give them the best service at the lowest rates," he complained. In a published interview, Javalina Recording owner Warren Peterson suggested that some Nashville studios may no longer be receptive to taking in Belmont graduates as interns. "They shouldn't compete with us if they want to get students placed," he told a reporter.

Others, however, seem less concerned. Engineer/mixer and co-owner of Back Stage Studios Chuck Ainlay stated that, "I don't mind Belmont getting involved in the studio business as long as they run it legitimately and don't undercut the rate structure. That would be my biggest worry. But I'd rather take a wait-and-see attitude than be alarmist about it."

Dino Elefante, co-owner of Sound Kitchen Studios, echoed that sentiment, adding, "We don't see it as anything but positive. We see an opportunity for students to see a traditional recording environment like that as a good thing."

Gary Belz, who remains owner of East Iris Studios in Nashville and House of Blues Studios in Memphis and L.A., believes that Belmont will be responsible to the community in the manner in which it operates the facility. "I mean, it's pretty funny when you think about it," he observed. "Most commercial studios are already nonprofit operations. There's a lot of irony in there." He also said that it was his and Sides' understanding that the school would maintain the standards the studio has set for service and maintenance.

Belz further suggested that Belmont may have seen a strategic benefit for the school in acquiring a world-class studio facility. "It helps position Belmont internationally, the way that [SAE owner] Tom Misner's 301 studios around the world do for his schools," he said.

Meanwhile, Emerald Recording has ended a joint venture with The Parlor, a small Music Row studio, and moved the SSL 4000 Series console it had put in there two years ago into what had been the former 16th Avenue Studios down the block. 16th Avenue Studios was, ironically, the first of the Row's major studio facilities to throw in the towel, in 1998, as Nashville's music industry was at the doorstep of what has become a lengthy economic recession. Emerald's Andrew Kautz said that the joint venture ended amicably, and that the space at 16th Avenue Sound was still ready to roll a console in and begin work. "It's the same acoustics as before," he said. "Even the wiring was there waiting to be used again."

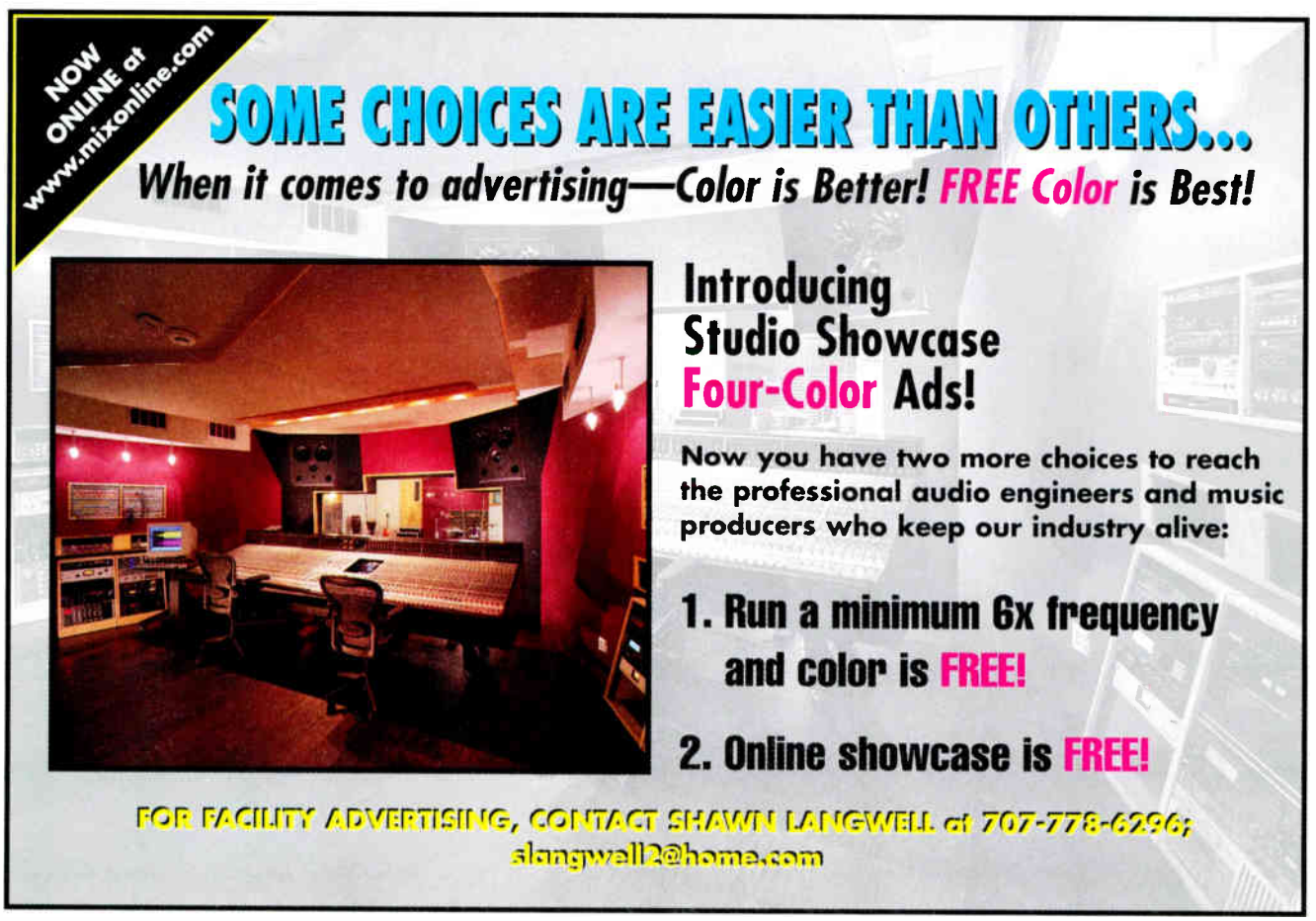
Finally, the same week, Milan Bogdan, considered by many to be the dean of the studio management corps in Nashville, with stints at Masterfonics, Ocean Way and most recently East Iris, has departed that studio and the studio business altogether, he said, to devote his attention to a burgeoning music publishing business he co-owns, and which he says has already been very successful.

Bogdan says he'll miss the business in some respects, but added that he also expects the studio industry here to continue to deteriorate. "The present rate structure here won't allow for a profit," he said. "With things like the Belmont transaction, I don't see that changing anytime soon."■

Send your Nashville news to danwriter@aol.com.

—*FROM PAGE 197, SESSIONS & STUDIO NEWS*

tarist Brent Rowan, who was working on a self-produced solo album. Johnson was the assistant engineer.



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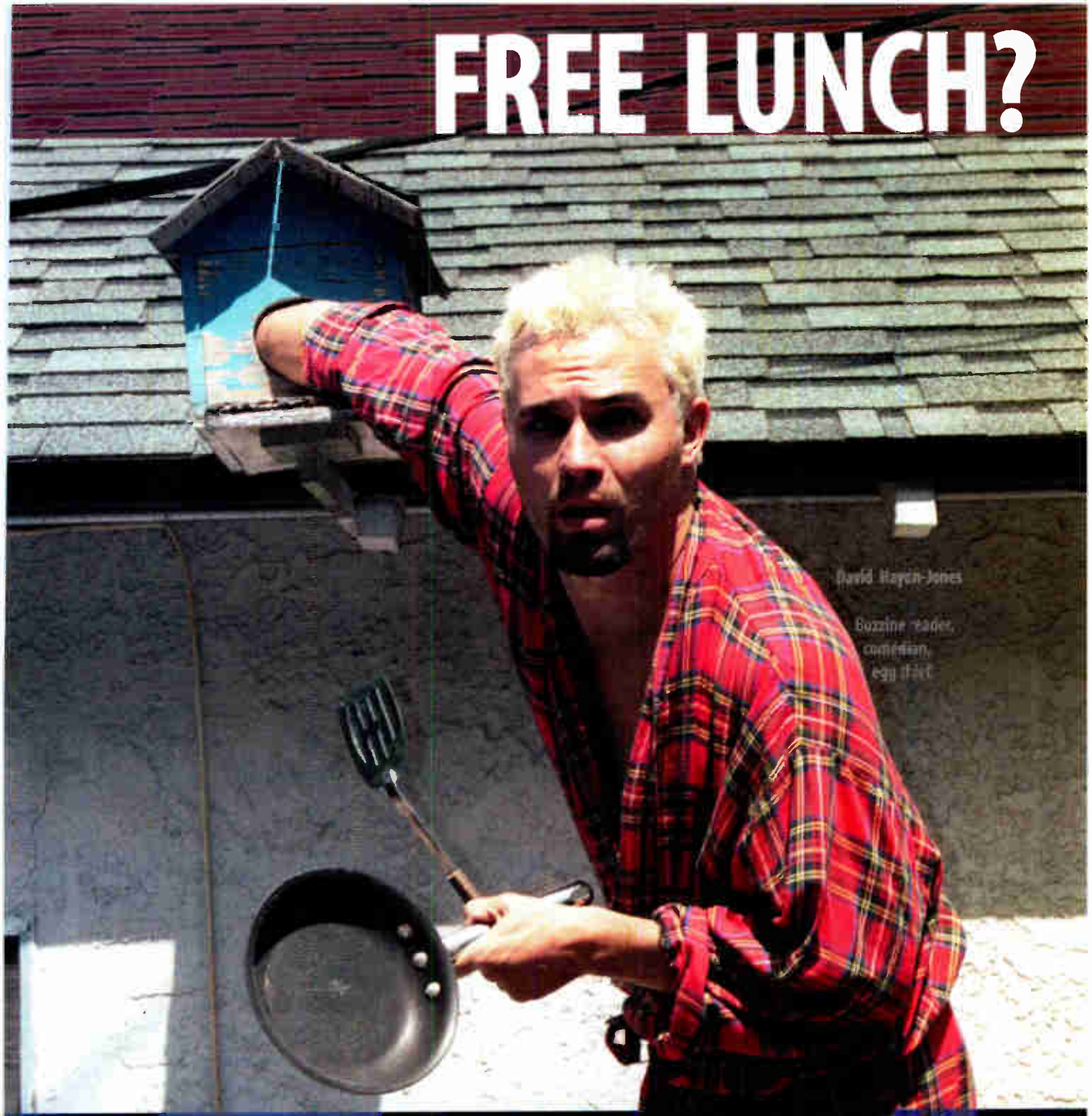

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Gentlemen prefer redheads at The Village (L-R): producer Andrew Ross, engineer Greg Morgenstein, Nicole Kidman and assistant engineer Matt Marrin.

SOUTHERN CALIFORNIA

C'est chic! Last fall, Tom Cruise's former better half, **Nicole Kidman**, sashayed her way into **The Village** (West Los Angeles) to work with producer **Andrew Ross** on the second soundtrack for the film *Moulin Rouge*. **Greg Morgenstein** engineered the session, and second engineer **Matt Marrin** kept everyone honest...Jazz saxophonist **Kenny Garret** cut his new album *Happy People* with engineer **Bill Schnee** and producer **Marcus Miller** at **Ocean Way** (Los Angeles). The LP is set for release on Warner Bros...**Patrick Giraudi** and **Kelly Vandever**, independent film re-recording mixers, burned the midnight oil at **Ideal Post Sound** (Hollywood), finalizing the mix for the new film *Rent Control*. The entire project was handled within the Pro Tools/Pro Control realm. The film was directed by David E. Brenner and stars Carmen Electra.

NORTHWEST

The Bay Area's own **Green Day** returned to **Studio 880**'s (Oakland, CA) Studio A, where they recorded their current album *Warning*, and to work on two new songs for their upcoming *International Superhits* record. **Jerry Finn** was in to produce, **Joe McGrath** engineered and **Reto Peter** assisted. Inside Studio B, **OXBOW** were busy working on their new record for Neurosis' label Neurot Recordings. **Gibs Chapman** was in to engineer the effort, and **Marco Martin** assisted...Sessions at **Rainstorm Studio** (Seattle, WA): Portland indie rock band **The Six Minute Heartstop** recorded an EP for Rise Records. **Steve Carter** co-produced the effort with the band, and Rainstorm owner **Paul Speer** mixed the project. Hip hop group **Rebelz** cruised in to record their debut album, with Carter engineering and Speer mixing. Dutch label Bee and Bee Records tapped Speer to mix a new album from Slovakian rock group **Miscellane**. ■

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PHOTO: DAVID GOGGIN

No Doubt put the final touches on their new album for Interscope Records, Rock Steady. Pictured during the sessions at Bernie Grundman Mastering are (L-R) No Doubt's Adrian Young, Tom Dumont, Tony Kanal, Gwen Stefani and mastering engineer Brian "Big Bass" Gardner.

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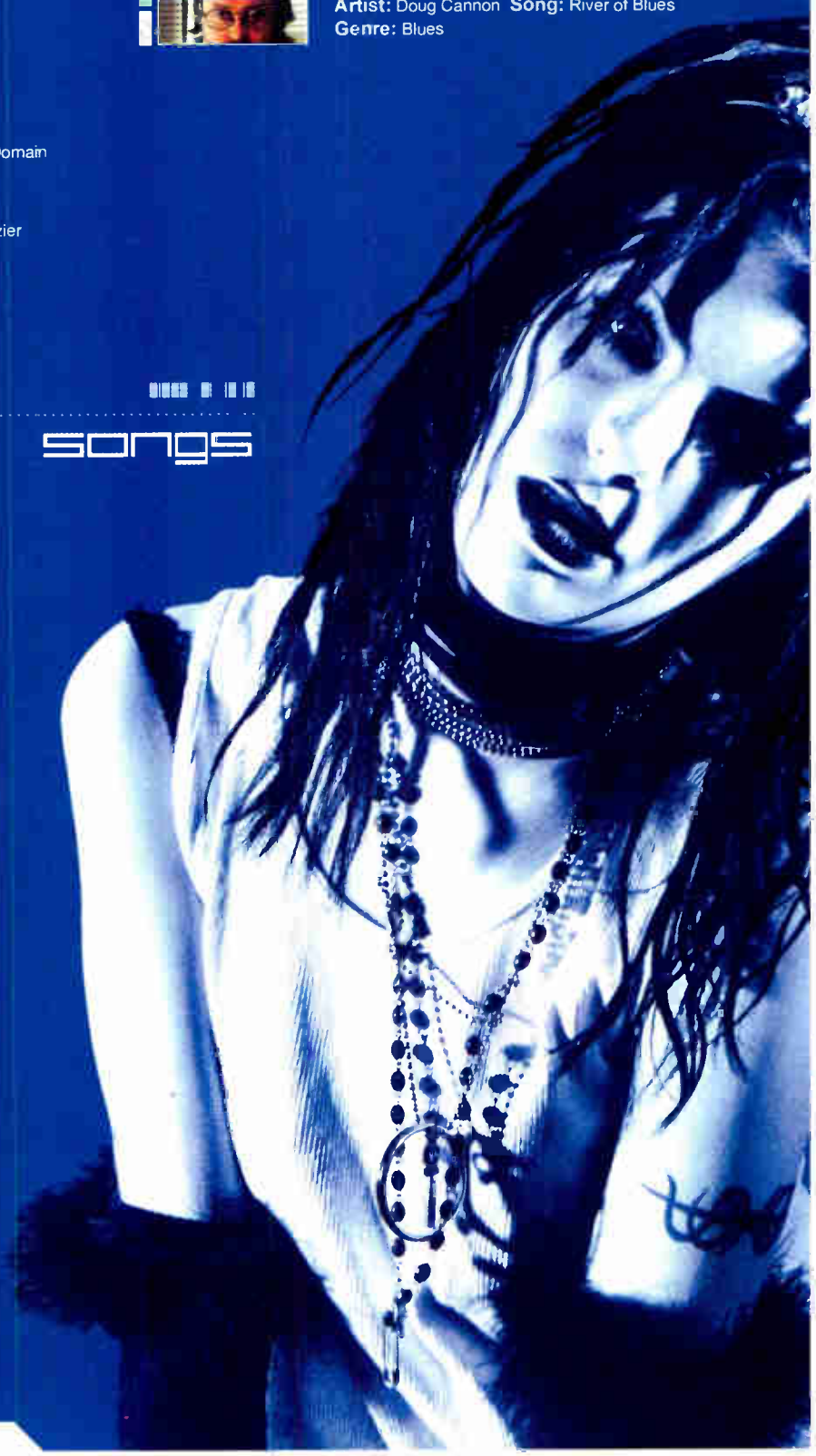

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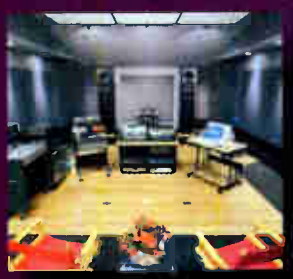

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—FROM PAGE 20, EENY, MEENY, MEINY, MO

they had, a lot of material was incompatible. Laserdiscs went away. I have about 200 sitting here de-laminating as we speak. Can't win 'em all.

SIXTEEN CANDLES SHOWED THE WAY

But the incredible success of CDs—with *one* standard I might add—restored the public's faith in little, round, iridescent, data-bearing reflectors. Every player played every title. You knew that if it was the right size, you could play it.

But as that core technology grew to encompass reasonably high-quality video, it was inevitable that the level of complexity would grow to fill its potential.

Multichannel films came out, and as others besides Dolby Labs began examining what could actually be done, the standards war began in earnest. It took a very short time before real golden ears like Tom Jung began to look to higher-quality encoding for his ultraclean direct recordings. It turned out that many people could actually hear and appreciate word lengths beyond 16 bits. Even in cases where the end product is 16-bit, new, more intelligent ways of dithering and shaping the data as it is crushed to that 16-bit final product were developed.

Some of these new data definitions were compatible with existing pressing and playback technologies, while other people felt that they could do so much more if they were released from the aging (remember, "aging" in this case is five years or so) existing standards.

And so it is, for a broad range of reasons. On one end, we have companies that truly wish to advance the state of the art, and feel that it can't be done properly if they attempt it within the limitations of current technologies. On the other, we have companies that use their massive weight to bend the direction of audio storage and playback technology to assure dominance in the market. It is they who perpetuate that never-ending cycle of "you just ain't cool if you ain't got the new 12.7-channel CD-RW-DVD-R-NetMD with MDLP-MP3 FireWire player with special 12-cup earphone headgear and anal subwoofer transducer." I haven't been able to sit comfortably for a week. Those bastards.

And then there are these features that the designers feel every 15-year-old kid wants, even at the "negligible" expense of actual audio quality. Hey, I admit it, I bought an iPod the very hour it came out. I enjoy the iPod's incredible control and convenience, mostly the playlist architecture, so much that I am willing to encode my CDs into the horrid world of MP3 just to use the iPod when I fly. Now, I assure you that I am using the newest, coolest, hot-rod VBR encoder, and I use the max data rate. But I have to face the fact that I have made a decision to listen to far-less-than-perfect music in order to have more fun doing it. The whole thing is loaded with oldies anyway, so I'm not really giving up so much. I am *so* close to believing this...

SO MANY VARIABLES, IN SO LITTLE TIME

Number of channels, type of encoding, data rates and so on—all fighting for world dominance. Some compatible with others to some compromised extent, some sounding rancid, some pretty damned good. And all the while, hiding behind the illusion that everything was safe because no matter what standards war was going on behind the scenes, they all used the same old silver CD that we knew and loved. Ha.

Certainly, new standards must be indefinitely developed and accepted if the state of the art is to advance. And though we as consumers appreciate compatibility, and to a somewhat lesser extent "backward compatibility" (one of my favorite ways of saying it's over), we must accept occasional jumps that leave what we have just bought in the dust. That's why one of the most important technological advancements of all time came to be—eBay.

As I almost never complain without advocating an alternative, I ask this: As new proposals appear from every corner of this world whenever a given technology has stabilized, while its technological possibilities have advanced, and because the time it takes for this condition of technological potential gap stress to develop has grown logarithmically shorter as tech growth rate in general has increased just as dramatically, and as sentences lengthen beyond what was once considered possible, that we, the industry that actually decides how the world of audio and video will function, carefully weigh the validity and advantages of each new standards proposal against the real costs to the industry and the consumer.

SSC has apparently been exposed to a few too many audio-for-film formats this year. Have you?

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Polar Pattern: cardioid
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Output Noise: <17dB typical, A weighted
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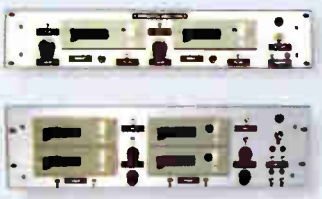

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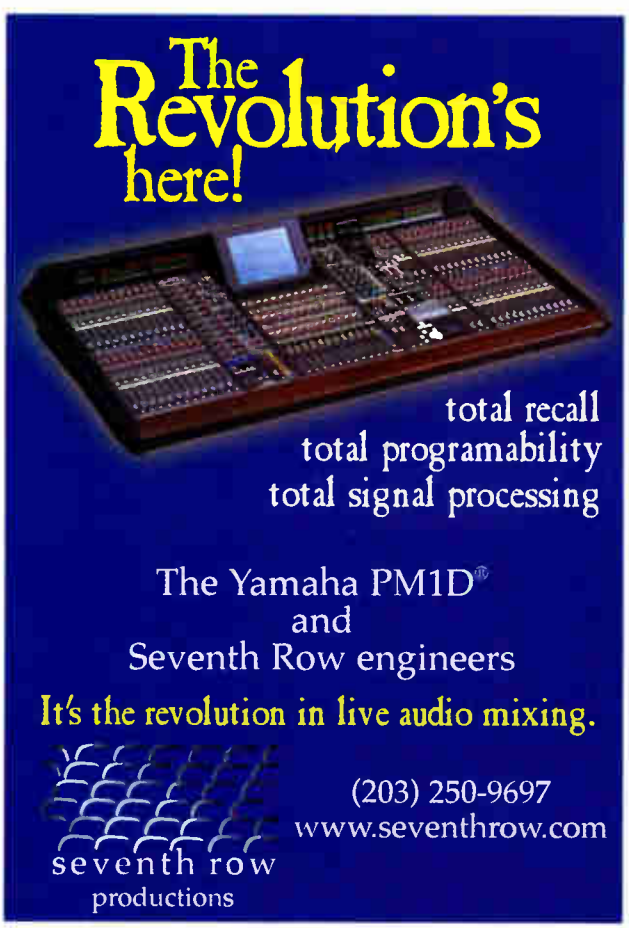

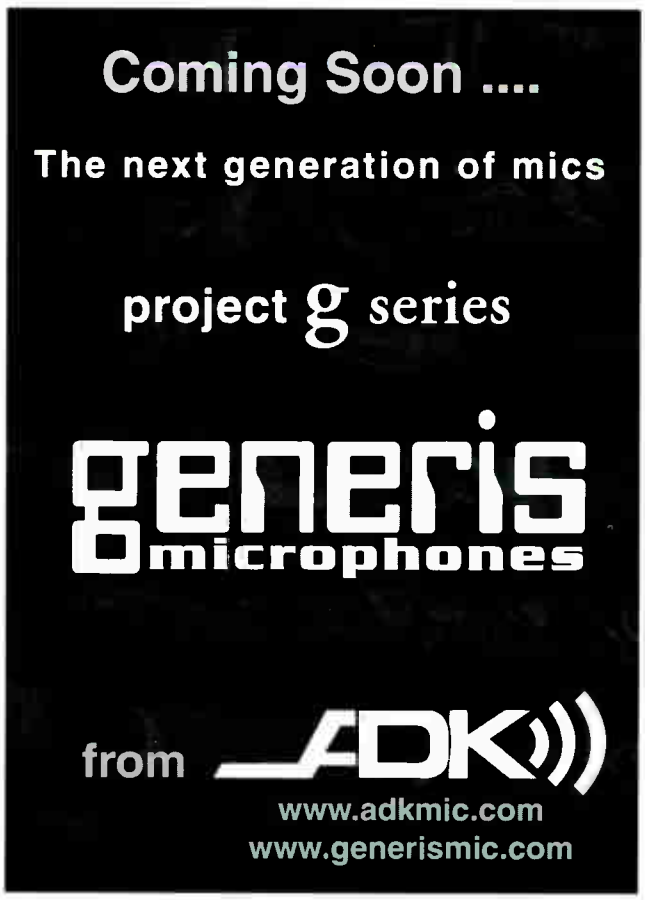

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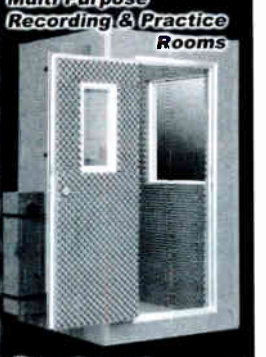

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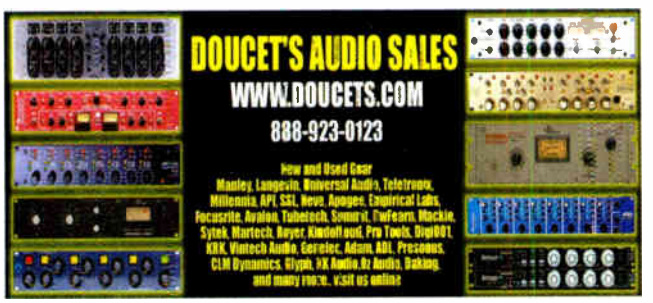

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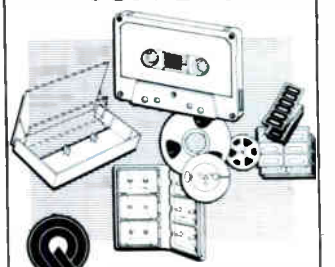
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World Radio History

—FROM PAGE 26, STRANGE TIMES, OTHER VOICES

They caught the last train for the coast
The day the music died

Peace love and understanding
There must be some place for these things today
They say we must fight to keep our freedom
But Lord there's gotta be a better way
That's better than
War
What is it good for
Absolutely nothing
Say it again

99 Decision Street,
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To worry, worry, super-scurry
Call the troops out in a hurry
This is what we've waited for
This is it boys, this is war
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As 99 red balloons go by.
99 dreams I have had
In every one a red balloon
It's all over and I'm standin' pretty
In this dust that was a city
If I could find a souvenir
Just to prove the world was here

So what *do* these songs have in common? Just this: If a certain very powerful group of individuals had had their way, then in the days following the attacks on New York and Washington, you would not have heard any of these songs on the radio. Was it the FBI, thinking there were secret terrorist messages in the songs? Was it the Defense Department, worried that these songs would undermine morale? Was it the demagogues who dominate the talk-show airwaves frothing about the degenerate culture of pop music?

It was none of these. Clear Channel Communications, the largest owner of radio stations in the U.S., with almost 1,200 properties, or about one in 10 stations nationwide—including a presence in 247 of the 250 biggest markets—sent out a private memo advising their program directors not to play any of these, or more than a hundred other songs. And besides the songs, one band was mentioned without even bothering to list any of its titles: none of Rage Against the Machine's music should be played, period.

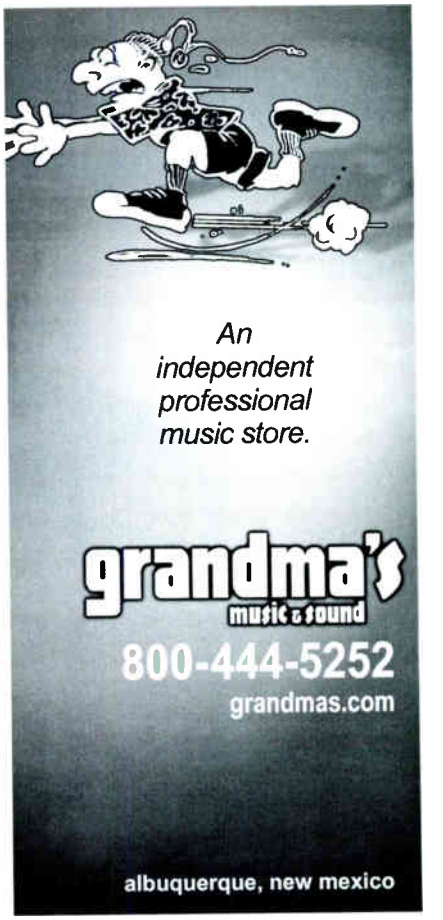
It wasn't a "banning" *per se*, and a number of Clear Channel stations reportedly ignored the list. When the story showed up on the front pages of newspapers around the country, the company quickly backpedaled, telling some news outlets that it was a "grassroots effort" by several program directors, while saying to others that the central office had indeed put out a "small" list of songs, and then other people within the organization added to it. But however it was created, a lot of the stations apparently quietly went along. "After all," said one wag, "these are the guys who sign the paychecks and will be looking at future job applications."

One of music's functions in any society is to unify. In America, whenever folks plan a fund-raising event, whether it's to send the varsity lacrosse team to the state semi-finals or to raise funds for the victims of disaster, the first thing they do is get a band. The telethon on September 21, which to date has raised some $150 million, was an amazing example of how music can help galvanize people to action. But music has another function, and that is—like art, poetry and other forms of creative expression—to make us think. Creative artists provide other ways to look at the world, and those alternate perspectives are particularly important during highly emotionally charged times.

Clear Channel is, for better or worse, one of the chief arbiters of the music we hear. Their decision to put a record on the air is based on taste, or record sales, or any of a number of criteria. They are entitled to their decisions. But for the largest radio chain in the country to decide that some music is too *dangerous* to play is an insult—both to their own program managers and to their audience. And to cast a net that snares everything from Rage Against the Machine to Neil Diamond to Simon & Garfunkel is ludicrous.

If the nation wants to use the power of music to unite and heal, then it also needs to acknowledge the power of music to disagree. Democracy is about making sure everyone's voice is heard, whether they support what their government is doing or not. At times of crisis, we need to hear many more voices, not fewer. If the voices of dissent—whether they're in speeches, in newspaper columns, on billboards, painted on the sides of highways, or sung or rapped—are stilled, then those who want to destroy this country—whoever and wherever they are—have won. ■

Paul Lehrman is Mix*'s "Insider Audio" columnist and Web editor. The titles and authors of all of the lyrics quoted can be found on mixonline.com.*



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BIAS Peak 3.0 for Mac OS 9 and X, is the ultimate editing, processing, and mastering companion for Digital Performer! Peak gives you lightning fast, nondestructive waveform editing with support for audio files up to 32 bits and 10 MHz, including 24-bit/96kHz files. Unlimited Undo/Redo gives you the freedom to work creatively. Select an audio region in DP, choose the "Use External Waveform Editor" command, and instantly switch into Peak! Peak's sophisticated options for on-the-fly marker, region and loop creation are simply unparalleled. Advanced DSP and looping tools include Convolve, Repair clicks, Loop Tuner™, Loop Surfer™, Loop It™ and Guess Tempo™ and more. Process thousands of files, or just a few, using Peak's batch processor. Peak directly supports all MOTU audio interfaces and includes Roxio Toast™ Lite CD for burning your own redbook audio CDs directly from Peak's powerful playlists. Create web or multimedia content for export with multiple file formats, including Apple's QuickTime.

Aardvark Aard Sync II™

Ultra-low jitter master clock for your MOTU studio

The problem? Multiple word clock devices that you need to sync perfectly with your MOTU system. The Solution? The AardSync II Master Clock from Aardvark. The Aard Sync II will make everything in your studio slave together smoothly. With four industry standard word clock outputs and ultra low-jitter performance, you can set the Aard Sync II to generate any digital audio sample rate desired—not only 44.1 and 48 kHz, but also the pull-up and pull-down rates required for film and video applications. The AES/EBU outputs are low-jitter approved and make any converter sound more accurate. No clicks, no pops, no falling out of sync! Slaves to video blackburst in both NTSC and PAL/SECAM format. If you've got multiple digital audio devices in your MOTU studio that need to stay in sync, Aard Sync II is the wonder box you've been looking for. Call Sweetwater today to find out more.

RADIKAL TECHNOLOGIES SAC-2K™ controller

Precision touch-sensitive automated worksurface

The Radikal Technologies SAC-2K sets a new standard for hands-on control of Digital Performer with a custom plug-in for DP and easy, one-touch access to every element of the recording process in Digital Performer with responsive, touch-sensitive automated controls. Within minutes, you'll achieve a whole new level of interaction and creativity that you never thought possible with fader groups, mix automation, plug-in automation (up to 12 parameters at once), transport with jog/shttle, solos, mutes...it's all just one touch away.

order yours today

Sweetwater®
music technology direct™

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Apple G4 Titanium PowerBook
Or a dual-processor G4 desktop for maximum horsepower

MOTU DP3 audio workstation software
Now with full surround production up to 10.2

MOTU 828 FireWire audio interface
Or a MOTU PCI interface like the 2408mkII or 1296

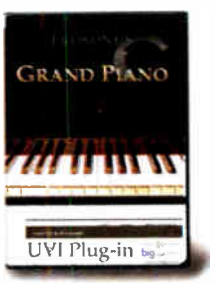
Altiverb™ Add real acoustic spaces to your mix with the first and only sampled reverb plug-in

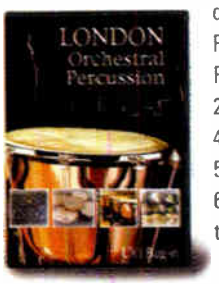
Pictured here is the Concert Gebouw, a world-famous concert hall in Amsterdam with superb acoustics. Altiverb, the first (and only) real-time sampled acoustics plug-in, delivers the sound of this hall to your Digital Performer virtual studio — along with dozens of other sampled acoustic spaces. Altiverb is an astonishing breakthrough in reverb technology because it fully reproduces the acoustic qualities of real spaces, rather than synthesizing an approximation with artificial algorithms. Only a few very expensive ($10K+) hardware processors offer sampled acoustics processing, but Altiverb gives you this unsurpassed level of realism for less than $500, thanks to the amazing "Velocity Engine" Altivec processor in all G4 Power Macs. Provides dozens of real spaces, from concert halls to closets, or sample your own! Now shipping exclusively for Digital Performer. VST version coming soon.

UVI Plug-ins™ Universal Virtual Instrument plug-ins for Digital Performer and MAS

bigfish audio™

The UVI Plug-in will revolutionize your Digital Performer system. It's a playback sampler that opens as a plug-in right inside your Digital Performer project. With nine brand new titles to choose from, you can have a different sound library with hundreds of samples at your fingertips. What makes this plug-in so unique? Instead of trying to cram an entire sound collection into a ridiculously small amount of RAM, these libraries serve as a virtual sound module right inside DP. No more wasted time loading CD-ROMs, waiting, listening, loading again, waiting some more... With UVI plug-ins, the patches are loaded in seconds and are available directly inside Digital Performer. There's nothing quite like this! London Orchestral Percussion, Prosonus Orchestral Collection, Prosonus Grand Piano, Six PlugSound Volumes: 1-Keyboards, 2-Frets, 3-Drums, 4-Hip Hop Toolkit, 5-Synth Collection, 6-Global and more titles on the way.





UVI Plug-in™

Cool School Interactus™ Vol. 6 — Interactive Training for Digital Performer 3

From the newbie to the guru, there's no better way to get more out of Digital Performer than CSi Volume 6. It's like having a DP product specialist looking over your shoulder, with click-for-click tutorials, a massive glossary of DAW-related terms and over 40 movie tutorials. Includes our new "AutoPlayer" mode: just sit back and soak up the info!

SweetCare™ 24-hour support from the MOTU system specialists!

Nobody knows MOTU-based systems better than Sweetwater. So we've developed SweetCare, one of the most comprehensive approaches to technical support in the music industry. On the web or in person, our commitment to helping our customers is our passion. Our 23 years of experience with advanced music technology products from companies like MOTU is at your disposal 24/7 via our online 24-Hour SweetCare Support Center or in person six days a week with new extended hours on Saturdays. SweetCare includes on-line services beyond just Q&A, such as in-depth articles, live media, online forums, and the most complete knowledge base of musical and technical information available anywhere. Visit www.sweetwater.com/support for complete details.

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Expand Your MOTU Desktop Studio

Start with MOTU's ultimate 96kHz, 32-bit native recording system

Avalon VT-737 SP™ Tube preamplifier / opto-compressor / Class A equalizer for your MOTU interface

The VT-737SP brings that magic Avalon sound to your MOTU workstation. Run your dullest, most sterile mic through the VT-737 SP and you'll be amazed at how warm and sweet it sounds. This 2U space combo brings a new standard to high-end audio, taking your sound to places you never thought possible and giving you precise creative control. With vacuum tube and discrete design, the VT-737SP provides a wide range of tube tone and control: Avalon sound with maximum flexibility.

AVALON DESIGN

PURE CLASS A MUSIC RECORDING SYSTEMS

PreSonus DigiMax™ Pristine 8-channel mic pre-amplification for the MOTU 2408 audio interface

Why is the PreSonus DigiMax perfect for your MOTU rig? Because it's the purest path to digital. DigiMax combines 8 channels of award winning 24-bit mic pre-amplification with our unique simultaneous RMS/peak detection limiting and EQ enhancement, giving you maximum gain before clipping while maintaining the musical transparency of a compressor. The result? Fast, natural and versatile limiting on every channel. And DigiMax connects all 8 channels via ADAT optical to your MOTU 2408 system in pristine, 24-bit digital glory. And you can expand: add up to 3 DigiMax's to your 2408.

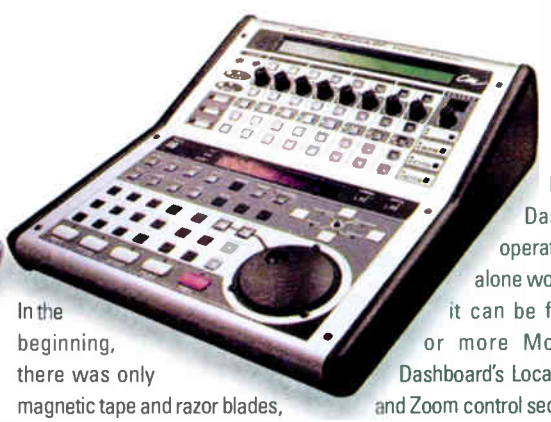
CM Labs MotorMix™

Hands-on automated mixing for Digital Performer

With its new, custom software written specially for Digital Performer, MotorMix becomes a seamless, tactile extension of your MOTU software recording environment. Put your hands on eight 100mm motorized faders and rotary encoders to tweak your mixes in record time. Gain instant easy access to all MIDI and audio tracks with control banks. You'll never even think about mixing with a mouse again. Imagine having tactile control over most of Digital Performer's features with MotorMix's intuitive layout and easy operation. MotorMix gives you all the advantages of a professional mixing board, at an incredibly affordable price. Bring motorized mixing to your MOTU desktop today. For more info, visit cmlabs.net or contact your Sweetwater sales engineer today to enter the future of mixing.

CM Labs DashBoard™

Editing worksurface for Digital Performer



In the beginning, there was only magnetic tape and razor blades, but editors could still make over 200 edits per hour! Dashboard restores speed and finesse to editing with DP3 and eliminates fatigue caused by point-and-click editing. Dashboard will bring you the same level of control to Digital Performer as the very popular Motor Mix. Dashboard can operate as a stand-alone worksurface, or it can be fitted to one or more Motor Mixes. Dashboard's Locator, Navigator and Zoom control sections get you qickly to where you want to edit, and the Clipboard section makes your actual edits. You can arm and record tracks remotely with Dashboard just like machine control. The mixer section provides access to Digital Performer's mixer and plug-ins.

order yours today Sweetwater® music technology direct™

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Dual-processor G4/MP800
Capable of 128 tracks with 8-band EQ and dynamics on every track

MOTU DP3 audio workstation software
Now with full surround production up to 10.2

MOTU 1296 12-channel 96kHz audio interface
Or any MOTU PCI interface like the 2408mkII or 1224

WAVES Gold Native™ Version 3.2

Optimized perfomance and complete automation

Check out the new Restoration Bundle
download the demo at www.waves.com

Waves Native Gold gives you the complete line of legendary "must-have" Waves processing, including C4 MultiBand and Renaissance Reverb. Version 3.2 introduces cutting edge performance optimizations and complete MAS automation. What does this mean for you? Apply more Waves processing to your mixes than ever before possible. Automate your Waves plug-ins with pristine, sample-accurate precision and 32-bit floating point processing. You get everything you need to track, sweeten, sound design and master. Get Native Gold now and join the top industry pros who rely on Waves to make their mixes Gold everyday.

Smart Code Pro™

Surround Encoder Plug-ins For DP3

KIND OF LOUD

SmartCode Pro is the first and only surround encoder plug-in for Digital Performer. It allows you to deliver fully encoded surround mixes to your clients. Burn CDs or DVDs that you can preview using any consumer DVD player that supports Dolby Digital™ or DTS™ — a crucial final step in producing professional quality surround mixes. By encoding with Smart Code Pro directly within DP3, you avoid having to invest in expensive dedicated hardware encoders (that cost thousands), which saves you both time and money.

SmartCode Pro is available in two versions to accommodate the two most widely used surround formats: Dolby Digital and DTS. Both versions allow you to preview your 5.1 surround mixes in real time 5.1, then encode and decode the mix to create a 6-channel surround master. Smart Code Pro is a must-have for serious surround production with DP3.

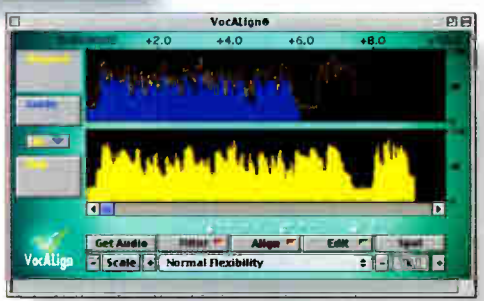
GLYPH TECHNOLOGIES, INC. M Project™

High-performance FireWire hard drive storage

M Project is the new FireWire hard drive for your MOTU hard disk recording system from Glyph Technologies. M Project adds up to 75 GB of audio storage to your MOTU rig in seconds, backed by Glyph's lengendary service and support. M Project is the only MOTU-approved FireWire drive for the 828 and all MOTU PCI-324-based systems, including the 2408mkII, 1296, 1224 or 24i. M Project easily shares the FireWire bus with the 828, and even allows you to connect multiple 828s to your computer. And M Project is the ideal alternative to SCSI drives because it frees up a PCI slot. So call Sweetwater today and ask about M Project, the ultimate storage solution for MOTU hard disk recording.

SYNCHRO ARTS VocALign™ Project

Unique automated audio alignment software



Still spending hours re-recording dialog or vocals? There is another way! Because of its unique ability to align two signals, VocALign can be used creatively to take guide or even live tracks and create performances with perfectly aligned overdubs. VocALign also gives the producer the ability to choose the rhythm and pace for a specific vocal, or even lay down the required tempo pattern for the artist. VocALign gives you perfectly aligned double-tracked vocals, tight backing vocals, easy re-grooving of recorded vocals for remixing and shorter overdub sessions. For post-production, VocALign is designed to take a line of replacement dialog and precisely align it with the dialog recorded with picture. And VocALign Project™ integrates seamlessly with Digital Performer 3. At only $299 list, can you afford to be without it?

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ALESIS MASTERLINK

ACCESS 100 PERCENT OF THE POWER

When DAT recorders evolved to their technical limits, the Alesis Masterlink stepped up to the next level. Most users treat Masterlink as a storage device, because recording, basic editing, burning a reference CD and archiving are a breeze. More than a 24-bit/96kHz recorder and CD burner, Masterlink also offers onboard SHARC DSP processing, but few Masterlink users take advantage of the unit's onboard compressor (DSP-1), multiband EQ (DSP-2) and peak limiter (DSP-3) features. Here are some hints to get the most from your Masterlink.

COMPRESSION

Because Masterlink's compressor threshold starts at 0 dBFS (as in full-scale), the only place to go is down. The gain reduction is quite literal—the reverse of what I had expected, because some compressors add gain to meet the threshold—but the Alesis approach allows for some headroom for the processing that follows, and the metering option within the DSP-1 menu structure in Version 2.11 is helpful. Another reason to upgrade to the latest software.

EQUALIZATION

The lack of an interface makes Masterlink's EQ rather challenging. You have to paint with broad strokes because microsurgery is just too tedious. With three bands—plus "Q"—for each band, there are plenty of options. Patient people will either be rewarded or carried off to the loony bin.

LIMITER

Like the compressor, limiter threshold starts at 0 dBFS. From there, it behaves in a completely opposite manner—gain is increased as threshold decreases. Attack is fixed (fast), while release has an extremely wide range, from 25 microseconds to 9.9 seconds.

NORMALIZATION

Of all Masterlink DSP functions, normalization (DSP-4) is the least understood. Last in the chain, the Normalizing tool can be considered a "level scanner" that reports the headroom margin. The resulting report can be engaged or not, or anything in between. Part of the mastering process is to make all of the pieces fit—this does not always mean maximizing the level. Rather than continuing the habit of "slamming zeroes," 24-bit technology allows our ears a little relief. You can commit and dither later.

In a traditional workstation, a track is scanned for its peaks—the distance between them—"digital zero" is determined, and, if desired, the level of the entire track can be raised by that amount and, typically, a new file is rendered. Masterlink can also scan the track for peaks, entering the amount into a window, so users can tweak or toggle on/off in real time. Masterlink normalization is a DSP process, and there's no need to render a new file. However, because DSP-4 is at the end of the chain, it becomes a moving target, subject to the amount of other processing that is done. For example, calculating the headroom above the peaks—with all processes off—might yield 4 dB of headroom. Add some compression, EQ and limiting, and the amount of normalization will change. Because normalization is virtual and therefore "real time," it can be switched in and out. You'll know right away if re-calculation is necessary.

BY EDDIE CILETTI

DRIVE SPACE: THE FINAL FRONTIER

The most desirable Masterlink upgrade is replacing the internal 4.3GB hard drive with something larger. To be safe, cable length should not exceed IDE's 18-inch standard. Other users have recommended a 20GB, 5,400 rpm EIDE drive. I tried a 40GB Western Digital drive without success, but a Maxtor 40GB drive worked fine when one of its jumpers was set to "4092 cylinder limit." The original 4.3GB drive held 5.3 hours of 44.1kHz/16-bit material. The 40GB drive bumped that to 51 hours! The manual doesn't breach this topic, but at least you can download the latest operating system plus an Adobe PDF version of the installation procedure at www.alesis.com. Also, info on other hard disk options can be found on my www.tangible-technology.com site.

On the removable side of things, www.TigerDirect.com sells pull-out drive caddies for about $15 and the ROMTEC "Trios," a 3-drive selector box that's $49 after rebate. Trios is designed for computer users who want separate operating systems on individual drives. It worked flawlessly with Masterlink.

I'd like to thank Bennet Spielvogel, A.T. Michael MacDonald and Greg Prestopino for their contributions to this article. Visit www.tangible-technology.com for more about this Masterlink project.

Alesis Electronics, 1633 26th Street, Santa Monica, CA 90404; 310/255-3400; fax 310/255-3401; www.alesis.com. ■

World Radio History

Instead of attending the 2001 AES Convention in NYC, Mackie Designs has chosen to make a significant donation towards disaster relief and present our "exhibit" on line.

MACKIE.COM

Visit our web site for details of six new products, free show "swag," streaming video demonstrations and more.

NOV. 28-DEC. 31

RECORD! EDIT! PLAY!

Save your computer for e-mail.

Plug in the HDR24/96 Recorder/ Editor and start recording. No external computer to boot up. No hardware and software configuration nightmares. No compromises like settling for 20-bit audio or just 12 tracks at a time.

Recording is easy with the HDR24/96.

Simultaneously record 24 tracks of 24-bit digital audio…without waiting for lock-up, tape shuttle or CPU lag. Drop up to 192 alternate takes into "virtual tracks." Record onto affordable, removable media that you can swap in and out for each project.

And do it all with your hands on a familiar, analog-style machine (or two sizes of wired remotes) instead of resorting to myriad mouse clicks. All basic functions are right on the HDR24/96 front panel including transport buttons and a Record Enable button for each track.

Twenty-four track masters for under $10 each!! Divide the cost of a Mackie Media M90 into the 20+ pop tunes you can record on it and you'll appreciate why we call it an affordable medium. Non-linear hard drives store audio data only, not silence. Tape (and linear hard disk recorders) just roll merrily along… eating oxide and costing money.*

Editing is easy with the HDR24/96.

Plug in an SVGA monitor, keyboard and mouse, choose from 2x, 4x, 8x, 12x or 24-track views and then watch them scroll smoothly past a centerline.

Mark hundreds of cue points and 4 locate points for looping and auto-punch-in modes.

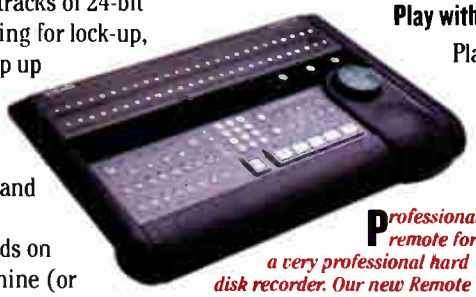
Use the mouse to "scrub" individual tracks, Cue, Punch and Loop points with continuously variable velocity.

You can mark a segment (or multiple non-adjacent segments) as a *region* and then cut, copy and paste it anywhere — onto a blank track or right in the middle of an existing track without erasing anything. The part of the track after the insert just "slides down".

You can audition regions or modify their start/end points instantly, capture them as "sound elements" for later use or quantize them to user-defined time grids.

Create fade-ins, fade-outs and crossfades just by dragging and dropping them …and then set their length by dragging the mouse.

Then use Track Render to combine all or selected regions of a track just as you hear it — complete with crossfades, volume envelopes, mutes, etc.



Professional remote for a very professional hard disk recorder. Our new Remote 48 lets you run two HDR24/96s – 48 tracks of total control including a weighted jog/shuttle wheel and full display!

Play with the HDR24/96.

Play back 24 tracks of pristine digital audio — instantly without any pause or lag time. It will be synched rock-solidly to everything in your studio — from MIDI-based sequencers to VTRs (via SMPTE and video black burst). Then let your partners, clients and friends "play" with your tracks anywhere in the world, thanks to the HDR24/96's Ether-net port and built-in FTP server.

Get a demo at a Mackie dealer.

Experience what we believe is the best of two worlds: the best standalone non-linear digital recorder, and an extremely robust editing system with ultra-functional graphic user interface.

Call toll-free or visit our web site (using that computer you won't need to tie up) for more info.

www.mackie.com • 800.258.6883

Need to back up a couple of songs? Plug a Mackie Media™ Project drive into the HDR24/96 external bay and transfer over 2GB to an ORB™ disk.

Made by Mackoids in Woodinville WA, USA

*based on average of length of current pop songs using 24 tracks @48kHz/24-bits and a liberal number of extra regions and virtual takes. Does not apply to extended trance remixes.

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World Radio History

Neil Karsh is the Vice President of Audio Services for New York Media Group. Recently, Karsh selected LSR monitoring systems for two of his Manhattan facilities, *Lower East Side* and *East Side Audio.*

"We've installed the first of our LSR 5.1 surround systems at East Side Audio and it's a great addition. The sound is extremely clear and is enjoyed by our mixers and our clients. Everyone is very pleased with the result."

New York

LSR. Profiles

The world's most noted recording professionals discuss the world's most advanced monitoring systems.

The World's Best Performing THX® Monitoring Systems Are Also The World's Most Applauded.

Since its introduction in 1997, the system-engineered JBL LSR Series has become a favorite choice of engineers, producers and performers, many of whom have also become its most loyal advocates. More important, this acceptance is found in every major geographic area of the recording industry: from Los Angeles and New York to Nashville and London.

LSR 32 LSR 28P LSR 12P

Monitors Whose Performance Profile Was Determined By Science, Not Opinion.

During a half century of building the most technically advanced studio monitors, JBL has developed a long list of working relationships with key recording professionals around the globe. As a direct result of this unique collaboration, these industry leaders have chosen JBL monitors more often than any other brand. Not once or twice, but consistently for decades. In fact, JBL monitors are a part of the history of recording itself. Consider as examples, the now fabled JBL 4200 and 4400 Series that, at their launch, actually defined an entirely new standard and new category of monitor. Such is the case now with the entire LSR line.

David Kershenbaum is a Grammy Award winner who has been on the cutting-edge of music production for decades. His discography is a remarkable *'who's who'* of popular recording.

"Speakers have always been important to me and I've had many systems that I have really loved. When Kevin Smith told me about LSRs, I tried them and was amazed at the accurate, flat response and how the mixes translated so well compared to other monitoring systems. Now we're using them to track our new records and we'll use them to mix, as well."

Los Angeles

JBL PROFESSIONAL

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