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Sound for Picture

- 'The Last Waltz' on DVD
- Dialog Recording for TV and Film
- Oscar-Winner Mike Minkler

Pro Tools|HD
In-Depth Review of the Switch to 192

Plugged in to Plug-Ins
Hot New Toys for Sound Sculpting

Mary J. Blige

No More Drama

"The XL Is Awesome"

Rob Chiarelli, Engineer / Mixer
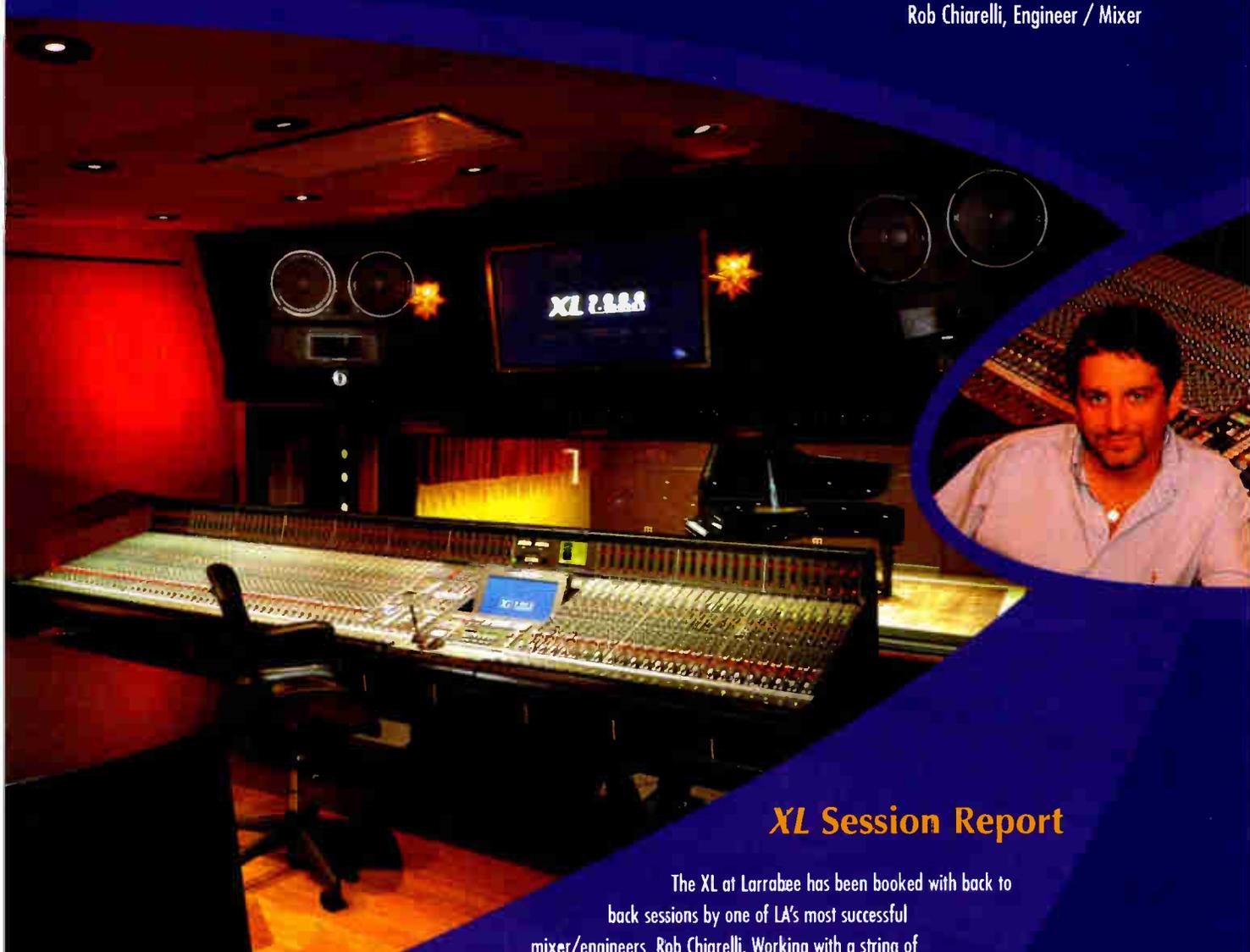
Larrabee Studios,
Los Angeles.

XL Session Report

The XL at Larrabee has been booked with back to
back sessions by one of LA's most successful
mixer/engineers, Rob Chiarelli. Working with a string of
renowned artists, Rob has already made the XL's meters bounce to the
sounds of the man in black, Will Smith, and LeAnn Rimes mixing her
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PROFESSIONAL AUDIO AND MUSIC PRODUCTION
September 2002, VOLUME 26, NUMBER 10
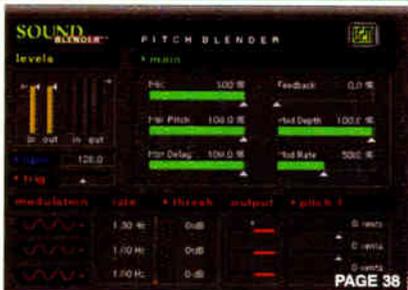
features

28 Location Recording...Real Time
A Glimpse Into the World of Production Sound Mixers
Production sound mixers are the workhorses of film sound: arriving on the set before shooting starts, staying through that night's dailies and often toiling in hostile environments. Blair Jackson interviews three top production sound mixers—Jeff Wexler, Mark Ulano and Glenn Berkovitz—about their techniques and their projects.

38 New Instrument, FX and Utility Plug-Ins
A Smorgasbord for the Senses
If all of the new plug-ins listed in Randy Alberts' article—and the thousands of effect, sampling, synthesis and utility parameters embodied in them—aren't enough to help you make better and more music, then seek counseling soon. Check out all of the types of plug-in categories, including some of the releases planned for next month's AES convention.

46 Product Hits From Summer NAMM
Mix scoured the show floor in Nashville to bring back all of the biggest product news. George Petersen reports on our hot picks.

66 "The Last Waltz"
The Rock Film Masterpiece Comes to DVD
Director Martin Scorsese's depiction of The Band's farewell concert on Thanksgiving 1976 made for one of the most riveting concert films of all time. Chris Michie and Blair Jackson go back to the source—original music recording engineer Elliott Mazer and the film's re-recording mixer Steve Maslow—and illuminate the remastering process that has brought us this year's *Waltz* DVD and four-CD box set.

94 Seventh Annual Mix L.A. Open
Los Angeles editor Maureen Droney provides highlights and photos from this year's fund-raising golf tournament, benefiting healthy-hearing assistance and outreach programs.

On the Cover: Todd AO West, home to the Academy Award-winning team of Mike Minkler and Myron Nettinga, features a dual Euphonix System 5 console. For more, see our interview with Minkler on page 50. **Photo:** Ed Colver. **Inset Photo:** Steve Jennings.

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World Radio History

Unsung Heroes

There are a lot of tough jobs in the recording industry, but the life of the production mixer is surely the most difficult, most demanding and least appreciated by the general public. While other audio pros often seek to capture and create sounds that seem larger than life, the responsibility of the production mixer is to deliver location dialog tracks—and sometimes effects—that are as clean, flat and unprocessed as possible.

It's not fair to compare the role of the production mixer to that of the music recording engineer, who stays mainly within the confines of a cushy, air-conditioned environment filled with automated consoles, lavish racks of outboard toys, and leather couches and ergonomically designed chairs at the mix position. Our music engineer friend rolls into work around noon to begin setting up a rock 'n' roll session, but the production mixer may have started the day at 3:30 a.m., making a 60-mile drive out to some far-flung location, to be ready to capture every nuance of dialog when the cameras start rolling at dawn.

Production mixers work with gear that's a little more compact than that of their studio counterparts. The all-important location cart contains all of the essentials, with shelves housing a small (but super-high-fidelity) console, wireless receivers for the radio mics and the recorder—usually DAT, Deva or the venerable Nagra (whether digital or analog). Typically, AC power sources are either nonexistent or too far away to be of any use, so dependable batteries to keep all of this gear at peak performance are the lifeblood of the profession. On location, there are no arguments regarding preferences in main or near-field monitors; a trusted set of headphones is essential, perhaps supplemented by a powered speaker or two for video-assist playbacks.

Weather is always a factor in the life of a production mixer. Besides dusk, darkness or the blazing heat of the Mojave sun, working in rain, dust, sand and dirt can play havoc with gear. Sweat drips into lavalier mics, rendering them useless; high humidity can put a condenser mic out of commission; and in extreme cold, battery life is measured in minutes, rather than hours. An umbrella mount in the corner of the sound cart helps keep sun and rain off of the gear (and sometimes the operator!), but there's no escaping wind, which not only creates unpleasant conditions for the cast/crew, but makes highpass filters and bulky mic windscreens necessary tools of the trade.

The production recordist must be adept at juggling feeds from multiple wireless units, as well as from fixed and boom-mounted mics, but the overall outcome depends largely on teamwork. An experienced boom operator and cable puller are key players in the quest for clean dialog tracks, and cooperation between the various members of the sound team is vital, particularly in multicamera productions where the director wants to save money by shooting wide-angle and tight shots simultaneously.

No small amount of courage is required when the location sound crew asks for a retake to get a clean dialog track, but going this extra mile makes a huge difference down the line. Every minute of usable location sound saves hours of expensive dialog replacement sessions in post, and here—especially in smaller independent films or television work where budgets are tight—production sound mixers really earn their hero status.

So in this—our fall Sound for Picture issue—we salute the hardest-working group in show business: the production sound mixers.

George Petersen
Editorial Director

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5X MORE POWERFUL THAN THE ORIGINAL 02R
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With more than five times the processing power

of its renowned predecessor, the new 02R96 is destined to establish another benchmark

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World Radio History

Letters to Mix

C-C-C-CORRECTIONS

I just finished reading Blair Jackson's article, "Ch-Ch-Ch-Changes: 25 Years of Great Recordings From the *Mix* Era," and although I found most of the individual album notes enjoyable, I found the information as to who mixed/engineered and where they were recorded to be filled with inaccuracies. So many engineers and/or studios were either omitted, or just plain wrong.

Our studio is proud to have participated in two of the albums as a mixing studio, yet we were not credited on either of your write-ups. The first is Nirvana's *Nevermind* album, which was not only a huge-selling album but quite possibly the *Sgt. Pepper's* of the 1990s. You listed Butch Vig, Nirvana and Andy Wallace as engineers, and the studios as Sound City (Seattle) and Smart (Madison, WI). I'm looking directly at the CD, which says "produced and engineered by Butch Vig and Nirvana," "Mixed by Andy Wallace," "Recorded at Sound City, Van Nuys, CA," with no mention of Smart Studios. You also state that Sound City is in Seattle, when, in fact, they have always (over 20 years) been located in Van Nuys. The *Nevermind* CD also says, "Mixed at Scream Studio, Studio City, CA," yet you failed to mention us. Every track and every single on that album were mixed here at Scream by Andy Wallace in 1991.

The other is U2's *All That You Can't Leave Behind*. I do not presently have the CD in front of me; however, I am looking directly at the Platinum plaque, which U2 sent us for being the mix studio where Tim Palmer mixed the hit song/single "Stuck in a Moment," which was a worldwide hit record. I know that Scream Studios is listed on the album as the mix studio for that song. Why are we not listed in your article?

Randy Alpert
Scream Studios
Studio City, Calif.

Please accept our humble, public apologies for these errors.
—Eds.

CAN OF WORMS

I started to write this letter to you to point out what I consider a glaring error on your part in the "Ch-Ch-Ch-Changes: 25 Years of Great Recordings" story in the 25th Anniversary supplement. On the Jane's Addiction album of 1990, the tracks you mentioned as standout were, in fact, not on that album but actually on their 1988 release *Nothing's Shocking*. The big hit off of the album you mentioned was "Been Caught Stealing."

As I prepared to jot this down, I took another look at the albums you listed and realized there were several albums included and many that were omitted that I think deserve a second look.

In the last 25 years of recording, does it really make sense to include two Elvis Costello albums and two by Talking Heads, Bruce Springsteen, Madonna and U2, but omit such influential and great-sounding albums as Miles Davis' *Tutu* [1986], which sold millions of copies and won a Grammy that year? Does it make sense to include albums by the likes of Hole and Baha Men (neither of which are notable for their production, originality or, frankly, the talent of the artists) and not include groundbreaking selections like Living Colour's *Vivid* [1988] (sold millions and got the whole funk-metal movement started), or Rage Against the Machine's debut album (huge commercial success and got the whole rap-metal movement started). How about *Never Mind the Bollocks* [1977] by the Sex Pistols (one of the most influential and profitable albums of all time, which defined a whole genre of music still viable on today's charts) or either of Korn's first two albums that begat the detuned nu-metal sound that still dominates rock records to this day? How could any retrospective on milestone productions of the last 25 years not include anything from the Windham Hill label? Where would new age and the adult contemporary genres be without them?

Don't George Harrison's *Cloud Nine*, Tom Petty's *Full Moon Fever* and the *Traveling Wilburys* all sound like the same record? Why mention all three and yet not mention revolutionary and influential albums by Tool, Alice in Chains, Public Enemy, or for that matter, Chic, KC and The Sunshine Band, Ozzy Osbourne, Jeff Beck or John Lennon?

I realize that you can't get 'em all, and I realize beauty is in the eye of the beholder, but Joe Ely? I think Joe's okay; heck, I live in Austin, Texas, and have worked on a number of his

shows, *but Musta Notta Gotta Lotta* and no Sarah McLachlan or even Seal? Come on, folks! To put it in the vernacular of the day, "That's whack!"

Miles Baum
Via e-mail

As stated in the introduction to "Ch-Ch-Ch-Changes" in our 25th Anniversary special issue, assembling our list was a largely subjective, space-limited can of worms that, we admitted, was bound to leave out many memorable recordings. That said, you raise some valid issues that many readers will doubtless agree with.

However, we must beg to differ with a few of your points: The Sex Pistols were awesome, but they did not define their genre. Punk was already alive and well in New York City before the Pistols were formed; look back to the New York Dolls and The Ramones. Rage Against the Machine may have heavily influenced the type of rap-metal we hear today, but the genre began earlier in the mid-'80s, with recordings by groups such as Run-DMC, Beastie Boys and Faith No More. And KC and The Sunshine Band's best-known disco recordings were released before 1977.

Barbara Schultz
Senior associate editor

RADIO RADIO

I enjoyed Paul Lehrman's "Insider Audio" ("Dumbing Down the Dial: Why Your Radio Doesn't Work, and Why You Should Care") in July *Mix*. I work for Crown (amps/IQ/mics, not broadcast) but still consult with the NC-FM at my college (Milwaukee School of Engineering in Milwaukee, Wis.; www.wmse.org).

WMSE is a 24-hour, free-form station at 91.7 MHz. We did a power increase in 1995 with similar issues to those you described. Those who live near the main antenna farm in Milwaukee would do better with little/no antenna because of the front-end overload issues. The guy at WUMB has got it right.

Great article. Nice to see. Loved the "litigious" reference; we see plenty of evidence on that subject here at Crown.

Marc Kellom
Product development manager
Crown International
Elkhart, Ind.

A new perspective on [the] bottom end.

Introducing *Laminar Spiral Enclosure*™ Technology: The new Genelec 7000 Series LSE Active Subwoofers.

The Truth - in black and white: a revolutionary, proprietary technology [*and shape*] that will forever change your expectations of what an accurate, multi-channel professional surround-sound monitoring environment should sound like. The new Genelec **7000 Series** consists of four (4) active subwoofers — painstakingly engineered to enhance the entire range of our active monitoring systems — from the award-winning **1029**'s right up to the formidable **1039**'s.

These new subwoofers look different for a very good reason: *Laminar Spiral Enclosure* technology. **LSE**™ is evident in the unique circular shape of the enclosures, identical in execution for the 8", 10", 12" & dual-driver 12" models. This radical design departure dramatically alters how high-level, low-frequency acoustic energy is delivered to virtually any critical-listening acoustic space.

The main benefit? The compromises inherent in traditional ported enclosures are now things of the past; the unrestricted *laminar flow* of low-frequency energy emanating from the rigid, tuned enclosures of the **7000 Series** is truly an extraordinary listening experience. When combined with the latest 6.1 electronic bass-management technology, Genelec *Laminar Spiral Enclosures* not only turn things around, they give the professional a whole new perspective on the meaning of superior performance.

Model 7070A Active Multichannel Subwoofer — 12" dual voicecoil driver, 19Hz to 120Hz, 114dB with 6.1 Bass Management feature set. There are two smaller models (7050A & 7060A) and one larger system (7071A).

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ALAN LOMAX, 1915-2002

Renowned field recordist/musicologist Alan Lomax passed away in July at the age of 87. Lomax enjoyed a 60-year career documenting the folk music of the American South and around the world. His recordings, most of which were made for the Library of Congress, have received renewed attention recently through Rounder Records' ambitious remastering of *The Alan Lomax Collection*, which, when complete, will comprise more than 100 CDs. In addition, one of Lomax's prison recordings opens the multi-Platinum, Grammy-winning *O Brother, Where Art Thou?* film soundtrack.

Lomax, who began recording with his father, John Avery Lomax, in the early '30s, assisted in the first recordings of blues legend Leadbelly. In the 1940s, he traveled throughout the South interviewing and recording blues and folk artists, including Muddy Waters, Big Bill Broonzy, Memphis Slim and the first Sonny Boy Williamson. Lomax's overwhelming body of work came to include music from Europe and the Caribbean, as well as regional folk music from the United States.

In 1997, *Mix*'s feature on the remastering of Lomax's work for Rounder included an interview with the recordist's daughter, Anna Lomax Chairetakis, who had become the caretaker of Lomax's archives after his second stroke at the age of 82. "I watched him many times," Chairetakis said. "He would lean in toward people with his microphone, put his microphone right up into their face, and just radiate a lot of warmth and geniality and ask them what often seemed like very low-key kinds of questions, like, 'How did you all get started?' and 'Where did you learn this song?' But the point about him was that he really knew what he was doing. He knew the cultural terrain, and he made people very secure."

Alan Lomax will be remembered through the magnificent music he captured and the important lessons he taught Americans about their own culture. The Lomax family suggests that contributions be made to The Blues Music Foundation for the Willie Moore Fund, c/o Experience Music Project, 2901 3rd Ave., Seattle, WA 98121.

—*Barbara Schultz*

HARRY SHEARER TO HOST TEC AWARDS

Actor, author, director, comedian, musician, political satirist, radio personality and one of the best voices in the business (just ask *The Simpsons*), Harry Shearer is set to host the 18th Annual Technical Excellence & Creativity Awards, slated for Monday, October 7, at the Wilshire Grand Hotel in Los Angeles.

The TEC Awards will induct Beatles engineer Geoff Emerick into the Hall of Fame and honor Robbie Robertson with the prestigious Les Paul Award, as well as present 24 awards for outstanding technical and creative achievement.

Probably best known for his work as co-creator and co-star of the mock-rockumentary *This Is Spinal Tap*, Shearer has extensive film and television credits, including *The Truman Story*, *Godzilla*, *My Best Friend's Wedding* and *Ed TV*, as well as guest shots on *ER*, *Just Shoot Me* and *Chicago Hope*. He is also entering his 13th season on *The Simpsons* as the voice of three of the leading characters—Mr. Burns, Smithers and Ned Flanders.

For the past 17 years, Shearer has also hosted a weekly radio program, "Le Show," that has been described by *Vogue* as "a wildly clever, iconoclastic stew of talk, music and political commentary." Most recently, Shearer wrote, directed and produced *Teddy Bears' Picnic* and is set to appear with Spinal Tap partners Michael McKean and Christopher Guest in the upcoming feature, *A Mighty Wind*.

For ticket and sponsorship information call Karen Dunn at (925) 939-6149, email Karen@tecawards.org or visit the website at www.tecawards.org.

YAMAHA 02R RETIRED

At a gala reception, Yamaha celebrated the launch of its 02R96 digital console (spotlighted in the May 2002 *Mix*) by donating a classic 02R to the Country Music Hall of Fame's music technology collection. Shown left to right: Yamaha's John Schauer, CMHF curator Mark Medley, producer/songwriter Tommy Sims, producer Brian Ahern, and Yamaha's Rick Young and Wayne Hrabak. Sims and Ahern spoke about their use of the 02R on projects for artists such as Emmylou Harris, CeCe Winans and Bonnie Raitt.

MOOG MUSIC LIVES!

SYNTH LEGEND RECLAIMS COMPANY NAME

After almost 20 years of creating under the company name Big Briar, Moog Music Inc. is reborn with the release of the first new Minimoog synthesizer in 30 years. Happy to be back in control of his namesake, Dr. Robert Moog, who founded the R.A. Moog Company back in 1954, will devote his time to product development and quality control; Michael J. Adams has been named president of Moog Music Inc.

"I am very pleased to once again be able to offer my products uncer my name," Moog said. "This is timely for the company and for the imminent unveiling of the re-engineered and greatly enhanced minimoog® Voyager." For more, visit www.moogmusic.com.

BALDWIN, GIBSON HIT THE RACETRACK

Henry Juszkiewicz (right) sips his latte and wonders if the race car will fit in his garage, while Nashville mayor Bill Purcell looks on.

Baldwin Piano and Gibson are goin' racin'—the company's chairman and CEO Henry Juszkiewicz announced a marketing partnership with A.J. Foyt's Harrah's racing team for the Firestone Indy 200 at Nashville Speedway in July.

Foyt's famous Number 14 Indy car is driven by Airton Dare, who won his first Indy race competing against Foyt's 18-year-old grandson, A.J. Foyt IV and who also captured the inaugural Infiniti Pro Series Kansas 100 race. "We, at Baldwin Pianos, are excited to join A.J. Foyt's team because the name Foyt is synonymous with winning and being the best in his field," Juszkiewicz said.

INNOVASON BROUGHT INTO DIGIGRAM FOLD

In mid-July, Digigram completed its acquisition of InnovaSon, manufacturer of digital audio mixing consoles for sound reinforcement in live performances. This past January, Digigram acquired a 44.76% stake in the company; Digigram now controls a 100% stake.

InnovaSon will maintain its identity and commercial autonomy within the Digigram group. The company's

Digigram's co-founders: Marian Marinescu (left) and Philippe Girard-Buttoz

products will continue to be distributed by its established network, while Digigram will provide sales support in markets that the company has yet to penetrate. InnovaSon's current management remains in place, with Philippe Royer as managing director for sales and marketing and Gérard Malvot as technical director. Both are co-founders of InnovaSon.

For more, visit www.digigram.com or www.innovason.com.

THE TRANSFER HOUSE

FOR ALL YOUR FILE-INTERCHANGE NEEDS

Design FX, an L.A.-based rental, systems and remote-recording company, has opened The Transfer House, a full-service facility that performs any format-to-format audio conversion. Available formats include Sony 3348 and 3348HR digital multitracks, Pro Tools, Tascam, Otari RADAR II, analog 24-track, analog 2-track, DAT, CD and much more.

The monitoring room was built with fully isolated balanced power to ensure a noise-free and clean electrical environment; equipment of note includes a Sony DMX-R100 console, Otari UFC format converters and Apogee AD/DA converters.

Inside the Transfer House are DFX Remote Recording/Transfer House manager Scott Peets (left) and DFX president Gary Ladinsky.

ON THE MOVE

Who: Mark and Shelly Hiskey
What: co-founder/production director (Mark) and co-founder/principal (Shelly) at ILIO
Previous lives:
Mark—
• 1990-1993, VP production
• Brown Bag Productions in the '80s and '90s
Shelly—
• Actor/vocalist, different life
• 1992-1993, production assistant for Sony and Nickelodeon children's books on tape
Main responsibilities: Mark conceives and selects sample libraries to produce or distribute, participates in production, maintains quality standards, scouts new technologies for customers, oversees advertising and other marketing duties. Shelly oversees sales and worldwide distribution, accounting, marketing and trade shows.
The one thing I must remind myself when working with my spouse is...
Mark: Shelly is always right.
Shelly: That Mark is my husband first and business partner second.
The hardest challenge of working with my spouse is...
Mark: Keeping the business out of the bedroom.
Shelly: Keeping business out of the bedroom.
The best part about working with my spouse is...
Mark: Having a smart partner I can trust.
Shelly: Sharing all aspects of our lives together.
If I could do anything else as a profession, it would be...
Mark: Architect.
Shelly: Cat juggling.
When I'm not in the office, I enjoy...
Mark: Playing with our son.
Shelly: Our son.

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CORRECTION

In *Mix*'s 25th anniversary supplement, Sound on Sound was inadvertently left off of the studio credits for Alicia Keys' *Songs in a Minor* album. *Mix* regrets the error.

</div>

EYE ON XTA

As part of XTA's 10th anniversary festivities, the company celebrated with a champagne toast aboard the London Eye, a giant 135-meter Ferris wheel overlooking Big Ben and downtown London. Shown here (left to right) are John Midgley (of Beyerdynamic, XTA's UK distributor), Gasoline Media's Sarah James, *Mix* magazine's George Petersen, Andrew Bruce of Autograph Sound, SCN's Kirsten Nelson, PSN editor Frank Wells, Paul Keating of Delta Sound, XTA's Guy Lewis, Jack Kelly of Group One Ltd. (XTA's U.S. distributor), theater sound designer Bobby Aitken and FOH engineer Steve May (Roxy Music, Queen, Deep Purple).

NOTES FROM THE NET

Business Plan One: Alienate Customers. At the end of July, Reps. Howard Berman, D-Calif., and Howard Coble, R-N.C.. introduced the Peer to Peer Piracy Prevention Act, a bill that would legally authorize copyright holders to hack into peer-to-peer networks. The bill would immunize groups such as the MPAA and the RIAA from all state and federal laws if they disable, block or otherwise impair a "publicly accessible peer-to-peer file-trading network." In a speech before the Computer and Communications Industry Association at the end of June, Berman offered a number of technological measures that the music and film industries could use: interdiction, which allows copyright owners to flash a file swapper's computer with false requests so that downloads can't get through; redirection, which points a file swapper to a site that doesn't have the file he/she is looking for; and spoofing, where the copyright holder puts up a false or corrupt version of a file that the swapper is looking for. However, these measures are illegal under the Computer Fraud and Abuse Act. According to Berman, "Removing the unintended legal constraints on technologies [which are found in the Computer Fraud and Abuse Act] that may help deal with the problem is an important part of the solution." Congress has a few weeks left before it adjourns for the year, leaving the outlook of this bill uncertain.

PRECISELY BACK WHERE IT BELONGS

Nearly two years after selling the company to a small group of private investors, two Audio Precision Inc. (Beaverton, Ore.) founders and the current CEO are reinvesting in the company. With this move, founder Bruce Hofer gains a majority share and becomes chairman of the board. Robert Wright, founder and a principal engineer at Audio Precision, and CEO Alan Miksch have also acquired shares.

Hofer said that since the sale in 2000, Audio Precision has seen too much emphasis on short-term performance and too little consideration for longer-range strategic issues facing the company. "Offering reliable, high-quality products at an attractive price with unrivaled customer and technical support is what made Audio Precision the market leader. We intend to grow the company based on that approach."

For more, visit www.audioprecision.com.

Industry News

Multitasking with his responsibilities in sales and management for Telex's (Burnsville, MN) European, international and ROW operations, Mathias von Heydekampf is now president of the company's pro audio group. In other company news, Mark Gubser has been promoted to product manager for Radiocom™ wireless intercom products; Tom Weems has been brought onboard as the company's Western regional manager for the RTS Systems division. His territory includes northern and western U.S., including Alaska and Hawaii…Solid State Logic (Oxford, UK) announced that it has hired Steve Zaretsky to the position of VP broadcast for the East Coast…Adding to its sales and marketing team, AKG Acoustics U.S. (Nashville) named Garry Templin as VP of sales and market development. Making the announcement on behalf of the company was PAMI Group Consulting (Centerport, NY), the company's new public relations firm…DTS (Agoura Hills, CA) has created two executive positions that were created to expand DTS-encoded DVD-Video and DVD-Audio in the U.S. and in Europe. Joining as director of business development in content is Jeff Briller; his European counterpart is Gerben Van Duyl, who will be based out of the company's Twyford, UK, office…Based out of Thailand, Eddy Vermeersch has been named director of Meyer Sound's (Berkeley, CA) Asia-Pacific technical support; he is also the company's first Asian support engineer…Yamaha Corporation of America (Buena Park, CA) announced these new appointments to its recently formed Commercial Audio Systems division: Michael Nicoletti, applications specialist for the PM-1D and DM2000 systems; Brian Coviello and John Conard, district sales managers for installed and touring sound, professional recording, post-production and broadcast accounts; Megumu "Mike" Matsumoto, assistant general manager, who will also act as a liaison between Yamaha Corp. America and Yamaha Japan; Daniel Craik, product manager in hardware; and Marc Lopez, product manager in software…With seven years of experience as a finishing editor and graphic designer, Ian Rummer joins film and video post-production facility Roland House Inc.'s (Arlington, VA) editorial staff. rhed Studios, Roland House Inc.'s effects and design division, has added senior designer and Flame artist Timothy Droll and graphics producer Curt Miller…Bringing Maxell products (Fair Lawn, NJ) to Utah, Colorado, Montana, Wyoming and Idaho will be John Eulberg, new district sales manager for the company's pro media group.

Mathias von Heydekampf

Mark Gubser

Steve Zaretsky

SONAR
MAKES
ME
INVINCIBLE

> SHAWN CLEMENT

Shawn Clement is one of the most prolific composers for film, television and video games on this planet. Always ready to take on the toughest assignments and the tightest deadlines. His secret weapon? SONAR, the award-winning, digital multitrack recording system from Cakewalk.

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SONAR. It gives you super powers.

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MIX LOOKS BACK

For *Mix*'s 25th anniversary this year, we begin looking back at where we started. Here are the Number One album and single from *Billboard*, September 1977, with special props to the engineers, producers and studios who make the magic.

NUMBER ONE ALBUM

For the sixth consecutive month: *Rumours*, Fleetwood Mac. Producers: Fleetwood Mac, Ken Caillat, Richard Dashut. Engineers: Ken Caillat, Richard Dashut. Studios: The Record Plant (Sausalito, CA), Wally Heider (Los Angeles), Criteria (Miami), Davlen (North Hollywood), Producer's Workshop (Hollywood). Mastering: Ken Perry/Capitol.

NUMBER ONE SINGLE

The Emotions' "Best of My Love." Producers: Maurice White, Clarence McDonald. Engineer: George Massenburg. Studio information not available.

HOT LINKS

www.carriagehousemusic.com Check out the new site for Carriage House Recording Studios (Stamford, Conn.).

www.iMusicWorks.com Visit this site to contact audio professionals for assistance and collaboration ideas for any project you're working on.

www.evolutionmics.com Browse through Sennheiser's dedicated, redesigned site for its Evolution Series.

www.transaudiodirect.com Go online to buy direct Pauly Superscreen Pop Filters and SoundField Microphones from Transamerica Audio Group.

PHASE ONE COMPLETE

NEW POST-PRODUCTION FACILITY OPENS IN BRAZIL

Phase One Studio of the Megacine post-production complex of Estudios Mega, Rio de Janeiro and Sao Paulo, Brazil, has just been completed. Additional construction to the complex will include the completion of a ground-up, three-story, 16,000-cubic-foot post-production complex dubbed Phase Two; the Megacine facility is expected to be completed in early 2003.

Phase One features a Euphonix System 5 digital console, Pro Tools, Tascam MMR-8/MMP-16, Dolby DMU and Tesseract loudspeakers; Phase Two will include a 60-seat dubbing stage/screening room with a Euphonix System 5 console, and Kinoton and Christie film and video projection, a second dubbing stage with a Eu-

Foreground (L-R): Ron Lagerlof and Rodrigo de Noronha, director of post-production audio. Rear (L-R): George Newburn and Jacqueline McNaney of Studio 440, and David del Boccio of Visioneering Design.

phonix System 5 and video projection, an ADR/Foley stage and several editing suites.

Visioneering founder Ron Lagerlof was chosen to lead the technical design, work flow and operational aspects; Studio 440 came onboard for design and construction.

Send your "Current" news to Sarah Benzuly at sbenzuly@primediabusiness.com.

World Radio History

BY STEPHEN ST.CROIX

You Can Never Have Too Many Lines

As Long as Your Heart Holds Out

With the advent of digital imaging, first in still photography, then in nonlinear video editing and finally in the integration of digital video feeds to the First World at large, we have succeeded in completely digitizing our world as far as sight and sound are concerned—all the way from capture, through editing and assembly, to final distribution and delivery to us, the audience.

Due to physics and economics (constants that now interact with each other to such an extent that they have virtually become variables), we still listen to our audio through analog transducers. To date, all direct-digital piston drivers and ionized plasma drivers are only exotic, freaky novelties.

And until very recently, moving-image display technologies have also been analog—phosphor television or good old film. And while film is just that—old and good—video, especially our pathetic NTSC, is just old and bad. Real bad.

But now both film and video have been digitized—at least in part—in the interest of speed, power and the American Way (commercial efficiency). Nonlinear editing, digital effects and the other digital stuff the audience doesn't see, like color correction and garbage removal, are absolute necessities if one wishes to compete and produce the kind of product today's world expects. Especially if there is a need to produce it within the target audience's lifetime.

Film wasn't really screaming for a resolution boost. In fact, it takes a high-speed, high-bandwidth system to even move the large amount of data in digital frames around, much less get them crunched and rendered. Digital imaging originally came to film as a power tool, but now it promises even film-resolution enhancement…in several ways.

New digital projectors for theaters that actually exceed the resolution of film are on the way. For audiences, this means a significantly more realistic, giant image, i.e., more fun. For the movie industry, it means digital delivery—perfect "prints" to every theater every time, all at the same time. No color inconsistencies from the dupe house, no scratches from Mikey setting his gates wrong at the Bijou. No more tons of film being duplicated and shipped all over the world. Theaters will simply download the film the day it is released.

And video? Because the data rate is so much lower than film, global digitization was a significantly more achievable goal. Immediately, there was work for anyone who could edit and creatively modify video with the arsenal of tools available within the digital domain. TV commercials, flying logos, real-time virtual adverts punched onto the fences of the race tracks we see on TV, and even drivers' stats floating in the air over their cars in real time like a giant PlayStation game.

But video has also been desperately crying out for improvement. It was just hard to tell, as the images of its crying were so blurry. And so DTV and HDTV, albeit in 142 flavors, came to be. Sort of. Still less resolution than good film, but real HD will knock your eyes back a few centimeters, and keep them there until sunrise.

> Nonlinear editing, digital effects and the other digital stuff the audience doesn't see, like color correction and garbage removal, are absolute necessities if one wishes to compete and produce the kind of product today's world expects. Especially if there is a need to produce it within the target audience's lifetime.

With DLP projectors quite possibly emerging as the next viable home theater technology, and plasma (or nanotube) as our next *Jetson* TV, we will finally abandon analog displays in the privacy of our very own homes.

Very soon, we'll all have *huge* high-res display devices and large amounts of impressively low-res stuff to display, along with a mixture of medium- and true high-res. And to make it worse, our new HD panels have pixels instead of 180 pounds of glass wrapped around soft, warm, friendly, forgiving, blurry phosphor. What to do?

DOT'S ALL FOLKS!

When phosphor ruled, it covered a multitude of sins. If you wanted to "change resolution," you just told the video card what you wanted and the monitor adjusted its scan rate to make it fit. There was no such thing as "native resolution" for a display device. You

YOUR AUDIO SKETCHBOOK.

[actual size]

Inspiration, like lightning, almost never strikes twice.
You've got to be ready to get your ideas down when they hit.

KORG's new PXR4 Digital Recorder delivers serious studio power in an incredibly light, compact package. The PXR4 performs high-quality digital recording/playback; edits with time compression and expansion; has 4 tracks and 8 virtual tracks (for 32 possible takes); packs a pro-quality built-in mic; boasts 77 digital modeling effects, and records directly to SmartMedia™ cards with the high-quality sharability of MPEG. The PXR4 is your audio sketchbook, ready to record, mix and edit...whenever and wherever inspiration strikes.

PXR4 KORG

just bought the sharpest one you could, with the tightest dot pitch, and threw more and more resolution at it until text got too small or too blurry to read.

But today's digital displays totally eliminate phosphor's blooming convergence problems, magnetically induced color shifts, nonlinearity and lousy edge focus. All those problems are now replaced with only one: native transducer resolution, a fixed number of discrete pixels.

The New Truth is that if you want razor-sharp imaging on any LCD, DLP, DILA, plasma or any other fixed-pixel device, *you must operate it at its native resolution*. Anything else requires resampling and scaling, and the results are always far inferior to native. Always.

But, with NTSC and all of the HD and SD standards being fed to display devices sporting native arrays of 1,024x768, 1,280x720, 1,280x768 and up, it's obvious that you aren't going to get your source to map to your display directly. Sad.

LINE DOUBLERS AND SCALERS

So here we all are, in 2002, trying to watch video images (developed in 3 B.C., with some color added in 2 B.C.).

Turning these wussy little interlaced 640x480 images into the nice, huge, high-res, progressive images we want today is no simple task. But it's the perfect thing for the high-speed crunching talents of mankind's first morally acceptable race of slaves—computers.

And just as it is for audio, it's all about gear-boxing: How well the sample rate

pling video is every bit as nasty as it is in audio.

Up-sampling, scaling and the associated motion-artifact management are all incredibly complex. It requires real intelligence to avoid blurry, milky-soft trash, yet it has to be done *very* fast. Yup, computers *owe* us this one for pixelating our damned images in the first place.

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converter (the video industry calls it a scaler) changes incoming 640x480i or 1,180p or whatever to the target's native resolution, and how all that new interpolated data is created.

But I can't say this too often: Resam-

Using a Pioneer 503 CMX (1,280x768) plasma as my reference display, I worked with various scalers and line doublers until I got it down to only two: the tiny Silicon Image iScan pro (DVDO)

World Radio History

BY PAUL D. LEHRMAN

Studying Hard, Hoping to Pass

Asking the Right Questions About Audio Education

ILLUSTRATION: DAVE CUTLER

September is back-to-school month. *Mix*'s Education Issue runs in November (go figure). But for some of us, like those who teach audio and music technology, education is a year-round occupation. As I write this column during mid-summer, I don't have to worry about this week's class schedule, but my mind is very much on my students' lab. At the moment, I'm replacing all of the first-generation Power Macs in the lab with new G4s and all of the fixin's that go with them—new audio and MIDI interfaces, new screens and software—because a lot of the old stuff I've been using won't work on these machines, even under OS 9. You know what a hassle it is to replace your computer, throw out everything on it and start again from scratch. Well, that's what I'm doing, times 10. (And I'm also rebuilding my home studio so that I can keep up with my students!)

With this going on, naturally I'm thinking about the courses I'm going to teach in the fall and the courses I'd like to teach someday. Not to mention the courses I've taught in the past, and what *I* have learned from

them, because in the world of education, it is often said that the best way to learn a subject is to teach it.

Audio education is really, really hot. Once upon a time, it was possible to walk into a recording studio knowing next to nothing and absorb everything you need to by watching and listening and helping. But today, if you don't have a solid background in things like signal flow, A/D conversion, signal processing, synchronization and computer operating systems, you won't last long enough to collect your first paycheck.

It's no surprise that about once a week, I get an e-mail from someone who wants me to help them choose an audio school or program. They want to know who's got the best gear, who's got the latest computer stuff and who's got the best placement rate for graduates. They figure, and rightly so, that a solid education in audio's principles and techniques will give them a leg up on the competition, help them get jobs or set up the businesses that they want. Yet surprisingly, few of them are asking the really important questions.

After 15 years in this business, I hope that I've

learned something about the kinds of schools and programs that help students succeed and which don't. So in this back-to-school month, here are some of my thoughts on what potential students should be asking about, and looking for, in a school.

Look for a broad curriculum and plan to take advantage of it. Don't decide ahead of time everything you expect to learn. Resist the temptation to take just courses you think you'll enjoy, or be good at, and exclude everything else. Use the opportunity of being in school to broaden your horizons and to get exposure to areas you know nothing about.

You may come into a program thinking you want to produce Britney Spears' next album and come out of it realizing that your true calling is installing surround systems in movie theaters. But, if the only courses your school offers (or the only ones you sign up for) are in record production and there are none in system design and installation, you'll never find that out. I can't tell you how many students of mine have ended up in places completely different from where they expected to be and love it.

Equipment is great, but it isn't everything. The number of vintage Neves or computerized SSLs a school has may look impressive, but remember, only a certain number of students can work on them at

> When you graduate and go out into the real world, you'll find the personal contacts you've made in school to be invaluable when you are looking for a job or a collaborator.

a time. Besides, the difference between the real high-end stuff and today's "mid-level" recording and mixing equipment isn't as significant as it used to be; a Yamaha 02R is not an expensive piece of gear, but learn-

ing on one will give you an understanding of how all consoles work so that if you some day encounter an SSL, it won't intimidate you. (And besides, in the real world, you're far more likely to end up using something like an 02R than an SSL.)

Does a school *have* to offer a particular piece of gear? Not really, although it's a safe bet that any school worth considering will have ADATs, Pro Tools setups and some digital consoles. But in 10 years, no one will be using ADATs, and someone else entirely might be ruling the world of DAWs. What's important is to learn the principles behind all of these devices. Once you do that, you can apply them to any other gear that does the same job: DA-88s and MX-2424s, SADiEs and Fairlights, Mackie D8Bs or anything else that comes down the pike.

Of more concern should be how many studios or workstations are available to students and how much time each student gets on them. Are there good spaces to record live instruments? Are there good musicians who are available to record? And are there enough microphones to go around, even if they're not all Neumanns?

Location Recording...

A Glimpse Into the World of Production Sound Mixers

Titanic: The constant presence of water posed challenges for mixer Mark Ulano.

Jeff Wexler had to record dialog and play back music for Almost Famous.

they are the workhorses of the film sound world, enduring endless days toiling in often hostile environments, arriving on the set before shooting begins and staying after it ends, there for every take and retake. They are the production sound mixers: location recordists charged with the responsibility of capturing crisp dialog and evocative ambiences; the pure performances. And though their work is often overshadowed by the more glamorous contributions of the post community, production sound mixers are the *first* critical link in the film sound chain. At best, their work is utterly transparent, not calling attention to itself. At worst, well, if you have to struggle and strain to understand what the characters in a film are saying, or noisy backgrounds overwhelm the dialog, or the finished film is overloaded with badly done ADR, chances are that the production sound mixer had a rough outing. And it probably wasn't his or her fault.

To gain some insights into different aspects of the world of production sound, *Mix* spoke with three top professionals in the field: Jeff Wexler, Mark Ulano and Glenn Berkovitz. All three are members of the Cinema Audio Society.

<div style="text-align:center">

BY BLAIR JACKSON

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Real Time

JEFF WEXLER

You might say that Jeff Wexler was born into film. He's the son of Oscar-winning cinematographer (and occasional director) Haskell Wexler, and he notes, "I absorbed a tremendous amount of knowledge from Haskell and from just being around the set all of my life, riding around on the dollies at the age of 2 and things like that. My first day on the set, when I actually had to do a job, felt very familiar; I felt like I'd been there all of my life, which I actually had been."

Not wanting to compete with or draw comparisons to his famous father, he gravitated toward production sound, breaking in on "low-budget, non-union Roger Corman movies, where a lot of people got their start." Now entering his fourth decade in the field, Wexler has amassed an impressive list of credits, including such films as *Bound for Glory*, *9 to 5*, *The Natural*, *Ghost*, *War of the Roses*, *Get Shorty*, *Independence Day* (for which he was nominated for an Oscar), *Jerry Maguire*, *Fight Club*, *Almost Famous*, *61**, *Rat Race* and *Vanilla Sky*. When we spoke in early July, he had wrapped up work on Martin Brest's new film, *Gigli*, starring Ben Affleck and Jennifer Lopez, and had done some re-shoots ("they call them 'scene enhancements' now," he says with a chuckle) for the Owen Wilson/Eddie Murphy film *I Spy*. Along the way, Wexler's been able to work on a number of films and commercials with his father; that's quite an accomplished team.

"For the most part, all directors proclaim that they're 'really into sound; it's really important,'" Wexler says. "Then you begin to discover what they really mean by that, and you find out that the fundamental reality is that the entire soundtrack can be done later. And this is one of the things that separates the production sound department from almost all of the other departments on a movie set the day of shooting. Even if the sound team completely screws up, or the director completely screws up, you still don't lose a day of shooting. You can loop things, use ADR; in fact, they refer to ADR as 're-shooting the sound.' Everyone knows this, and some directors are quite willing to say, 'I don't care, get me a guide track, the sun's going down. We need to get it on film; I'll worry about the sound part of it later.' That's the extreme position, although it's also sometimes the *realistic* position if you are working with a lot of mechanical effects or wind machines, where the sound we can record on the day could never be in the movie.

"Almost all directors say that they don't want to loop anything, and they say it for all of the right creative reasons, which is the importance of the performance on the day and that sort of thing. They all know it does not hurt the movie in terms of the budget or time to do most of the sound later. It's in every budget. The best situation is where you have an experienced and realistic director, a talented and experienced first assistant director, a location manager who understands that you cannot make a scene work if you're trying to shoot a three-walled set constructed under the freeway and it's supposed to be Iris' bedroom; it just isn't going to work.

"I've been extremely lucky to work with people who *do* have an allegiance to the production soundtrack because of all the things it can bring to a movie. Not just the fact that you don't have to replace the dialog. But the fact that the actual recording itself lends something to the movie; it tells you something about the characters. I've always said that I feel like I've done a really good job if I can sit in dailies with my eyes closed and listen to a scene—the raw recordings before anyone else has gotten to them—and you can tell something about the characters, how they're feeling, where they are in the room, what emotions they're having.

"Obviously, that doesn't happen all the time. A lot of times, I'm just glad I can hear *something*, because maybe we were fighting the wind machine, or the actor insisted on playing with his props during his whole speech and there are noises, or you have the actors who sound just fine when you're talking to them as real people and as soon as they start acting, you can't understand a word they're saying. Those situations aren't nice, but they happen all the time. I've had directors come to me and say, 'Could you understand what she was saying? Is there some sort of microphone we can use to make that more understandable?' I say, 'Take off your headphones, forget about the microphones. Go over and listen to this person speak. Tell me if you can understand anything she's saying.'"

Wexler does a considerable amount of preparation before his first day on the set, talking to the director and feeling out his or her needs with regards to the production sound, getting involved in location

scouting whenever possible and making notes on the shooting script: "I do an extensive breakdown on the script as soon as I get it and highlight areas where I think there might be some difficulty and areas that need some attention before shooting; whether it's building something somewhere, or changing something physically in a location. I might say, 'Can we find a place that maybe looks the same but is a little quieter than the place you've chosen?' Because if we're doing a quiet, emotional scene, you don't want to have to go to the actors and say, 'You gotta speak

Jeff Wexler ot work on the I Spy *film*

louder.' Or, 'We've got to get this quickly because at one o'clock, they fire up this factory next door.'"

Where technology is concerned, Wexler has always been a part of the vanguard in production sound, experimenting with new gear before it was widely used, but noting that "the changes that have come in our field, say, in the last five years, are all equipment-based technological changes that haven't had much impact on the actual work that we do. Recording sound is still not a big mystery; there's little magic involved. It still boils down to, if things sound good and you record them properly, they will sound good, and all the technology in the world will not change that."

That said, he was among the first to use DAT on the set, and he was an early convert to the increasingly ubiquitous Deva nonlinear digital system. "When I first started using DAT," he recalls, "I was not about to make any director or producer be the guinea pig for a new format that everyone believed would never work. So I ran my Nagra, which I completely entrusted all of my work to, and

ran both machines for the first three pictures, and then I went to running two DAT machines [on *War of the Roses* in 1989]. At that time, I was a co-owner of the post-production facility where all of the sound transfers were being made, so I didn't have to let anybody know what we were doing. On the set, people would came over, look at the sound cart and see the Nagra and figure everything was fine.

"Then, when I started using the Deva, there was initially quite a lot of resistance from people in post-production and from various others. Of course, ultimately the promise of nonlinear work is that we'll be using the same sound files; there won't be questions about the quality of transferring the material because it's digital data, not audio."

Though the Deva has 4-track capability, Wexler notes, "I almost never use all four tracks. That's my own personal choice. I'm still an old mono kind of guy; I'd rather give them one good track that makes sense to everybody. It requires no apology or explanation: 'Oh, the good sound is on three or four.' Or, 'When you remix it, it'll sound great!' There are other sound mixers who love using multitrack, and they also shower a scene with multiple techniques. In other words, they're not content to just boom the scene with one microphone; they'll also put wireless on the actors, they'll put plant mics. And whenever you get involved in multiple techniques, it would be suicide to commit all those to one track; you need to split those things off. You need to make them discrete so that somebody can reconstruct whatever it was you were thinking of on the day later."

Wexler will use the other tracks for additional material that might be useful to the editors later, such as a sync ambience track or live effects that are essential parts of the scene, like a television playing in the room or a telephone ringing. But generally he likes to get as much as he can in mono off the boom while using wireless mics on the other tracks. Wexler especially trusts his boom operator: He's worked with Don Coufal for 25 years. "He really understands what the camera sees," Wexler says, "and he understands what he needs to do to make dialog work. And that's really the most important thing that we do: Make the dialog work for the picture."

Location Recording... Real Time

GLENN BERKOVITZ

Though the same fundamentals of recording location sound apply to both feature films and television, the pace of work on series television is faster and the budgets are smaller.

"Anybody who works TV will tell you it's definitely a very long day," comments veteran TV production sound mixer Glenn Berkovitz. "The *exception* is to have something under 12 hours per day." Berkovitz, who did production sound last year for the popular series *Crossing Jordan*, and whose other credits include work on such series as *Freakylinks, Resurrection Blvd., Clueless, Chicago Hope, Lois and Clark* and *Dream On*, as well as various TV movies and feature films including *Zero Effect, Freejack, Young Guns 2* and *Robocop 2*, explains that "usually there will be a template for a show where you'll shoot eight days per one-hour episode. A lot of times, it will be five days studio and three days on location."

In episodic television, the chain of command is usually different from the way it is in feature films because directors are generally hired guns for each episode,

Noted production sound mixer Glenn Berkovitz on location

and the overall look, feel and sound of the show have been established over previous episodes, sometimes in the pilot. "Quite often, the individual episode's director is *gone* after shooting," Berkovitz says, "and the machine of the show operates without a director once it gets into post-production. Editors cut the basic picture of the show per the style they've refined. Then the post-production department takes over: If the sound supervisor, who usually works for the sound house

that is contracted to the show, thinks a scene is dicey from a sound point of view, or there are scenes that they think they can make crisper, they will spot those lines for ADR.

"It varies from series to series how much ADR is usually done, which usually happens about a week-and-a-half after you wrap an episode. They get an ADR list together and then they walk in the actors. The guest players usually don't mind, but the featured actors who are working every day usually aren't anxious to go over to the looping stage after work or during lunch. On *Crossing Jordan*, they started out looping a lot, but by the end of the season, the actors were less eager to accommodate; they would loop for technical fixes, not for performance. In features, they will sometimes loop a line for performance, but in TV, if you don't get the performance on camera, you usually don't get the opportunity to massage it in post-production."

Berkovitz, who got his start in the business in live sound and lighting for rock 'n' roll, was a studio engineer before he moved into audio post. He transitioned into production sound full time in the mid-'80s, and has also worked on a pair of reality TV series: MTV's *Real World* (Los Angeles) and *Making the Band*, which traced the creation of the popular boy-band O-Town. This is grueling work in a different way: Generally, each of the principals in a reality series will have a two-person crew assigned to him or her—camera and sound—who unobtrusively follow the "actors" around on a 10-hour shift, stopping when the actor stops, moving when the actor moves. If there are four principals in a room together, there might also be four crews out of sight, with each sound person responsible for different coverage of the moment.

"Usually, you stick a wireless mic on each person, actually, they often put it on themselves; it becomes second nature. They wake up in the morning and put on a mic. And then you run a boom, as well," Berkovitz says. "When I worked on *Real World*, it was occasionally difficult when you'd have several crews in a room together, but it's easier now that they've got some very good frequency-agile audio

A scene from **Crossing Jordan**

gear. Each actor gets their own frequency, and each sound person will have three or four receivers on their little walk-around sound rigs, and you dial it in. You say, 'I've got actor B,' and you touch B on your receiver and suddenly you've got their audio. It really worked well [on *Making the Band*], and that's now become the norm.

"I understand that all of *Survivor* is on booms, so the sound folks must get in as close as possible, gauge what their camera and potentially what any other camera, is seeing, focus on the action, but also know the camera might leave the action for something else. You've got to stay with the meat of the dialog, and then when the camera moves, get a coherent sentence before the audio leaves—so it can be edited with decent continuity—and then follow the camera. It's fun, but it's also hard. You have to think, and you have to be physical."

For his regular production sound work, Berkovitz's gear of choice includes the Deva, with a Nagra ¼-inch as a backup, an 8-input Cooper mixer, Sanken CS-3 short shotgun mics and pair of Schoeps mics he uses for stereo: "I do as much stereo work as I can. Sometimes, it's just splitting channels for foreground and background, but if there's a street scene and it kicks into something that's not dialog—I don't really run stereo dialog—where I can get away with putting a stereo pair up there, I will."

Of the Deva he says, "On the three series we've done with Deva, that choice was always driven by post, and I think it's an excellent way to go. The machine itself could be further refined: It's clunky. Physically, the box sits on the cart oddly and is somewhat fragile in its connectors. The ergonomics are not great, but it records very, very well and very reliably. They're constantly updating their soft-

ware, which is nice. The post-production guys like it because they can load the sound files of our day's work and they don't have to do it in real time, and they can go back and check something immediately without having to shuttle through a tape. That's why we used it on *Crossing Jordan*."

MARK ULANO

For a more specific look at how production sound technology is used in the field, we turned to Mark Ulano, a 20-plus-year veteran who won an Oscar for his work on *Titanic*, and whose lengthy résumé includes such notable recent features as *Austin Powers*, *Jackie Brown*, *The Patriot*, *Stuart Little*, *Spy Kids*, *The Majestic* and the recently released surf movie *Blue Crush*.

From the set of the next Quentin Tarantino film, *Kill Bill*, currently being shot in China, Ulano described some of the obstacles he faced during the making of *Blue Crush*, much of which was filmed at various beaches on the Hawaiian island of Oahu. He also described how recent technological strides are making his job as a production sound mixer easier.

"*Blue Crush*, which is being produced by Brian Grazer [*A Beautiful Mind*] for Imagine Films, had multiple creative challenges for the production sound crew," he says. "Helping me solve these was my friend, master boom operator Tom Hartig, and a wonderful sound man from Oahu, John Reynolds, as our second boom/utility sound technician. We were faced with recording a great deal of dialog out in the surf, at the break. Most of our principal female actors rarely wore more than very skimpy bikinis, so that precluded much in the way of choices for body miking. Our primary approach for the surf work was via wireless boom on a combination of floating platforms, ranging from boats, jet ski and, most often, an inner tube with a suspension seat. John Reynolds developed this last technique during his time on the *Baywatch Hawaii* series. We also used a lot of the waterproof pouch/Aquapac technology we developed for use on *Titanic*. Some of Aquapac's newer pouches now allow for generic cable exits, making for more flexibility in our choices of wireless configuration. The boomer's rig mainly consisted of roll-top,

waterproof neck pouches we got at REI that contained the microphone transmitter and a ComTek receiver.

"Our primary wireless," he continues, "was either the new Zaxcom digital unit or the new Audio Limited Envoy. Both performed superbly under great duress, and I believe this was the first time a production model Zaxcom had been used for the whole show. Our primary boom mic was the magical Sanken CS-3, Rev.2. When we weren't actually in the surf and instead shooting on the beach, these Sankens gave us extraordinary control over what background noise was or was-

Mark Ulano developed the floating boom, used on Titanic and, here, on Blue Crush

n't in the pattern. This didn't always save us from discontinuity because of changing wave patterns in the background, but we were able to capture a much higher percentage than would be traditionally possible. We also captured a variety of stereo ambiences for different weather and wave conditions, which were intended to help smooth out the hard changes."

Like the other mixers interviewed for this piece, Ulano has been using the Deva hard disk system, in part, he says, because "it is the first practical production field recorder to address the realities of post-production's digital realm. We can deliver the work in the resident file format that most of post works with—the media is vastly superior as far as archival stability is concerned—and we can multitrack, if needed, with no hassle. It's 24-bit, plus it's the pioneer for a whole *family* of devices only now coming to market."

What kind of feedback did Ulano get from post people about the Deva? "It has been mixed, but it's changing," he says. "The main bottleneck has been at the Avid, as they have been very slow to ac-

knowledge the need to read their own SD2 file format. This is finally improving, as the pressure to move away from real-time import flows in from the customer base. There is also a conservative element in the studio post-production supervisor community, and as often as not, the sound supervisor isn't hired on early enough to engage in the discussion [about what format to use], so the decision often is more about familiarity than specifics. Approach is another issue. Many wonderful and talented post sound supers are very different in their styles, some are surgical in what they bring to the mix, preferring the editing process to be where elemental choices are made, and others want to bring every resource into the mix and work subtractively. Both styles produce great results, but they are completely different processes.

"I like to supply as many options to the post sound crew as possible, but only if it is in context to the work and, hopefully, the style of the post suite. What's the point of struggling for sync ambient stereo pairs to mate with the primary dialog/effects tracks if the philosophy of the post crew is to disregard that kind of material? On the other hand, if all things are in alignment and I get the opportunity to connect with our post people in pre-production, we can go through the script together with a fine-tooth comb and talk about preferences and hopes and so on. I had this opportunity on *The Majestic* with Mark Mangini and Richard Anderson [of Weddington Productions], and it made all the difference. I knew that they really wanted large stereo ambiences of those big crowd scenes with hundreds of extras in vast rooms. It wasn't a library item to them."

Ulano is also a great believer in the new Zaxcom digital wireless system, which he views as "a great breakthrough. Zaxcom has eliminated the need for companding by using a purely digital system, thus affording the full dynamic range possible with digital technology. It's quite startling the first time you use it for a scene with wide dynamic swings. It's tiny, it's sturdy, it sounds marvelous and it has many innovative features. But it's also still early in its production life and, being software-based, new capabilities for it are frequently coming down the pike, in the Zaxcom tradition of intimate end-user inclusion for developing new stuff. There is

a latency issue if you mix the Zaxcom with analog wireless equipment, but most of this can be controlled by mixing or going with a digital mixer, such as Zaxcom's Cameo, allowing for matching the delay channel-by-channel.

"While the ability to use wireless boom has been around for a long time," Ulano adds, "it had been traditionally used as an occasional solution to a challenging shot, such as a 360-degree camera move. I've been treating the whole subject very differently since my move to Audio Limited UHF-diversity wireless technology. This was around the time I did _Austin Powers_ and _Titanic_ in 1996. I broke with tradition and committed what was considered professional heresy: using a wireless boom all the time. With the equipment performance levels that had become available, it became the only way to fly for me, and it was instrumental for our work on _Titanic_. Of course, this required working out a lot of issues, and it ultimately resulted in double-transmission from the boom operators, in the form of the primary transmission off the boom, and the PL/IFB secondary transmission to the private sound channel, which we run all day long; we use Lectrosonics for this. It also required a dual monitoring transmission: one public channel of program and one private one for our team and all of its communication needs. I use a pair of Comtek BST-50b's for this task. I wrote an article about this a few years back and was amazed by how many people contacted me to discuss my experiences. Now, I see the method appearing more and more as mixers become more trusting of their wireless hardware. It truly frees my crew from a host of unnecessary cabling issues and lets them focus on finessing their boom work and responding instantly to sudden changes on the set.

"Our biggest problem with the whole issue of wireless is the lack of frequency allocation. There is literally _none_ for motion pictures or television. We are considered secondary users, and there's no movement toward improvement. As all the DTV channels are coming online, we are just leaves in the wind; just at the moment we most need to expand our frequency usage. I don't think this will be solved until a group of major players in Hollywood make that phone call pushing the political system for allocation. This melodrama continues to unfold. Stay tuned." ∎

Blair Jackson is the senior editor of Mix.

World Radio History

New Instrument, FX and Utility Plug-Ins

features. Pattern-based synth, sampler, bass and drum modules can stack or sit alongside distortion, delay, mixer and an assortment of other tools to tweak melodies and loops as far as the user's CPU will allow. Platforms: MultiMac, PC, VST ReWire.

Applied Acoustics Lounge Lizard EP-1

BIAS' (www.bias-inc.com) Vbox ($99) multi-effects control environment for VST plug-ins now has Windows and Mac OS X support working in either standalone or as a VST effects plug-in, and all BIAS audio products now support OS X, as well.

Brand-new from the company in the plug-in category this year is SuperFreq ($79 download), and it *is* super freak-ayy Native to OS X, this mastering-quality, real-time, 10-band, paragraphic EQ plug-in is a true Carbon Event-driven OS X tool with -18 to +18dB gain values, wide-Q bandwidth values, individual band-bypass buttons, 24dB stereo input/output meters and sweepable frequencies ranging from 20 to 20k Hz. SuperFreq, one of the first Mac OS X-native plug-ins offered, operates with any Carbonized VST-host environment and can alternately be launched as an 8-band EQ to save on system drain. Platforms: Mac, VST.

Big Fish Audio (www.bigfishaudio.com) created quite a ripple on the plug-in pond by announcing an interesting sort of hybrid plug-in format. Don't panic: UVI (Universal Virtual Instrument) isn't

Arturia Storm 2.0

yet another proprietary plug-in format but rather the ultimate democratic one. Essentially three product types rolled into one, each new real-time UVI plug-in is equal parts virtual instrument and sample player, VST/MAS/RTAS plug-in and large sound library. And, most importantly, sounds can be accessed via MIDI and played and modified directly through the console of your favorite DAW software. Sound files can be edited parameter-by-parameter and saved directly to a sequence/song for an all-in-one music, sound and patch info file. Installed and opened just like any other plug-in, the Big Fish UVI interface remains the same, regardless of which library is loaded. Controls over amplitude and filter envelopes, LFO rate, depth and destinations, velocity curves,
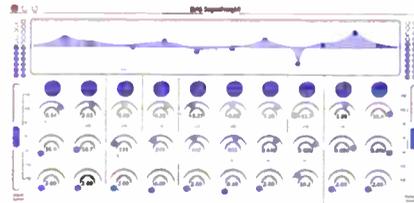
BIAS SuperFreq

filter, pan, gain and sample-program management are provided.

Eight new UVI plug-ins called Plugsounds, each with more than 600 MB of high-quality sampled sounds, were released by Big Fish to help launch the

Big Fish Audio Plugsound

new borders-ignorant format. Volumes 1 through 6 (Keyboards Collection, Fretted Instruments, Drums and Percussion Elements, Hip Hop and R&B Toolkit, World of Synthesizers and Global Collection; $99.95 each) provide a wide palette from which to paint your next production. Platforms: Mac, PC, VST, MAS, RTAS.

Two new high-quality effects plug-ins to reach **CreamWare's** (www.cream ware.com) DSP platforms are Vintage Compressor Vinco and MasterVerb Pro ($195 each). No conventional compressor algorithms were used during Vinco's

development to better model the sound of classic analog studio compressors, and the company's Circuit-Modeling technique was employed for the same reason. MasterVerb Pro sports an enhanced reverb processor over its predecessor plug-in MasterVerb. Thirty-two-bit live processing, unlimited reverb times and authentic early reflections based on the source-image method were used to create this high-quality reverb plug-in. Vinco and Master-Verb Pro plug into the company's Luna, PowerSampler, Pulsar, Pulsar XTC and SCOPE SP platforms.

Also new from CreamWare is Minimax ($245), a complete software emulation of the venerable Moog Minimoog. Minimax was designed for a 1:1 ratio in emulating the Minimoog's sonic characteristics. Being able to create feedback by routing Minimax's second audio output into the mixer section and other original minimoog tricks have also been faithfully reproduced. Platforms: PC, Mac, CreamWare.

The new Pluggo 3 ($199) was released this May from Cycling '74 (www. cycling74.com). It now offers more than 100 effects and more than 20 soft synthesizers. Created by programmers working in the Max/MSP environment or rolled on your own, each Pluggo plug-in makes good use of the improved Max4/MSP2 language. New modules include Shape Synth, a user-controlled waveshape synthesizer, and the company's Essential Instruments collection, which was culled from the developers who created the crafty iSynth. Essential Instruments include a wide range of additive, analog-modeled, granular, waveshaped, wavetabled and percussion synth engines. Big Pluggo news for Digidesign users is RTAS support. Platforms: MultiMac, RTAS, MAS, VST.

Digidesign (www.digidesign.com) released Reverb One TDM and announced distribution of new plug-ins from Wave Mechanics (SoundBlender) and Access (Virus Indigo TDM). Reverb One TDM ($995) is a high-quality reverb with an intuitive early reflection and reverberation contour display that includes independent controls over level, decay time, attack, spread, size, diffusion and predelay, and it comes with an extensive cache of reverb presets. Separate dynamics and chorus sections allow detailed shaping of reverb decay, and a built-in multiband EQ has adjustable crossover points. Platforms: Mac, PC, TDM, HTDM.

Access' Virus Indigo TDM ($795) puts the ferocious growl and upper-end punch of its namesake hardware synth in the hands of any Pro Tools|HD or

MIX user. Check out the Access sound, with four oscillators per voice, 20 available voices, dual 6-pole filters and up to eight multitimbral parts per DSP, and a 96kHz sampling rate. Platforms: Mac, PC, TDM, HTDM.

SoundBlender ($495) from Wave Mechanics brings the PitchBlender and TimeBlender plug-in suites together under one revved-up roof, with an extensive collection of time, pitch, filter and modulation effects. The heart of the beast is Wave Mechanics' Tri-Modulation Matrix, a trio of modulation sources that can be mixed and routed to dozens of effect parameters. Platforms: Mac, PC, TDM, HTDM.

HQ-OR Orchestral ($199) from Edirol (www.edirol.com) is a potent new VST and DXi soft synth. Much like working within any standard general MIDI module, Orchestral's individual screens to select sounds, add chorus and visually pan instruments across a stereo pan field display leave little else for the user to do but play. Sounds focus mainly on strings, woodwinds, brass, percussion and keyboards in a package that also
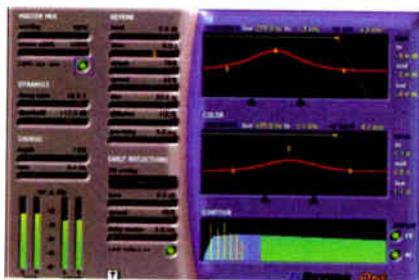
Digidesign Reverb One TDM

includes Cakewalk's Music Creator 2002 software. Up to 16 parts and 128-voice polyphony are possible, and up to 24-bit/96kHz compatibility is offered. There are also more than 350 preset and user patches, 39 drum kits, high-quality 32-bit floating-point processed reverb and chorus/delay, and real-time access to many parameters via hardware control surfaces. Platforms: PC, Mac, VST, DXi.

Emagic (www.emagic.de) has been busy studying old beer-stained Hammond B3s and dusty Hohner Clavinet D6s lately to come up with the new EVB3 (Emagic Vintage B3, $199) and EVD6 (Emagic Vintage D6, $179) plug-ins, respectively. EVB3 uses the company's Component-Modeling technology to capture the orig-

inal faithfully and then some—all the way down to the way aging components and the resulting artifacts and key click variations affect a good B3's sound. EVD6 similarly goes this far to faithfully reproduce the Clavinet D6. Platforms: Mac, PC, TDM, HTDM/Mac.

Also new from Emagic is a full port-

Edirol HQ-OR Orchestral

ing of every effect plug-in found in Logic Platinum to the TDM platform in the form of EPIC TDM ($699), due out this fall. Plug-ins range from meat-and-potato dynamics to wildly modulated special effects, and includes the new Spectral Gate and Enverb modules. Platforms: PC, Mac, TDM.

ZombiRATor? BubbleRATor? It really doesn't matter what GenieSyS (www.genevoice.com) names its SchizoRAT Pack ($47.95) of five DirectX plug-ins aimed at the sound design environment; they look and sound great. GenieSys has come up with its own Fast Fourier Transform (FFT) algorithms that, when combined with the Pack's user-designed break-point envelope control over each plug-in's parameters. present an almost endless palette of animated timbres. BubbleRATor and ZombiRATor add vibrato only to selected portions of a source waveform and momentarily "freeze" selected harmonic ranges. Other RATs allow designers to create nonlinear frequency shifts, add complex spectrums to individual tracks, create four-note polyphonic material from monophonic tracks and allow user reshaping of pitch and melody. Platforms: MultiPC, Windows, DirectX.

Recently released as a $39 plug-in bundle, Space Synthesizer 1.1b, Space Effect 1.0 and FlexFx 1.0 from developer Mikael Hillborg (www.mhc.se/software) pack a lot of punch per buck. The $39 FlexFx family of CPU-conscious audio processors with built-in LFOs and host syncs includes five meat-and-pota-

toes effects, including basic delay, chorus and filter. Space Effect's synth architecture provides sync, feedback and mix controls over left/right delay signals, as well as extensive control over resonance, filter, chorus and tone-sequencing parameters. Space Synthesizer, as the name implies, looks much like Space Effect, but it also offers an evolving waveform module onboard. Platforms: Instrument/MultiPC, VST.

Who needs 1,260 amp combinations and a wide array of stomp boxes and post FX features all in one Pro Tools|HD and VST plug-in? You do. IK Multimedia's (www.ikmultimedia.com) AmpliTube ($399) turns both platforms into a sort of vintage amp and pedals heaven, complete with orange power-soak buttons and faux tubes glowing behind a convincingly rendered amp grille. This plug-in sports separate pre, EQ, amp, cabinet and mic-emulation modules, and it models a large selection of vintage and modern amps, spring reverb, tremolo and stomp boxes. Platforms: Mac, PC, VST, Logic, RTAS.

Developed with mastering engineers and sound designers in mind, Groupe de Recherches Musicales de l'Institut National de l'Audiovisuel, aka INA-GRM (www.ina.fr), released its new GRM Tools ST (Spectral Transform) Bundle ($549; $249 per separate plug-in) as a four-module suite for the "Free through Pro Tools|HD Mac family." ST Contrast uses novel compression and expansion techniques to add subtle changes in "vibrancy, depth and liveliness" for mastering and archival audio restoration applications and any extreme sound transformation uses. ST Equalize is a 31-band, ⅓-octave graphic EQ that features GRM's elastic string feature when mouse-manipulating curves with "sound-performance" applications, and ST Shift allows a user to perform two complementary sound-processing operations at a time. Finally, ST FreqWarp, a spectral component rearrangment plug-in, can best be described by one INA-GRM user's feedback from the company's site: "The most far out, radical, bizarre, powerful and effective sound-transformation tools I've ever seen." Platforms: FX/Instruments, Mac, RTAS, VST.

Mackie's (www.mackie.com) UAD-1 ($995) is a PCI DSP card/plug-in suite package that takes the heat off of a CPU by handling all plug-in processing "offline." Developed by Universal Audio, the UAD-1 software solution

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Grammy Award winning producer Elliot Scheiner recently remixed Queen's classic "A Night at the Opera" in 5.1 Surround for a DVD-A release The complexity of this ahead-of-it's time album required some exceptional finesse as well as the very best sound quality 'Nuendo allowed me to do things that were intended but not possible at the time this album was made On top of that it sounds incredible! The combination of flexibility and sound quality really made this remix the best it could be."

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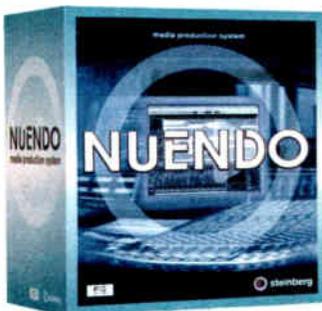
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New Instrument, FX and Utility Plug-Ins

includes RealVerb Pro, 1176LN and Teletronix LA-2A Vintage Compressors, Nigel Guitar Processor and the CS-1 Channel Strip; the latter includes EQ, compression, delay modulation and reflection reverb modules specific to the UAD-1 platform. Universal's Version 2.2.6 software now also includes Digital Performer support. And Nigel not only looks like an interface Mr. Tufnel would love, it sounds as big as any Spinal Tap concert, with its own mini-suite of preamp, speaker cabinet modeling, echo, tremolo, modulation filter, compressor/ gate and phaser plug-ins. Rock on! Platforms: MultiMac, PC, MAS, VST.

Also from Mackie are several new plug-ins for its D8B/UFX and new Soundscape DAW platforms. The Drawmer SDX100 ($399) is a new mixpander plug-in designed for use as a channel dynamics package or mixdown processor; it allows users to control its components in groups or individually. SpinAudio's SpinDelay ($89) is another Mixtreme plug-in for Soundscape that includes a handy tempo-based delay and tap delay calculator that links taps by ratio. And, after releasing Acuma Labs' Final Mix Mastering Suite ($399) and its DSR-1 frequency-specific de-essing UFX plug-ins at Winter NAMM, there were two more for the recent Summer Session. Acuma's RTA-31 ($199) is a new graphic equalizer and spectrum analyzer for the D8B desktop, and the aptly named Saturated Fat ($199) handles all sorts of distortion and cabinet-modeling chores like a short-order cook at a greasy spoon. Platforms: PC, Soundscape, D8B/UFX.

McDSP (www.mcdsp.com) is well-known for its Analog Channel plug-in when it comes to warming up a digital signal, so warming up to some modeled oscillators, LFOs and ADSRs in the company's new Synthesizer One ($695) should come easily. The additive, sub-tractive, wavetable, FM- and AM-based modular Synthesizer One can process external audio and combine that with synthesized signals. And all oscillator, filter, LFO and envelope signals can be routed to multiple modulation targets easily using a straightforward, logical interface that resembles McDSP's plug-in family line. Also newsworthy is the company's offering of free Pro Tools|HD updates for McDSP plug-ins that now include 44.1 to 192kHz support; see the company's Website for details. Platforms: Mac, TDM Mix/HD.

IK Multimedia AmpliTube

Not new but certainly worth mentioning is the recently announced Pro Tools|HD and VST plug-in format support for all **Metric Halo** (www.mhlabs.com) plug-ins, including SpectraFoo, SpectraFoo Complete and ChannelStrip.

Take one spectral graph and an eight-operator FM engine, add a battery and one B3 emulation so real you can smell it, and what do you get? Four new Mac and PC virtual instruments from **Native Instruments** (www.native-instruments.com). NI-Spektral Delay PTE ($449) claims to be the first real-time, Fast Fourier Transform (FFT) plug-in effect. Kontakt ($399) and FM7 ($299) each support Mac and PC via DirectConnect, VST, MAS or DXi, and can operate as stand-alone instrument applications. FM7 can actually read every sound library ever created for the classic DX family of FM synths, and Kontakt is a soft sampler that sports real-time time-stretching and resynthesis and an integrated loop editor. Native also offers the Pro Tools Editions of B4, Pro-52 and Battery for Mac HTDM/RTAS for $999 as the Studio Collection. Platforms: Mac, TDM/HTDM, RTAS (unless otherwise noted).

To even try to sum up what the plug-ins from Ohm Force (www.ohmforce.com) are all about in 50 words would be futile. Users can get lost in the company's lush Goth- and comic-inspired Website for ages and still not know exactly what each plug-in does. So, rather than attempt to explain VST and DirectX audio processing/mangling plug-ins like MobilOhm, HematOhm, FrOhmage, PredatOhm and OhmBoyz, we are pointing readers to the site. You have been warned. Platforms: Mac, PC, BeOS, VST, DirectX.

Power Technology's (www.dspfx.com) DSP-FX Virtual Pack 6.5 ($149), a stable line of DirectX plug-ins for PC audio processing that also operate as stand-alone devices, has recently added 96kHz support and full optimization for Windows XP. Twelve bread-and-butter processor tools are bundled together in a Virtual Pack, including the high-quality StudioVerb, Multi-Tap Delay, Analog Tape Flanger, Parametric EQ and Aural Activator. Platforms: MultiPC, DirectX.

New from **PSP** (Professional Sound Projects; www.pspaudioware.com) from Piaseczno, Poland, are four audio processing plug-ins. Lexicon PSP 42 ($149) is a high-quality digital stereo delay and phrase-sampler plug-in based on the legendary Lexicon PCM 42 processor; it simulates vintage tape machine delays with PSP's own tape-saturation algorithm and variable sampling-rate manipulation. VintageWarmer ($149) is a single- or multiband plug-in that simulates many analog-style compressor/ limiters and comes with a large library of device presets. VintageMeter (freeware) is a professional VU and PPM-metering plug-in. Another free gem from PSP is PianoVerb, which reproduces unique types of reverberation originally generated by piano strings. RTAS support for all PSP software plug-ins is expected by the time this story prints.

Serato Audio Research's (www.serato

PSP's Lexicon PSP 42 plug-in

World Radio History

Mike Minkler

Storytelling Through Sound

He is arguably the finest film sound mixer of his generation, with a credit list that stretches across five pages on www.imdb.com and runs the gamut from action to comedy to suspense to rockumentary to drama and everything in between. Last March, after 30 years behind the board, Mike Minkler took home his first Academy Award, for a stunning mix on *Black Hawk Down*.

But so many of his films over the years have been Oscar-worthy: *China Syndrome*, *Altered States*, *Tron*, *Born on the Fourth of July*, *JFK*, *True Lies*… the list just keeps going. One word you might hear to describe his mixes is "tasty." In his own words, Minkler modestly says that he just knows when sounds "fit."

You could say that Minkler was born to mix films. Certainly, the genes all but demanded it. His grandfather began developing disc recorders back at Chicago Labs in 1928, then came to Hollywood soon after to work on the Vitaphone project at Warner Bros. He later built a company called Radio Recorders; today, we know the site as the Record Plant.

His father, Don Minkler, began in the late '40s and went on to found a company called Producers Sound Service. His uncle, Bob Minkler, won an Oscar for a little film called *Star Wars*. Minkler's son Christian is an Emmy-winning mixer, graduating from TV to feature films (*Natural Born Killers*, *The Farm*). Four generations. Nepotism? Sure. But that will only get you so far in a town where you're only as good as your last job.

Minkler started mixing full-time in 1974 at the age of 22, jumping at whatever work presented itself—TV, trailers, commercials, small features, anything he could get his hands on. He admits that it was not easy breaking in. "Directors would walk in and see me at the console, and they'd say, 'I'm not giving my tracks to this kid,'" he recalls. "I had a really rough couple of years."

It's not as if Minkler has been without controversy over the years. He's outspoken, he's passionate; to some, he may even be difficult to work with. But every Minkler story ends with an absolute respect for his talent and dedication. His commitment is to each and every film in the broadest sense—a dedication to sound as an emotional linchpin in the art of storytelling. He does not compromise, but now, at the age of 50, he has certainly mellowed. He seems to be right where he wants to be.

We pick up the Minkler story in early 1976 when he got his break, a really big break. In classic Hollywood fashion, it all began with a phone call…

After years of hard work, you're at the right place, the right time.

I was in my dad's office, and he's on the phone to Al Green over at Warner Bros. Al is looking for a replacement for two weeks on a feature. I was listening to my dad go down his list of mixers, going, "No, he's not available…" and I'm standing there saying, "Dad! Dad! Dad!" He finally says, "The only one left is my son Mike. He's kinda new, but if you want to give him a shot." I raced home, got on my fancy clothes and went over to meet Al Green. He didn't even look at me, but he walks me over to the stage and he introduces me to Arthur Piantadosi, the lead mixer on stage 5. Arthur looked at me and says, "We're going to lunch. Be back in an hour," in this very intimidating voice. So they leave me sitting there by myself for an hour, and then I had to audition for the rest of the afternoon. They were doing M&Es on *All the President's Men*. Les Fresholtz and Arthur. They were just about to win the Oscar for that.

So I spent the rest of the afternoon taking these one or two footstep tracks and working on this M&E, trying to do an audition. They wrapped at about 6 o'clock, and I said, "So, do you want me to come in on Monday?" Art said, "Well, did anybody tell you not

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to?" So I showed up Monday. Dubbing 5 was the big room, the big feature room, so it was a tremendous break for me to work with Art and Les. They were my mentors, and I owe a lot to them because they brought a sense of cinema. I couldn't have gotten anything better from anyone else. We had four years together.

What was the board back then?

An award-winning Quad Eight, their biggest one to date. The first to have... well, it actually had 24 mix buses on it, but it looked like it only had eight. In 1975, we got *The Grateful Dead Movie*, an experimental art film with a 5-channel quadraphonic mix. They were very technical people. They went into the schematic of the board and figured out that we actually had 24 mix buses. We could split this thing out. We could do all kinds of panning, with all kinds of separation, if we would just rethink what we were doing. I was in awe of what these guys were doing with signal processing, just watching [Grateful Dead sound mixer] Dan Healy manipulate audio. So I took what I learned from them, and our next picture was *Star Wars*. I wanted to do things that everybody said I couldn't do, that hadn't been done before—the simplest things, like insert recording in stereo. If we can do it in mono, why can't we just do it in stereo? They said we can't do that. Well, sure we can. Watch. [Laughs] I hit the button. Then I wanted to pan something to the surrounds at the same time I was recording in the front. They said, "You can't do that; the surrounds are always done in a separate pass." I said, "What do you mean?" and I did it. From that day on, we did all of our 4-track and 6-track recordings using surround panning in the same pass.

Les, Art and I premixed *Star Wars*, but due to a commitment to go on to another film...[long pause]. We put together a team of Bob Minkler, Ray West and Don Macdougal working nights over at Warner Hollywood, then called Goldwyn.

A lot of work in the predub...

It was wild. Ben Burtt and Sam Shaw had come up with all these great sounds. The visual effects were not finished yet, so we were premixing the battle scenes to WWII footage, with bombers representing X-wing fighters and fighter planes representing Tai fighters. It wasn't until the cast and crew at the Academy Theatre, about a week before the premiere, that anyone had seen the finished picture, including George. Their print was so wet, so new. Even the end credits looked like they were scribbled on. When that screening started,

Myron Nettinga and Mike Minkler, with Oscar

PHOTO ANDREA CIMINI

with the first overhead pass-by, people were screaming and yelling, and it went that way for the whole movie. When it was over, it was a 10-minute standing ovation, just hooting and hollering. At that moment, everyone thought, this is it.

Do you agree with what some say, that it changed film sound?

Absolutely. A hundred percent. It was a defining moment because of Dolby Stereo. At the same time, it was the birth of baby boom. The 6-track was devised by Steve Katz, who was the Dolby consultant on the show. When we were pre-dubbing reel 1 spaceships, we couldn't get this big thunderous low end that we wanted on the pass-by. We were going to do what we called a "Todd spread" back then, which was to record a left, center and right, and a surround—then fill in channels 2 and 4, the left extra and right extra, with information from these adjacent channels. But Steve said, "What if we used 2 and 4 for boom only, the low-frequency information, and we'll use full-range speakers." Well, we didn't have them; we had the Altec A4 speakers, and we put low-frequency material in there as much as we could to enhance the spaceships. And every time there was an explosion, there was a sweetener that was cut for those two channels. Years later, it switched again when *Apocalypse* came along, where the two channels were used for left and right surround, and 6 was used for the boom. That was the Walter Murch idea: Why waste two channels for boom? He also had the advantage of low-frequency speakers. Anyway, *Star Wars* was the first baby boom, and it worked.

It was also the first time that there were 300 tracks per reel. Prior to that, the most

I had ever seen was around 25. So there was the necessity of making great pre-dubs, because there was no way you could go in and hang them and start over again with something like that. Now it also had the advantage of the Dolby A-type noise reduction. No way could we play that many predubs and original units without Dolby noise reduction. The hiss level would have been enormous. As it was, it was still bad. [Laughs] Everything was a little cruder back then.

Walter Murch recently wrote in an essay that we have all these amazing tools at our disposal now, so it's time to go back and revisit the art *of film mixing.*

I agree, and certainly on the *Apocalypse* side. The success of that soundtrack is its art. Technically, it's not astounding. It was 1978, and that's what they had to use. The beauty of that film is its art; it doesn't get any better. I recently redid *The Exorcist* from scratch—the only thing we used was the dialog mono channel. But when I had my hands on that original masterful mix, technically it was a piece of junk. There were more snaps and pops and bad this and bad that. God it was horrible. But artistically, it's a perfect mix for that movie. *Apocalypse* is the perfect mix. They don't get any better than those two movies.

There has always been this interplay between technology and art. How have technical advances of the past 25 years changed the way you work?

On a technical level, we had to be very aware of phase shift, all the way through the chain—the machines, the recorders, the consoles. If you had bad-quality tracks, it really showed up in this new world of the x-curve and multiple speakers. Before, we had the mono Academy

roll-off, which actually could hide all of the imperfections in the sound. The leap from the mono world to the Dolby Stereo world was so drastic that a lot of the old-timers had to retire. They just did not have the mindset of what it took to stay on top of the technical requirements of the track.

Of course, then we had the use of multiple speakers. What are we going to do with this on an artistic level? From 1976 to the mid-'80s, we were all getting used to the format and experimenting. Once it leveled off—for me at least—it was time to get back to the storytelling. The next big change is the change we've gone through in the past four or five years with the digital consoles. The digital worksurface allows me to perfect the things I want, the moves that I need to make, the processing that I need to do.

You've mentioned before that you rely on "the vibe" of the stage to bring insight to your tracks. Whom do you tend to rely on?
The director and the picture editor, because it's their baby. They have the familiarity that no one else has. Secondly, I'll listen to the supervising sound editor and sound effects editor. Then the mu-

sic editor; he's intimate with the music content and will share things with me. I don't know if it's a hierarchy, but it's those four people. It's up to me to interpret all of their feelings because they are all valid.

What about conflicts on the stage between sound effects and music? Has that changed over the past decade?
This goes back to *Star Wars* and the advent of the big sound effects movie. It used to be that people wanted big music in the '50s and '60s, the days of the musical and the flashy scores and the big emotion. Then sound effects became the glitzy, attractive element in the soundtrack that draw audiences or gave scenes certain character. There was a 15-year period where they fought that battle. But now, the composers have gone through it, the mixers have gone through it, the music editors have gone through it—we're all aware that you need integration.
Let's talk about the '90s, then, and the era of loud mixes.
That was because of digital release and digital recorders in our back room. I firmly believe that when we were loud in the '70s and '80s—and we were just as loud,

but we didn't know it—we had two factors to limit us. Everything was SR-encoded, and that particular unit will clip at +22. Also, consoles would distort at about the same place. But most importantly, we were recording on film, and you have tape compression. The film itself will only allow certain amounts of level, and then it starts to round off. Once we started going to more digital original recordings that were 16-bit, they were very spike-y. Then, we started recording them into our room on digital recorders that were very spike-y, then putting them out in release formats that were digital, also very spike-y. And we had digital consoles that could handle the level. I just think we, as mixers, weren't realizing that mids to mid-highs were going through the roof and hurting us. I think it was up to the mixers to change their techniques and maybe use some different tools that they never used in the past, like compressors on the mix buses or multiband compression on certain elements—something to help smooth this out. I like being big and bold, but I don't want to hurt anybody. It's not how loud you make something that's going to impress people. It's the use of your sounds.

All right, time for Black Hawk Down. *A difficult movie?*

There are over 6,000 loop lines in that movie—a lot of dialog, and it all must be heard because they're giving you information. If you don't get the information, it just looks like a bunch of guys getting shot at. And they must be running in circles because they keep getting shot at! There were also 37,000 gunshots in the movie, and it's two hours and six minutes. How does this all fit together? And the music is the type of music that shines when it's supposed to shine and accompanies when it's supposed to accompany. It's structured very well by Hans [Zimmer] and his editors. I just fit it in there.

Was it a tight schedule?

From the moment they said, "Let's go," it was nine weeks. And we hadn't cut sound effects yet! We gave them one week to start up and then we started mixing. Simultaneous. Eight weeks of calendar, but 28 weeks' worth of time. Fifty-six straight days, and we had the other room going probably for 30 of those.

So effects got a week head start.

For editorial, yes. They had ideas because we had done a temp with the basic helicopters and basic guns. And this ADR track had been produced on location because of the gunshots. They had one week to get the production ADR in good enough shape for a temp mix. Then Per [Hallberg, supervising sound editor] had made a rough mix of 6-track guns, 6-track helicopters, 6-track backgrounds—six 6-tracks that were generically made in his design room. Based on that temp dub, they made a decision to go. That was the start of our nine weeks. We got Thanksgiving off. On December 18, we premiered it, and we were mixing that day. The premiere had four incomplete reels—nobody in this town saw the final movie until the public saw it first.

You have a relatively new partner in Myron Nettinga. He walked into a hell of a picture…

Myron has impressed the hell out of me in terms of his learning. It's not that he's new or green. He's been an editor and a musician, and he's been mixing for about three years. But I have seen him grow in leaps and bounds in terms of his abilities to articulate what people are trying to get
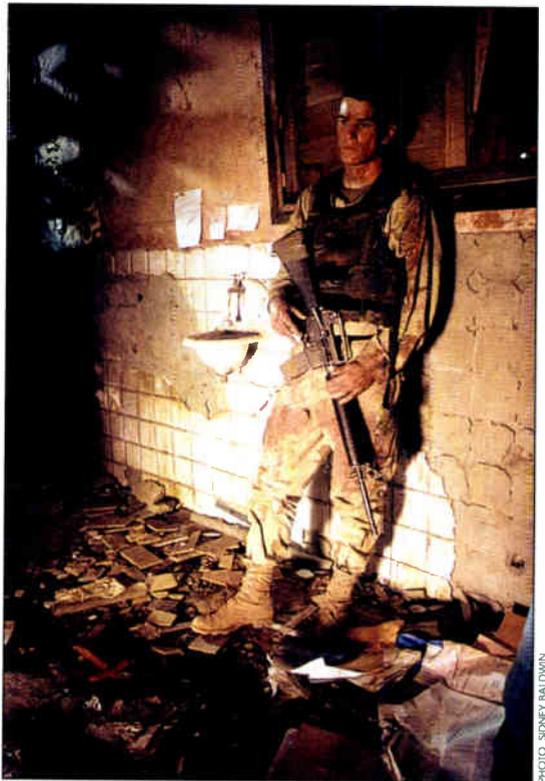
A rare quiet moment in Black Hawk Down

PHOTO: SIDNEY BALDWIN

out of the picture—how to articulate the sounds to give them what they need, give the movie what it needs. That's where the talent in mixing comes from. Certainly, there is the operational aspect of how you can work the board and understand what the board can do for you. And you have to have those things, but it's really about your understanding of what the movie needs and how you can take these things and develop them into a track that works.

Okay, you have a room full of your peers, not a class of students. What do you tell them about the state of film sound today?

I would just say, pay attention. Don't let things get overwhelming, because they certainly can get overwhelming very easily with the schedules, and the amount of editorial, and the amount of changes, material coming in from multiple stages. Just calm down, relax and take care of your projects. Don't let them push you. Don't get too loud. Pay attention and do nice work. And get more time to do a better job. But most of all, keep your artistic and creativity levels extremely high. We have great tools now, so go back and pay attention to the story. ∎

Tom Kenny, editor of Mix, *first interviewed Mike Minkler in 1991 for* The Doors *movie.*

Dennis Sands

Capturing the Orchestra, Harnessing the Synths

Dennis Sands loves his work, and it shows. A three-time Oscar nominee for Best Sound (*Cast Away*, *Contact* and *Forrest Gump*), a TEC Award nominee and a winner of two Golden Reel Awards for Best Sound Editing-Music, he's reached an enviable place in his career: working daily with the best composers and the best musicians on the best stages. Sands has more than 100 feature film scores to his credit, and he's adding more all of the time. As either music, scoring and/or re-recording mixer, he's worked on such high-profile films as *Erin Brockovich*, *American Beauty*, *Pleasantville* and *Good Will Hunting*. He's also accumulated an impressive album discography with projects for luminaries such as Joe Pass, Sarah Vaughan, Ella Fitzgerald and the Count Basie Orchestra, along with numerous soundtrack albums.

Yes, life is good for Mr. Sands. It's also good for the people who get to work with him. His years of experience and relaxed style make for smooth and even—dare we say?—fun sessions, a talent that's prized in the high-pressure world of feature films.

I first sat down with Sands on the Warner Bros. scoring stage after he'd spent a day mixing music with composer Alan Silvestri for *Showtime*, the Tom Dey-directed buddy cop spoof starring Robert De Niro and Eddie Murphy. The huge control room was filled: a big synth setup in one corner, a wall of converters, signal processing and computers in another, and behind that, a jam-packed machine room. Every fader of the 96-input SSL 9000 J was in use. Outside the control room, the stage was set for the next day's session with a 98-piece orchestra. As we wandered among the maze of microphone booms, baffles, music stands and chairs, Sands clued me in on his philosophy and techniques.

It looks like you're doing pretty much back-to-back sessions.
We finish here Saturday night, then I start *SpiderMan* with Danny Elfman on Sunday at Sony—two quite massive projects, but it seems like most projects are massive now. Even this [100-input] board is sometimes too small.
There do seem to be a lot of machines in here...
We're recording to a 48-track digital—a Sony HR machine. There's usually an additional analog machine for synthesizers, and I also record orchestra to analog. Then we'll probably have another machine for choir. So, we're using at least three analog 24s and a digital 48, and even that...
...isn't enough?

There's a lot going on—a hundred and some odd tracks, and it can be more. When we did *Planet of the Apes*, I had to have three additional DA-88s running. We did that at Fox, which has the same board as here, and they had every single fader filled, plus I had to bring in sidecars. Projects are just expanding.
Why is that?
Some of it's my choice because I like to have flexibility and control; not so much with the orchestra, but certainly with synths. And if I'm working with Danny, he uses a lot of stereo samples, so every sound requires two channels.

Also, mixes are expanding, and I like to have the ability to create surrounds. Then, of course, they'll want elements separate for the dub: percussive elements separate from pads, which are separate from orchestra. And if you have choir, that's separate. It's more and more complex. Here's a board that's relatively new in design, and it's right on the edge of being obsolete. It's not the manufacturer's fault. It's just so hard to keep up with the demands. Then you add in the fact that the typical post-production schedule has shrunk down a lot. Directors are continually editing and changing. That affects us, and we have to allow for it.
It's just part of the job these days.
It's the way the business is now. There's so much

World Radio History

money involved, and there can be so much tension. But when you understand everybody's issues and problems, you can't really get angry with anyone. Everybody's under the same time pressure and everybody's trying to do the right thing. You have creative people who want to maximize what they do, and there are time constraints. It's a frustration that everybody has to deal with.

I've heard it suggested that things will improve when everybody is on the same computer system, getting the changes at the same time.

[Laughs] Actually, I have this great fear. I was thinking about digital distribution of movies, whether over the Internet or whatever, when it dawned on me what could happen: A movie would not necessarily have to be completed by the release date! The director will be able to say, "Okay, the movie's done, but there's a cue in reel two that really bothers me and I want to replace it." The release print was always the cutoff, but that doesn't mean anything if you're downloading digitally. You can have endless new versions.

You could spend your whole life on just one movie.

[Laughs] Actually, sometimes it seems like I've done that already.

You're all set up for tomorrow, except for the mics. I guess you take them down every night.

If mics are left up, there literally has to be a guard in the room with them all night. A lot of the mics are irreplaceable; you can't even put a dollar amount on them. Like my four M50s. I use them on every orchestral project. If anything happened to them, I would be heartbroken.

The M50s are your main overhead mics?

Yes, for the orchestra. They're wonderful microphones, and they only made 600, of which there are probably 400 left in the world. They were the first purchase I made as a mixer, and I treat them better than I do my children.

Can you describe your setup of the musicians?

There are two basic setups I use. This is a traditional one: [audience left to right] first violins, second violins, violas toward the center, cellos with bass behind them, piano to the right, or sometimes I'll pull a piano out of the orchestra so it's right in front. Harp is in front, also. French horns in back, woodwinds in the middle, brass and trombones over to the right, percussion in the back.

You have the percussion more baffled.

There are two Latin percussionists, and I

kind of isolate them. If percussion is too much out in the room, it gets washed out and you hear a bit of delay. It just doesn't sound good, so I try to contain it as much as possible.

The rest of the setup is very open.

I don't use many baffles for orchestra. I prefer to control the dynamics out in the room. And I don't use a lot of microphones. I have a fair amount set up, but most of them I use just for spot if I want to reach for something here or there. Mostly for orchestra, I use about a dozen. Usually five room mics: the three M50s and two Klaus Heyne-modified Brauner VM1s. Dirk Brauner, who's German, makes a contemporary tube mic that Klaus modifies fairly extensively. I've had them less than a year and I think it's the best-sounding contemporary tube microphone. It's also very expensive.

You can buy it stock, but modified is much richer-sounding. Klaus handpicks them. Dirk sends him 20 or 30 mics, and, for example, if he has a client who wants a great vocal mic, he'll go through them and find the one that's best for that. In my case, he found two mics that matched as closely as possible and, in his opinion, were best suited for scoring, left and right wide.

Where else do you put overheads?

I like percussion overheads. I'm not big on percussion in your face, and if it was a classical recording, I probably wouldn't use the overheads. But for film, where you're dealing with sound effects and dialog, you want a little more presence to help it cut through. You still want to keep it in the room, in the same perspective with some nice depth to it, but a little more presence and texture helps. It's sub-

tle, but it makes a difference. So I'll use B&K 4006s on left and right; in the center, I have a U47 over the timpani.

I like to put the timpani in the middle, particularly with Alan Silvestri. He often writes a lot of it, like in last year's *The Mummy Returns*. It was in everything, very rhythmic, almost like a drum kit, and I love the sound of it in the middle. Some classical composers have it set off to the side; it's a personal taste. To me, in the center, it gives a nice power—both in the room and coming off of the screen.

So your setups change, depending on the style of the composer.

To a degree. The other setup, which Danny Elfman likes, is, we'll split the violins: firsts on the left, seconds on the right. Violas go mid-left, cellos mid-right and basses in the middle. Danny's orchestrator Steve Bartek orchestrates for this setup, giving it a beautiful quality where the violins answer one another. Sometimes it's harder on the musicians because, typically, violin players want to sit next to one another. It helps their intonation. But they've been great, and it has really worked on the last few movies. Also, having the basses in the middle, there's something nice about having that low stuff right in the center.

What are your other mic preferences?

I love the Schoeps CMC 54 and use it on harp and woodwinds. I'll use the Sennheiser MKH 40s, Neumann KM84s or B&K 4011s for the violas. I use two Stephen Paul-modified U87s for the celli, and on basses, I use Soundelux U96s. I am fortunate enough to own a matched pair of Neumann KM54s, and I always use them for the piano. I mike the brass two ways: M-149 overall, and Coles 4038s

(trombones) and Royer M-121s (trumpets) for solos.

You work regularly at several different studios.

As far as scoring, there are really five facilities in Los Angeles: Warners, Sony, Fox, Todd-AO and Paramount. I move around. We're fortunate here to have these five really excellent facilities and what comes with them: Excellent crews that understand film work. It's really very different from record work.

What are some of those differences?

Cue systems, for one. For example, string players typically like to hear only clicks, but percussion players want to hear the whole mix, plus click. If we have pre-records and we want to hear just the piano part, or just the percussion part, these facilities are set up for a number of different cue systems and they have someone to operate them. If you go to a facility accustomed to doing record work and it's running to rent the video machines, it's very hard on a mixer. I just don't have time to train people and also do my job.

A film is a world unto itself, and a big part of my job is dealing with the politics. There are more people involved, and everybody needs to have an understanding of who's who and when to say something and when not to. It's all part of the job. And it's a great job; there's always something to learn, something to get excited about.

Do you listen in 5.1 surround while you're recording?

Yes. My three main monitors are PMCs, tri-amped, with a built-in X-curve, the film equalization curve. I always use them for mixing. There are subwoofers, and the surrounds here—a JBL system—are actually built into the side and back walls.

You don't switch between systems while you're working?

No. I use this system for mixing. When I'm scoring, I use another set that are full-range: ATC Model 100s with Entec subwoofers. They have built-in power amps. Although, for this project, we'll continue on with these that are specifically for film mixing (for the scoring), because it's too much to move them in and out.

How many channels are you mixing to?

This is a 16-channel mix. There are four stems: percussion, orchestra, a stereo extra and five channels of synthesizers. We usually mix to two machines and Tascam MX-24. Essentially, we're mixing Pro Tools files; the drive goes out to the Pro Tools system. This has been a wonderful

addition, because you don't have to deal with Pro Tools here, which often falls offline and can slow you down. They're also a pain to set up and interface. So this works great. I use Genexes for backup; the studio takes them and has the mixes archived automatically.

What else is in the racks here?

I have Neve 1081 mic preamps for scoring. Then there are converters, 16 channels. I like the dB Technologies 122s. And I use an outboard folddown mixer. We're always having to do two tracks for soundtrack albums, but there's rarely an opportunity to do a separate 2-track mix, so I use an outboard mixer to take the 16 stems and create a 2-track.

Sorry, but the only word for all this routing is "awesome."

That's this man here: Greg Dennen. It does take a few minutes to set up. [Laughs] Just to transition to the mix from scoring is a good eight or nine hours. It wouldn't take that long if it were just an orchestral score, but we have all the electronics and they need a lot of reverbs to create ambience. Then, to split it all out means that there's more tracks, so there are more things to patch.

These guys have to check everything out and make sure everything's patched right, that it's a clean signal, on and on. There's no quick way to do it. Again, as mixes and complexity grow, the time required to get it together grows.

What else is in your rack? I see a lot of Millennia logos.

I like Millennia a lot. We have some Avalons, Manleys, some GMLs, which are great. The nice thing about it is, they all have a little bit of a sound to them. The Millennia probably are the least colored. It's nice to have a selection to get the right combination of sounds.

Obviously, you're using the SSL 9000 J Series console preamps also.

We are. The 9000 is a great-sounding board. The preamps are really good. I was never an SSL fan, but this console has completely changed my perspective on it in terms of sonics.

Can we back up for a little history? How did you get into scoring?

My first studio job was for MGM's record company when I was 22. A friend of my brother's who worked there called me because they had a huge tape library and they needed someone to administer it.

You were looking to get into film?

PHOTO: SAM EMERSON

I just wanted to get into music; I didn't really know that much about film or television. Working there taught me a lot. The studio had three rooms, and I got to know the mixers. It wasn't a rock 'n' roll studio; the mixers were more traditional, very experienced guys who were mixing a lot of Steve Lawrence and Eydie Gorme, Sammy Davis Jr., Frank Sinatra; I just loved it. I loved pop and rock, but the orchestra got me. When I wasn't working, I'd just hang out. I lived at the studio; I didn't want to leave. One night, we scored a film and it was the most thrilling thing I'd ever done.

After I was there about six months, they taught me record mastering because the mixers didn't want to do it. Then at night, if there were nothing going on in the studio, I'd take a tape into a room and started learning on my own.

One Friday night, there was a session booked with Joe Pass, and the mixer showed up so wasted he couldn't even stand. Every other mixer was gone; I was the only guy there who knew how to work the equipment—it was me or the guard, and the guard didn't want do the take! I was nervous at first, and then I was fine. It was just so great.

The producer liked me, so he started asking for me, and I did more and more of his records. After a while, I'm doing Count Basie and Ella Fitzgerald, Oscar Peterson; amazing things. I couldn't even believe I was sitting there engineering.

Eventually, MGM sold the studio. I stayed with them and did administrative stuff, but it wasn't what I wanted to do. I'd hit it off with another mixer at MGM;
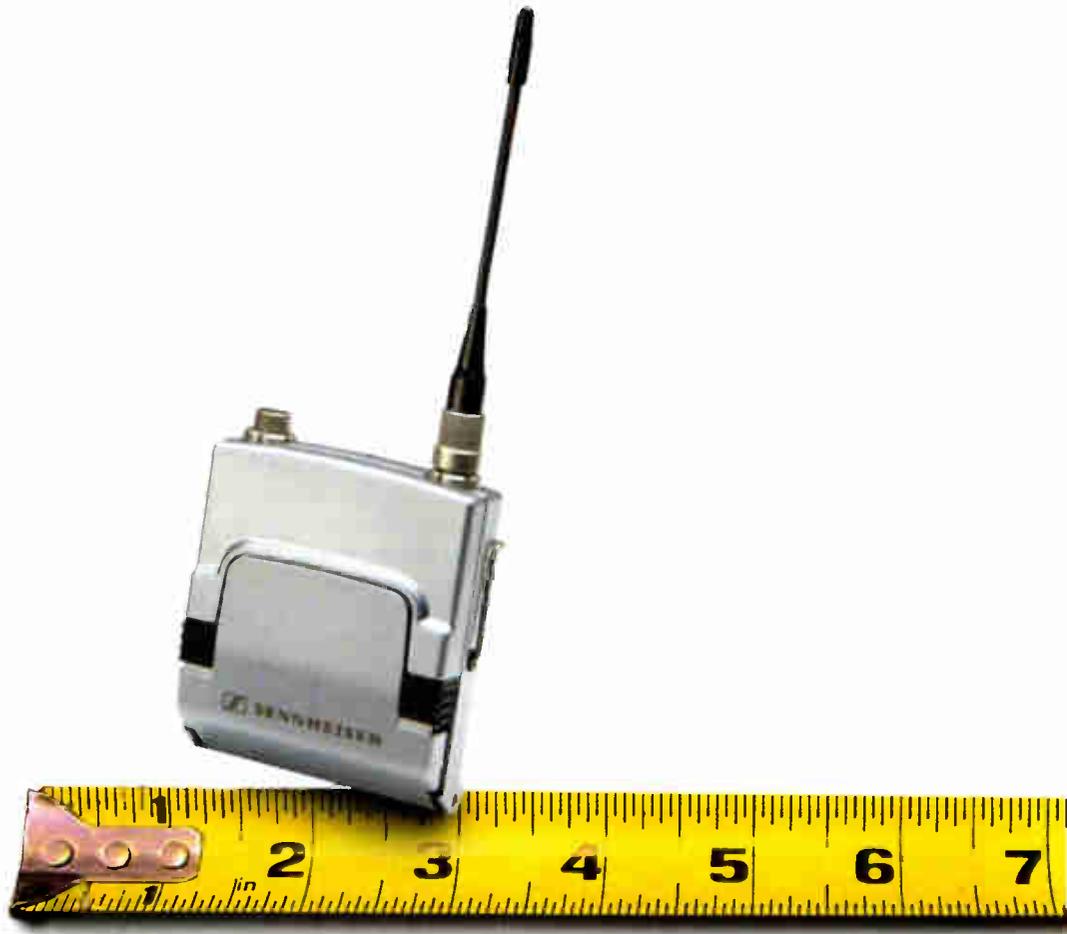
we formed a partnership and started doing record dates. Our business grew, we started doing television shows, and we got the idea to build our own studio and to focus on television work. No one else was doing it. So in 1977, we opened Group IV in Hollywood. It was the first really modern recording facility available to the television and film worlds.

The great thing was, I really learned how to mix there, because at that time, TV used live musicians and it was all mixed live. Not only that, I'd be doing two different shows a day: one in the morning, one in the afternoon. Different composers, completely different styles. I worked on *Dallas;* I did the show where J.R. got shot! *Hill Street Blues, St. Elsewhere,* I met Alan Silvestri doing *CHiPs.* And we also started doing some film work.

The studios at Group IV weren't that big; it must have been cozy doing orchestras!
For *Romancing the Stone,* which was a pivotal movie for me and a lot of other folks, we had 56 musicians and they were absolutely jam-packed. I had four musicians in the control room: the electronic drum kit and three keyboard players behind me. Then the director, Bob Zemeckis, Michael Douglas and who ever else was hanging out. It was too cozy! We had one iso booth that had two guitars and bass, then strings and brass and percussion. But it was a hit movie, and it was

such an innovative score. It was Bob Zemeckis' first hit movie; the same for Danny DeVito and for Alan Silvestri. Prior to it, Michael Douglas had been doing the *Streets of San Francisco.* It was a real special project. People saw it and liked it, and I got phone calls and started to get more and more into film work.

Do you read music?
I taught myself. I do better mixes because I can follow it, understand it, see what the concept is. It helps me adjust the dynamics in a room, which I much prefer to do rather than reach for the fader. If I feel bar 23 would be great if we heard more trombones, I'd rather say, "Let's do another take and have the trombones play louder."

Do you get the score beforehand?
No. But I try to get the movie with its work track and temp music, particularly if I'm going to dub it also. I do about two movies a year where I'll also dub. Not too many people do that, but Bob Zemeckis gave me the opportunity, starting with *Back to the Future III.*

How else do you prepare for a session?
I do a fair amount of homework. I'll have a number of conversations with the composer about what approach we're looking for. And I can tell a lot of things just by looking at how many and what types of musicians.

If it's a straight orchestral score, I don't

need to ask much. But when there's a lot of electronics, there's more planning involved. Then I do the right kind of setup and the right kind of preparation in the control rooms with the right machinery.

Are you a harsh taskmaster with people who work for you?
They're not scared of me! I think it's important to be easygoing. We're all human beings; we all make mistakes. If people are diligent, try hard, that's all you can ever ask of them. I think it's important not to freak out because the mixer sets the tone. If the mixer is obviously tense and nervous and seems concerned, everyone else is going to be the same way. There will be tension and you don't want that; there's enough tension on a film. The last thing in the world that you want is for there to be a sense that you're nervous or concerned.

Sometimes, people are scared when they walk into a control room. It's not their world, and it's got to be frightening when you know you're dependent on this but it looks so unbelievably complex. If you sense the operator is tense and nervous and you know there's a big meter running, you're going to be really uncomfortable. So I go out of my way to stay very calm.

Was that always your style or did that develop over time?
Certainly, experience relaxes you a lot. There just aren't many things that can happen that I can't fix. But I think I've always been calm and good with people. As I say, I understand that people walk in and they're nervous. Directors have a lot of pressure on them. Studios have a lot of pressure on them. There's a lot of money on the line and I understand that.

I have great respect for the business; I really do. I'm very appreciative to be here, and I want people to have a good time. It's all an experience. You want the technology invisible. It doesn't have to be a miserable experience, a tension-filled experience. You can do good work and still have fun doing it.

I love what I do, and I think of myself as an artist. I don't think of myself as a technician at all. I don't care why something works. To me, these are all tools to create the sonic experience. And I feel very fortunate to be able to work in this environment and this kind of job. I've had a real job before, and this is way better! ∎

Maureen Droney is Mix's *Los Angeles editor.*

SELECTED FILM CREDITS

Men in Black II (2002) (music scoring mixer)
SpiderMan (2002) (music scoring mixer)
Planet of the Apes (2001) (scoring mixer)
Legally Blonde (2001) (scoring mixer)
Cast Away (2000) (sound re-recording mixer)
Erin Brockovich (2000) (music mixer)
American Beauty (1999) (music mixer, music recordist)
Pleasantville (1998) (music scoring mixer)
The Horse Whisperer (1998) (score mixer, score recordist, sound re-recording mixer)
Good Will Hunting (1997) (score mixer, score recordist)
Contact (1997) (music scoring mixer, sound re-recording mixer)
Independence Day (1996) (score mixer)
Eraser (1996) (score mixer)

The American President (1995) (score mixer)
While You Were Sleeping (1995) (music recordist, music scoring mixer)
Richie Rich (1994) (music scoring mixer)
Forrest Gump (1994) (music recordist, sound re-recording mixer)
Gettysburg (1993) (scoring mixer)
Bram Stoker's Dracula (1992) (sound re-recording mixer)
The Last of the Mohicans (1992) (score mixer)
The Abyss (1989) (score mixer)
Who Framed Roger Rabbit (1988) (score mixer)
Back to the Future (1985) (music scoring mixer)
Romancing the Stone (1984) (music scoring mixer)
On Golden Pond (1981) (music recordist)

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The LAST WALTZ

The Rock Film Masterpiece Comes to DVD

By Blair Jacksoɪ

Acclaimed by many as the greatest rock concert film ever made, *The Last Waltz*—director Martin Scorsese's riveting depiction of the Thanksgiving 1976 farewell concert by The Band and a gaggle of their musician friends—was a natural candidate to make the jump to multichannel formats. Last fall and winter, the film was completely restored and remixed. It enjoyed a brief run in selected theaters this past spring, and was released by MGM Home Entertainment on DVD in both 5.1 and conventional stereo. Additionally, Warner Bros./Rhino came out with an expanded four-CD version of the popular soundtrack.

As is usually the case with these sorts of restoration/remastering projects, nothing was as simple as it seems. But then, neither was the making of the original film, which, despite its relatively straight documentary approach (with minimal additional interview footage), sprawled over 18 months from the winter of '77 through the spring of 1978.

"Everything was pretty much state-of-the-art for the time," remembers Steve Maslow, the veteran re-recording mixer who mixed the music for the original film on the Goldwyn stage's Quad 8 console. "They brought it in on [24-track], and initially they wanted to do something that wasn't done too much then—it might have been one of the first movies to do it—which was to interlock the multitracks to the film chain. It was quite cumbersome at the time. I can't even remember what th used—some sort of film sync lock c vice—and it took at least 20 feet for the fi chain to lock up; it was pretty frustratin

"It was quite time-consuming taki the [multitrack] information and locki up the film channel and going to 3- or track mag. We EQ'd and made a little r predubbed to 4-track mag, which becaɪ the dubbing unit. We had almost ɪ

months of premixes, getting everything from 16-track to the film, and then there was a little time spent getting the production dialog from premix. Rob Fraboni, who was the music producer, was involved almost from the beginning. Robbie [Robertson, leader of The Band and producer of the film] showed up at the final, mostly.

"The length of the mix was the longest I'd ever been on," Maslow continues. "It was six months, done mostly at night. I had three days off: Thanksgiving, Christmas and New Year's. One reason the film as a whole took so long is [The Band] took the tapes to their ranch and messed with them for a year, overdubbing bass and keyboard and vocal parts. I remember one of the problems we had to deal with was that Rick Danko had all-new bass tracks, and he overdubbed them without regard to the sync fingering onscreen. So part of what I had to do was every time he was on camera, I had to switch from the overdub bass to the production bass and make it sound seamless, which wasn't easy because it had a slightly different quality to it. As I recall, there were also quite a few piano overdubs, too, but since you never saw Richard Manuel's fingers, that wasn't a problem."

Maslow, who had a background in conventional music mixing before making the move into film, says that mixing *The Last Waltz* "was incredibly challenging because there were a lot of really interesting

Joni Mitchell and Neil Young

camera moves, and Scorsese wanted the sound to reflect the movement onscreen. So, for instance, there might be a sequence where the camera was moving, say, stage left to stage right with a sweep, and we would actually pan the instrumentation and vocals with the camera move. That was something I don't think had been done before in a concert film.

"Of course, in those days, we had no automation," he adds. "It was rather primitive compared to today. So there were a few times when we had three,

four, five people on the console handling different instrumentation or vocals on the mix. It was quite a scene. Very difficult to get that right, but also fun. The teamwork becomes *very* important," he says with a laugh. "Dolby had just introduced surround, but we did what was essentially a 3-track left-center-right stereo mix. There were no discrete surround tracks at the time."

Now flash forward 25 years and head out to nearby Santa Monica's Pacific Ocean

REMAKING THE MUSIC

Dan Gellert

Dan Gellert prepares *The Last Waltz* for three different formats: the four-CD boxed set, the film (and DVD-Video), and DVD-Audio

By Chris Michie

As independent engineer Dan Gellert tells the story, he first met Robbie Robertson when *The Last Waltz* project was in the planning stages. Robertson needed an engineer to remix the entire original album for both an expanded CD re-release and the remastered film soundtrack. Also planned was a DVD-Audio release (in 5.1 surround), which, like the four-CD boxed set, would include a slew of previously unreleased performances. "It was a long process to do, for sure," recalls Gellert, who eventually spent about 125 days working on the various remixes.

Originally from New York, Gellert started his career at the Power Station (now Avatar), eventually reaching the position of chief engineer. After developing a roster of clients while at Avatar, Gellert went independent about two-and-a-half years ago. Recent projects have included remixing tracks for two Robbie Robertson projects, mixing an album for Sweet Honey in the Rock and recording jazz pianist Akiko Grace with her trio.

Gellert joined *The Last Waltz* project after the original

tapes—including five hours' worth of 24-track multitracks from the concert, plus the "Last Waltz Suite" and other tapes recorded on a Hollywood soundstage after the event—had been transferred to 48-track digital format. "The signal chain was as clean as possible, just straight into the Sony 3348, which is 24-bit," explains Gellert. "Unfortunately, I was brought into the project just as the transfers were done. [I say] unfortunately because the transfers weren't done perfectly—not the audio, which was fine, but the clocking, which was a problem. We had to figure out how to fix that in the end when the music got synched to film."

Gellert's first task was to listen to all of the tapes to find the correct performances to mix for the film soundtrack. "There were a lot of extras—a lot of tapes, a lot of outtakes—so I had to weed
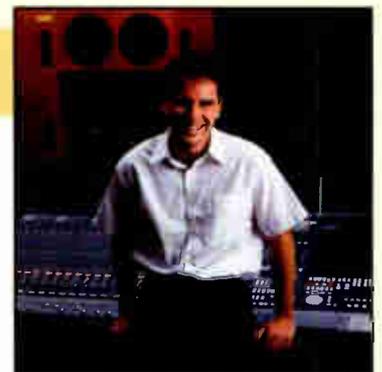
The LAST WALTZ

Post (POP) Sound Studios, where Ted Hall remixed *The Last Waltz* in surround for both its theatrical and 5.1 DVD release under the supervision of Robbie Robertson. Hall, who was widely hailed for his expert surround job on *Yellow Submarine* three years ago (see *Mix*, September 1999), had his work cut out for him.

"What came to me were from the original 2-inch masters transferred to Sony 3348 HR 24-bit," he says. "And, unfortunately, when they transferred the tapes, they ran the tapes wild, so I had to resolve the tapes from the timecode on a digital track, which was difficult. But once I got that up, there were issues of music edits and sorting through the tapes and doing a lot of archaeology to find out what was used. For instance, what vocals they actually used, because they overdubbed them on some songs for the [original *Last Waltz*] soundtrack album. Robbie's mixer, Dan Gellert [see "Remaking the Music," page 67] did stereo mixes and made stems, splits—splitting out the guitars and everything. He is the hero in this; his attention to detail is outstanding. That was approved by Robbie soundwise and stereowise, and then I made a 5.1 to match the original mix to some extent. That original mix, which Scorcese worked on back in '78, was a stereo mix with lots of panning. So if the picture moved from the piano to the guitar, the sound would move with it.

"Part of my job was not only to get everything in sync and to get a nice-sounding 5.1 theatrical music mix hap-

THE WINTERLAND RECORDINGS

Elliot Mazer's Live Recordings for *The Last Waltz*

Elliot Mazer was the chief recording engineer for the live concert that is central to The Last Waltz. *In his words…*

I had worked with The Band previously and had known them from Woodstock and Albert Grossman's office. I helped them with *Music From Big Pink*, mostly around mastering time. They had mixed it, and Robbie [Robertson] was concerned about how dull and dark it was. We listened in my apartment and in the studio, A&R Studios, the old Columbia studios on 7th Avenue. Turns out that it sounded dark and it sounded great. They had not planned it that way, but the engineers that worked on it were very conservative about EQ. A lot of it was done live in the studio, and the 8-track multitrack tapes were worn. All of which can make a project sound dull.

I also helped John Simon get the equipment and set up the studio for their second album, *The Band*. It was recorded in a home in the L.A. hills that had been built for Sammy Davis, Jr. And I had recorded a live show with The Band at Wembley Stadium [London] in '74. So I knew Robbie and The Band, and I was called in to record *The Last Waltz* after Robbie and Rick heard Neil Young's *Time Fades Away*.

We met in L.A. at Shangri La, The Band's studio in Malibu, and talked about the show and traded ideas. Marty [Scorsese] had prepared a shooting script that was based on the lyrics of each song. The camera assignments and moves were built around the songs. We worked the setup at Winterland, all the rehearsals at Winterland and the evening rehearsals in the basement of the Miyako Hotel, which were magical.

The truck was one of Wally Heider's trucks. Rob Fraboni mixed the house sound at the gig. John Simon did many of the arrangements, conducted various parts of the show and was very much involved with the rehearsals. He had to teach the guest songs to The Band and worked with the horns. John also played piano on a few songs in the show. Rob and John also worked on the overdubs and mixes for the original LP.

The Heider crew was great. Ray Thompson, one of the greatest live engineers, set up the piano sound and the house mics for the show. He could not be there for the actual show, but he was very helpful.

I was responsible for the concert recording. Every aspect, every detail of *The Last Waltz* was discussed and planned out

Elliot Mazer pictured recently in his wife's New York studio

to perfection. We knew the entire show before it started. There was one song in the show that had problems: Paul Butterfield walked out to the wrong mic, Robbie broke a string and one of Marty's lighting rigs went down—all of this at the same time. By the time Robbie got new strings and Butter was on the right mic, most of Marty's cameras were out of film. Marty told Robbie to go, and he covered the song with one camera, I believe, until the crews had time to load new magazines on the other six cameras.

The tape format was 2-inch, 24-track on 3M machines with Dolby A noise reduction. We had two machines running on overlap, and I think we got every song on both machines. But at some points, the power dipped so low that on a few tracks we had hum since the Dolby units were not connected to the same power source as the machines and console.

The vocal mics were Beyer ribbon models. The Band had great mic technique, and these mics had good off-axis response, which allowed for a lot of jumping around—the singers didn't have to eat the mics. We had mics from my studio, His Masters Wheels, the Heider's mics and the P.A. mics. We even painted the mic stands black so that they did not glare on film— Keith Monks stands and booms! So as not to screw with Marty's shots, we put up no drum overheads and put mics under the cymbals facing up instead. Levon's vocal mic gave us an extra amount of air on the drums.

We used every input on the API Heider board, and I believe that I used my Neve BCM 10/2 for additional inputs. We mixed the drums to four tracks and everything else was isolated. No compressors, no gates and generous EQ. ∎

Martin Scorsese directing Robbie Robertson

pening, but to re-create all these pans. I took the VHS release tape home for a couple of days and mapped out as much as I could of what Steve Maslow had done 20 years ago; it was a humbling experience in this era of massive automation and data networks. Some songs were pretty static, but almost every one of them had some sort of dynamic panning going on. We mixed everything digital on a Neve Logic 2 console with all panning, EQ, dynamics, automated. I would go through the mix, get it to where I thought it was working and then call up Robbie, and he'd drive over, we'd run through a couple of songs and tweak. We'd listen in a theatrical environment, and he was really good at picking out things that involved the sound in a theatrical 5.1 environment. He's a very attentive, great guy. Everything he said was always totally right-on.

"Eventually, before it was released, I made 5.1 stems and took those to Andy Nelson at Fox, and we played it in a *huge* room there just to give it its final little blessing and make sure that everything translated well. It's funny, I was working with old ¾-inch picture for the longest time. I didn't actually see the new picture until we went to Fox. And when I saw it there, I was stunned."

According to Hall, "Robbie's whole

Ted Hall at Pacific Ocean Post

intention with the 5.1 mix was to try to make you feel like you were there; he wanted it so that after 90 minutes in the theater, you felt like you were at a concert. The way we mixed it, it's a little bit like you're standing on the stage and the band is around you. While most of the music is still up front, there's also music in the rears pretty much all the time; there's reverb, some drums and whatever the instrumentation is that seems to wrap you into the mix, whether it's a guitar or keyboard part. There's also very discrete crowd stuff going on [in the rears]. In fact, there's one guy who's whistling all the time that drove me absolutely nuts. The same whistle over and over again. Even Robbie was saying, 'Can't you notch that guy out?'" Hall says with a chuckle. He also notes that because Gellert "had mixed it in more of a studio album style, for the 5.1, I tried to match the ambience of the room [Winterland in San Francisco] using a couple of processors to give it a little more of a live feel.

"Robbie was intent on really restoring this the right way, so we took the time to do it right. I spent a lot of time getting the original mix together and then probably another month mixing the music. Dan would be working across town, and if there was anything I needed, he'd send it to me and vice versa; we were swapping files. Getting the movie just to where it should be before the 5.1 [work] took a while. What Robbie wanted to do on the DVD was have a new 5.1 mix and the original 2-track mix, mastered and EQ'd. That way, people at home can listen to what it originally sounded like. And the people with surround systems will definitely hear something exciting and new." ∎

REMAKING THE MUSIC

—FROM PAGE 67, DAN GELLERT

through it all to see what would make sense," he says. Not surprisingly, documentation was less than comprehensive. "With anything from that long ago, the first thing to go away is the documentation, the track sheets. We had 50 or 60 large reels of 48-track digital multitracks, so I started by going through them to find the extra bits, and some bits that no one has heard. So that was a long process in and of itself, just listening." Not only were there duplicate tapes to sort out, with no documentation to show which was the master, but occasional musical patches, overdubbed on the master tapes after the concert, had to be identified and logged.

"It went in stages," recalls Gellert. "The first stage was the transfers, and then I got all the tapes. Then the next stage was listening to everything before I started delving into mixing it. Finding out what was going to be useful and then creating a schedule for mixing it all. We decided to mix the original album first, then the extra stuff and then what was in the film that wasn't on the album.

"My original plan was to mix each song in stereo and then go to the surround version. But after the first one or two songs, I realized this was not the

most efficient way to do it," he continues. "I found that for this kind of project, mixing in surround is such a different beast. The subwoofer excites the room in such a different way that to go between the two formats quickly wasn't efficient—

Robbie Robertson

you had to get your head around the room sounding very different. So, I mixed it all to stereo first; all of the original album, things in the movie that were not on the original album, the extra stuff I found, like the jams and rehearsals and 'The Last Waltz Suite,' everything. Then I went back and concentrated on the surround mixes."

All the mixes were done on an SSL Axiom MT digital console, with stereo mixes committed to an Ampex ATR-102 running ½-inch analog tape. "We mixed to other formats, but that's what ended up winning for the stereo," comments Gellert. Surround mixes were captured in 24-bit Pro Tools sessions. All stereo mixes were monitored on Yamaha NS-10s, while Gellert set up Genelec 1031s and a matching subwoofer for the 5.1 surround mix.

The private studio was well-equipped with a combination of classic analog devices and the latest digital processors. "One of the great devices that I really enjoyed using was the Sony S-777 sampling reverb," he says. "It just sounds accurate, like you're actually in the space. I used that a lot, and a Lexicon 960."

How did Gellert approach the remixes of an album that many consider a classic? "I started out listening to the original. I wanted this version to bring out all of the musical detail that was masked in the original, and also to have a real impact. That was my agenda." To achieve consistency with the rhythm and vocal levels, Gellert used some compression but more often relied on fader rides, which were captured and repeated by the MT's automation system. "Compressors would level it out a little bit, but to make it really level out was just eating up too much," he explains.

As it turned out, Gellert had to do quite a bit of preliminary work before actually getting down to mix each track. "Every song was a little bit different," he says. "There were so many different performers, and people would move around the stage. I mixed 54 songs altogether, and after mixing the 20th song, you'd think I could say, 'Okay, I know what's coming.' But there was always some technical thing I had to spend time with. On 'The Last Waltz Suite,' I had to find the right performances by A/B'ing with the record to make sure it was the right take. It wasn't straightforward, but that was the process and was expected by everybody."

Not surprisingly, Gellert had to make adjustments for different players on the same instruments. For example, Richard Manuel's grand piano sounded very different when Dr. John sat down for the New Orleans funk of "Such a Night."

"I found that when Levon [Helm] was singing and playing, the drums sounded very different from when someone else was singing," adds Gellert. "It's a natural physical thing—when he's singing, he plays differently. The horns were also a little difficult to bring out."

Gellert and Robertson quickly established a routine. "I'd mix all day, and he would come in toward the end of the day and we'd listen and tweak the mix,

The Band

maybe an hour, maybe two, and then it was done," explains Gellert. "It was the optimal way to do it. I got it sounding the way he wanted to hear it—I learned that pretty quickly—and then he'd make little fixes here and there, just updating the mixes."

For the stereo mix, Gellert and Robertson opted for a wide stereo soundscape. "For the live concert, the premise was to make you feel like you're a little too close to the stage, in the first row, so the stage is really wide, with the piano way to the left, Robbie's guitar way to the right," explains Gellert. "That was the idea: To make it really wide and to have the ambience of the arena come from behind. I was very happy with it. With 'The Last Waltz Suite,' I made it as wide as possible and I played more with all of the available stereo fields, not just the left/right front but, for example, the left front and right rear, as well. I mixed the extra tracks after I mixed the rest of the stuff, so I had an idea of what I wanted it to sound like. It was fun hearing tracks that, unless you'd been at the concert, you wouldn't have heard before."

The surround mixes for the DVD-Audio release were addressed on a case-by-case basis. "Some were similar, some were quite different," says Gellert. "On some of them, I did a surround mix for the DVD movie and the film and then tweaked it a little bit differently for the DVD-Audio. It needed to be a bit different, because you're not looking at the movie."

Once Gellert completed the mixes for the film and video releases, they went over to Ted Hall at Pacific Ocean Post. "I was there listening to stuff; both Robbie and I went there now and then," says Gellert, "but Ted did such a fantastic job. He had all the elements—the original dialog and all that—and he had the same nightmare I had of finding the right things and making sure that it's appropriate and correct and the best it can be at this point." ∎

Crime Scene Audio

A Forensic Look at Location Sound for "CSI"

By James Careless

C lean, clear audio: It's central to the success of CBS' hit series, *CSI: Crime Scene Investigation.* Without clear audio, the complex *CSI* plot line would be lost, as would the smart, snappy dialog. Fortunately, *CSI* has the right man behind its audio board: Mick Fowler, a music-trained mixing veteran, who's been with *CSI* since its inception.

For four days of each episode's eight-day shoot, Fowler does his work in the predictable confines of Santa Clarita studios in Valencia, Calif. "After two seasons, we're pretty used to these studios, their acoustics and how well wireless works in them," he says. "We now know what to expect."

However, for the other four days, Fowler can be anywhere from LAX Airport to the middle of the desert. How does he cope, what equipment does he take with him and (of most interest to this writer, who's struggled with this problem time and time again) how does he hide wireless mics on his actors so there's no clothing rustle?

HAVE AUDIO BOARD, WILL TRAVEL

As a veteran of TV series such as NBC's *Profiler* and Fox's *Action,* Fowler is accustomed to location work, which is why he's developed a basic audio setup that accompanies him wherever he goes.

"I start with an 8-channel Soundcraft

Mick Fowler, on location

GP1 board, soon to be a Zaxcom Cameo," says Fowler. "Into this, I input audio from up to eight wireless Sanken microphones: lavalier, boom or a combination of both. The transmitter units are Lectrosonics: four operating in VHF, and four in UHF."

Whenever possible, Fowler relies on boom man Donovan Dear, whom he describes as "one of the best in the business." To make sure Fowler's audio gets back to the board, Dear is equipped with a 250-milliwatt transmitter, which is one-and-a-half times more powerful than most wireless units.

Fowler records audio on a 4-track Zaxcom Deva hard disk recorder. "As we record, we automatically 'mirror' the audio to a DVD. At the end of the day, both the DVD and the hard disk are sent to post-production." For backups, Fowler uses "a good ol' fashioned analog Nagra TC reel-to-reel. It's so reliable that it almost never lets you down. And, being analog, the Nagra isn't prey to the various bugs that can affect digital files."

Finally, there's wireless intercom. Fowler and Dear are linked via a Lectro-sonics IFB system, while the show's director has a Comtek link that lets him hear the audio mix while it's recording.

In general, Fowler sites his audio station as far away from the action as possible. "Forget the romanticism of being close to the actors on set," he says with a laugh. "I've been doing this a long time." As he points out, being far away means that there's less equipment and fewer people cluttering up the set, "which makes everyone happier."

TRICKS OF THE TRADE

For Fowler, recording clean, intelligible audio is what this job is all about. "*CSI* is dialog-driven," he explains. "There are lots of clues provided in the audio. The viewers are very smart; they want to hear all of the forensic details so that they can solve the crime themselves." However, as anyone who's ever done location audio knows, the combination of clothing rustle, varying audio levels, microphone cross talk, wireless dropout and background noise can often lead to distorted or unintelligible audio, or both. Especially both.

To get intelligible audio, Fowler records dialog "as if I'm standing right beside the actors. It doesn't matter whether the actors themselves are standing in close-up or 100 feet away in an establishing shot. The audience must feel like they're eavesdropping on the conversation."
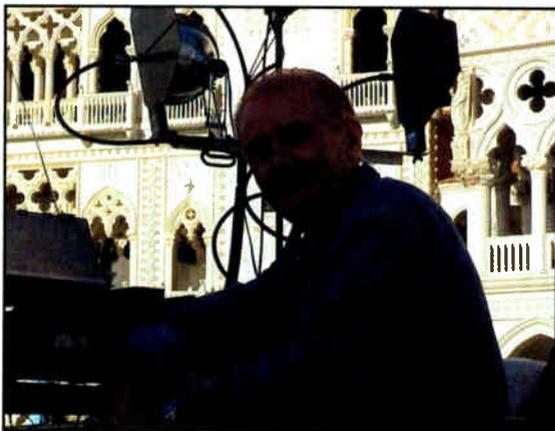
9/11: In Memoriam

HBO and the New York Philharmonic Record Their Respects

By Gary Eskow

Premiered on May 26, 2002, the HBO documentary *In Memoriam: New York City, 9/11/01* recounts the events of that extraordinary day by intercutting interview material with then-Mayor Rudy Guiliani, and raw documentary footage culled from the millions of feet shot by news organizations and private individuals.

The producers, who prepared a music track based on recordings spanning several decades, decided that it would be simpler to re-record the entire score than attempt to license the original material. The New York Philharmonic was selected for the re-recording sessions, which were engineered by Larry Rock, currently in his fifth season as the Philharmonic's audio director. Rock received a 1997 Grammy Award for his work on an RCA Victor Red Seal/BMG recording of the St. Louis Symphony Orchestra, conducted by Leonard Slatkin. (As we were going

to press, Rock was nominated for an Emmy Award in Sound Mixing, and *In Memoriam* was nominated for five total, including Sound Editing. The Emmys are this month.) He records

every Philharmonic performance, mixing them for weekly radio broadcasts, which go out live on WQXR in New York and are syndicated throughout
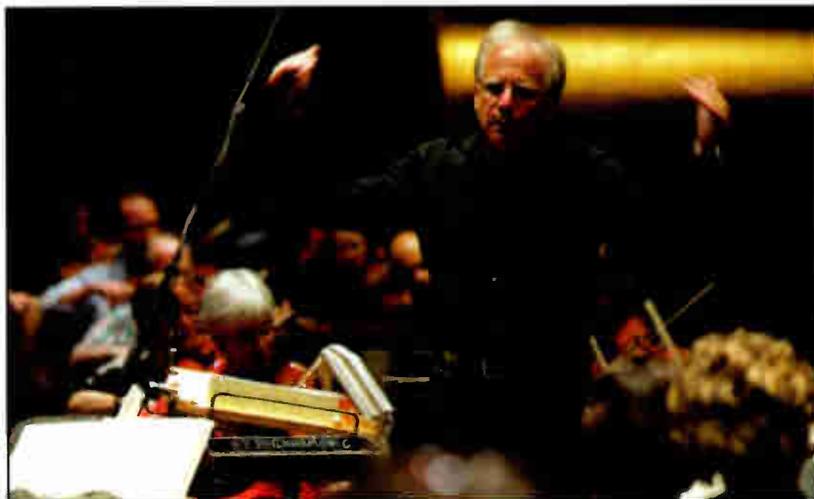
Conductor Leonard Slatkin with the New York Philharmonic

Facility Spotlight

Bustin' Grooves at HUM

By Maureen Droney

It's buzzing (okay, make that "humming") like a beehive at the warehouse-style office and studio space of HUM Music+Sound Design and its satellite companies, SubZero and Grasshopper. Recent action at HUM includes high-profile commercial scores like Microsoft's "One Degree of Separation" campaign, Chili's ads featuring top-of-the-poppers 'N Sync, and projects for Toyota, Lexus and Budweiser. Meanwhile, subsidiary SubZero, formed last year to bridge the gap between advertising agencies and the music industry, hired influential KCRW DJ Tricia Halloran as creative director, joining forces with HUM/SubZero executive producer Debbi Landon.

Musician/composer Jeff Koz is the driving force behind all of HUM's related companies. A multi-instrumen-

talist who broke into sound-for-picture by scoring B horror movies, Koz founded HUM in 1996, wisely locating the company in what has become Santa Monica, Calif.'s, thriving media and post-production district. The building, by architect Walter Meyer and acoustic designer Marshall Long, now houses offices, two full recording studios, voiceover and Foley suites, and a dubbing room, along with a kitchen, numerous client lounges and a rotating display of large-format paintings by artist Gregory A. J. Miller.

Although the complex is fitted with

Hum/SubZero executive producer Debbi Landon and musician/ composer Jeff Koz

Pro Tools systems and Yamaha 02Rs, as well as a plethora of gear by manufacturers such as Avalon, API and HHB, the heart of its recording setup is Logic Audio. "I never got into Pro

Tools," Koz confesses, "even though we have all of the hardware and upgrades. The Logic interface is more intuitive for musician types like me. You can do everything with it now. The Logic EXS sampler, for example, is unbelievable. I can honestly say it has changed my life because now everything in a session is recallable."

a lot of ideas, a lot of evolution, on something as high-stakes as a global-branding campaign for Microsoft. Initially, the clients weren't looking for specific music; instead, they wanted a very ambient background sound, like a bed, for all of the spots. It was intended as a mood rather than a music track, and they wanted it to be very sound design-oriented.

trend in the industry. This is a way to tackle it head-on. Bring us your low-budget projects, and our people in Grasshopper will make sure they're done right and that you're happy. Grasshopper is a positive, proactive reaction to what our industry needs right now." ■

"CSI"

Wherever possible, Fowler gives Dear the task of capturing location audio using Neumann microphones, specifically KMR 81 and 82 models. "I love Neumanns," says Fowler. "The sound on them is so great." In situations that demand the use of wireless microphones, Fowler is very, very careful about where he places them.

On *CSI*'s female characters (Catherine Willows and Sara Sidle), the placement is relatively simple. "It's probably not politically correct to say this," Fowler says, "but I take advantage of Marg Helgenberger's and Jorja Fox's physiology and place the mics between their breasts using surgical tape. Needless to say, I have the actresses do the mic placement themselves. Gary Dourdan—who plays Warrick Brown—has a good set of pecs. So I use the same technique on him, too."

When surgical taping isn't possible, Fowler and Dear have other ways to hide lavalier mics. Sometimes they hide them in buttonholes. Other times, they use a combination of "vampire clips" and putty to attach them to an actor's clothing. In all instances, their goal is to balance clothing rustle against invisibility to end up with a mic placement that does the job.

At Hum, L-R: composer Jason Steele, Jeff Koz, sound designer Marc Levisohn, and Dan Hart, member of the Grasshopper Collective

Koz has also recently become a fan of Korg's Karma synthesizer, citing it as an example of composer-friendly new technology. "It used to be so difficult to get inside the architecture of a synth that you were likely to leave it up to the engineer to process things," he says. "Now, with all the software, synthesizers and samplers, programming has become easy. As a musician, you can intuitively follow an idea and experiment along the way with the sound. It's really amazing in terms of musical inspiration."

Inspiration was definitely a necessity for the Microsoft campaign, a multipronged challenge requiring music and sound design for both the melody that interprets the corporate "dot-Net" brand and four different, split-screen format spots. For example, in "Vintage"—recognizable to anyone who's seen television in the past few months—an accident causes racks of wine bottles to crash to the floor. On one screen, a fast-thinking manager quickly increases the price on his now-reduced inventory, while on the other screen, a nonchalant worker notices the sudden change on his bar code reader.

"Today's music for the advertising world is very much about giving clients options," says Landon, who served as producer for the tracks. "You go through

But because the music really set the temperature for the spot, they realized the first concept didn't work; it left them feeling cold. They needed something that would help move the spots forward, so we went into creating specific, very diverse types of music for each spot."

Koz acknowledges a definite trend toward very "music-conscious" directors. "There's definitely increased awareness about how powerful a role music plays in marketing your project," he says. "Whether it's television, a film or a commercial, you have to get an identity across quickly. What we do is help people achieve that goal through music."

The most recent company under the "HUMbrella" is Grasshopper, described by Koz as an endeavor to help keep the company fresh by allowing its younger up-and-coming composers the ability to accept lower-budget projects. "It's exciting," he says. "In a way, it breathes new life into things. People already working here can target their peers; the up-and-coming editors and directors who are looking for tracks."

Grasshopper is a reaction to the recent excess of low-budget projects making the rounds in the advertising industry. "A bell went off," Koz says. "People were complaining, but there's no denying that it's a

MUSICAL EXPERIENCE HELPS

Fowler got his start in London in the '80s, working as house producer for Philips Records. "Back then, I had to mix up to 24 tracks," he recalls. "The fun part was to balance all of the separate elements—drums, voices, instruments—and produce a cohesive whole that sounded right. Today, I take the same approach when I'm recording *CSI*. My goal is to deliver a finished product, not a series of ingredients. The reason is simple: I like to mix."

For example, whenever Fowler is recording a group of *CSI* actors in, say, a hallway scene, "I'm riding the faders." As soon as one actor's finished speaking, Fowler pulls his channel down, which prevents cross talk and also helps keep his

levels balanced. Of course, sometimes he adds an open mic at the back of the room to capture the right reverb.

THE NOT-SO-FUN STUFF

Every location job has its challenges. In *CSI*'s case, the biggest one is background noise. Actually, the noise itself isn't a big problem, as long as the viewer understands the reason for it. For instance, when there was a sequenced shot inside LAX Airport, the audience could see why there was so much ambience on the soundtrack. But during a shoot inside a strip club, which was right next to a freeway, "You could occasionally hear traffic noises on the audio track," says Fowler. "Trouble is, there was no reference to the freeway in the script. So the audience wasn't able to understand and then dismiss this ambience."

When noise gets to be too much of a problem, *CSI*'s actors remedy the problem by re-doing the audio in the studio. However, this takes time and is something Fowler does his best to avoid.

Script changes also present minor problems. Despite what the viewers might think, scripts are not written in stone. In fact, *CSI*'s scripts can be in flux right up to the moment of taping. Typically, changes are driven by the actors themselves. "They have a solid understanding of their characters and how they react in certain situations," explains Fowler. "Of course, the scripts have to be changed to take their feedback into account."

To cope with such challenges, Fowler sits in on all of the rehearsals, keeping a sharp eye on each episode's evolution. During taping, Fowler keeps a copy of the latest script on a music stand. With each fader assigned to an individual actor, he then "plays" the mix, reading along and making his moves in accordance with the actors' lines.

Risky? Yes, but it's also the best part of the job, as far as Fowler is concerned. "Sometimes I've got two boom mics and six lavaliers running capturing a last-minute script change, or even an unscripted ad lib. To me, this kind of organized chaos smacks of my old days in music mixing. It's just plain fun!"

The quality of Mick Fowler's location work speaks for itself. Tune into *CSI*, and you can count on hearing everything the actors say, every time. No matter where they happen to be. ■

James Careless is a freelance writer based in Ottawa, Canada. He has 21 years of experience in audio, radio and TV production.

In Memoriam

the nation by WFMT in Chicago. Rock also culls the archives to prepare weekly broadcasts for evening drive- time listeners in the tri-state area.

Though the New York Philharmonic is based at Lincoln Center's Avery Fisher Hall, the orchestra was traveling on

September 11. "Needless to say, our flight was canceled and we didn't get home until the next weekend," says Rock. "Our Opening Night Gala programming was scrapped in favor of a performance of the Brahms Requiem. It was extremely moving, but also technically demanding, because it was going out live on TV and radio. I was paying attention to what was going on, but at the same time, I was lost

JOHN HOFFMAN ON THE MUSIC

Producer John Hoffman was instrumental in selecting the music for the HBO documentary *In Memoriam: New York City, 9/11/01.* He explains how the music was chosen and why HBO decided to re-record it with the New York Philharmonic.

"Sheila Nevins, our executive producer of original programming, who is also a producer on this show, wanted to involve as many New York institutions as possible," says Hoffman. "The idea for the program was brought to us by Brad Grey, who is the executive producer of *The Sopranos.*

L to R: Hoffman, Slatkin, editor Paula Heredia

"Let me back up a bit: *In Memoriam: New York City, 9/11/01* looks at 9/11 from two different perspectives. First of all, we have Mayor Guiliani talking about how he and the city government functioned that day, and the ways in which democracy itself was challenged.

"Additionally, we used the work of hundreds of New Yorkers who picked up their cameras that day to document one of the most important events of our time. We solicited material from filmmakers and the networks, all of which came to us voluntarily. We placed ads in the *Village Voice,* spread the word through independent film groups and other organizations. At this time, we probably have the largest archive of video material documenting 9/11 and the days following. Any and all profits coming out of this project will go to the September 11 fund.

"As I said, Sheila wanted to involve New York organizations as much as possible, and we wanted American concert music to comprise the underscore. Naturally, the New York Philharmonic came to mind. Larry Rock and the orchestra's general manager, Paul Meecham, opened up their archives to us. In particular, I went through all—or most—of the boxed set *American Celebration,* which Larry had suggested I listen to. I found sections that I brought to our editor, Paula Herredia, and everyone agreed that the music of Copeland and Barber, in particular, fit the images perfectly.

"The tracks that we cut picture to came from records made over the last 60 years. Getting the rights and paying AF of M fees to thousands of people and their estates would have been a nightmare. It made better business sense to employ the current Philharmonic musicians and work with music publishers for sync rights."

—*Gary Eskow*

in a fog of emotion. I remember that when the piece ended, there was no applause; the silence was awesome. Gradually, everyone got up and walked off the stage."

Typically, Rock records the orchestra using an array of four omni mics. "Generally, I incorporate a pair of Neumann 130s—they have a slight rise in

Engineer Larry Rock (left) recording at Avery Fisher Hall

the high end that I like," he says. "I also use a pair of Schoeps MK 2S mics as outriggers; of the four that I spread out, they're the farthest left and right. I also use diffraction spheres on the Neumanns because the effect is reminiscent of the old Neumann M50 that had the diaphragm mounted in a sphere. It causes the mic to have a slightly directional quality at the high frequencies. The practical result is a little more focused sound. Not that it changes the response per se, but in the room, it makes them slightly directional, but only in the upper frequencies.

"I place these two omnis on a bar spaced about 70 centimeters [roughly 18 inches] wide. They act almost like an ORTF pair. The theory here, as many *Mix* readers know, is that you don't want a coincident pair but a pair that is slightly spaced at approximately the same distance as your eardrums. For broadcasting, in particular, you want a stable center image."

Rock uses as many as 16 microphones total, deploying various Neumann and Schoeps models as spot mics, and mixes on a Mackie analog 8-bus console. "I monitor on Martin Logan speakers, which I like a lot," he says. "They're a hybrid electrostatic speaker with a dynamic woofer. Speakers don't have to be huge to

have a good low end. These are about six feet tall and 16 inches wide."

Because the HBO session was not a live concert, Rock was able to hang mics that he might not have otherwise used. "Neumann was kind enough to loan us a pair of their new M150 tube mics," he recalls. "That's the latest version of their vintage mic. Neumann came out with a

transistor version of the old M50, the TLM 50, in the 1980s. The M150 tube is cleaner than the old M50s were and warmer than the TLM 50s." Thanks to the carefully designed grille, the M150 had the directional characteristic that Rock could otherwise achieve only by putting diffraction spheres on the Neumann 130s.

Because the Philharmonic's retiring music director, Kurt Masur, was not available for the HBO sessions, Rock found himself working again with conductor Leonard Slatkin. As Rock notes, a conductor's style can change the way he records the orchestra. "Masur worked to get a very warm sound from the orchestra," he says. "That meant that I didn't have to work to avoid printing a harsh sound. Aggressive material, when played in an aggressive manner, calls for me to tone things down with subtle changes in the way I aim mics. In general, by the way, Masur raised the level of playing in the orchestra."

Another factor that Rock had to consider was the notorious acoustics of Avery Fisher Hall. "The problem is that it has a large volume," explains Rock. "A lot of sound goes out, and it doesn't come back readily. The space is just a little too deep, affecting concert listeners more than those listening to a recording made there.

There's too much diffusion for the amount of reverberation. But it's not a terrible hall—I've worked in much worse—it just doesn't shine real well. The strings tend not to have enough surfaces that are close by to give the kind of reflections that would be desirable. But it does have a very solid stage box to support low frequencies, especially those coming from the back of the stage, which, unfortunately, is too rigid. Its lack of proper resonance results in a bit of a hard sound."

Rock typically records the orchestra's performances in stereo to two different digital formats. His stereo mix from the Mackie runs through a Benchmark AD2004 A/D converter and then to a Tascam DA-45 at 24-bit, and also through an Apogee UV22 that dithers the signal down to 16 bits to feed an HHB CD-R 850 CD burner. "I'm really careful about the CD media I use," says Rock, who has been using Taiyo Yuden CD-R media. "The Mitsui media is also well-made. There is a trade-off, supposedly, between the media that yields the best data right away and what lasts the longest. We won't be certain for generations.

"DAT is clearly a stopgap measure," he continues. "Everyone knows that its reliability and longevity are questionable. However, the DA-45 runs very well. The next step up for us is the DA-78, which we bring in for important concerts, including the HBO tracks. My standard procedure when using the DA-78s is to create six tracks of surround components, although I'm not creating a finished surround mix, which we're not capable of executing here. These are more like surround-ready tracks spread out across eight tracks. I'll put the same stereo mix as I'm feeding to the other recorders onto the first pair of tracks, plus another six tracks consisting of left- and right-rear channel information and a pair of tracks containing material you'd want to steer in and around the middle channel, soloists in particular.

"On the HBO session, we used one DA-78 to record the stems, plus three more that we used to create a full multitrack mix, 24 tracks wide. We did this for two reasons: One, the critical nature of the project. We needed protection, just in case HBO wanted to remix something for balance reasons. Secondly, HBO plans on releasing a DVD of this show (with profits to aid the September 11 relief efforts) and they'll need to tailor a surround mix for that production." ■

Gary Eskow is a Mix *contributing editor.*

A commitment to both talent and technology has always been the hallmark of Universal Studios Sound Department. A division of Universal Operations Group, Universal Sound offers a comprehensive array of services to the post-production community, including feature film and television mixing, sound editorial and design, digital mastering, soundtrack restoration, ADR, Foley and a full complement of sound transfer services, as well as 11 state-of-the-art theaters and screening rooms. Universal's post-production engineering division is second to none, with a dedicated engineering staff applying the highest standards to day-to-day operation of the mixing stages and editorial rooms, while also constantly striving to address a rapidly changing technological landscape. Client service is also an integral part of the Universal experience; an experienced staff attends to the needs of clients with the goal of complete customer satisfaction.

"Over the years, the Operations Group has invested to maintain the exceptional standards necessary to serve the extremely demanding Los Angeles client base," says Chris Jenkins, senior vice president of sound services at Universal Operations Group. "In the last two years, the studios have diversified, to offer not only the best in mixing and editorial, but also the best in the growing areas of ancillary services such as transfer, restoration and digital mastering. Along with investment and diversification, Universal's high regard for, and commitment to, talent has resulted in a creative environment that is the key to its success in meeting the needs of its clients."

FEATURE FILM MIXING

The Sound Department's three feature film mixing rooms, designed by Jeff Cooper and outfitted with the world's largest Harrison automated consoles, are staffed by high-caliber talent whose combined accolades include 35 Academy Award nominations and eight Oscars, as well as 13 BAFTA nominations and 10 BAFTA Awards. All three feature mixing rooms offer a combination of comfort and technical proficiency that makes for an extremely creative, and very private, environment, with an on-site concierge staff dedicated to client needs. The stages are equipped with built-in, dedicated digital workstation bays, all current digital formats and adjacent producers' lounges.

Studio 3 is manned by Andy Koyama and Chris Carpenter, whose recent credits include *Austin Powers in Goldmember*, *Meet the Family* and the groundbreaking soundtrack restoration of *E.T. The Extra-Terrestrial: 20th Anniversary*.

Studio 4 is home to Chris Jenkins, a two-time Academy Award winner, and Frank Montano, whose recent credits include *Star Trek: Nemesis*, *The Sum of All Fears* and *A Beautiful Mind*.

Studio 6 is the residence of Steve Maslow and Gregg Landaker, three-time Oscar winners whose credits also include *Red Dragon*, *Time Machine* and *Tomb Raider*.

B L U≈W A V E
A   U   D   I   O

Universal Studios' 18,000-square-foot BluWave Audio opened in early 2002. A unique, ultra-modern technical and creative operation, BluWave was designed from the ground up to service digital mastering, trailer mixing, soundtrack restoration and transfer for third-party clients, as well as Universal's theatrical and television mixing divisions. The BluWave facility comprises two large mix rooms, four digital mastering suites, three Sonic Solutions clean-up suites, two core transfer mix sound rooms, DVD-Audio authoring, dailies, telecine services and loading stations. In addition, BluWave offers video transfer operations that focus on high-end customer service to the picture editorial community, as well as the division's own internal needs.

BluWave represents years of thoughtful planning and the determination to create a unique audio environment. A high-density fiber network allows audio and video to be moved about the facility with utmost efficiency. Shared technical resources make for quick, quiet and trans-

parent operations. All digital formats are available, and each room's router allows the selection of any machine at any time, as well as the downloading and daily archival backup of all audio and video elements. Fail-safe backup is provided by individual RAID arrays at the central machine room, which are in turn backed-up to AIT tapes housed in a large, robotic central storage system.
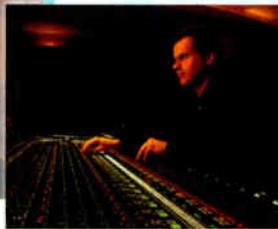
DIGITAL MASTERING

Universal offers what is arguably the finest digital mastering division in the world. Specializing in audio for DVD and other mastering formats, this division is a unique environment combining the technologies of CD and motion picture soundtrack mastering. Digital mastering encompasses AC3 streaming, DTS mastering, foreign language versions and added-feature audio for DVDs. The company specializes in hard-to-handle audio challenges and is equipped for all file formats and conversions. Led by Richard LeGrand, whose credits include *About a Boy*, *E.T. The Extra-Terrestrial: 20th Anniversary* and the restoration of Steven Spielberg's *Duel*, Digital Mastering's highly trained and enthusiastic creative staff is second to none.
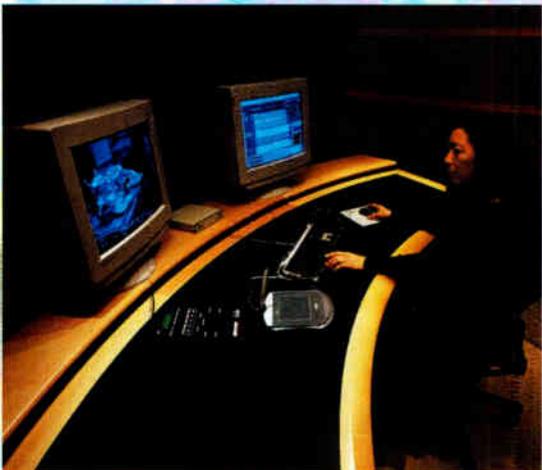
RESTORATION

Universal's soundtrack restoration division serves the needs of the archival and restoration community with a keen understanding of the care and respect required to preserve the integrity of original masters. Three Sonic Solutions suites and one large mix room are dedicated to preserving and protecting the aims of the original filmmakers. Headed by Tom Regal, the division's proven track record in this area has earned the respect of its most demanding peers, with such projects as *2001: A Space Odyssey*, *The Shining*, *A Clockwork Orange*, *East of Eden*, *Rebel Without a Cause* and *Ben Hur*.

TRAILERS

The Universal Sound Department offers two different environments to support the creative advertising community. BluWave's Studio A, headed by Peter Reale, focuses on theatrical trailers and is equipped with a digital Harrison Series 12 console and a comprehensive Pro Tools environment. Studio 7, the TV spot room, is helmed by mixer David Brolin and is also fully loaded with Pro Tools. Editorial for trailers is handled by the Sound Department's editorial division, with sound files easily shared between the two facilities.

TELEVISION MIXING

Universal Studios is extremely proud of its legacy in television sound work; ongoing projects include HBO's *Six Feet Under*, as well as *Providence*, *The Agency*, *Crossing Jordan* and Dick Wolf Productions' *Law & Order, Special Victims Unit, Criminal Intent* and the upcoming *Dragnet*. The company provides comprehensive sound services specific to television and has garnered 47 Emmy nominations and six Emmy Awards. Studio 1 is staffed by Roberta Doheny and Bob Edmondson. Studio 2 is staffed by Bill Nicholson and Tom Meloeny. And Studio 5 is staffed by Gerry Lentz and Rich Weingart.

SOUND EDITORIAL

Headed by Scott Hecker, a feature film veteran (*Road To Perdition, How the Grinch Stole Christmas, Meet Joe Black, Hollow Man, Rollerball*) who made his name at Blue Light Sound and Todd-AO, the Sound Editorial department features approximately 50 editorial suites adjacent to the feature film stages, along with a complete menu of design and editorial services. Currently undergoing a top-to-bottom upgrade, to be completed in winter 2003, Sound Editorial is refocusing its facilities in order to better accommodate the needs of the high-end feature film community. In addition to its numerous feature film and television projects, the editorial department has established a significant presence in the game community, with credits that include *Scorpion King, Crash Bandicoot 1 & 2, Monster Force* and *Electronic Arts E3 Game Wall*. Sound Editorial also supports the digital mastering division, as well as theatrical and television trailers for the motion picture group.

ADR

Two state-of-the-art ADR facilities are manned by Jeff Gomillion and Diana Flores, whose recent credits include *Red Dragon, Austin Powers in Goldmember* and *Blue Crush*. Designed with an eye to comfort by Jeff Cooper, the ADR studios offer top-notch acoustical and creative environments.

FOLEY

Having been designed and built by Jack Foley, the inventor of the craft, Universal's Foley stage is truly the birthplace of the art. Manned by Albert Romero, an 18-year veteran of the Sound Department, the stage provides a large studio environment and a wide selection of props and services.

POST PRODUCTION ENGINEERING

Universal Studios Sound is exceptionally proud of its post-production engineering division. Headed by industry veteran Doc Goldstein, working in tandem with Chief Engineer Jeff Taylor and Supervising Engineer Jack Snyder, the division is staffed by a team of 20 experienced engineers. At many facilities, engineering is seen as an evil necessity, but at Universal we fully understand the value and importance of our engineering staff, and have taken an extremely aggressive stance in this area to attract and keep the highest quality of personnel.

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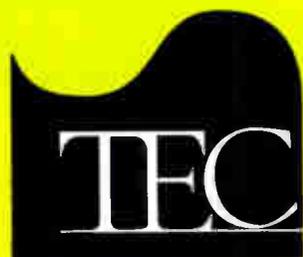
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Bag and Cart Field Mixer

A review of a new field mixer might appear, at first glance, to be of limited interest to *Mix* readers. Even though the dialog and ambiences recorded by a location mixer—the person, not a device—are often heard by millions of people, the number of location mixers is dwarfed by the number of people with project studios and larger recording facilities.

Unlike the music business, in which audio is frequently produced to blow people away, the best dialog and ambience sound draws absolutely no attention to itself. That type of unpretentiousness requires a lot of talent and the right tools. One of those tools is the field mixer—the device, not the person. A good field mixer must be highly functional, portable and durable.

That means a field mixer should have a lot of Gozintas and Gozoutas, does not weigh much, operates for a long time on batteries, withstands physical abuse and operates in inclement weather. Traditionally, there are bag mixers and cart mixers. Bag mixers are smaller, lighter, battery-operated, have rotary knobs and fit into a bag or shoulder harness. A bag mixer can be operated on a portable cart, but most cart mixers are too big to schlep around in a bag. Cart mixers frequently have faders instead of knobs, and while some run on internal batteries, cart mixers usually run on an external DC supply.

Moving a fader only requires one finger. Twisting a rotary pot usually requires a finger and an opposable thumb. I mention this because recording dialog can require constant gain riding of multiple inputs—you run out of opposable thumbs more quickly than you do fingers. With that said, watching an experienced mixer's hands "tarantularize" three or four rotary knobs on a field mixer is an amazing sight.

The Sound Devices 442 Field Mixer ($3,195) is an instant classic in design efficiency. It's a head-turner, and by its look and feel, you instantly know this is a high-functioning, professional and very solidly built 4-input bag mixer that is also quite at home on a cart. All of the connections and knobs are mounted on three sides of the

mixer (left, front and right). This means that once this 4.5-pound mixer is strapped into a bag, you don't have to pop it out to connect or disconnect any audio cables, change batteries or flip dip switches.

Pre-production 442s were drop-tested at a height of six feet to concrete. The 442 has a main U-chassis constructed of one continuous piece of 5052-H32 ⅛-inch-thick aluminum alloy. The smaller C-chassis, which the knobs and switches are mounted on, is slightly thinner. The strap extrusions are designed to hold a strap and take the brunt of a fall, rather than allow the knobs and shafts to take the impact. If the knobs do get smacked, they are designed to divert the shock to the case and not the guts. The battery tube cap is attached to a heavy-duty, machined block of solid aluminum mounted inside the C-chassis.

On the inside, two four-layer main circuit boards are populated on the top and bottom. The two inner layers of each board carry ground and power. With its low-consumption silicon components, the

442 runs on four AA batteries or an external 5-17VDC supply. The 6 VDC generated by the AA cells feed a very carefully designed switching power supply on its own circuit board, which provides three low-noise power rails: 48-volt, 12V and 3.3V. Phantom-powered mics suck up most of the juice. Four alkaline AA batteries will last up to eight hours without phantom; less with phantom-powered mics, louder headphones and brighter LED displays.

OUT FRONT

The 2x10-inch front panel is quite busy. There are 19 knobs, nine switches and a striking Gallium Nitride LED display consisting of two 20-LED rows that indicate levels from -30 to +20. The LED meter can be adjusted to show VU, peak, or VU and peak. A four-stage brightness control allows the display to be read in full sun; it is also bright enough to cause you to see "tracers."

The trim, pan, EQ, master and headphone pots are of a unique pop-up design. When not in use, they retract into the

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Three blown tweeters.

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Eight audio discs.

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face of the mixer with the push of a finger, where their adjustment status can be seen, but where they are out of the way. The mix knobs may be a bit small for ham-fisted mixers, but the edges are nicely knurled and the action is very smooth.

Each of the four inputs has its own peak and limiter LEDs, momentary PFL switch, pan pot, input trim, rotary channel knob and sweepable highpass filter. The peak lights fire when the signal is 3 dB below clipping. The LF EQ sweeps from 80 to 240 Hz. At 80 Hz, the filter's slope is 12 dB/octave. Above 80 Hz, the slope is a more gradual 6 dB/octave.

The EQ can be turned off completely by rotating the pot fully counterclockwise. A slight electrical click is audible when switching the EQ on or off; you probably wouldn't want to do that during a take.

An LED between mixer pots 1 and 2 reminds you that those channels have been linked for either stereo or M/S operation. And speaking of M/S operation, the 442 has a switchable M/S matrix built into its headphone output, so you can actually get a clue as to what your M/S will sound like.

The headphone section also has more usable possibilities than I have seen on any other mixer. A rotary pot allows you to choose the following configurations: left or right to both ears; mono to both ears; standard stereo; stereo return A or return B; stereo summed A return to the left ear and stereo summed B return to the right ear; decoded M/S left in both ears; decoded M/S right in both ears; and decoded M/S stereo.

ON THE RIGHT

The output (right) side of the 442 is no less busy than the other two. There are three pairs of balanced stereo-mix outputs, one pair of transformer-fed XLRs, another transformer-fed pair via a multipin Hirose connector, and a pair of TA3 active-balanced outputs that get tapped before the output transformer. The XLR and Hirose outputs have switches to select mic, -10 or line output level for each channel. The TA3 outputs can be switched between mic- and line-level with the user-configured settings (see below).

Separate unbalanced stereo TA3 male and 3.5mm tape output jacks provide for MiniDisc or cassette recorders, and there is a separate mono mic-level output plus TA3 male master-bus input connector that allows several 442 mixers to be linked to each other or to a Sound Devices MixPre or MP-2 preamp. There are also two return B jacks, an unbalanced stereo TA3 male and 3.5mm TRS jack. The A return is part of the Hirose multipin connector. Stereo headphone jacks are both ¼-inch and 3.5 mm.

Depressing the Peak/VU button during power-up accesses 18 extremely extensive, user-adjustable setup configurations. The output-limiter threshold is adjustable. The input limiters can be defeated; outputs can be set to mic- or line-level. The tone-oscillator frequency can be set for 100 Hz, 400 Hz or 1 kHz, and tone levels can be set in 1dB increments or OFF. Tone can also be selected to go to the direct outputs.

Another configuration option disables the built-in slate mic. PFL level can be sent to the meters. Monitoring can also be sent to the main meters. The 0VU reference can be set to 0 dBu, +4 dBu or +8 dBu. Each of the two returns can be configured to a Split mode so that when the front panel return switch is activated, one ear of the headphones hears the stereo return combined to mono, while the other hears program audio.

Return A is part of a Hirose 10-pin cable and connector. Return B is a separate stereo mini jack. The Return switch operates momentarily to the right and latches to the left. The user configuration lets you choose just A, just B, B momentary/A

DISC 14, TRACK 49, "WEAR A HELMET"
OR
DISC 14, TRACK 43, "SYPHILIS & YOU"

latching, or A momentary/B latching. Another configuration drops the headphone level 20 dB when the tone is engaged. Because the 442 operates across such a wide range of DC voltages, there's a parameter that allows you to choose among six voltage ranges so that you can know more precisely how much juice you have left. The last parameter setting resets the mixer to the factory defaults. Parameter changes cannot be done while the 442 is in normal operation.

A DAY AT THE ZOO

After getting to know the 442 in the studio for a few days, I got a call from Flite Three here in Baltimore to grab some wild audio for an ad campaign for the Baltimore Zoo. This was a boom-and-bag job with DAT. I packed my Ktek boom, Schoeps CMC6 with Mk41, Sennheiser 416 and Panasonic SV-255 DAT and headed for the zoo.

After throwing some tone from the 442 to the DAT to set levels, I spent four hours with the zoo staff getting rehearsed and ad-libbed lines from staff members, parents, kids, animals and the steam whistle from the zoo's train. Despite the widely varying sources, the 442's input and out-

put limiters kept me from losing a take and never sounded squished. Mark Patey, the A2 at Flite Three, confirmed that all of the audio was usable.

Back at the studio, I put the 442 through a controlled battery-consumption test. I loaded a fresh set of alkaline batteries and plugged in a Sennheiser MKH416, Schoeps CMC6/Mk41, a T-powered Sennheiser MKH435 and a pair of Sony MDR7506 headphones. I put a CD on as I worked and adjusted all of the mics and headphones to normal levels. The green power LED began blinking a little over four hours later, letting me know that the batteries were going. Depending on the current drain, the blinking LED means that you may have about a half-hour left; two hours after that, the power quit completely.

The extreme number of features and flexibility built into the 442 position it not only as a solid bag mixer, but also as a well-appointed cart mixer. With its features fully extended to encompass peripheral equipment, you could easily expect the 442 to act as the audio hub for a four-mic/two-camera shoot with mixed stereo feeds going to each camera, a third stereo mix going to a DAT or Nagra, and

each of the four inputs going "iso" to a Zaxcom DEVA, Tascam, Mackie or other MDM. Oh, and don't forget to feed the mixed mic or tape output to the director's wireless headset.

IN CONCLUSION

The Sound Devices 442 is well-designed and packed with features that make it a logical upgrade from a Shure FP33A. I was able to distort the audio by pushing the output limiter to extreme excess with a Sennheiser MKH416, but no one in their right mind would operate a mixer that way. The small but hardy community of location sound mixers will welcome the fourth input for additional talent or as part of a stereo ambience pair. The first round of money saved in switching from 9-volt to AA batteries will be eaten up by the cost of TA3 plugs for all of the 442's extra features. But hey, there had to be a downside somewhere.

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World Radio History

Dolby DP564

Covering the Reference-Decoding Bases

When it comes to audio for consumers, few companies have been more influential in setting standards than San Francisco's Dolby Laboratories. The company originally made its mark in consumer electronics with Dolby B, back in the distant days when audio cassettes were first used for music. Dolby Labs has managed to stay relevant ever since, spurring the home theater phenomenon with Dolby Surround and Pro Logic, and later developing Dolby Digital (AC3), the dominant codec for audio on DVD-Video and the audio standard for Digital TV (ATSC) in the U.S.

Today, Dolby's analog and digital formats are used in broadcast and cable TV, on VHS tapes, on DVDs, in set-top DTV boxes and in computer games. Dolby's success in these multiple spheres means that a big chunk of the sound mixed and processed daily in post houses, broadcast facilities and recording studios will ultimately reach end-listeners through playback formats that were defined in part by Dolby. Naturally, to optimize the preparation of sound-for-playback in those formats, audio professionals need to accurately monitor what end-listeners will hear. And because there are many different formats for different playback situations, engineers need to be able to switch easily among monitoring formats in order to assess how their mixing or processing affects playback in each.

It was with those needs in mind that Dolby designed the recently introduced DP564 multichannel audio decoder, a revamped version of the company's DP562. "The DP564 is the 'reference standard' that content creators use to ensure that their content sounds great everywhere," says

Steven Venezia, Dolby's manager of DVD/DTV broadcast support. "Consumer decoders typically are not designed to offer all of the variety of possible playback conditions. But the DP564 is a reference decoder allowing content creators to hear their soundtracks in any way a consumer may listen."

MULTIPLE MARKETS
According to Venezia, Dolby's target markets for the DP564 include recording, DVD authoring, broadcast and post-production.

"In post today," he says, "many productions involve mixing 5.1 audio for the digital customers and Dolby Surround for the analog Pro Logic customers. The DP564 provides a convenient tool to check different listening modes for different environments." Similarly, monitoring through a reference decoder allows content creators involved in DVD recording and authoring to confirm the integrity of their audio streams.

For example, Venezia cites a mixing engineer working on a DVD with 5.1 audio: "You'll want to know how the DVD will sound in a whole range of playback situations," he says. "Through a high-end Dolby Digital Surround EX home theater at full dynamic range, through the same system in 'late-night listening' mode, downmixed to Lt-Rt and played through a Dolby Surround Pro Logic II home theater, downmixed to Lt-Rt and played through an older Dolby Surround Pro Logic home theater, downmixed to stereo, downmixed and fed though the RF connector to a small TV with a mono speaker, and all of the other various combinations."

A reference decoder also has a role in

broadcast—typically, for critical monitoring of DTV signals and for diagnosing problems. "Let's say that a technician at a broadcast facility gets a complaint from a viewer that the dialog from the 'movie of the week' is dropping out," Venezia says. "With the DP564, the broadcasters can re-create what the consumer hears and help determine where the problem resides. They can check to see if it is a problem with the audio leaving the facility, the over-the-air signal or in the customer's home. Also, the unit has a Dolby Headphone output, so the technician can do the checking in small or noisy environments. Even without a full 5.1 monitoring system, Dolby Headphone can simulate 5.1 monitoring in a headphone environment."

INPUTS, OUTPUTS AND PORTS
Like the DP562, the DP564 decodes and outputs audio program in Dolby Digital and Dolby Surround Pro Logic, and accepts regular PCM soundtracks. Formats added in the new unit are Dolby Digital Surround EX and Pro Logic II.

For inputs, the DP564 offers Toslink optical and AES3 inputs, via 75-ohm unbalanced BNC connectors. With two AES3 inputs for digital audio, the DP564 makes it possible to switch sources without changing connections or using a router. The AES3 and optical inputs can receive both PCM and Dolby Digital signals; the decoder automatically recognizes the format and processes the signal appropriately. Two AES Ref connectors (also BNC) are provided to sync to an external reference source (house sync) and pass the source through to an additional device.

The DP564 also has a new 100Base-T Ethernet port, which allows input of

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PlusXXX, Sony, Sphere,
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streamed Dolby Digital audio from a server using a free RTP server application called Dolby Streaming Server. The port also allows the DP564 to be controlled remotely from an external computer using the Dolby Remote 564 software application. Alternatively, the Dolby Remote 564 software can be run (though less efficiently) over a connection to the unit's RS-232 or Remote RS-485 ports, which can also be used for software upgrades to help keep the unit current.

A 37-pin GPI/O port is also included; it offers the possibility of simple button-based remote control of front panel func-

tions via Dolby's 549 GPI/O Controller or other remote control. The DP564's configuration menus include a GPI/O setup feature that allows you to assign the function of each individual pin.

On the output side, a set of four BNC connectors provides digital output signals to connect to a digital monitoring system. Each connector handles a channel pair: front left/right; center/subwoofer (LFE); left surround/right surround; and back surround-left/back surround-right (for Dolby Digital Surround EX). Eight XLRs provide analog outputs.

The level of the audio outputs is now

adjustable with a front panel master volume knob that was absent on the DP562. The knob operates over a range of ±95 to +10 dB. A Ref button resets the level to 0dB reference level, and a Dim button can be used to drop or mute the program by a user-definable amount.

The DP564 also has a headphone output with an independent volume control and Dolby Headphone processing, which offers headphone listeners the effect of a 5-channel surround system using regular 2-channel headphones. The output allows monitoring of Dolby Headphone content in any of three different room modes, as well as monitoring a downmix in stereo.

The DP564 is also able to extract linear timecode (LTC) from a Dolby Digital bitstream and output it through an LTC out (BNC). By locking picture to this timecode, users such as DVD facilities will be able to check A/V sync between encoded audio and associated video.

MENUS AND CONTROLS

The DP564 can be operated effectively with its front panel buttons, but only after the unit has been set up for the current listening situation. Setup is achieved via menus accessed through either the front panel vacuum fluorescent display or the Dolby Remote 564 software application. The menu structure breaks into two main branches: status (which displays by default) and setup (accessed via the Setup button).

The status menu structure offers access to information about the DP564's current state and activities. The main status menu shows the type of input, sample rate, data rate (in kbps), channel mode, timecode and dialog level. An output level meter screen displays the level of each audio output signal after all decoding, downmix, listening mode, compression mode and bass-management signal processing, but before any channel-level trims or delays. A compression meter screen provides a visual representation of how the dynamic range control would operate if opened in a Dolby Digital program.

The monitor status menu shows the settings for the current monitor setup, including speaker configuration, subwoofer presence (or absence), crossover frequency (for bass management), extended bitstream emulation status and Headphone Output mode (stereo or Dolby Headphone profile). The metadata status menu displays the settings for metadata parameters received in the Dolby Digital bitstream. Additional menus cover input status, AES reference input status,

less ohms.
more aahs.

timecode status, error statistics and system status.

Within the setup menu structure, available submenus cover operating mode, monitor control, user presets, I/O control, monitor configuration and system settings. The variety of options is very deep, primarily because the device covers so many formats and each format has multiple possible variations in decoding mode. The ability to address all of these different possibilities is what makes the DP564 such a valuable tool, but that brings with it the potential for inadvertently making incorrect settings. This means that a thorough study of the manual—never a bad idea—will be mandatory for anyone who wants to stray from the unit's four factory-preset modes. Happily, an additional 28 user-definable presets are available, so after a variation is defined once, it can be stored and easily recalled later. Four of the 32 total presets may be assigned to front panel buttons for instant recall.

Describing all of the various parameters that can be modified in the setup submenus is beyond the scope of this article, but it is worthwhile to note that for any monitoring through the DP564 to be valid, the monitor configuration submenu must accurately reflect the listening environment. The process begins with assigning speaker-configuration settings to match your system. The settings cover the number of speakers, as well as parameters such as speaker size (full or limited range) and subwoofer crossover frequency, which determines how the DP564 distributes low frequencies to the speakers.

Next, you need to set delay values using measurements and calculations explained in the manual to compensate for speaker placement. Then, calibrate the speaker playback levels using an SPL meter, once again following procedures described in the manual. The DP564 has built-in full and band-limited pink noise to aid in this process. After the levels are set (Dolby recommends amplifier gain controls as the best place in the signal chain to make these adjustments), the last step is to assign a level to the one-touch dim setting.

MONITORING THE OPTIONS
Once the DP564 is set up for the listening environment, the front panel buttons (or their equivalents in one of the remote-control options) are used to determine the way the incoming signal is actually being processed during monitoring. These buttons break down into four categories: downmix, decode, listening and compression.

The downmix options used on a multichannel Dolby Digital signal begin with a choice between downmixing to two different 2-channel options. In Lt-Rt mode, the 5.1-channel signal is downmixed to a matrixed 2-channel (left total/right total) Dolby surround signal that would play back as surround sound (left, center, right, surround) if decoded by a Pro Logic decoder. In Stereo mode, the downmix is to a simple stereo left-only/right-only signal (Lo-Ro). Either of these 2-channel signals may then be monitored in monaural with the Mono button.

The three buttons in the Decode section are used when the Pro Logic and Dolby Digital EX submenu settings are set to manual rather than controlled automatically based on the detection of metadata flags. The Pro Logic and Pro Logic II buttons only function when processing a 2-channel signal or when a Dolby Digital multichannel signal is being downmixed to two channels. EX, available only when the monitor setup includes at least one back surround speaker, applies Surround EX decoding to any Dolby Digital input with two surround-channel signals.

The listening section provides the ability to switch between emulations of different listening environments. Full feeds all speaker outputs directly. Stereo routes the Ls and Rs signals to Left and Right outputs, respectively. Phant (phantom center) mutes the center output and splits the center signal equally between left and right.

The compression section is used only when decoding a Dolby Digital signal. Like consumer decoders, the RF and Line buttons apply dynamic range-control profiles that are carried in the Dolby Digital bitstream. The Custom button engages a scalable application of the line profile.

Venezia says that the layout of the Listening mode buttons are designed to give the user a logical method to emulate all of the possible varieties of listening conditions for a given program. "If you are listening to a 5.1 soundtrack," he says, "you can first hear the signal downmixed to stereo, Lt-Rt or even mono. You can then choose either Pro Logic or Pro Logic II to further decode your downmix. Next, you can use the Listening mode buttons to quickly emulate a monitoring system that has neither a center speaker nor surround speakers. Finally, you can apply dynamic range control that a user may select for

late-night listening. This is just one example of the combination of buttons that a content creator may choose to emulate and listen to during the mix process."

One side effect of this design is that it's not that difficult to monitor a given program in an "incorrect" playback setup, such as a plain stereo signal (Lo-Ro) decoded through Pro Logic. Venezia points out that this is a necessary part to cover all of the bases.

"There will always be cases where a consumer may listen in some mode other than what a producer intended," he says. "For example, a lot of people who have Pro Logic decoding for their stereo TV leave it on all of the time because they like the way it sounds or never bother to shut it off. A producer may wish to emulate some of those common conditions. Most of the time, you do not find significant problems, but occasionally you'll catch an issue and thereby prevent a confusing or unacceptable listening experience for the consumer." Fundamentally, that's the purpose of the DP564: to make it easy for professionals to monitor in every listening situation so that consumers are happy, no matter what mode they're in. ∎

Seventh Annual Mix L.A. Open

By Maureen Droney

Veterans of *Mix* golf tournaments were in agreement: Monday, June 10, 2002, was a particularly beautiful day. The sun was warm, but gentle ocean breezes cooled the rolling hills of the Malibu Country Club as 40 foursomes teed off with hopes of claiming a winners' trophy.

Celebrating its seventh year, the Mix L.A. Open has become one of the pro audio industry's most popular annual events; this year's sold-out tournament welcomed a large number of new faces, as well as many who have played every year since 1996. Participants ranged from the extremely serious to the occasional duffer, with the common denominator a determination to have a good time.

And a good time it was, although once again, a hole-in-one proved elusive, leaving the prize of a BMW roadster unclaimed. A silent auction helped to fill the gap with items from a Gibson electric guitar to rare wines, reserve-level Dodger tickets, JBL speakers and a complete Steinberg Nuendo Media Production System.

Schmoozing, as always, was nonstop; meeting and greeting began with breakfast and continued through warmup swings, a putting contest and cart-driving practice. All teams met the challenge of finding their starting holes; then, equipped with box lunches—courtesy of Royaltone Studios—set out to conquer the challenging course. More sustenance, as well as cool swag, was provided by sponsors, including Design FX's popular Hägen-Dazs, Emtec's serious candy and chips collection, The Village's groovy sweatshirts and an innovative highlight: Warner Bros. Studios offered shoulder massages at Hole 10. Other sponsors included Audio-Technica, CE Pickup, Disc Marketing, House Ear Institute, Quantegy, Record Plant, Shure, Signet Sound, Steve Thomas BMW and TC Electronic, all providing caps, tees, golf balls and good cheer.

Once again, the game was tight. First-prize trophies were awarded for the third year in a row to The Recording Academy's foursome, with players Miller London, Terry Medoza, Sydney Miller and James Arcenaux, who rocked the house with a score of 57-15 under par. Second- and third-place teams tied at 59; second place was determined by back-9 score, with statues going to the "most serious" Group One (Chris Fichera, Rob Grubb, Gary Lux and Kevin Riley). The team sponsored by Michael Greene, comprising Steve Little, Scott Robelen, Zach Darr and Mike Garza, took home the bronze.

Ricky Phillips aced the putting contest. Audio-Technica president Kazuo Matsushita presented the "Longest Drive" prize to Ryan Andrews. Shure Inc.'s Jack Kontney awarded Steve Myers' "Longest Putt." And Signet Sound's David Dubow bestowed David Was from Team Ed Cherney with "Closest to the Pin."

Proceeds from the tournament benefit a cause that's critical to our industry: hearing health outreach programs at both House Ear Institute and H.E.A.R, which provide education on the importance of hearing protection and help for music and sound professionals with hearing disorders.

First-time hole sponsors TC Electronic: (L-R) Wade Pistole, Andrew Kastner, Krishan Borup and Doug Stanny.

Mix associate publisher Erika Lopez and Mix publisher John Pledger.

From left: Doug Bernhardt, Tim Purnell, Dan Goldstein and Ralph Sutton of Emtec Multimedia, hole and beverage cart sponsor.

From left, Jeff Simcox, Dweezil Zappa, Kazuo Matsushita and Mike Edwards of Audio-Technica, sponsors of the Longest Drive.

Mix L.A. Open honorary chairman Ed Cherney hauls out the goods before hitting the course.

Perennial sponsors and players, the Design FX team hams it up on the course (L-R): Jim Pace, Gary Lodinsky, Gary Skardina and Jeff Welsh.

The Recording Academy team wins again. (L-R) Mix Foundation president Hillel Resner, James Arcenaux, Miller London, Sydney Miller and Terry Mendoza.
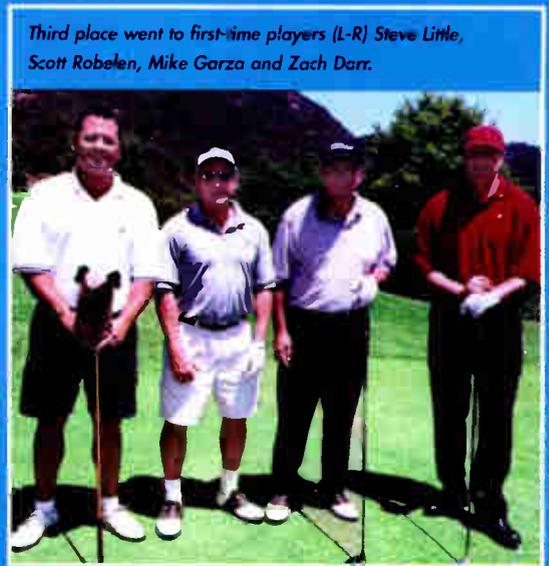
Third place went to first-time players (L-R) Steve Little, Scott Robelen, Mike Garza and Zach Darr.
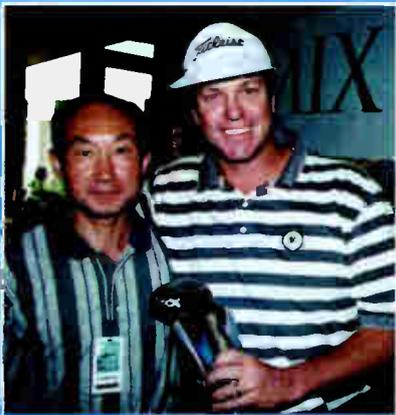
Audio-Technica's Kazuo Matsushita congratulates longest-drive winner Ryan Andrews.

Hillel Resner presents a Ping putter to Ricky Phillips, winner of the putting contest.

Second-place winners, Group One: (L-R) Hillel Resner, Kevin Riley, Gary Lux, honorary chairman Ed Cherney (standing in for the missing Rob Grubb) and Chris Fichera.
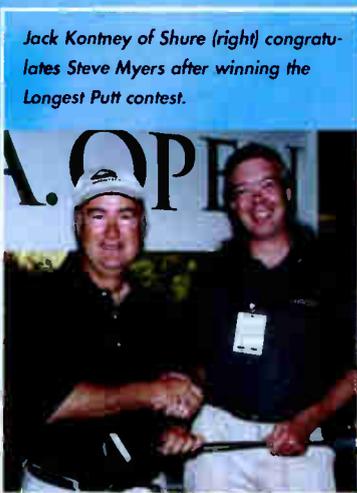
Jack Kontney of Shure (right) congratulates Steve Myers after winning the Longest Putt contest.
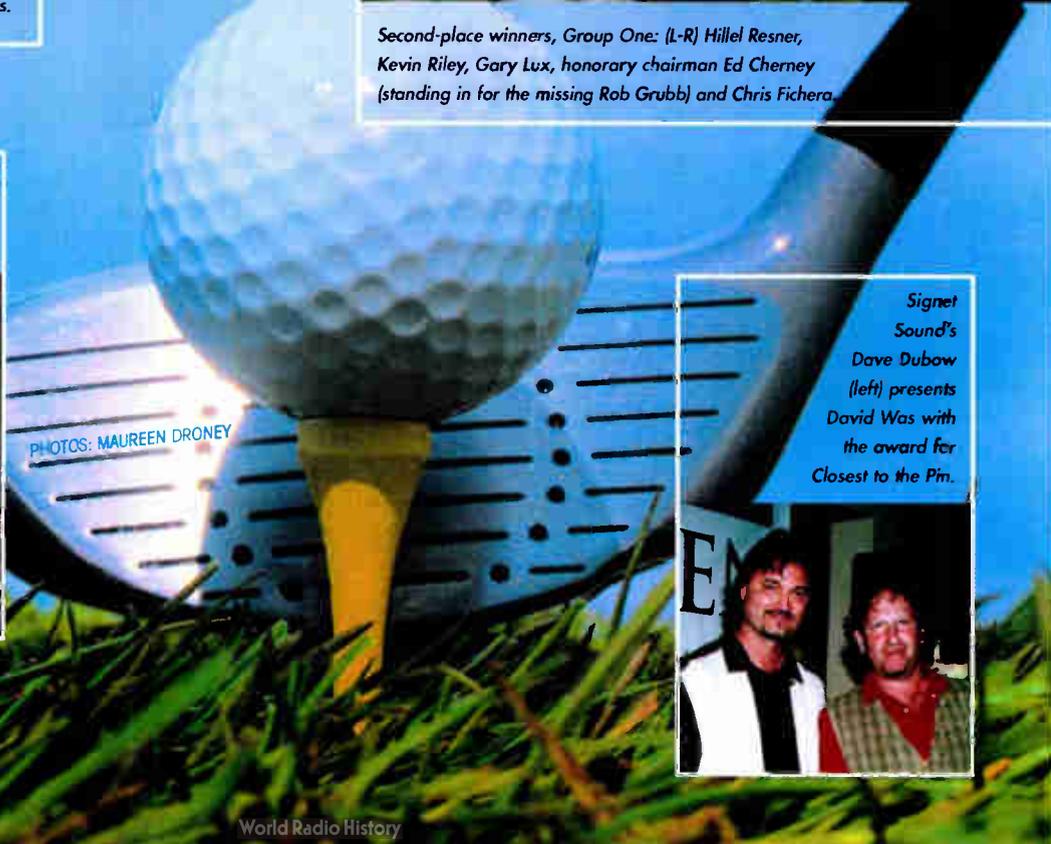
PHOTOS: MAUREEN DRONEY
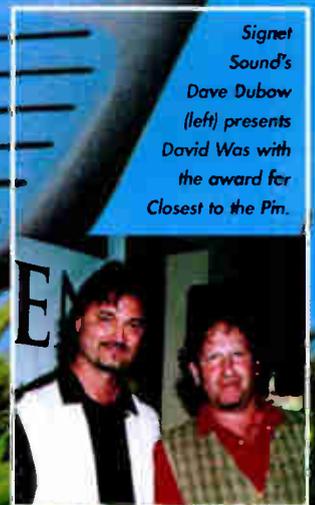
Signet Sound's Dave Dubow (left) presents David Was with the award for Closest to the Pin.

New Instrument, FX and Utility Plug-Ins

.com) Scratch Studio Edition ($299) is expected to be released before the end of the year, and for any turntablist straddling the creative fence between vinyl and digital audio workstation, it couldn't come any sooner. DJs can display their new dub plate skills using a physical "virtual" vinyl LP that connects via USB to scratch any digital sample or sound file. The included vinyl record controller device contains a control signal that allows the computer to track the record position and the motion and direction of the needle, and to simulate the same movement within a sound file. Scratch Live ($599; Mac/PC stand-alone) will include a USB interface for dual turntables that allows turntablists to do "crateless DJ'ing" by transferring all vinyl to hard drive and controlling those .WAV, .AIFF and MP3 files with Scratch Live. Platforms: PC, Mac, RTAS, HTDM, MAS (unless otherwise noted).

Also expected soon from Serato is Pitch ($399), a multiplatform Pro Tools plug-in that uses intuitive MIDI controls to carry out real-time polyphonic pitch changes. Expected to be announced as part of a stand-alone bundle of Serato plug-ins, Pitch carries on in the tradition of the company's popular Pitch 'n Time software. Platforms: PC, Mac, RTAS, HTDM.

Steinberg Media Technologies (www. steinberg.net) offers eight new processors and instruments that emphasize on making recording guitarists feel right at home on the computer. Virtual Guitarist ($249.99) picks up where the Oberheim Strummer box left off long ago in creating convincing strummed chords for acoustic and electric guitar sounds. One look at the guitar face interface in either mode should comfort even the most newbie of computer recording guitarists. WARP VST ($299.99) does much of the same by putting a Hughes & Kettner amp face on this potent guitar amp simulation plug-in. HALion ($399.99) is a new 32-bit VST sampler that streams audio direct from disk, includes a 1.6GB sound library, and can import Akai, E-mu, GigaSampler, Sound Font, .WAV and .AIFF sound files to any VST environment. Similarly, The Grand ($299.99) provides 1.3 GB of multiple-velocity, layered, high-quality piano samples, and the new LM4 Mark II VST drum machine ($149.99) provides an independent

ADSR envelope on each of its 16 pads. Finally, Voice Machine ($199.99) is a real-time "pitch-shifting" plug-in that can create four additional voices, each independently controllable, from a mono voice track. Attack ($149.99) from Waldorf provides meaty analog-synth percussion sounds. GRM Tools Vol. 2 ($199.99) is the new VST version of this sound designer's dream package, which includes INA-GRM's Reson, Doppler, Freeze and Delay modules. Platforms: PC, Mac, VST.

TC Works (www.tcworks.de), Steinberg and a few others were neck-and-neck for the most new plug-ins released this year. TC VoiceStrip 96K (included with TC PowerCore) is a VST- and MAS-based vocal-processing tool that includes voice-optimized EQ, vintage compression, gate, de-esser and SoftSat modules—and a pair of VU-emulating meters. Assimilator for PowerCore ($249) is a potent "fingerprint EQ" plug-in due out later this year that can sample the EQ curve of one audio file and apply it to another, and morph between two totally disparate sets of EQ curves. DeScratcher, DeClicker, DeClipper and DeNoiser will all be included with TC PowerCore Restoration Suite ($999) when

Waves Mechanics SoundBlender

it releases later this year. Native Bundle 3.0 ($399; $69 upgrade) has been spiffed up with added parameters, improved sound and a new user interface. Master X3 for PowerCore ($249), also from TC Works, was recently announced; essentially, it is the company's Finalizer mastering processor but now as a VST or MAS plug-in. And the new Waldorf D-Coder ($249) is an easy-to-use, Mac- and Windows-savvy VST/MAS plug-in that puts 100 bands of vocoded audio bliss at anyone's fingertips. Finally, TC Works released Spark FX Machine ($199) earlier this year. Also a multiplatform VST/MAS performer, this bundle comes with 21 plug-ins, including numerous effects processors and synthesis tools. Platforms: Mac, PC, VST, MAS.

Last but not least are six new plug-ins from Waves (www.waves.com). Version 3.5 Waves Native and TDM software now provide more simultaneous plug-ins, support of higher sample rates, and increased bit depth and dynamic range and support for TDM users of Control24, Pro Control and Mackie HUI control surfaces.

Waves Masters Bundle ($1,800 TDM/HD; $900 native) provides more transparent mastering firepower with the company's L2 Ultramaximizer, Linear Phase Equalizer and Linear Phase Multiband plug-ins. The latter two use FIR filters for improved musical balance and independent gain and dynamics control on five bands with linear phase crossovers.

TC Works PowerCore 01 Monosynth

Ultramaximizer carries on as "the next step in peak limiting," with Automatic Gain Control, IDR dithering and ninth-order filters. Another multiplatform performer is Restoration Bundle ($1,300 native; $2,600 TDM) for restoration applications and noise reduction. The intuitive graphics, audio difference and direct audio output feedback of Restoration Bundle can make better mastering engineers out of us all. Modules included in this bundle include X-Noise, X-Click, X-Crackle and X-Hum. Platforms: Mac, PC, TDM, HTDM, VST, MAS, RTAS, Audio Suite DirectX.

The all-in-one Waves 360 Surround Tool Kit (price TBA) is a complete surround mixing and management tools bundle. The accelerated Version 3.5 Waves system has 192- and 96kHz support for all Digidesign MIX and Pro Tools|HD users, as well as enveloping spacialization and localization, among other benefits. Included are the S360 Surround Imager for adding distance panning and generating early reflections and shuffling for improved low-frequency spacialization, and the R360 Surround Reverb for control of more than six channels of perfectly decorrelated reverberation. The C360 Surround Compressor, M360 Surround Manager and M360 Surround Mixdown round out the package. Platforms: Mac, TDM. ■

Randy Alberts is the author of Tascam: 25 Years of Recording Evolution. *Visit him at* www.opendooredit.com.

All Right Mr. DeMille, I'm Ready For My Close-Up

MPEG-4 Stars Audio and Video
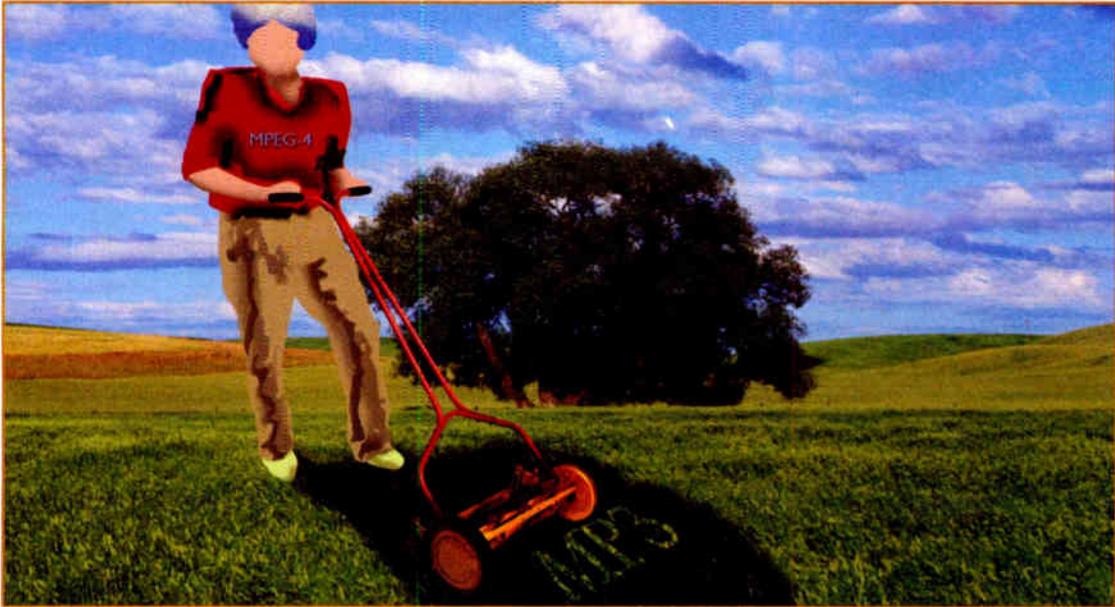
ILLUSTRATION MAE LAROBIS

This month's issue is devoted to sound tagging along with picture, and, glory hallelujah, we audio folks finally come out ahead! Pardon my exuberance and permit me to explain. Yesterday, I strolled the aisles of the MPEG-4 Industry Forum's Workshop and Exhibition and became amused by all of the crawly, noisy video that was being demo'd. Ah, but the audio—though only mono or stereo—had exceptional quality considering its data rate. Welcome to the wonderful world of MPEG-4, where audio finally steps to the front of the line.

Established in 1988, the Motion Pictures Expert Group (MPEG) was formed to specify digital-coding schemes for audio and video at low data rates. Its most well-known creations are MPEG-2 video, sanctioned by the DVD Forum, and MPEG-1 Layer III, also known as MP3, the current fave of the download crowd. Over the next few years, MP3 audio may be dethroned by MPEG-4 AAC, the advanced audio codec developed to improve quality without backward-compatibility restrictions imposed on prior codecs. AAC was designed to provide quality audio that is indistinguishable from a lossless parent file by the majority of listeners. The interesting thing is, the target data rate specified in the mandate was 320 kbits/second for five full bandwidth channels!

Though MPEG-2 AAC was developed awhile ago, it was chosen as the basis for sampled or natural audio in MPEG-4. If you've done any listening tests on lossy codecs, then you know that at high rates they all do an okay job. Some actually sound quite good. However, at dial-up data rates, most codecs fall on their faces, and that's where some help is needed. As a recovering MP3 basher, I've learned that the equation isn't MP3 = the death of quality. Rather, as in all things in life, it's a trade-off. The real questions are which codec do you choose, which sample and data rates do you encode, and whether or not preprocessing is warranted. With the exception of preprocessing, MP4 provides a wide range of solutions to the low data-rate dilemma.

MPEG-4 comprehensively describes methods to represent content, and the audio tools available are as varied as the range of distribution methods. Building on previous efforts, the MPEG-4 group has given us geeks more of everything. MP4 is:

1) More efficient. The music codec in MPEG-4 is designed to operate at around 64 kbit/second (kbps) per channel. To give you some real-world perspective for that number, MP3 stereo at 192k VBR (96k times two) sounds pretty darn good to me; AAC at Main profile does about the same job at 128k. 'Nuff said. Save space when storing or save bandwidth when streaming; it's your choice.

By the way, MP4 AAC can handle from one to 48 channels and includes both downmix capabilities and default channel configurations, including 5.1 multichannel in Dolby's Mode 6 (C | L | R | LS | RS | LFE) assignment. Having all of those channels available means that you can, for instance, do spiffy multimedia presentations with separate mix-minus, VO and effects tracks.

2) More scalable. Because MPEG-4 audio allows for a wider range of bit rates, quality can be matched

to a wider range of applications. In conjunction with the increased efficiency, applications such as transmission over wireless data networks, Internet streaming, digital audio broadcasting and advanced portable players are more practical.

Transmission over best-effort protocols like IP will not cause buffer underflows because the decoder adapts by simply scaling back on the quality, usually by reducing the audio passband when it's starved for data. Another tool available, usually for speech transmission, provides that scalability. The Twin-VQ coder is a good example of the adaptive abilities to encode several partial bitstreams, which can be decoded alone or, if the sustained data throughput is high enough, in concert for higher fidelity.

3) More modular. MPEG-4's "object-oriented" approach to content delivery means optimal encoding for each data type. Content creators have a broad range of methods to code audio, though software vendors have yet to bring *mature* production tools to market. One of the new additions to the MPEG-4 audio toolbox, along with long-term prediction and bit rate-scalability tools, is Perceptual Noise Substitution, or PNS, a feature designed to further optimize bit rate efficiency.

PNS is based on the observation that, perceptually, all noise sounds about the same. This means that the actual fine structure of a noise signal isn't that important. Rather, the bitstream just transmits a region of frequencies as noise-like; additional information defines the total power in that band. In the decoder, a randomly generated noise will be inserted into the appropriate spectral region according to the power level.

4) More extensible. Not locked into the limits of current technology, MPEG-4 can grow as new developments emerge. As the president of the MPEG-4IF says, "The object-based MPEG-4 standard is both state-of-the-art and future-proof; it can easily incorporate improvements in technology, if and when they materialize."

5) More cooperative. Sorry to break the news, but MPEG-4, though a worldwide standard for audio, is more important for video and multimedia. Though preliminary testing and my experience indicate that MPEG-4 won't improve on existing proprietary video codecs like Sorenson, it does produce a much better quality image than MPEG-1 and has the ISO stamp of approval to boot. That, in turn, will go a long way for widespread market acceptance as was the case with MPEG-2.

Designed with interoperability in mind, MPEG-4 is meant to be wedded to MPEG-7, an emerging deep-metadata standard to describe content. Together, they will work more graciously with DRM (Digital Rights Management) and interactive presentation infrastructures (DTV anyone?) as all of this stuff matures. This will reduce confusion for consumers. As an example, MPEG-4 includes a set of standard interfaces to proprietary rights-management systems. If you access protected content, then the MPEG-4 bitstream should contain the information needed to obtain the correct unlocking software.

If you're still awake, you may have noticed that I snuck in the "sampled" qualifier back in paragraph three. The reason is that, along with so called "t/f (time/frequency) coders" for music and speech, MPEG-4 audio includes tools for synthesized audio among its data objects or types. MP4-SA, or "Structured Audio," relies on the decoding infrastructure to algorithmically create synthetic programming from very compact instructions. If this sounds like MIDI, you're not far off. MIDI and wavetable synthesis are also supported.

Well, there's lots more to cover, but that's all for this overview. For those wanting to test the video capabilities of MPEG-4, DivX 5 has been available for a while. Though audio tools are a bit more rare, www.AudioCoding.com has some Win source code and a Winamp plug-in. For cross-platform fun, QuickTime 6 should be out of beta testing so that everyone can begin to hear the benefits of MPEG-4 audio. RealNetworks has also adopted a strategy of interoperability to combat the balkanization of the Web that Microsoft envisions. In a future "Bitstream," I'll dig into MPEG-7, the future of metadata and MPEG-21, so stay tuned.

In the long term, MPEG-4 will significantly impact us, so let me know if you'd like more depth on this subject by dropping a line to bitstream@seneschal.net. See you next month! ∎

OMas provides tech help to a wide variety of media mavens. In his quieter moments, this column was decoded while under the influence of Nusrat Fateh Ali Khan's Sha-hen-Shah, *along with the classic strains of* (Who's Afraid of) The Art of Noise. *Links and other useful arcana relating to this month's "Bitstream" are lurking at* www.seneschal.net.

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One of four X-Rack Series mixers, the compact XRM is built inside and out to deliver high-end console performance for today's in-ear monitoring situations. It features individual circuit boards on each channel for the sonic performance of a sophisticated mixing console, and ease of servicing. Made in the USA, Crest's X-Rack Series includes the exceptional X-Matrix, XR-24, XR-20, and XRM mixers.

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World Radio History

Tools of the Trade

DIGIDESIGN DIGI 002

Digidesign (www.digidesign.com) introduces Digi 002, featuring FireWire connectivity, a touch-sensitive control surface, support for 24-bit/96kHz resolution and Pro Tools LE 5.3.2 software. Borrowing technology found in Digi's Control l 24, Digi 002's touch-sensitive faders, rotary encoders and LCD scribble strips allow tactile control of most Pro Tools

Windows XP Home and Mac OS 9.x systems. The $2,495 package is slated to ship this quarter.

PELONIS SIGNATURE SERIES

Studio designer/acoustician Chris Pelonis (www.pelonis sound.com) debuts wideband active monitors. The Pelonis Signature Series 215WBA is a four-way active system. Frequency response is a stated 22-45k Hz, with linear trailing phase. The monitors feature a proprietary driver on a custom low-distortion, Tannoy Dual-Concentric 15-inch and a super-tweeter. The $33,000 package includes custom crossover tuning by Pelonis. A custom subwoofer complement is also available.

ALPHA-CORE BALANCED POWER SUPPLY

The BP30 power system from Alpha-Core Inc. (www. alphacore.com) is a balanced, symmetrical power supply specifically designed to eliminate the noise and hum caused by unbalanced AC power lines. Designed by Dick Sequerra, the BP30 can handle a continuous power of 1,000 watts (8.4A) with input and output voltages of 120 volts for 60Hz operation. (A 240V/60Hz version is also available.) Features include four duplex-grounded receptacles (eight separate AC outlets) and a 15A time-delay fuse. Its toroidal transformer provides a low-profile enclosure, and the 14x9x3.5-inch (LxWxH) black-anodized aluminum casing weighs 26 pounds. Price is $895, with a 10-year limited warranty.

LEXICON MPX 550

Lexicon's (www.lexicon .com) MPX 550 is a dual-channel effects processor featuring 24-bit AD/DA conversion, 24-bit internal processing, 255 factory presets—plus 64 user memories—including classic true-stereo reverbs and programs combining two independent effects. Reverb effects include ambience, plate, chamber and inverse, as well as tremolo, rotary, chorus, flange, pitch, detune and delays. The digital compressor has limiting, expansion and tape-saturation effects. I/Os include balanced analog XLRs and an S/PDIF digital port. Price: $649.

PMC MB2 MONITORS

The new MB2 Series of three-way loudspeakers from the Professional Monitor Company (www.pmcloudspeaker.com) includes single- and twin-cabinet systems, in passive and active forms; matching horizontal center-channel versions are also

LE features and parameters, including plug-in manipulation. Additionally, the single-box design includes all inputs and outputs. For live applications, Digi 002 can be uncoupled from Pro Tools and used in a stand-alone mode as an 8x4x2 digital mixer with onboard EQ, dynamics, delay and reverb. Features include eight analog inputs, including four mic pre's with highpass filters and phantom power; eight analog outs, plus separate monitor, headphone and -10dBV RCA outputs; eight touch-sensitive faders; eight motion-sensitive encoders; and 10 4-character scribble strips for individual track parameters. The MIDI in and output ports handle 16 channels in/32 channels out; also standard are eight channels of ADAT optical I/O and stereo S/PDIF I/O. Digi 002 ships with a 32-track version of Pro Tools LE 5.3.2 software and bundled plug-ins, and runs on

DRAWMER TUBE STATION PREAMP

Drawmer offers the Tube Station 1 (TS1) 2-channel compressor. Distributed by Transamerica Audio Group (www. transaudiogroup.com), the one-rack-space TS1 features Class-A Drawmer preamps and a stereo soft-knee Drawmer tube compressor, coupled with a 24-bit/96k digital converter. Usable either as a stand-alone stereo-tube compressor or as a dedicated voice or instrument channel preamp/compressor, the TS1 features a HF contour control and variable high-pass filter on the inputs, and a variable Tube Drive control for adding tube saturation. Additional features include balanced analog I/Os, phantom power, an effects insert point and compressor sidechain. A $250 optional digital-output module adds S/PDIF or AES/EBU at up to 24-bit resolution and 96kHz sample rate. The TS1 is $749.

available. The MB2 Series offers a 20-25k Hz (±3dB) frequency range. The MB2-A (active single-cabinet system) and MB2XBD-A (active twin-cabinet) PMC systems are driven by ultra-low distortion electronics co-developed with Bryston. An XB2 subwoofer provides an LFE channel for surround installs or when more bass headroom is required. The variants of the MB2 Series are based on a driver complement including a 12-inch woofer, 3-inch soft-dome mid and silk-dome HF tweeters. Prices start at $12,100/pair.

CREAMWARE MINIMAX

A new synthesizer for Creamware's SCOPE Fusion platform is Minimax, a virtual Minimoog® that simulates all of the properties of the original synth, from the sound of the oscillators and the unique filters to the fast envelopes and the characteristic saturation of the mixer section, as well as features such as filter FM and internal feedback. The positions and action of the controls match those of the original, so users can set up Minimoog sound sheets on the Minimax and store them as presets. Parameters can be controlled via MIDI, and the Minimax is polyphonic and comes with more than 400 sounds. Download a free demo version at www.creamware.com.

AUDIO-TECHNICA ES WIRELESS

Audio-Technica (www.audio-technica.com) expands its range of Engineered Sound microphones for the fixed install/contracting market. New models include the ESW-T212 plug-on

transmitter and the new cardioid and omni condenser lavaliers designed for use with A-T's ESW-T211 UniPak™ bodypack transmitter. The ESW-T212 plug-on transmitter converts a "wired" handheld dynamic or battery-powered condenser (728.125-740.500 MHz) to a UHF wireless system with A-T's 100-channel UHF ESW-R220 dual receiver or ESW-R210 single receiver for a frequency response of 100-15k Hz, 300-foot operating range and a seven to nine-hour 9V battery life. Price for the ESW-T212 is $835; the lavaliers are $175/each.

Note: The following product description was inadvertently omitted from our recent article on top-of-the-line wireless systems (July 2002). Mix regrets this error.

LIGHTSPEED 800 SERIES

The 800 Series Multi-Cell™ wireless from LightSPEED Technologies (www.lightspeed-tek.com) is designed to produce

highly reliable reception in large areas such as stadiums, cruise ships, theme parks, outdoor/field-training areas, racetracks, etc. Multi-Cell systems employ from two to 16 remote cell-receivers to capture wireless transmitter signals in very large areas (50,000 to 400,000 square yards) or multilevel facilities. The remote cell-receivers connect to a Multi-Cell processing unit, which uses tri-stage diversity processing for seamless audio from one or two independent Light-SPEED UHF wireless mics. Prices start at $5,760.

NATIVE INSTRUMENTS PRO-53

New from Native Instruments (www.nativeinstruments.com), the Pro-53 synthesizer is a Pro-52 upgrade offering new functions and improvements such as new oscillators, the option for inverted filter envelopes and an additional filter highpass mode. The Pro-53 is now equipped with a MIDI Learn function for fast and easy integration of hardware MIDI controllers and the option to load controller maps. The graphical interface

BOOK CORNER

"THE ART OF RECORDING: UNDERSTANDING AND CRAFTING THE MIX"
By Dr. William Moylan

Dr. William Moylan's *The Art of Recording* (Focal Press, $29.99) is a critical-listening/analysis resource book and educational tool for audio pros and students. The book's techniques and concepts are based on those Moylan developed as a result of over 20 years in research and teaching at the University of Massachusetts Lowell, where he chairs the Department of Music and coordinates the Sound Recording Technology program. The text examines the dimensions of sound in audio, explains the unique sound qualities of audio recording and reproduction, and presents a system to develop critical listening skills to evaluate recordings and accurately describe sound. A forward by Rupert Neve further emphasizes the importance of listening. For more info, visit www.focalpress.com.

has been enhanced, and new sounds are included. List is $199; Pro-52 users can upgrade for free.

MACKIE DRAWMER SDX100 PLUG-IN FOR SOUNDSCAPE

Mackie (www.mackie.com) announced the Drawmer SDX100 plug-in for the new Mackie Broadcast Professional Soundscape 32 workstation. The SDX100 is a dynamics plug-in based on the Drawmer ADX100 used in Mackie's Digital 8-Bus console. The SDX100 offers Drawmer's Frequency-Conscious Noise Gating, Program Adaptive Expansion, "Bootstrap" compression and Zero Overshoot Limiting. The plug-in is available through Mackie Broadcast Professional dealers for $399.

SENNHEISER BOOMSETS

Sennheiser's (www.sennheiserusa.com) HMD 280 and HMD 281 boomsets are ergonomically designed, 102dB SPL headphones that attenuate 32 dBs of ambient noise via a closed-back, circum-aural design. Both models use a super-cardioid mic mounted on a flexible, acoustically isolated boom to ensure intelligible communications in noisy environments. Frequency response at the earpiece is 8-25k Hz, while the noise-compensating microphone provides a voice-critical 50-13k Hz response. The $249.95 HMD 280 has two earpieces, while the $219.95 HMD 281 has only one.

UPGRADES AND UPDATES

Genelec offers a complete 5.1 surround monitoring package, the 1029.LSE Power-Pak, for $3,999. Including five Genelec 1029A bi-amplified active monitors, a Genelec 7060A LSE Series active subwoofer and a measuring tape, the Power-Pak is designed for control rooms that measure less than 3,000 cubic feet. Call 508/652-0900 or visit www.genelec .com...Mackie Designs releases the Pultec EQP-1A Program Equalizer for the UAD-1 Powered Plug-Ins family, developed by Universal Audio and marketed and distributed by Mackie. Visit www. mackie.com for more info...Digidesign (www.digidesign.com) announces that the Access Virus Indigo TDM plug-in ($795) is now available. The synth plug-in offers up to eight multitimbral synthesizers per DSP with up to 16 voices on Pro Tools | 24 MIX and up to 20 voices on Pro Tools | HD...Now shipping: automation option for Lexicon's 960L Multichannel Digital Effects System. Included in Version 3 software (free to all existing registered customers), the optional automation feature allows MIDI timecode automation of program changes, pan moves, parameter adjustments and mutes. Call 781/280-0300 or visit www. lexicon.com...SEK'D's PRODIF 88 PCI-Interface card transmits eight channels of AES/EBU with a maximum 24-bit/96kHz resolution. Visit www.sekd.com for

specs...True Audio offers Version 2.0 of its TrueRTA PC-based, real-time analyzer (RTA) software, a collection of real-time, software-based audio instruments for testing and evaluating audio systems and materials. Call 865/494-3388 or download TrueRTA at www.trueaudio .com...SAWStudio Version 2.6 features IEEE1394 FireWire DV-video capture, playback, cuts editing, rendering of the multitrack mix to a new video file, and mixer channel snap-shot save and recall. Download a demo at www.SAWstudio .com...Version 1.2 of Spektral plug-ins

features a new Clear Morph mode in the Spektral Morpher plug-in, an improved edit mode in the Spektral Shaper, in/out gain knobs and more. Visit www. delaydots.com...Edirol Corporation (www. edirol.com) is now shipping the UM-550 5x5 USB MIDI interface, a ¾-rack unit with a 5-input/5-output MIDI-switching interface...New SpinWise DVD copiers

from Telex (www.telex.com): SpinWise 4-28D is a stand-alone tower unit with a 20GB hard drive with four drives, and will copy DVDs at 2x speed and CD-Rs at 8x speed. SpinWise's 7-28D, also a stand-alone tower unit with a 20GB hard drive, has seven drives and will copy DVDs at 2x speed and CD-Rs at 8x...Dynaudio's AIR 6, AIR 15 and AIR Base-2 now are all THX pm3-certified. For details, visit www.dynaudiousa.com...Bit-Headz' Unity Session Version 3.0.2 adds VST support for Logic 5 and Cubase 5 for Mac, enhanced navigation features and more. Check it out at www.bit headz.com...Tascam now has OS X drivers for the US-428; visit www.tascam .com for details...Listen Technologies' latest product catalog of wireless audio solutions for auditory assistance, language interpretation and tour group communications includes sample application-specific systems and detailed parts lists. For your free copy, call 800/330-0891 or download it in PDF format from www.listentech.com/pdfs/ CatalogE.pdf...Homegrown Sounds' *Organic Chaos* ($39.99), the seventh CD in its collection of atmospheric instrument CDs, can be purchased online from www.homegrownsounds.co.uk. The site also contains free downloads and The Ambience Generator, an online interactive "atmosphere creator." ∎

Digidesign Pro Tools | HD

24-Bit 96/192kHz Workstation

B y now, you've probably heard of the new Pro Tools | HD system (the HD stands for High Definition) from Digidesign. There has certainly been enough talk about it, and its 24-bit/192kHz recording rate is raising plenty of eyebrows. The big questions on everyone's minds are, what does it sound like and is it time to update my system? In order to answer these questions, we installed a complete HD system (three cards and three interfaces for 32 channels of analog output, 16 channels of analog input and 32 channels of digital I/O) at the cozy and very reputable Infinite Studios in Alameda, Calif.

If you're familiar with the Pro Tools | 24 MIX and MIXplus systems, then understanding the new HD system will be a walk in the park. There are three different setups to choose from: Pro Tools | HD 1, HD 2 or HD 3. (System prices are shown in the sidebar "Pro Tools | HD Prices.") HD 1 includes a single "HD Core" card. Add one HD Process card (which is what the new DSP Farm cards are called), and you have the HD 2 system. Add two HD Process cards and, you guessed it, that's the HD 3. The cards are, as usual, PCI-based. Thirty-two channels of I/O are available per card, and each card packs nine Motorola 56k DSP chips, which are 25% more powerful than the MIX cards' chips; this translates to about twice the voice count and DSP power in a 44.1- or 48kHz session. Up to six HD Process cards can be used with a single HD Core card for a whole lotta dedicated processing power.

The maximum track count using the HD Core and at least one HD Process card, on a 48- or 44.1kHz session, is up from the previous 64 tracks to 128 tracks. Depending on a session's sampling rate, maximum track count will vary. For example, using the HD Core card alone at 88.2 or 96 kHz, you can have up to 48 tracks, while at 176.4 or 192 kHz, the maximum number of tracks is 12. Add an HD Process card, and the track count increases to 64 tracks at 88.2/96 kHz and 24 tracks at 176.4 or 192 kHz. (Adding a

Pro Tools | HD: Looks familiar, sounds new.

second HD Process card, like the HD 3 configuration, only increases DSP power and not track count.) Pull-up/pull-down sample rates are now available for every sample rate.

To run HD, you'll need a "Digidesign-qualified" Power Macintosh, which translates to a G4 (AGP-based) with as much system RAM as possible (crucial for high track counts). O.S. 9.1 through 9.2.2 are currently supported, and Digi is hard at work on OS X support. (No official release date announced yet.) Near the end of this field test, support for PC computers was announced with the release of Version 5.3.1 for Windows. The PC you'll need for Pro Tools | HD must have a P3 or P4 processor and must be using Windows XP, Professional or Home.

MEET THE NEW INTERFACES

Digidesign's crowning new interface is the two-space 192 I/O. This is the box that allows 24-bit/192kHz recording and playback. It's designed with maximum flexibility in mind, having four I/O card bays, one of which can be loaded with your choice of analog or digital connections. For example, the stock configuration is eight analog ins on card bay 1, eight analog outs on card bay 2 and digital I/O in

card bay 3. Card bay 4 is left open for you to add more I/O at your discretion. All of the analog connectors are of a DB-25 type and follow the same pin-out configuration as Tascam; Digidesign offers cables with a variety of breakout ends (if making cables isn't your cup of tea) called DigiSnakes. As usual, standard features include two channels of AES/EBU and S/PDIF, and Word Clock I/O is standard

The analog inputs feature a Soft-Clip limiter that kicks in when a signal reaches -4 dBFS. The limiter can be turned on or off for each individual input channel (from the Hardware Setup window), giving you total control over which incoming signals receive the dynamics processing—very cool. The DB-25 can accommodate parallel +4dBu and -10dBV connections, allowing two input sectors per group of eight channels. With both sectors wired, you can use the Hardware Setup Input window to select which cable is feeding a channel. The 192 I/O's A/D card has a dynamic range rated at -120 dB (A-weighted).

The Digital I/O card (which is found in the 192 I/O and the 192 Digital I/O, a digital-only interface) can perform incoming real-time sample rate conversion. This is an especially nice feature, because you
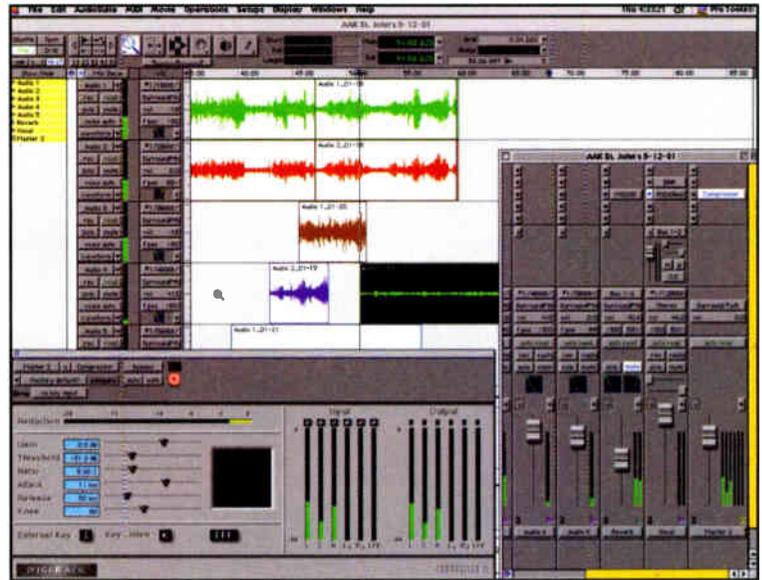
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The Antares Vocal Producer.™
Killer vocal sounds.
Auto-Tune™ pitch correction.

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TEC NOMINEE

"Such a deal!... I guess I'll be buying this one." (and he did)
DAVE BEYER, *GIG Magazine*

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is a great vocal sound. With Antares's Vocal Producer, we've combined our world-renowned Auto-Tune Pitch Correction and TEC-Award-winning Microphone Modeler technologies with state-of-the-art vocal processing modules to give you everything you need to create stunning vocal tracks in any musical style.

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Live or in the studio, the AVP lets you instantly select from a large library of sounds. From gorgeously mellow to seriously twisted, we've included factory presets for a wide variety of vocal styles as well as an interface that makes it easy to create your own signature sounds.

NOW HEAR THIS
Check out the Vocal Producer at your local Antares dealer or surf on over to our web site for some illuminating audio examples. With an estimated street price of $495, this is one great producer you can afford to work with.

"I liked the way my voice sounded so much (using mic modeling, compression and a tiny bit of EQ) I think it lead to a better vocal... the AVP-1 provides the secret sauce of mic modeling and pitch correction... this box delivers the goods." CRAIG ANDERTON, *EQ Magazine*

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02

can fly in tracks recorded at different sample rates directly into the session's current sample without having to convert individual audio files offline—what a time-saver. Three types of digital formats are available on a single digital-expansion card: TDIF and AES/EBU have separate DB-25 connectors, and there are also ADAT Optical connectors.

If the 192 I/O is too much for your needs, a 96kHz interface is offered. The two-space 96 I/O allows 16 simultaneous channels of I/O; there are 20 I/Os total, including eight analog channels on ¼-inch TRS, ADAT optical, and 2-channel AES/EBU and S/PDIF connections. There are no I/O card expansion bays, and the Soft-Clip feature is missing, but at half the price of the 192 I/O, the 96 I/O is still a good deal. All of the new I/O boxes feature a Legacy Port for daisy-chaining your old Digidesign I/O boxes with the HD system (up to 16 channels per HD interface). To access the 96 I/O's other eight inputs (or outputs), you can use its Legacy Port with an older-model Digidesign interface, or feed its ADAT optical ports with one of the many compatible Lightpipe interfaces on the market.

In addition to the I/O boxes, Digidesign has announced three other companion interfaces to create a fully self-contained HD system. The SYNC I/O is a single-rackspace synchronization device that reads and writes time code in all of the standard frame rates and features a large, 7-segment time code display that's easy to read from a distance. Though SuperClock is still supported (for example, SYNC I/O can receive a 1x wordclock and will output a 1x-based SuperClock), Digidesign decided to focus on wordclock as the primary clock source. The single-space MIDI I/O has 10 ports and is USB-powered; the two-space PRE is an 8-channel mic preamp that can be remote-controlled from Pro Tools. (We didn't actually get to try these units because they weren't available yet, but should be by the time you read this.)

All of the units have an identical look, sporting silver-aluminum face plates and blue plastic trim. When they are rack-mounted together, they're impressive, even if they do appear a little glitzy. The 192 I/O has two rows of eight 4-segment LED meters that show input and output signals. These meters have less resolution compared to the meters of the 888 interfaces, but then the 888 interfaces can't display inputs and outputs simultaneously

because they only have eight meters (albeit bigger meters). We much prefer to see all of the inputs and outputs at the same time, even if the meters are limited by their LED segments. Most users will simply use the high-resolution onscreen meters.

INSTALLATION JIG
We were determined to give Digidesign's new flagship system a serious workout. No matter how you go about upgrading, it's a challenge that's not for the faint of heart. Moving up to an HD system from an earlier Pro Tools rig does require purchasing at least one new I/O peripheral, and to soften the economic bite, Digidesign offers a variety of hardware-exchange upgrade plans, as well as financing through Avid Financial Services. Details on both programs can be found on Digidesign's Website.

PRO TOOLS | HD PRICES	
Pro Tools | HD 1	$7,995
Pro Tools | HD 2	$10,495
Pro Tools | HD 3	$12,995
Process card	$3,995
192 I/O	$3,995
192 A/D expansion card	$1,295
192 D/A expansion card	$1,195
192 Digital I/O expansion card	$995
96 I/O	$1,995
SYNC I/O	$2,095
MIDI I/O	$595
PRE	$2,495

To keep our businesses running smoothly, we depend on our recording studios, so installing an entirely new multi-track recording/editing system for this testing is a major operation. We decided we could either close up shop while we installed the new system or set up Pro Tools|HD on a second computer, totally separate from our main working Pro Tools|24 MIX3 system. With the help of the people from Apple, who were gracious enough to loan us a computer, we were able to set up a second system to test that didn't interfere too badly with our daily routines.

Rather than go with the ultimate CPU for our testing, we opted for a mid-line,

single-processor, G4 867MHz machine with 1.12 GB of system RAM and a dual-SCSI ATTO card, and we did not have any problems. The computer was running O.S. Version 9.2.2, and we used external, 15,000 rpm Seagate Cheetah drives for audio storage and playback. After the cards were installed, we ran the DigiTest application, as directed, to check if they were operating properly. The HD Core and both HD Process cards passed with flying colors.

The Pro Tools software that controls the new cards is Version 5.3.1. It looks and feels the same as previous versions, but it supports the new interfaces and sample rates, so the Hardware Setup and Setup I/O windows appear quite a bit different. The software now automatically recognizes all of your Digidesign HD interfaces, which means that you don't need to spend time manually entering your interfaces in an initial Hardware Setup window anymore. The 5.3.1 release also features DigiTranslator and Unity, and pull-up/pull-down sample rates are now available for every sample rate. Currently, only Mac versions of the software support AVOption, AVOption|XL, Unity, Post Conform, PRE and DigiStudio.

The computer and interfaces were installed in the studio's machine room to ensure a dead-quiet control room where we could scrutinize our 192kHz recordings. The 192 I/O interfaces were connected to an Otari Concept Elite console. Several inputs on the first 192 I/O were also left open to record direct into Pro Tools using Infinite Studio's collection of vintage mic pre's and microphones. The 192 Digital I/O interface was connected to an Otari FS96 to transfer outside sessions into Pro Tools. And the SYNC I/O was connected, as directed, in a closed-loop circuit with the interfaces.

Making the cables and connecting all of the hardware to the console took some time, but installing the HD Core and Process cards, connecting them to the interfaces and updating the Pro Tools software was quick and painless. Unfortunately, making sure that all of our plug-ins were HD-compatible was not so simple. Because Infinite Studio is a busy mixing facility, there are a lot of plug-ins constantly in use, and the sheer logistics of upgrading such a slew of plug-ins was clearly daunting and potentially expensive. If your setup is simple—a couple of interfaces, a console for monitoring Pro Tools stereo bus outs and not too many

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plug-ins—you can get an HD system installed and running inside of a day. By its very nature, a complex setup such as ours required more time.

PLUG-IN PEDANTICS

Digidesign and its third-party plug-in developers are fed up with cracked plug-ins cutting into their livelihoods. We don't blame them. To counter this ongoing problem, an iLok USB Smart Key copy-protection dongle is now being employed. This is a small plastic USB dongle that utilizes an electronic copy-protection "License card" to install the authorizations (about the size of a thumbnail). The card is inserted into the end of the dongle, and you publish your authorizations on it (up to 99). When you buy an HD system, an iLok Smart Key comes standard. It's an annoying system because the dongle is easily misplaced and simultaneously gets in the way, but until a more convenient protection system is invented (there's an oxymoron) or hackers stop cracking protection protocols (we won't hold our breath), we're just going to have to deal with it. On the plus side, the license card approach allows portability: You can use your own authorized plug-ins wherever they're installed.

Currently, all of Digidesign's HD-compatible plug-ins are protected using the iLok; your existing plug-ins require a Smartdisk VST Floppy Drive (the only drive that supposedly works) for old-fashioned floppy authorization. Digidesign provides floppy-based authorization versions for the convenience of users who are upgrading to an HD system. Most third-party developers are reportedly implementing the iLok protection scheme, as well. Again, most don't have it in place yet.

Every HD system comes with the standard set of Digidesign DigiRack plug-ins (EQ, Compressor, Delay, D-Verb, etc.). The HD 2 and HD 3 systems come with additional plug-ins that vary, according to whatever promotional bundle is being offered at the time of your purchase. Our HD 3 system's bonus plug-ins were Focusrite d2, Bruno/Reso, Reverb 1, Maxim, D-fi, DPP-1, Wave Mechanics' Pitch Doctor, the Bomb Factory's LA-2A and 1176 classic compressor plugs, and the Access Virus. Not every plug-in we needed was HD-compatible at the time of this field test. Of those plug-ins that weren't yet compatible, most were promised in the next few months.

The third-party plug-ins that we were able to give a thorough workout included the Waves Platinum bundle (with

Waveshell Version 3.5), Metric Halo's Channel Strip and SpectraFoo, Antares' Auto-Tune, McDSP's Filter Bank and Compressor Bank, and DUY's DSpider Global Bundle—they all passed with flying colors. And, when opening up older Pro Tools sessions in Version 5.3, we did not encounter any plug-in instantiation problems; all of the new HD plug-ins replaced previous instances of themselves and operated as expected.

When upgrading your plug-ins, be aware that some third-party HD plug-ins are not 192kHz-capable, and a few aren't even 96kHz-capable yet. A Plug-In Finder on Digidesign's Website shows HD compatibility and supported sample rates for all plug-ins. If you plan on running a majority of your sessions at 192 kHz, you may find your plug-in choices limited.
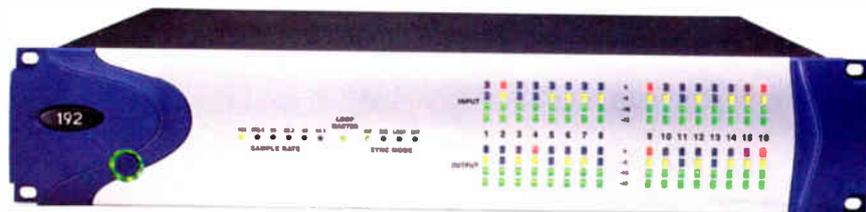
Digidesign reports that, given time, most plug-ins should be able to make the switch to 192 kHz; time will tell.

RTAS is still alive and well and working in Version 5.3.1. But keep in mind that an RTAS plug-in, though it may work in an HD session, isn't an HD-compatible TDM plug-in. Some third-party developers run rather misleading ads that simply say that their plug-ins work with Pro|Tools HD. But with the advent of RTAS, you can't assume that just because a plug-in works in Pro|Tools HD that it's a TDM plug-in. RTAS is a wonderful feature, but if you own HD DSP cards, you'll want to use the TDM plug-ins whenever possible, and also take full advantage of the system's "power-on-demand" DSP functionality—a significant improvement over tapping into CPU power to run plug-ins. Keep in mind that an RTAS plug-in passing a 192kHz signal requires a lot more native processing power than the same plug-in passing a 48kHz signal. If you plan on performing this maneuver regularly, make sure your computer's CPU is up to snuff.

LISTEN CLOSELY

The first thing we did after Pro Tools|HD was up and running was to open a previously recorded Pro Tools|24 MIX3 session. There was a definite improvement in

sound quality listening back through the 192 I/O interfaces when compared to our usual 888|24 interfaces and the RADAR's 24-bit converters. The clarity and imagery of the stereo field and the definition at the bottom end was noticeably better. Even an 888|24, which we had plugged into the first 192 I/O's Legacy Port, sounded a little sweeter. The mixes we did through the new 192 I/Os, despite the fact that the recordings were only 48 kHz, rocked the house. (I'm sure this had something to do with the fact that we were working with higher-performance AD/DA converters, tight low-jitter clocking and a greatly improved mixer with 48 dB of headroom!) And, even after instantiating a ton of plug-ins, we didn't come close to running out of DSP power on the HD cards.

To try out the 192kHz recording rate, we recorded a session with African drums and flamenco guitar. Everything was recorded straight into Pro Tools through Vintech Audio X73 mic pre's (duplicates of the Neve 1073), which were plugged directly into the 192 I/O. A djembe drum was miked using a Sony C800G tube and a Shure FM7; a talking drum had a C800G at its head and a Nuvistor tube AKG C61 miking its bottom. For the nylon guitar, we employed a Tracy Korby-modified Neumann U67 and a KM254c. All of the tracks were recorded at 24 bits, but we recorded different sampling rates for comparison purposes. We also recorded with the Soft-Clip Limiter on and off and hit the inputs really hard.

There was a significant difference in sound quality between 48 and 96 kHz, and a smaller difference between 96 and 192 kHz. Either way, this added up to a very large difference between 48 and 192 kHz. Recordings made at the new rate had a wonderful depth of field, and the details in the instruments' tones seemed to stay cohesive longer as they decayed. The talking drum sounded amazing, and you could hear every nuance, from the side-stick to the dynamics of the skin; the recording breathed. The Flamenco guitar sounded clear and natural, pulling you inside the guitar with every finger strike. Interestingly, the clarity of the 192kHz rate

Universal Audio 2108

Dual Mic/Instrument Preamplifier

The whole look, feel, vibe and sound of the Universal Audio 2108 Dual Mic/Instrument Preamplifier say "rock" to me. Maybe it's the black-anodized front, no-nonsense operation like its sibling, the UA 1176LN Peak Limiter. The 2108's design was inspired by the original 1108 line amp developed by Bill Putnam Sr. in the early '60s to use in his recording consoles and subsequently in the 1176. The 2108 uses a newly designed J-FET mic-input stage that allows precise control over saturation characteristics, followed by an 1176 line amp and output transformer. In the spirit and heritage of UA CEO/president Bill Putnam Jr., this *is* his father's preamp; enhanced, modernized and reincarnated into a versatile and worthwhile unit reminiscent of the 1108 amplifier and a bygone era.

INSIDE AND OUT

Right out of the double shipping boxes, I saw that the 2108's finish, white silk-screened labeling, knobs and E-Switch push buttons all matched the 1176. To obtain an extremely low-noise spec, the 2108 is powered by an external power supply; one power supply is included and required for each 2108 in your rack. The 2108 is ruggedly constructed and housed in an all-steel cabinet. Service techs will like the neat and spacious circuit board layout and the way all of the components and beefy transformers are securely mounted. Metal polypropylene-coupling capacitors and metal film resistors are used throughout. It's hand-built like a tank; I would have no qualms about taking this unit on the road or renting it out. With the 1176's output-stage circuit and specially made UA-5002 output transformer, the 2108 shares the same sonic world: one that is inhabited by many top mixers who, just for the sound, strap a pair of 1176s across the stereo bus without compressing.

Each of the two identical preamp channels on the 2108 uses two control knobs to set recording levels. The Gain control uses a sealed ElectroSwitch rotary switch and sets gain in 5dB steps from a minimum of 25 dB to a maximum of 65 dB. The Level control is a smooth-feeling pot that sets final output levels from zero (off) to 10 (i.e., the full value of the Gain knob setting). I found the 2108 was best used in a deliberately overdriven mode like a guitar amp with a master volume control: Wind up the input Gain knob and turn down the output Level control. This produces harmonic-enriched soft saturation and, being a solid-state, all-discrete, Class-A preamp, sets the 2108 apart from most other transistor mic pre's. Overdriving transistor gear is nothing new, but producing many usable and repeatable results is.

After the Gain and Level controls, each channel has a +48-volt phantom-on/off, phase reverse and input/output meter switch. For metering, the 2108 uses a tri-colored LED mounted in a nice-looking, glass jewel housing. With the Meter button pushed in, any signal present on the input causes the jewel to glow green,

changing to amber with more level and then red when circuit saturation begins. The manual states that red does not indicate clip, but I wish there were output clip LEDs, anyway. With the button out, you'll see output levels with red that indicate a +12dB output at the rear panel XLR output connector. While recording, you'll see it changing colors all of the time, a quick check clearly seen from across the control room. Precise metering is best accomplished at your tape deck, MDM or DAW.

There are two ways to get audio into the 2108: the standard XLRs on the back panel or the gold-plated, high-impedance, ¼-inch jacks on the front. The rear XLR jack is active only when the Gain control is in any position between 30 dB and 65 dB. The hi-Z jack automatically takes over when the Gain control is set to the 25, 30 or 35dB positions. Therefore, it is impossible to have, say, 25 dB of gain for the XLR or 30 db of gain for the hi-Z. Because there are no -10 or -20dB mic-attenuator positions onboard, you may have to use more gain than usual and reduce the output level control to achieve proper recording levels. Conversely, if you run out of gain, then you'll have to make it up somewhere else in the recording chain. I found out that none of these initial concerns mattered much when I used the 2108 for my recordings. High on my wish list would be separate XLR line-level input jacks to process whole mixes through the output section of the 2108; get that 1176 sound without tying up two 1176s!

Last, but certainly not least, is impedance switching. Two different input windings on a custom-made mic input transformer are available. This is the same transformer used in the UA 2-610 tube mic pre-

UA 2108 SPECS

Microphone-input impedance: selectable, 1 k-ohm or 4 k-ohms
Hi-Z input impedance: selectable, 2 Meg or 58 k-ohms
Maximum microphone-input level: +8 dBu
Maximum output level: +26 dBu
Recommended minimum load: 600 ohms
Frequency response: 20 to 20k Hz, ±1 dB
Maximum gain: 65 dB
Noise: -165dB EIN @ 65dB Gain
Dynamic range: >100 dB
CMRR: 50 dB @ 1 kHz
Power requirements: 115 volts/230 volts
Weight: ~11.5 pounds (5.2 kg)
Dimensions: 1U rack, 11.5 inches (29.2 cm) deep

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amp, and I'm happy to see this method used because it is the only correct way to incorporate this fine feature on a mic pre with transformer input. The Z-In Select switch changes the XLR input between the 1k-ohm and 4k-ohms windings. Z-In also toggles the hi-Z input jack between 58k-ohm (switch in) and 2Megohms (switch out) impedance. The manual suggests that the 58k position for -10dBv signals from synths or active instrument pickups and 2Megs for passive pickups where any loading (of the preamp) might change the instrument's sound.

IN THE STUDIO

My first job for the 2108 was recording a Martin D-16 acoustic guitar. I found that the 2108 worked fine for acoustic: clean, quiet and smooth, but not boring. I did run out of gain when recording a finger-picking part a foot away with my low-output Royer 121 ribbon. I could, of course, move the mic closer or make up gain somewhere else. No biggie, because this preamp is so quiet that there aren't any worries about noise buildup when using a big compressor after it. I also tried the hi-Z input to record the Fishman pick-up system installed on the guitar. The 58k impedance position worked well for no additional noise or coloration. Rotating through the different Gain knob settings is clean, and I was able to overload easily for a very retro-direct sound.

While recording electric guitars, I was amazed: The 2108 might be the ideal pre-amp. You can record guitar sounds transparently at full recording levels by using the minimum necessary Gain knob setting and keeping the Level control fully up. You'll get mostly green and amber flashing LEDs with a few reds. The fun begins when you push more Gain and turn down the Level control to maintain proper recording levels. The 2108's true personality surfaces, producing a much more present and "in your face" sound. This is not like using an equalizer, closer mic placement or a compressor. Guitar sounds broadened and projected farther out of my monitor speakers. I tried the Royer ribbon, SM-57 and AKG C-414ULS mics on a Fender Champ amp. The impedance switch definitely made a big difference with ribbon mics. The Royer has a rated output impedance of 300 ohms, so the 1k-ohm position was louder and more present to me. You can notice a slight difference when changing impedance on the SM-57 dynamic moving-coil mic. I found myself checking the sound differences by changing impedance with every new mic

setup and recording job.

Next, I went over to Jimmy Hunter's Cazador Recording in Hollywood for vocals, snare drum overdubs and direct Fender bass. We were recording into a Pro Tools HD system with a 192 interface. I close-miked the top and bottom of a vintage 1967 6½-inch Ludwig chrome snare with a pair of Audix ADX-90 electret condensers. Plenty of gain here; again, winding up the Gain knob to 50 dB and cranking back the Level knob produces a thick and dense sound that is great for double-tracking.

On vocals, I used an AKG 414ULS without pad or roll-off. My singer was about a foot away from the mic and pop filter. I liked the fact that while using the 50dB gain setting, I had plenty of Level knob adjustment to "ride" vocal levels up and down, while keeping softer sections loud enough and the loud sections from over-compressing. Overloading the pre-amp was fun, although the results were unpredictable with live vocal overdubs. I found that if the transistor AKG mic *and* the 2108 overloaded on the same vocal peak, it was not pretty. For grungy vocal sounds, I'd use a cheap dynamic and overload the 2108.

Lastly, the pre-CBS Fender P-Bass sounded very clear and present using the hi-Z input. For the passive pickups, I kept the Z-In Select switch in the 2-meg position for the loudest and clearest sound. Using the lowest Gain setting at 25 dB and the Level knob fully up, I got a perfect level into a following compressor. Overdriving results (for me) depend on your player's touch and technique: Every fret noise, string squeak or buzz is greatly amplified. The DI sound is like any well-designed FET-based direct box.

The Universal Audio 2108 Dual Mic and Instrument Preamplifier stands out from other units, with a long list of sonic options when recording any mic or direct source. I found its operation straight-ahead and simple, its sound unique for a solid-state pre and its build quality excellent. Having the overdrive/saturation feature and musical sound of an 1176 alone make it a tool worth having in any studio. The unit sells for $1,695 MSRP.

Universal Audio, Box 3818, Santa Cruz, CA 95063; 831/454-0630; www.uaudio.com. ■

Thanks go to engineer Aaron Kaplan at Icon Recording Group (Hollywood), producer Jimmy Hunter, and Tim Prince and John Hinson at U.A. Barry Rudolph is an L.A.-based recording engineer. Visit his Website at www.barryrudolph.com.

World Radio History

Cakewalk Sonar 2.0

Professional Project Studio Recording

Sonar's Track view with Loop Explorer. This is the main working window in Sonar. From here, virtually all recording, editing and arranging can be done. You can also draw volume, panning and effects envelopes. The Loop Explorer on the bottom is for real-time loop auditioning. To add a loop to a project, simply double-click.

I n case you missed it, the battle over software supremacy just got a little hotter. Both Emagic and Steinberg have upped the ante in releasing bold new versions of their flagship products, the mega-modified Logic 5.0 and the completely rewritten Cubase SX, respectively. The feud grew even more heated in July when Apple announced it had purchased Emagic, throwing the future of Logic Audio on the PC into question and prompting competitors such as Steinberg and Cakewalk to offer competitive crossgrade deals. And, as if the fire needed stoking, Digidesign is offering the PC crowd the Pro Tools LE/M-Box package. But a funny thing happened on the way to Summer NAMM: Cakewalk, right on the heels of an evangelical 2001 (with Sonar 1.0), surprised everyone with the unveiling of Sonar 2.0 ($479) and Sonar 2.0 XL ($599). On the surface, this unexpected upgrade may appear to be a touched-up rendition of 1.0, but after taking the plunge, I discovered that Sonar's new tweaks should encourage even more PC users to dive a little deeper into 2.0.

Topping the "what's new" list is an upgrade of Cakewalk's DXi (DirectX instrument) technology to DXi 2.0, which now features multiple outputs, automatable presets and several "under-the-hood" performance enhancements. Also, the addition of ReWire support makes software integration a reality in Sonar 2.0. You can now route stand-alone software synthesizers like Propellerhead Reason, Rebirth and Cycling '74 Max\MSP through Sonar's mixer, or at the very least synchronize playback. The advantages of ReWire's emergence are many: You can now use DirectX effects, layer MIDI and audio onto existing Reason and Rebirth tunes, or simply patch in your favorite modules like Reason's drum machine or Rebirth's 303 synths. Additionally, a recently added downloadable patch from Cakewalk's Website allows Sonar to work with Ableton's Live 1.5.
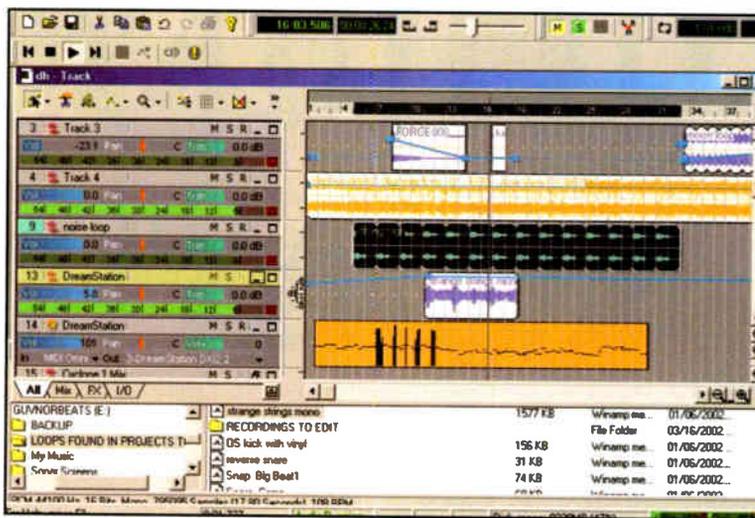
Other cool additions to 2.0 include a brand-new Sonar DXi called Cyclone, which has been designed with loop-based production in mind (more on this later). Like 1.0, 2.0 ships with the versatile Dreamstation DXi (now in DXi 2.0 format) and a demo version of Live Update's Sound Font player DXi called LiveSynth Pro; see www.liveupdate.com. Incidentally, sound fonts are samples that sit in your system's RAM for instant recall. The upgrade price for Live Update is $51.96, plus shipping and handling for Sonar customers.

Sonar 2.0 also includes dedicated piano-roll-style MIDI editing and a separate drum editor (complete with a flexible drum map editor). Also, an interesting new Brush programming tool (for painting redundant MIDI patterns) and several tweaks to the

MIDI programming interface make Sonar 2.0 a little easier on the eyes and mouse. Cakewalk has also improved Sonar's file-management schemes, which now include a safer and more logical "Sonar Project" format that is sure to aid in storing projects, with their respective audio, MIDI and parameter settings, in a single file folder. In addition, Cakewalk has added the possibility of exporting Groove clips in RIFF, or Acid-compatible format.

And if you're into knobs, Cakewalk has come up with its own answer to Mackie's Logic Control surface by building in software support for many of the more popular MIDI/USB controllers on the market, along with the ability to "learn" new controllers as they become available. Currently, Sonar 2.0 is compatible with CM Labs MotorMix, Kenton Control Freak, Keyfax Phat.Boy, JLCooper FaderMaster, Peavey PC-1600, Roland MCR-8 and Tascam's US-224/US-428. Regrettably, Sonar 2.0 is still not open to VST effects or instruments without the use of a software adapter like DirectiXer (www.tonewise.com) or FXpansion's VST-DX Adapter 3.2 (www.fxpansion.com/vstadapter.html).

minimum SYSTEM REQUIREMENTS

500 MHz (1.2 GHz recommended)
64 MB of RAM (256 MB recommended)
Windows 98 SE/ME/2000/XP (2000/XP recommended)
100 MB of hard drive space
Windows-compatible sound card and MIDI interface

SUBMERGED

Installing Sonar is fairly simple, though you do need to give some thought to how much sample content and additional Cakewalk tutorials, presets, etc.,
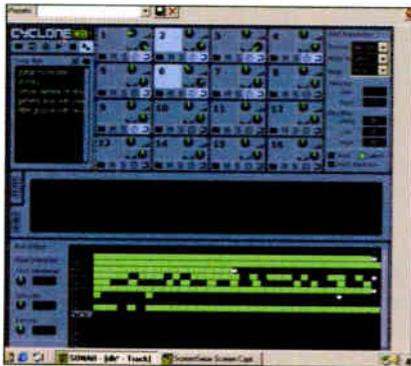
Cyclone DXi. Cakewalk should be proud of its new software-based phrase-sampler's loop-manipulation skills. You can intermix slices of loops with other loops, send to separate output tracks, and much more. Further development has continued all the way up to print time, so be sure to monitor the Cakewalk Website.

you want taking up space on your hard drive. After keying in the serial number and launching Sonar, the program proceeded to search my system for the soon-to-be-famous WDM drivers. Note: Sonar can use Windows MME drivers, and I personally experienced excellent results with them. But if Sonar is your

app, then you should listen to its creator and run WDM. This also means that Windows 98 Gold is basically obsolete, should you commit to Sonar. (See sidebar below.)

UP AND RUNNING

Once I started playing, it was immediately apparent to me that Sonar is flexible. All views and screens are highly customizable and easy to maneuver. And, while Sonar has the ability for notation and video editing, I primarily focused on the audio editing and recording side. The test unit was an 800MHz Athlon processor with 256 MB of RAM and an Audiophile 2496 M-Audio sound card running Windows 2000. As usual, I tried to crash my system by cramming as much as possible into any given project. To my surprise, it took roughly 20 audio tracks (some of them quite large) before I noticed some system slowdown. And only after applying several DX effects and a couple of soft synths did Sonar become sluggish.

WHAT LIES BENEATH

Sonar has two important distinctions from "the other guys." For starters, Sonar allows loops to be auditioned or previewed in real time with the rest of the project. If you use Sonic Foundry's Acid Pro or Ableton's Live 1.5, you'll be right at home with Sonar's groove-clip schematic. Sonar can

import pre-looped Acid loops as well as make your audio recordings loop at user-designated start and end points. Simply double-click on your audio track to launch the Loop Construction view, which looks suspiciously like Propellerhead's infamous loop tool, ReCycle. From here, you can add or remove transient detection points, alter the loop's pitch or
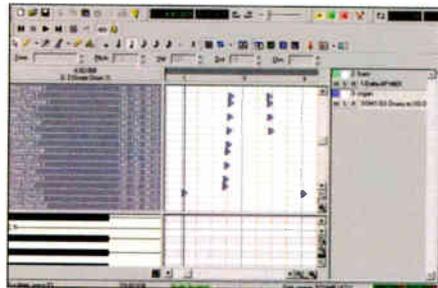
Drum map manager. This is Sonar's most marked MIDI improvement. If you like piano-roll-style editors, then you will like how easy it is to edit in here. If you're in a hurry, Cakewalk has added a new MIDI brush tool to paint your favorite patterns.

save the loop as a RIFF file.

Because Sonar is its own wave editor, you do not need a specific wave-editing application like Sound Forge, Wave Lab or Cool Edit Pro. In Sonar, you are able to zoom in to the smallest point necessary to edit the loop. I noticed that this helps to maintain workflow and ultimately more precise audio cutting and pasting within the multitrack application.

DRUM CIRCLE

With 2.0, Sonar has gone drum crazy. The new drum editor will be a major attraction for MIDI drum programmers and dance-music producers alike. A dedicated drum map editor allows you to scroll easily though your banks of drum samples, be they SoundFonts, DXi or an external hardware sampler, which enables you to build your own drum kits in an organized and efficient matter. Other drum-programming enhancements include a new MIDI painting tool (Sonar calls it Pattern Brush) that allows you to write MIDI patterns en masse. For instance, if you have a basic kick and snare pattern or a repetitive percussion rhythm that you find yourself constantly reprogramming, Sonar allows you to save it and then "brush" it on the track. Though many may shudder at the thought of generic drum-pattern reproduction, there are many flavors of repetitive drum patterns that work in dance music. And, after using it a couple of times, it feels quite similar to painting audio loops. There are also literally hundreds

DRIVERS? LATENCY? WHO'S GOT THE TIME?

WDM, "Windows Driver Model," was developed by Microsoft to work with all of its currently supported operating systems. That said, WDM drivers seize control of your system's audio card (before any extraneous processing can get in the way), provide excellent sound and boast incredibly low-MIDI/audio latency. However, I should caution you that not all sound cards support this newly revamped technology, and even though my M-Audio Audiophile 2496 can use WDM, you must download an older Windows 2000 driver to do so (while running Windows ME). Note: My second machine is outfitted with a little bit better card, an M-Audio Delta 1010, and has the exact same limitation.

The point is that Sonar has been streamlined for WDM and not MME and cannot use Steinberg's ASIO technology. Furthermore, Windows 2000 and Windows XP are the recommended operating systems for all Sonar versions. Kuper also added an ominous caution: "Microsoft is no longer developing for Win 95, 98, 98 SE or ME." So if you're clinging to the past, it's time to migrate to 2000 or XP.

For more information on WDM, check out what Microsoft has to say at www.microsoft.com/hwdev/driver/wdm/default.asp.

For a list of Sonar-compatible sound cards, refer to www.cakewalk.com/Tips/audiohw.html.

—Dave Hill Jr.

of MIDI brush patterns automatically installed during Sonar's installation process.

Also drummer-friendly is Cakewalk's new baby, the Cyclone DXi. This DX instrument is similar to a phrase sampler with internal editing capability that should help non-drummers break up a stagnant groove. You can load up to 16 Acid/Cakewalk-formatted loops (.WAV files must be pre-looped) into each Cyclone DXi. Like most DX instruments, you can run several instances at once if needed. Keep in mind that each will require its own track and a fair-sized bite out of your PC's RAM. Cyclone feels like the start of something new, yet also like the continuation of programs like Re-Cycle and the Dr. Rex loop player in Reason. There are no internal filters or effects in Cyclone, but you can, with some effort, route each of the 16 loops to separate outs, apply Direct X effects and get loopy. I was a tad disappointed that there were no presets for Cyclone, but once I took the time to set it up, I was rewarded with some interesting breakbeat-style possibilities.

LIVING LARGE

Sonar 2.0 XL offers a few significant advantages over its little brother. First, XL sports the inclusion of Fxpansion's DR-008 DXi drum synth/sampler combo,

If all of this horizontal audio makes you dingy, don't worry. You are always just one click away from the Console view, seen here with one of Cakewalk's included reverb plug-ins.

which may just be the world's finest computer-based drum machine. And, while this isn't a full review of the DR-008, you can find out more at www.fxpansion .com, including the asking price of $149, which is about the same figure you can

tack on in order to buy the full XL Version. Add to that the newly improved Timeworks' CompressorX and Equalizer plug-ins, and you're talking about a serious bargain. Both of these plug-ins sound professional and provide the XL user with some great tools to apply final touches to a mix. Note: The latest upgrade for DR-008 will set you back another $50, but I used the stock Sonar 2.0 XL Version and enjoyed myself thoroughly. I also should point out for those who contemplated 1.0 XL that a Tassman synth is not included in either version of 2.0.

THE VERDICT

While there is so much to celebrate about Sonar 2.0, some users may want to know why Sonar requires an external "wrapper" to support VST plug-ins (instruments and effects). According to my contact at Cakewalk, the company certainly considered built-in VST support, but decided against it because the existing wrappers are already of such high quality (having several man-years of development be-

hind them) that it would be a needless duplication of effort.

My wish list items really just seem greedy at such an incredible price point, but here we go. Sonar's automation could be simpler. Currently, Sonar requires you to select the parameter, or at least the track, to be automated in advance. Then you can record the pre-selected automation by pressing the Record Automation key. Though the results are smooth and accurate, I would prefer to have all available parameters' automation recorded at all times. Perhaps a toggle switch or option setting could determine which recording mode (Automated or Audio) Sonar is in. I feel that this would lead to quicker and more spontaneous mixing, and more fun and livelier results. After all, automation is really at the heart of digital audio. One other gripe is that Sonar momentarily stops all audio when you decide to add (load) an effect. Worse still, when auditioning MIDI effects, you can only audition the affected track. (You can't hear it in the mix while you adjust.)

Also, Cyclone is an excellent start as an arrangement tool but needs to be developed further. Although Cakewalk divulged a number of possible future im-

provements and ideas, we know all too well that software improvements take time. Other suggestions, which the Cakewalk product management team assures me are on the way, would be a Scrubbing feature in the Loop Construction view (as well as Cyclone) that would considerably help target the correct slices when editing a given audio loop. I also would appreciate the ability for Cyclone to work with any .WAV file, which seems to be the next wave in loop-playback plug-in technology (i.e., pHATmatik Pro, www.bitshiftaudio .com/).

CONCLUDING REMARKS

The bang for the buck with Sonar 2.0 ($479), and especially 2.0 XL ($599), is exceptional. This is not to imply that Sonar is an economical or inferior application, but that it is a pro audio-savvy, well-supported, well-documented and growing application that pointedly caters to the audio PC contingent (at a reasonable price). If you missed Sonar 1.0, there is no better time to jump into the fray. Tutorials on both the installation disk and the Web will aid Sonar's implementation into your project studio. Cakewalk has proven its commitment to furthering its innovative DXi

technology, as the company did with early Cakewalk Pro Audio MIDI effects. Since its inception, DXi development has been adapted by Native Instruments and countless others.

At press time, Cakewalk released a free downloadable DXi 2.0 development kit (see www.cakewalk.com). Don't take my word for it; check out www.thedirect xfiles.com and look at what a world full of developers has to offer. As an audio software junkie, I must confess that Cakewalk has done its homework, listening to their customers and critics alike. Sonar has the distinction of being the only MIDI/multitrack audio written specifically (and exclusively) for Microsoft Windows. For this reason alone, I expect more and more PC users will decide that the time is right to dive a little deeper into digital audio.

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Former Seattle multitasker Dave Hill is currently drumming, programming and composing in New York City. His project Jettatura *will be released on www.sixtyone sixtyeight.com in winter 2002.*

Shure ULX Wireless System

Severing the Leash for Good

Long before Shure entered the wireless market, concert engineers specified cordless mics with SM58 or SM87 capsules. Since introducing its own UHF system—and discontinuing the supply of capsules for others—Shure has grown to dominate the market, at least for live and broadcast music applications. When Shure introduced the new ULX wireless system, what caught my attention was the claim that it could sound as good as a wired mic. As it turns out, the claim is well-founded.

There are two versions of the ULX system, Standard and Professional, and the same wide range of handheld and belt-pack transmitters work for both. The differences are all in the receivers. The Standard receiver's chassis is plastic, while the Pro's is the same metal chassis found on the PSM-400 transmitter and includes a rackmount kit. Both units contain backlit LCDs that show group and channel selection plus a three-segment battery "fuel gauge," but the Pro can also display the six-digit frequency.

The Standard receiver comes with detachable quarter-wave whip antennae, but the Pro's longer half-wave antennae, which provide similar RF performance, can also be remoted with a co-ax BNC cable. Both receivers have five-segment LED audio meters, but the Pro also has five-segment RF metering, whereas the Standard has only a single RF idiot light.

The coolest feature of the ULX is its ability to scan for clear channels. The Scan function on the Pro version goes further to scan all 10 groups to find the group whose spacing permits the greatest number of channels to operate. This is helpful when going up against interference from TV broadcasts. The Pro version's five-segment RF metering is handy when marginal RF interference can be worked around with antenna strategies.

The ULX operates on more than 1,400 frequencies across a range of 36 MHz, and up to 20 units can be operated in one of 10 preset groups. There are two North American RF bands, J1 (554 to 590 MHz, or TV channels 28 to 34) and M1 (662 to 698 MHz, or TV 46 to 52). When combined, these two RF bands can provide up to 40 compatible channels. Two European bands mirror the U.S. bands, plus there's another European RF band, a UK band and a Japanese band.

For comparison, Shure's top-of-the-line system, the UHF, is available with four bands in the U.S.: J4 (554 to 584 MHz), M4 (662 to 692 MHz), UB (692 to 716 MHz) and UA (782 to 806 MHz). Up to 24 units can be operated compatibly in a single band, for a total of 78 possible simultaneous systems. The UHF and ULX systems' J and M bands overlap but are not cross-compatible. The ULX operates over a slightly wider range in each band, the equivalent of covering an additional TV channel, offering better frequency coordination possibilities in metropolitan areas with the most RF crowding.

The ULX receivers use an in-line AC transformer rather than the IEC connector found on the UHF. The optional UA-844 is an RF and power combiner that distributes two antennae to four receivers, while eliminating all but one of the four power supplies. The 844 includes all cabling and cleans up the rack—a must for multiple unit systems. Other options include the UA-830 RF amp that can be used to add either 3 or 10 dB of gain for antenna cable runs when remoting the half-wave antennae. A familiar paddle-shaped directional antenna, the UA-870, offers 6 dB of gain and better reception in the area it's pointed toward.

Holding the Mode key for 10 seconds as the ULX powers up allows the user to enter lower- and upper-frequency limits. This will stop the unit from scanning and accepting frequencies above or below the limits, a useful feature when known intermittent sources of interference might otherwise be accepted by the scanning feature. On the Pro version, the squelch can also be adjusted to help fight borderline interference.

The ULX handheld's housing is made of plastic, and a plastic sleeve can be slipped on to cover its controls and display. It uses a 9-volt battery instead of two AAs, which makes battery changes faster. Capsules can be swapped out and are interchangeable with those from the UHF and other Shure systems. The ULX transmitters can be locked.

In the old days, wireless users could just turn on their system and hope for the best. There were enough problems that simply carrying a spare, or moving to a different frequency, was a workable solution. Now, airwaves are sufficiently congested that avoiding problem frequencies ahead of time is essential. The ability of the ULX's scanning feature to reduce the headaches of RF interference alone might convince most intermediate users to go with this system for a variety of applications.

Perhaps the most striking feature of the ULX is its sound quality: There's hardly any difference between the ULX and a wired mic. The older UHF system is a bit more robust, but the ULX is more user-friendly and sounds much better, plus it has the Scanning feature. And let's talk prices: The Pro ULX with a 58 lists for $1,312, while the Standard ULX is $1,050, about half the price of the UHF.

While the ULX can't compete with Shure's top-of-the-line UHF Series software control and ability to operate more channels, the sound quality and scanning features are sure to make it a hit for second-tier wireless customers. Musicians who need only one system should consider the Standard, while installations and regional companies running multiple channels will appreciate the extras on the Pro. I won't be at all surprised to see ULX systems appearing on tours and at festivals. It's the best Shure wireless I've ever heard.

Shure Incorporated, 222 Hartrey Ave., Evanston, IL 60202-3696; 847/866-2200; info@shure.com. ∎

M-Audio SP-5B

Bi-Amplified Studio Monitors

There was a time when, even in recent memory, someone who was shopping for a good pair of bi-amplified studio monitors needed more than $1,000 to get started. Then, Genelec broke the $1k barrier with the excellent 1029 monitor. (List price for the current 1029AP is $1,080/pair.) Two years ago, Event upped the ante with the Project Studio (PS) Series; at just under $500 a pair, the PS6 was a steal. (Current list is $699/pair.) Many other companies have since introduced compact studio monitors at very competitive prices.

M-Audio, a company known mainly for digital audio cards and MIDI products, has recently entered the market with its SP Series monitors, available with a 5-inch or an 8-inch woofer. M-Audio has also added a subwoofer, the SP-8S ($499.95), for those who are looking for more bass response. For this test, I took the SP-5B model ($399.95/pair) without the subwoofer.

The SP-5B is constructed of 15mm vinyl-laminated MDF encased in a 0.4mm PVC shell. The monitors measure 9.85x6.54x7.88 (HxWxD) and weigh 28 pounds a pair. Each cabinet contains a 5¼-inch magnetically shielded, mineral-filled polypropylene curved cone with a high-temperature voice coil and a damped rubber surround, and a 1-inch magnetically shielded, swivel-mounted, silk-dome tweeter with a Ferro-Fluid coolant and internal damping. The monitors boast a fourth-order active crossover (2.7 kHz), and separate amplifiers supply 42 watts to the woofer and 33 watts to the tweeter, a total of 75 watts of power. An LED on the front of each monitor indicates power on, and there are XLR and TRS inputs on the back, which is also where the volume control is located, an unfortunate choice. Frequency response is 33 to 22k Hz, while the signal-to-noise ratio is greater than 100 dB (full output, 20kHz bandwidth). The monitors also feature a sub-frequency port on the back that is designed to discharge extreme low frequencies under 30 Hz.

THE SOUND

For my initial listening tests, I set the monitors up about four feet apart with the drivers at ear level and connected my SEK'D soundcard to the ¼-inch inputs on the monitors. My first choice for listening was Rush's live CD *Exit...Stage Left*, because I think "YYZ," which begins with the light Neal Peart rhythm and then jumps immediately into Geddy Lee's driving bass, is a good test. Initial impressions were good. The cymbals seemed well-defined, and the bass response was strong. I tried a variety of other test CDs, including Led Zeppelin's *BBC Sessions*, the Rolling Stones' *Exile on Main Street*, Natalie Merchant's *Motherland* and the Cowboy Junkies' live *Waltz Across America*. For acoustic music, I chose fiddler Kevin Burke's *In Concert*, Karan Casey's *The Winds Begin to Sing*, and Tim O'Brien and Darrell Scott's *Real Time*. I was impressed with the balance that the speakers showed. The bass response, in particular, was impressive on all of the material, while the highs sounded tight. On all of the rock-oriented material, the monitors did a good job, especially at reproducing the cymbals, which is something I always listen for. On the O'Brien and Scott material, the mandolin sounded smooth and clear, while the "high lonesome" vocals were crystal-clear.

TEST, 1, 2

The acid test came when I took the monitors over to my friend Marc Nutter's Sonic Sense studio to A/B the SP-5Bs against a pair of Genelec 1029s; perhaps not the fairest test, but a good barometer of the monitor's overall strengths and weaknesses. For kicks and giggles, we also set up an Earthworks microphone about a foot away from the right monitor and ran Smaart Live to test both sets. Though the Genelec 1029s cost more than twice the M-Audio SP-5Bs, the SP-5Bs did quite well. In particular, the SP-5Bs actually had more present bass than the 1029s, evidence that the sub-frequency port was working. The Smaart Live analysis backed this up, showing that the M-Audio SP-5Bs exhibited a smaller initial drop-off, followed by a quick spike before a sharper drop-off in the bass frequencies. After the second drop-off, both monitors came up at a similar rate. The other interesting thing in the M-Audio response that Smaart Live revealed was a spike at 1 kHz and a small drop-off at 4 kHz, after which the response quickly rebounded.

Overall, the Genelec 1029s sounded more refined and had a crisper high-end definition than the M-Audio SP-5Bs. When I listened to a CD by Irish supergroup the Bothy Band, the pipes, fiddle and flute came through a little smoother in the Genelec 1029s, but the M-Audio monitors were by no means lacking. Even after several hours of listening, I did not experience any ear fatigue.

At its current price of $399.95/pair, the M-Audio SP-5B is definitely worth consideration for a project studio. With its magnetic shielding and small size, the bi-amplified monitor is particularly well-suited for use with a PC-based DAW in a small studio.

M-Audio, 45 East Saint Joseph St., Arcadia, CA 91006; phone 800/969-6434; www.midiman.net. ∎

records, but it does insert a little *if-then* logic loop into the creative process. Subtle speed variations may not be noticed until a *piece* of a take is moved from one end of the reel and spliced *into* a take at the other end.

All of the various tension-control methods minimize headwear, improve speed accuracy and handling, as well as improve tape path stability, especially at reel extremes. In the most general of terms, Ampex, Fostex, Otari, Studer and Tascam chose tension guides/arms while MCI placed a tachometer under each reel table, eventually adding a "dancer arm" on the supply side. The primary goal is to quickly get the tape up to speed. The secondary goal is to minimize "tension blips" that might be caused by accumulated splices, poor threading or poor tape wind. Let's look at the challenges.

DO YOU KNOW CAPTAIN STAN?

If this question isn't silly enough, did you miss the lecture on the purpose of capstan drive and (in most cases) that puck-ish roller called "pinch?" The Capstan Motor—just to the right of the head area—drives the tape at a constant speed. On ancient transports, the Capstan Motor was of the synchronous variety, which means that its speed was determined by, and locked to, the AC line frequency (60 Hz at the outlet in America and some other places). At the other end of the capstan shaft is a large flywheel that smoothes speed variations.

On modern machines, the flywheel is gone. Instead, capstan speed is precision-controlled by a Servo System (often referred to as a Phase-Locked Loop, or PLL) and is referenced to a crystal oscillator. An example from an MCI machine

is shown in Fig. 1. The more sophisticated transports add a tension servo and a tape-speed Tachometer (via roller guide) so that the machine can get the tape speed in the ballpark before engaging the pinch roller. With the flywheel now in an electronic form, the capstan speed is now easily slaved to timecode.

START YER ENGINES

After the capstan, the other major influence on tape motion across the heads is the torque applied to the supply and take-up reels. If motor torque is servo-locked, then a tension malfunction can easily break the lock, allowing tape speed to run away or slow down without recovery.

From the Stop position, all machines apply a "Start Torque" signal to the take-up motor to overcome reel inertia. (MCI calls this "acceleration.") The intensity and duration of this momentary boost correspond to the amount of tape on the take-up reel. For example, Start Torque is almost unnecessary when the take-up reel is empty, but an absolute must when trying to move a nearly full 2-inch reel.

The tension on either side of the Capstan Motor should be nearly the same, with just a little more take-up tension to move the tape at approximately the desired speed. A gross imbalance of supply and take-up tensions can aggravate subtle tape-path anomalies. Under the worst conditions, too much take-up tension and too little supply of hold-back tension may cause the tape to ride very high or very low in the guides, edge-curling at those extremes if not eventually slipping out and causing more serious damage.

TENSION TOOLS

The two tension-measuring tools are an old-fashioned spring gauge and a Tentelometer (www.tentel.com), a pricey but effective device that slips over the tape. The spring gauge is useful to measure brake tension and pinch-roller pressure; the Tentelometer is best used for measuring tape tension under operating conditions. Most often, absolute tension is measured in two locations: just as it spools off the supply reel and just as it winds onto the take-up reel. Fven at center reel, these two measurements will not agree because of the added friction as the tape passes over the heads.

The manual is a good place to start to learn how to adjust reel tension, but the ultimate test, when applicable, is the relative tension on either side of the capstan. Because most versions of the Tentelometer will often not fit in the space between the capstan shaft and the head block, another technique is employed. Once the machine is in play, the pinch roller is disengaged and then either the supply tension is adjusted down or the take-up tension is adjusted up so that the tape runs as close to speed as possible; this method is detailed in both the MCI and the Studer manuals. Try to minimize supply tension whenever possible to extend head life. If performance suffers, then have the heads lapped.

ON THE ROAD AGAIN

Justin Morse—at www.rollmusic.com here in the Twin Cities—contacted me regarding a problem with an MCI JH-24 16-track. The machine was in remarkably good shape, but tape speed at the reel's head and tail was out of whack as if tension seemed to be the culprit. After a few phone calls and multiple e-mails,
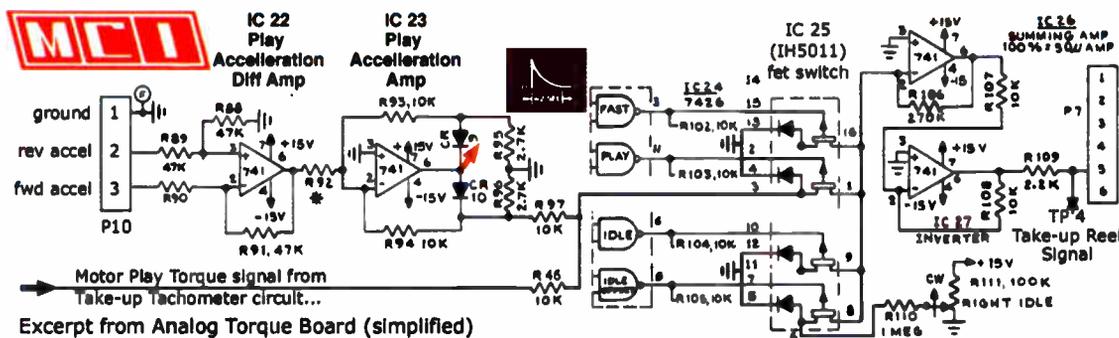
Figure 2: Portion of MCI analog torque board circuit that details how the Play Acceleration signal is mixed with the reel-motor Tachometer signal (at the junction of R97 and R46).

he finally requested a service call.

It had been awhile since my tool case and parts bins last traveled. Ages ago, they negotiated the New York subway system on a luggage caddy with giant bungee cords that held everything together. Now a car is required. I walked through the doorway of Roll Music, we chatted briefly, and the machine was threaded.

Ah, the sweet aroma of analog tape as it passes from one reel to another, constantly changing the hub diameter and along with it, torque (large hub = low torque; small hub = high torque). The machine behaved almost normally until the end of the reel, at which point either the tape would not go forward or it took too long to achieve full play speed. Cheating the tension a little higher on the take-up side almost solved the end of reel start-up problem, but it also made the tape run too fast at the head of the reel.

Note: MCI machines have three torque-limit switches in order to safely limit total torque (and minimize tape stress) for 7-inch plastic, 10-inch or 14-inch reels. Under normal conditions, even the lowest setting should have worked.

I WANT MY MCI CHECKLIST

When I pivoted the transport for service, the power connectors fell out, which provided a good opportunity to check for corrosion. The connectors were surprisingly clean, so I reseated and secured them using the factory-restraining loops. Justin had already measured all power-supply voltages, but beyond this, I assumed nothing. The Vulcan Mind Meld was applied to the machine and then autopilot took over. It's best to start at the beginning, so here's the checklist:

Under each reel motor, a Tachometer generates a DC voltage corresponding to reel rotation. With the tape wound to mid-reel while in play, each Tach should (and did) generate the same voltage. Had the machine failed this test, the Tachs would have been cleaned or replaced.

The Capstan's PLL board has a test point for observing duty cycle via an oscilloscope. In Fig. 1, Test Point 3 is highlighted using "reverse video," indicating a square wave that is 30% "on" (70% "off") when optimized. During operating conditions, it's possible to "see" how reel-tension variations can push or pull the duty cycle, which is totally cool because that's how the start-torque signal is derived. Observe the PLL with no tape

threaded: The capstan gets right up to speed and the duty cycle is rock-solid. However, if a finger is dragged on the supply reel—or the take-up reel is helped along—the duty cycle will change and the PLL will attempt to correct the tension.

Go to the analog torque board (Fig. 2) to confirm the start-torque signal at pin-6 of IC-22 and IC-23. In this case, start-torque signal was wimpy, so the signal was traced through the motherboard and back to the PLL board (pin-7 of J-61). Simulating stress on the Capstan Motor helped to generate a more substantial error signal. However, no stress on the Capstan Servo means that an error/compensation signal was not generated; a similar condition exists when pinch-roller pressure is too light. To test my theory, the pinch-roller tension was increased by hand whilst going into Play mode and, *voila*, the start torque increased dramatically.

This may appear to be a labyrinthine way to discover that the pinch-roller pressure was too light, *but* it is through experience that technicians learn to go easy on this adjustment to avoid damaging the Capstan Motor bearing. Too much pressure makes the bearing hot, increasing friction until the PLL can no longer maintain speed. For a machine on its third owner, the "slippage" could be as simple as 20-year-old spring fatigue, or as complex as having been tweaked by who knows how many technicians.

Pinch-roller pressure is a function of tape thickness as well as pinch-roller diameter, combined with any "play" in the capstan-mounting holes. Any past operation to remove or shim the Capstan Motor might have resulted in a position that relaxed the pinch pressure. I gradually increased pressure while applying a little supply-reel drag (by hand) until it became more difficult to slow or stop the tape. Once satisfied, the pressure was confirmed via spring gauge and found to be spot on. Woof! ∎

Eddie thought this was going to be an easily written article because the sleuthing went so well. Instead, he pored over the schematics to prove the convergence of logic, technician's intuition and reality (finding at least two instances where a pair of signal lines were mislabeled). Now he's gonna take a break from the analog world and delve into the DVD/r/rw/ram domain.
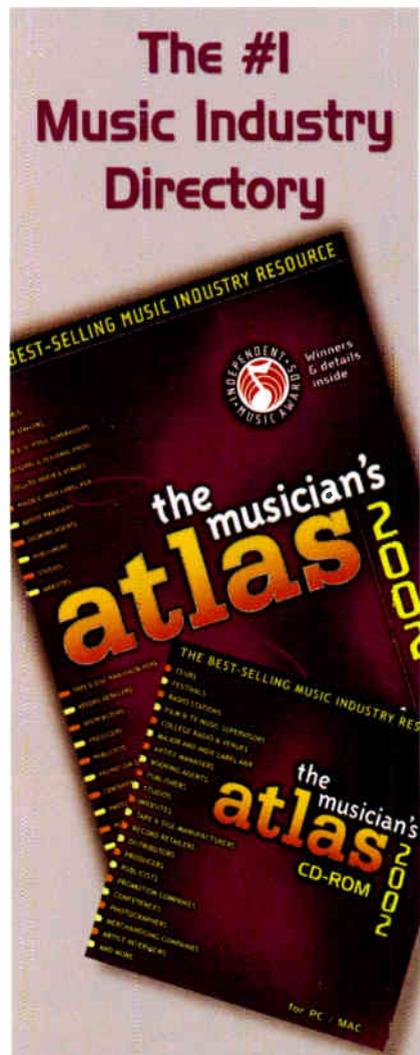
Recto Direct

A Recto Stack in a 2-Space Rack

We know you won't believe it…so STOP READING! Get your guitar, and go check out the new RECTO PRE direct through a console.

Still reading? Then here's the deal: There were several times we almost gave up. For three years we worked day and night to deliver the sound and feel of our legendary DUAL & TRIPLE RECTIFIER stacks …direct to tape.

Rear Panel (not visible): Six 12AX7s and Rear Input Jack

MARY

All Access

Out on a world tour since January, Mary J. Blige brought her No More Drama show to the Chronicle Pavilion (Concord, Calif.) in late June. The hip hop soul diva, accompanied by a nine-piece band and four dancers, presented a generous selection of hits and album tracks from her five studio albums, including the 2001 release No More Drama (Universal). Punctuating the almost nonstop show with frequent references to her troubled early life, Blige also treated the appreciative and vocal crowd to two costume changes and one song at a rotating piano.

The Mary J. Blige sound crew (L to R): monitor engineer Vish Wadi, FOH engineer Horace Ward, FOH tech Mike Mason, sound tech Joe Manges and assistant monitor engineer Brett Stec.

J. BLIGE

PHOTOS BY STEVE JENNINGS
TEXT BY CHRIS MICHIE

FOH engineer Horace Ward (above front, with FOH tech Mike Mason) has toured with Prince, Maxwell, LL Cool J and The Fugees, among others. Mixing on the Showconsole digital control surface, Ward uses a minimum of outboard processing: an Avalon AD2044 compressor on the lead vocal and Summit DCL-200 compressors on the kick drum mics and bass and keyboard DIs. Ward also makes use of an H3000 Harmonizer on the lead vocal and an H4000 for the backing vocals, with a Lexicon 224X as "house" reverb. Ward typically records each show direct to a laptop running Cool Edit Pro.

In addition to the latest Showconsole software (Version 2.1), Ward is using Clair Bros./Showco's new iO, a digital crossover/speaker-management system manufactured to Clair specs by Lake Technology. Six of these 2-in/6-out units drive the Clair Bros. I-4 line array P.A., which was supplemented at the Concord show with flying I-4B bass cabinets and Showco 2x18 subwoofers.

Veteran monitor engineer Vish Wadi manages all in-ear mixes for the nine musicians, plus mixes for 12 onstage wedges (all Clair 12AMs) and Clair R4 sidefills. The IEM systems are all Sennheiser 3000 models with Future Sonics molds and drivers.

Mic selection includes Shure and Audio-Technica models on drums and percussion, with the new ATM63HE on the snare and Neumann KSM32s for overheads. Background vocal mics are Shure Beta 58s. Bass guitar, bass synthesizer and the three electronic keyboard stations are all captured via Countryman DIs. All three keyboard players mixed their instruments to stereo on Yamaha 01Vs, with Wadi switching them among various presets.

Mary J. Blige sings into a pair of customized Sennheiser Evolution E 565 wireless microphones (one gold, one white) and listens to herself and the band via the Sennheiser Evolution 300 Series in-ear monitor system.

THE ALLMAN

Taking the Stage at Another Fillmore

Gregg Allman at the Hammond B3

Guitarists Derek Trucks (left) and Warren Haynes

The current incarnation of the Allman Brothers Band is unquestionably one of the strongest they've put together in their long history; some fans even believe it is comparable to the original lineup that included Duane Allman, Berry Oakley and Dicky Betts. This year marks the 31st anniversary of the group's seminal release, *Live at Fillmore East*, and the band, which now consists of Gregg Allman (keyboards and vocals), drummers Jaimoe and Butch Trucks, percussionist Marc Quiñones, bassist Oteil Burbridge, and guitarists Derek Trucks and Warren Haynes, commemorated the anniversary with a three-night stand at Denver's Fillmore Auditorium in June.

For this tour, the Allman Brothers are using an Electro-Voice X-Array line array system provided by db Sound (Mt. Prospect, Ill.). At the Fillmore, FOH engineer Bruce "Slim" Judd set up two XF long-throw cabinets and two XB double-18 bass cabinets per side, supplemented with two pairs of E-V's CN compact mid/high speaker. Additionally, the Fillmore setup included two X-Line subs on the floor with a 2x2 XCB compact single-18 bass cabinet on top of each. The system was powered by Electro-Voice P3000 amps, and Judd's drive rack included a Klark Teknik DN6000 Audio Analyzer, an Al Smart compressor for system compression, an XTA DP226 and two Klark Teknik 3600 stereo equalizers. "You can store 66 memories in those, so if you come back with the same band and P.A., you can call up your EQ and be ready to go," notes Judd.

Judd controls the whole system with a laptop, a technique that db Sound developed for the Rolling Stones' Bridges to Babylon tour. "Every amp rack has a stereo three-way crossover," Judd explains. "The DP226 lets the unit's 232 connector go to the XTA and an RS485 from there to our drive

snake, linking all of the XTAs with a Winbook running Windows XP. We use a wireless computer, using remote-desktop protocol, as the controlling computer, keeping the other on standby. Using this system, we can build our P.A. from the ground up, tailoring it to the room. Craig Laskowski, our systems tech, walks the room during the show listening for trouble spots, and he can clean up any muddiness or problem areas with the remote."

FOH IS A GAMBLE

Judd, who has been with the band for 13 years and took over FOH mixing a year ago, mixes on a Gamble EX56 console. "We record 48 tracks on six Tascam DA-78HR 24-bit DATs every night. One of the things I can do with the Gamble is go to tape from post-fader so that I keep the mix open. I use a total of 49 inputs for the band, then submix my effects with a little Mackie mixer and send a stereo feed back, leaving me three to four open holes for guests. I do most of my mixing in subgroups, using compressors across the submixes so that I'm not recording the compression."

Judd keeps effects to a minimum, using a Roland SDE3000 digital delay, an Eventide H3000B Harmonizer, two Lexicon PCM70s and one Lexicon PCM80 reverb. For dynamic control, he uses six dbx 160A compressors, three Drawmer 1960 tube compressors, a TL Audio tube compressor and four Drawmer DS201 gates. Explains Judd, "They play so well that I bring it up and go with what they give me. I don't use effects much. The only difficulty is that the guitars are a little loud coming off the stage, and we are going for a quieter mix this year.

BY CANDACE HORGAN

BROTHERS
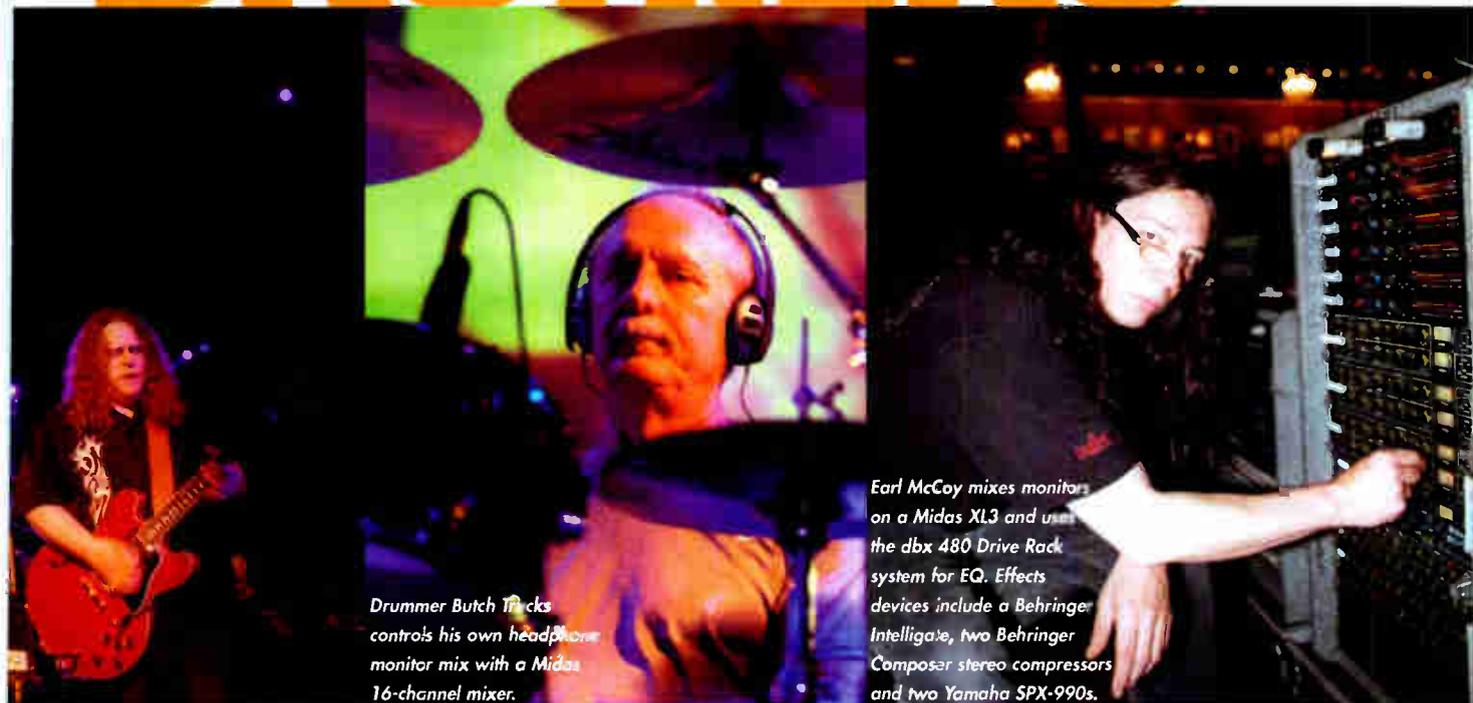
Drummer Butch Trucks
controls his own headphone
monitor mix with a Midas
16-channel mixer.

Earl McCoy mixes monitors
on a Midas XL3 and uses
the dbx 480 Drive Rack
system for EQ. Effects
devices include a Behringer
Intelligate, two Behringer
Composer stereo compressors
and two Yamaha SPX-990s.

Derek has been playing Washburns lately and the SG a little, and Warren uses Les Pauls and a 335. The sounds are different because of that and the amps. Warren runs a Soldano SLO 100 head and a Diaz CD100 head into an Engl 4x12 cabinet, using a Custom Audio Electronics head switcher to control them. The Soldano is more over-driven, while the Diaz has reverb and is more Fenderish. Derek runs a Marshall 100-watt Super Lead Reissue head into a Randall 4x12 cabinet."

MIC CHOICES

For all of the vocal mics, Judd picked Shure Beta 57As, which he likes because of their crisp sound and tight pickup pattern. All of the DIs are Countryman. To capture Gregg Allman's keyboard sounds, Judd takes a stereo feed via a DI from a Roland MKS20 piano module. Allman also plays a Hammond B3 into a Leslie. "We put a Sennheiser 421 on the low Leslie and a left and right Shure SM58 on the high. For [bassist] Oteil, we take a DI feed from the Ampeg speaker output and mike the cabinet with a Beyer M88. Most of the time, that mic only goes to tape. For the guitars, I use a Shure Beta 57 and a Sennheiser 421 on each cabinet."

Judd mikes Jaimoe's bass drum with a Beyer M88, snare with a Shure Beta 56, hi-hat with a Shure SM81, a Sennheiser 604 on toms and an AKG 414 on the overheads. Truck's setup is similar: "I actually put an SM91 inside the bass drum," says Judd, "and an Electro-Voice RE20 at the front head. I blend the two sounds without using a lot of EQ, which would create phase shift and be difficult to get rid of on tape. The rest of the setup is the same as Jaimoe's."

FOH engineer Bruce "Slim" Judd at the Gamble EX56 FOH console.

For Quiñones, Judd puts a Shure SM57 on the timbale and bongo, a Beta 57 on congas, an SM58 on cowbells and a Neumann KM184s on the overheads. "With the Neumann, I can pull back on the other mics and let it be a percussion-area mic. The gong has an SM58 low and SM81 high, and the timpani has an RE20 pointing up, with a third of it above the head, which we learned from Tom Dowd. For overhead on the timpani, I use an Audio-Technica 4050." For guests, there is a spare Randall cabinet with a Randall head miked with an SM57, and Judd keeps a few RE20s, a 451, and SM57s and 58s handy.

Earl McCoy, who has been with the Allmans since 1997, mixes monitors on a Midas XL3. "It's very road-worthy, has great EQ and has been my favorite monitor console since it came out," says McCoy, who uses the dbx 480 DriveRack system for EQ and two Yamaha SPX-990s for reverb on the vocals, snare drum and on horn players when they sit in. Effects devices include a Behringer Intelligate and two Behringer Composer stereo compressors. All the wedges are E-V XW15s powered by Crown Micro-Tech models.

MONITOR SUBMIXES

Mixing for the two drummers is complex, explains McCoy. "Butch and Jaimoe have their own consoles. I supply a submix to Butch's Midas 16-channel and Jaimoe's Mackie 16-channel mixer. Butch uses headphones instead of monitors and a headphone amp for controlling volume. Jaimoe has a pair of E-V 1122 monitors up on stands next to him, like big headphones," says McCoy with a laugh. "I use several mix channels for them. Mix five through six is a stereo feed going to Jaimoe with kick, snare, toms one through four, bass, both guitars, keys, the B3, all vocals, timpani and the guest mic if it's utilized. Mix seven is a bass mix that goes to Butch, and mix nine is Butch's timpani mix. Mixes 10 through 15 are my submix channels for both drummers. Mix 10 has Butch's toms that goes to Butch. Mix 11 is all Jaimoe's drums going to Butch. Mix 12 is the keyboard mix, and mix 13 is vocals, each going to both drummers' consoles. Mix 14 is a percussion mix, and mix 15 is a subcabinet with kick and a little bit of bass, both for Butch."

The other mixes are simpler. "Gregg doesn't like a lot of volume; he has a little kick and snare, his voice and keys. Mix two is the center mix for Warren, an instrument mix with some B3, kick, snare, hat, congas, timbales and bongos. Mix three is Warren's two outside wedges, which are vocals, panned equally.

"Mix four is Oteil's, with vocals predominant, keys right underneath, then kick and snare, Derek's guitar and a little bass. Mix eight is Mark's, with his vocals, keys, Warren, both congas and the cowbell. He hears everything else onstage because he is high on the riser. Mix 16 is a mix for guest artists. Derek doesn't use monitors; he doesn't like to hear anything but his guitar. All of the musicians have a good attitude. They have been at it for so long that they can give me a hand signal to get what they want. They are laid-back and very professional. They don't make a big scene if they aren't getting what they want; they call me over, and we discuss it and straighten it out." ■

Candace Horgan is a freelance writer based out of the Denver area.

New Sound Reinforcement Products

COMMUNITY TWO-WAY SYSTEM

The MVP37 from Community Professional Loudspeakers (www.loudspeakers.net) is a full-range, two-way loudspeaker built expressly for club systems and stand-alone P.A. applications. Part of the MVP Series, the MVP37 has dual 15-inch woofers and a one-piece 90°x40° FiberGlas horn section housing Community's new proprietary LM20 compression driver. The bass-ported design has a 60-16k Hz frequency response, 97dB SPL (1W/1M) sensitivity, and power handling rating of 400 watts RMS, 1,000W program. Constructed using internally braced MDF board, the 86-pound cabinet measures 43x18x19 inches (HxWxD). Additional features include ¼-inch inputs, recessed steel handles, rigging points, a 16-gauge steel grille and a stand socket.

CREST COMPACT MIXER

Crest Audio (www.crestaudio.com) offers the XRM monitor mixer, a compact 10-rackspace package providing up to 12 independent mono mixes or up to six stereo mixes for stereo "in-ear" monitoring systems. Featuring 12 mono and four stereo inputs, all with mic preamps and individual 48-volt phantom power switches, the XRM includes a 20-input mic splitter system with individual ground-lift switches. Additional features include 4-band EQ on all input channels, highpass filters on the 12 mix bus outs, channel and bus inserts, and XLR outputs.

APEX INTELLI-Q

The Intelli-Q Real-Time System Optimizer from Belgian distributor Apex (www.apex-audio.be) is a digital problem-solver to maximize the performance of any P.A., stage monitor or in-ear system. Intelli-Q has two identical channels—dual mono or stereo linked—each featuring graphic, parametric and shelving EQ, high/lowpass filters; dual-band compressor; output limiter and variable delay. Users can draw EQ curves freehand, and store and instantly recall scenes/parameter setups. Intelli-Q software supports remote control of up to 16 units from any hard-wired or radio-remote PC. The hardware includes a pink-noise generator and phantom-powered mic input for the system's onscreen, 30-band spectrum analyzer.

SM PRO AUDIO DI/LINE MIXER

SM Pro Audio (www.smproaudio.com) announces the DI8 8-channel, direct-injection box/stereo line mixer. Each of the DI8's inputs provides unbalanced-to-balanced conversion with a -10dB pad and ground-lift switch, plus volume and pan controls for each channel's feed to the stereo mix bus. Suitable for onstage keyboard or electronic drum submixing, or as a project studio submixer, the DI8 may be linked with multiple DI8 units to a single stereo output. Price: $399.
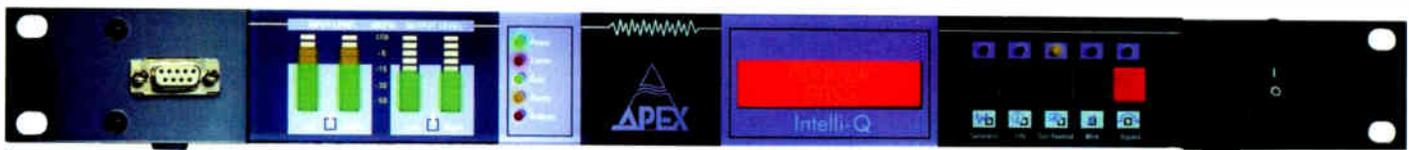
A little innovation.

They may be among the smallest full range, 3-way loudspeaker systems available, but the changes we've made to the **KF300z** and **KF360z** are huge.

All three transducers are newly designed specifically for these systems. The HF compression driver uses a powerful neodymium magnet to reduce weight and increase efficiency. The MF driver/phase plug assembly is a complete story in itself (see inset). And the woofer is mounted in a sealed chamber for a tighter, punchier sound and enhanced reliability. These highly efficient drivers mean that the crossover requires significantly fewer components, further reducing weight.

Another great innovation can be found in the ingenious one-piece MF/HF horn. Combining the two horns into a single unit eliminates two of the flanges and adds about 2 in of vertical area to the horn flares themselves. These bigger horns provide better pattern control and increased output, both of which are crucial in so compact a loudspeaker.

Call **508 234 6158** or visit **www.eaw.com** to learn more about the big changes in these little loudspeakers.

The cone of the all-new 6 in midrange driver created for the KF300z uses a non-woven carbon material to eliminate the distortion associated with the directional bias of a woven material.

This new adaptation of our patented Radial Phase Plug™ maintains a coherent wavefront and prevents the coverage pattern from collapsing in the upper register.

In the absence of a full-sized horn mouth, the slot aperture plate makes the phase plug itself a directivity-enhancing device, maintaining the vertical dispersion pattern throughout the passband.

THE CRANBERRIES

PHOTOS: STEVE JENNINGS

The Cranberries are on a world tour promoting both the 2001 album *Wake Up and Smell the Coffee* and this year's four-CD box set retrospective, *Treasure Box: The Complete Sessions 1991-1999* (the first four albums, remastered with additional tracks). Ireland's Platinum-selling rockers passed through San Francisco in early June and will be back in the U.S. for an arena tour later in the year.

FOH engineer Joe O'Herlihy (whose credits include U2 and R.E.M.) is touring with "the truly tried-and-tested Midas XL4 console, the automated one that seems to have followed me around for the last couple of years." Production is carrying its own FOH and monitor systems and control gear; P.A. for the U.S. leg is a Clair Bros. I-4 line array. For effects and control, O'Herlihy is carrying "only a few gadgets: a Distressor, the usual reverbs, the Lexicon 480L, the Eventide H3000 Harmonizer, a few dbx compressors, DC2001s, as well as Summit compressors on the bass and the keyboards." Vocalist Dolores O'Riordan sings into a wireless Shure Beta 58, which O'Herlihy runs through a Manley VoxBox.
—*Steve Jennings*

Joe O'Herlihy

SENNHEISER AND NEUMANN MICS FOR D.C. BENEFIT

At a recent charity event to benefit the Washington, D.C., Youth Orchestra, a 60-piece professional orchestra performed the evocative music of film composer Charlie Barnett in D.C.'s recently restored Lincoln Theatre. Greg Lukens, audio director for the event, specified more than 25 top Sennheiser and Neumann microphones and numerous high-end preamps from True Systems, API and Millennia. Multitrack recordings and multicamera video footage of the event are being edited for upcoming CD and DVD releases.

SHURE AT MONTREUX JAZZ FEST

As the official microphone and wireless systems provider to the Montreux Jazz Festival for its eighth year running, Shure contributed a total of 947 different catalog items during the 15-day festival. For the showcase Auditorium Stravinski and Miles Davis Hall, Shure supplied 14 U2/Beta 87, eight U2/Beta 58 and 14 U2/SM58 wireless systems. Hard-wired elements used among all of the venues included everything from SM58s to the company's studio-grade KSM Series microphones.

NOTES FROM THE ROAD

Big Sound, based in Swansea, South Wales, chose an Allen & Heath ML5000 Monitor Console for Bob Geldof's Sex, Age and Death tour. Big Sound provided sound reinforcement for 15 dates of the UK leg of the tour, which promoted the ex-Boomtown Rats singer's first release in five years. The 40-channel ML5000, operated by Big Sound's Duncan Wild, was configured as a dedicated monitor console, with all 16 auxes controlled by faders. A Midas Heritage 1000 mixer at FOH fed Adamson Y10 speakers, while a compact Allen & Heath MixWizard WZ16:2DX console was used for supporting acts...Jackson Browne recently hit the road accompanied by nothing more than 10 guitars and a Yamaha P-80 electric piano. In keeping with this low-impact approach, for one leg of the tour Browne relied on a Meyer Sound M2D Compact Curvilinear Array loudspeaker system provided by Muse Productions of Birmingham, Ala. Comprising six self-powered M2Ds and one self-powered M2D-Sub Compact subwoofer per side, the system was more than adequate for

the 2,100 to 2,500-seat auditoriums Browne played at Birmingham, Nashville, Memphis and Louisville. "It was very smooth from side wall to side wall," says FOH engineer Dennis Scrimo. "Walking across the room, I want it to sound the same in every seat, and that's not easy to do."

INSTALLATION NEWS

The Symetrix 371 SPL Computer has been installed in three new Nordstrom retail locations in California, Utah and North Carolina to provide automatic gain control for live pianists, who provide the main music in all Nordstrom stores. Specified and installed by Leibold Communications, the Symetrix 371 uses one or more sensory mics to continuously monitor ambient noise and adjusts program levels, ensuring that the piano can be clearly heard even during the busiest times...Crest Audio has introduced NexSys® 4, the latest generation of the company's amplifier control system. Operating across a standard Ethernet network, NexSys 4 allows both control and audio signals to be transferred to compatible amplifiers on the network in conjunction with Ethernet and CobraNet. ■

SLAYER TESTS NEW MACH SYSTEM

Anaheim, Calif.-based Integrated Media Systems recently installed a Mach Sling-Shot P.A. system in The Grove of Anaheim, a 2,000-plus-capacity multi-use venue. One of Southern California's premier live venues, The Grove has in the past presented top bands such as INXS, Simple Minds and the Doobie Brothers, but heavy metal gods Slayer were the first to use the Mach system for two sold-out shows in May. According to The Grove's production operations manager Chris Wrightsman, "The debut show with the new Mach system totally blew everyone away." The system comprises eight Mach MS1262 SlingShot top-boxes and four MS15X2 SlingShot fly-bass units, with additional power coming from 12 Ballister subwoofers.

World Radio History

World Radio History

From left: Geddy Lee (bass/vocals), Neal Peart (drums) and Alex Liefson (guitar)

RUSH: CREATING "VAPOR TRAILS"

By Bryan Reesman

When Canadian progressive rock legends Rush assembled at Reaction Studios in Toronto at the start of 2001, it had been five years since they recorded their last studio album, *Test For Echo*. A lot had changed personally and professionally for the band: Drummer Neil Peart had to cope with the deaths of his wife and daughter in separate episodes, while his bandmates were off producing other groups. Bassist/vocalist Geddy Lee even recorded a well-received solo album, *My Favorite Headache*. How would these changes alter their chemistry? How difficult would it be to compose new material after being away from each other for so long?

All doubts were cast aside once the power trio began working in their traditional way: Lee and guitarist Alex Liefson jamming until melodies emerged, Peart writing lyrics (some of which reflect his personal trials), and then the threesome uniting to flesh out the tunes. Eventually, their myriad parts gelled together into *Vapor Trails* (Atlantic), a powerful blend of Rush's fiery, thunderous '70s style with the sophistication of their '80s and '90s albums. In short, it is a return to a classic form that has fans buzzing.

The band spent 11 months at Reaction creating *Vapor Trails*. "We each have our own studios, but we didn't work there on this project for some stupid reason," jokes Lee. "We'd rather pay someone else to use their space!" Liefson and Lee both praise Reaction as a small, intimate place to work, which is fine for a trio. "We needed somewhere that was part rehearsal space, part recording space, part writing space," says Lee. "We ended up in the right place."

Vapor Trails is the first Rush album in a long time not to feature keyboards prominently: Liefson simply would not allow Lee to use his synths, a fact they both amiably joke about as they relax in Atlantic Records' New York offices. "I thought it would be more interesting if we created the same things that keyboards were doing in the past with Geddy's voice or a guitar or even bass," remarks Liefson. "That's more natural and more organic, I think, than using a fake string sound."

"It gives him more to do," quips Lee.

"And it's a lot of fun to create these bizarre sounds and textures," adds Liefson.

The new album certainly comes roaring out of the speakers, with Peart's propulsive drumming

ANGÈLIQUE KIDJO
OUT OF AFRICA

By Chris J. Walker

The realm of contemporary African-based world music has been mostly dominated by male singers and griots (traditional oral historians) such as Baaba Maal, Salif Keita, King Sunny Ade, Youssou N'Dour, and Femi Kuti, who carries on the Afro-beat

ANGÈLIQUE KIDJO *Black Ivory Soul*
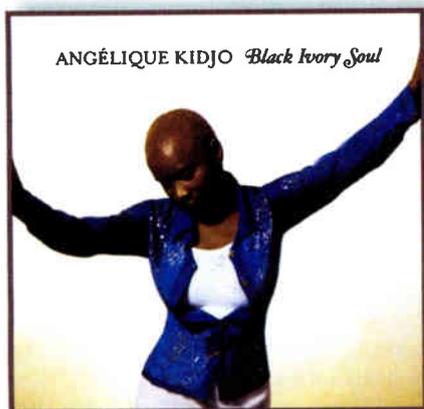
legacy of his father, Fela Kuti. However, Angèlique Kidjo, who hails from Benin, West Africa, puts a uniquely feminine spin on the genre. The result is that her career has blossomed in the past few years and has developed a strong international following. In terms of her musical approach, Kidjo is more pop-oriented than other African artists, and she is quick to note that Western icons such as Carlos Santana, The Beatles, James Brown and Aretha Franklin are important influences on her.

In 1991, she took the world-beat scene by storm with the Afro dance hit "Batonga," which was a track from her *Logozo* CD. After that initial hit, she created a string of worldly pop recordings that mixed elements of traditional African folk with rock, R&B, jazz and electronica. Much like her personality, the music was mostly upbeat and playful, but also very direct. Then, starting with *Oremi*, which was released in 1998, Kidjo embarked on a three-CD

quest to showcase and celebrate her musical origins and the path that African music has taken in moving over to North and

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E AND THE EELS
ECCENTRIC AND ECLECTIC

By Chris J. Walker

The Eels' music is, shall we say, a little different from the mainstream. It definitely rocks, awakens the senses and can be hip hoppy, edgy and even poetically profound. Case in point, the impact of three separate deaths in multi-instrumentalist/singer E's (aka, Mark Oliver Everett) family—his father's (Everett was 19), his sister's suicide and his mother's death from lung cancer. It goes places most rockers don't go and covers subjects few attempt. On the group's fourth and latest CD, *Souljacker*, there's a song about being a dog-faced boy and another about having your soul stolen.

Eels leader Mark Oliver Everett (aka, E)

PHOTO: ROCKY SCHENCK

However, Everett and The Eels aren't out to shock or outrage like Marilyn Manson or Eminem. Rather, the reclusive artist is expressing his off-kilter per-

ceptions in a somewhat modern rock framework.

In the early '90s, Everett, working under the E moniker, put out two promising, mostly solo, recordings on Polydor that he describes today as "constantly evolving." His single "Hello Cruel World" became a Top 10 alternative rock hit and created a bit of a buzz. By 1995, he had moved on to DreamWorks and added other bandmembers; together, they became The Eels. That move, along with the adaptation of some trip-hop textures, marked a major transition for the Virginia native, leading to even more airplay on alternative radio stations, extensive tours and several MTV "Video Music Awards" trophies.

RUSH

driving the fierce opening track, "One Little Victory." There is definitely a sense of urgency permeating the album, but there are also many different moods explored throughout the CD's 13 songs. The edgy but melodic "Ghost Rider" searches for personal catharsis, while "Stars Look Down" takes a gentler approach with a crystalline guitar sound. "Peaceful Kingdom" and "Secret Touch" juxtapose turbulent guitar and bass passages with more restrained sections; a nice contrast. As ever, Liefson experimented with a variety of guitar sounds. But for a band commonly labeled as progressive rockers, the songs are quite accessible.

Liefson and Lee assembled the songs in Logic Audio, using a drum machine and a click track as a base. "When the sketches of the songs were ready, Neil would go in and just lay down his track," says Lee. "It wasn't always final. He would lay down the drums, and then we would continue working on the track. Then maybe I would redo the bass or [Alex would] weave some lead guitars around to adapt to the feel of real drums. It was an evolutionary process, so I think the reason it doesn't feel stiff is because there was back and forth and back and forth, adapting the parts back to the drums when necessary."

It is somewhat unusual for a band to record music without a live drummer and then have him fill in his parts later, but Rush have made this process work for many years. "When [Lee and I] were putting stuff down, we were so into the playing that the click and the drum machine became irrelevant to us," muses Liefson. "We're in a groove, and the two of us feel that groove, whether it's on the front or back end of the beat. It's not something that's right on the beat."

Rush spent the first half of the recording period engineering everything themselves, but when they wanted to take things up a notch, they brought in co-producer Paul Northfield, who engineered three of the band's studio albums—*Permanent Waves, Moving Pictures* and *Signals*—and three live CDs, one of which he also produced (*Different Stages*). Northfield is an industry veteran who has worked with Ozzy Osbourne, Hole, Marilyn Manson, Porcupine Tree and Black Sabbath bassist Geezer Butler, among others.

When Northfield arrived during the *Vapor Trails* sessions, things became more focused. The drums were re-recorded then, and Liefson's and Lee's parts were often embellished with new ideas.

"When I came in, it was like, 'Where do we go from here?'" Northfield recalls. "There were a lot of inspired moments in their jams that they had used to build songs. It seemed a smart move to me to just set straight into recording using a certain amount of their original stuff, then rebuilding on top of that.

"We recorded using a Mac G4/500 MHZ using Logic Audio, with a Digidesign Mix Plus system with 32 inputs and outputs. The converters we used were a mix of Digi 888, those on the Mackie D8B and an Apogee Trak2, which we used for all of the overdubs and vocals." During mixing, they added another [Pro Tools] Farm card to give them 48 outputs from Logic. Monitoring and rough mixes were done on the studio's SSL 4000 G console.

Northfield agrees with the bandmembers that Reaction was a perfect environment for Rush. Because the band took over the space for nearly a year, they were given some freedom to adapt it to their needs. Northfield decided to put up some drywall in the studio to get a warmer drum sound, and the people at Reaction liked it so much that they kept it.

To record Peart's drums Northfield used Earthworks and Royer ribbon mics as overheads, 421s for the toms, a pair of D112s on the two kick drums and occasionally a U48 for ambient kit sounds. Peart does not like having holes in his kick drum heads, so the mics were placed inside and the heads were tightened on. "The mic support inside the bass drum was the May System, which

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Cool Spins

The Mix *Staff* Members Pick Their Current Favorites

Sonic Youth: *Murray Street* (DGC)

Murray Street in lower Manhattan is where Sonic Youth's Echo Canyon studio is located, just blocks from the World Trade Center disaster. This album was well under way when that tragedy occurred, and the members insist that the music was not really colored by that event. At any rate, what's here is mostly quite beguiling, a mixture of pleasingly melodic tunes (all credited to the entire band) and plenty of Sonic Youth's trademark *noize*, though they've definitely sounded *noizier*. Some songs are as accessible as the best ones on *Daydream Nation*, but you never have to wait too long to hear some squealing feedback or to lose yourself in a long, spiraling jam. I'm not sure what this group does to retain that unmistakable sound-of-a-band-that's-still-learning-how-to-play, but it's part of what defines Sonic Youth, and I, for one, hope they never change. Best tracks: "Rain on Tin," which contains a cool jam that sounds like early psychedelia—"raga rock" lives!; "Radical Adults Lick Godhead Style" (don't ask!); and the punky Kim Gordon-sung "Plastic Sun," which is one of the great bitter songs of all time: "I hate you and it never ends!" Ouch!

Producers: Sonic Youth. Engineer: Jim O'Rourke. Studio: Echo Canyon (NYC). Mastering: John Golden.   —*Blair Jackson*

Ladytron: *Light & Magic* (Emperor Norton)

There is no '80s music revival! As any seasoned L.A. club kid will tell you, moody, melodic, '80s-influenced synth pop never went away. Ladytron's newest release, *Light & Magic*, has this "fashionista" foursome

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allows for adjustment of the mic without removing the drum heads," explains Northfield. "It's not exactly remote control, as it is not motorized, but it makes life a lot easier using a drum key for positional adjustment."

According to Northfield, most of Lee's bass parts were recut. "Not so much the lyrical bass parts," he says. "For the most part, we recut the basses that needed to fit pretty precisely with the drums." Lee recorded his bass with three different kinds of directs: a SansAmp, a Palmer

> There were a lot of inspired moments in their jams that they had used to build songs. It seemed a smart move to me to just set straight into recording using a certain amount of their original stuff, then rebuilding on top of that.
>
> —Paul Northfield

speaker simulator and an Avalon U5 DI Box. "So if I do three different bass tracks [on one song], that's nine tracks there—three different ranges," the bassist observes. "On this record, I played a lot of chordal parts, so the bass acts as a rhythm guitar a lot, and that took some pressure off of Alex to supply a lot of rhythm parts so, instead, he would go somewhere else."

Liefson's setup was more basic: He recorded simple mono guitar tracks. "I was using primarily a Hughes & Kettner Tri-Amp, which is a 3-channel tube amplifier," says Liefson, "and the zenTera, a modeling amp that Hughes & Kettner makes. I used two 412 Marshall cabinets with Greenbacks set up, but primarily used one for 95 percent of the recording. I basically used a 57 [mic] on everything." The guitarist recorded DI for safety rather than his main track.

"Generally with a guitar, there were two or three tracks per song, sometimes a few

more than that," Liefson says. "Sometimes, it was just a single track. In 'How It Is,' we created this very lush, rich mandola section in the middle of the song that was made up of 21 tracks of different mandola parts done in blocks of four and five."

"That's the beauty of Logic," Lee chimes in. "You can take 20 tracks and mix them down out of two outputs, and you've already created your mandola orchestra. That's coming up on just two faders on the board, yet there's all that music."

For vocals, Lee used a Neumann 149 in either cardioid or omni mode, depending on the sound they were going for. He used the Apogee Trak2 as a preamp and ran it through an 1176 compressor.

Vapor Trails was mixed by David Leonard at Metalworks in Mississauga, Ontario, and mastered by Howie Weinberg at Masterdisk in New York. "We mixed down on an SSL G-Plus Series console, to 96k digital," says Lee. "At the same time, we mixed down to 1-inch analog so we could compare in the mastering facility what sound we liked better. The 1-inch tape won about 70 percent of the time, but they both sounded great. It just depended on the style you wanted for the particular sound.

"David Leonard describes the difference very accurately," Lee continues. "He calls digital a 'faster medium.' So when there's a lot of information that's really coming at you, sometimes the faster medium reproduces it a little bit better, and I think that's the case with the song 'Victory.' Other songs, like 'Peaceful Kingdom,' 'Ghost Rider' and 'Ceilings,' [sound better] on analog. They were warmer and kind of lumpier. 'Ceilings' is kind of a frenetic song, and I liked the way the analog slowed it down, made it easier to get inside of the track. It's just another option that makes you crazy in the end, but it really has a profound effect on the listener, I think. At the end, the analog tape sounds more like the song."

Judging from the overall sound of the album, they made the right choices. Fans have responded favorably to the long-awaited *Vapor Trails*. It debuted at Number 6 on the *Billboard* Top 200, selling over 100,000 copies that first week alone. Obviously, this is a band in touch with its loyal fan base.

"We were trying to get the most soulful approach to making the record we could with the most inspiration," Northfield says.

This time, they succeeded admirably. ∎

ANGÉLIQUE KIDJO

South Americas. "The general theme of the trilogy is to follow the roots of the music that has been brought to America, Brazil, Cuba, Caribbean and New Orleans by the slaves," Kidjo says. "The first part was in New York with Peter Mokran as the producer. On it, I had Branford Marsalis [saxophone], Cassandra Wilson [vocals], Kenny Kirkland [keyboards], Kelly Price [vocals], Robbie Neville [vocals] and Ahmir Thompson [drums] from The Roots." That project emphasized the link between African music and American R&B.

For the second installment, the recently released *Black Ivory Soul*, co-produced by Kidjo, her bassist/husband Jean Hébrail and Bill Laswell, the focus was on the connection between Africa and Brazil, particularly in the city of Bahia, which Kidjo visited for the first time in 1999. Kidjo says that Bahia reminded her of her own home village, Quidah, with the food, vegetation and, most importantly, the similar rhythms of the local music. She had traveled to Brazil previously on tour with Malian vocalist/guitarist Ali Farka Toure, and while other parts of the remarkable country touched her, they didn't have quite the same impact Bahia had. After all, Benin and Bahia were a source and destination, respectively, of the slave trade and share common ancestry.

"It was a shock going to Bahia," says the New York-based Kidjo, who sings in French, English, and the African languages Yoruba and Fon. "People told me it was just like my home, but I didn't believe it till I saw it. You see more black people than white people, and I thought, 'Where am I?' I felt I had to do something musically before I went. And being there just emphasized it and made it more urgent than anything else."

Less than a year after that visit to Bahia, the singer returned with her husband, Pro Tools rig in tow, to capture the sound of Bahian drumming. At the same time, she connected with Carlinhos Brown, one of the region's heralded percussionists, to create many of the songs for *Black Ivory Soul*. (Additionally, Kidjo collaborated with Brazilian singer Daniela Mercury for two compositions that ended up on Mercury's latest CD.)

"They were some of the basic tracks that we used on the album," says Hébrail. "For the first song on the CD 'Bahia' [and

several others], the basic production was done in Brazil. Once we were back in New York, we put together a guide vocal with light production and the musicians would play on top of it." In addition to playing bass, Hébrail did some engineering for the sessions at Sear Sound, and "I wrote a lot of songs with Angèlique for this project. In the studio, with all the musicians, I was mostly watching because there was an engineer there [Clark Germain]. I would give some input to the musicians, but Angèlique was really on top of things."

Surprisingly, in all her years of recording, going back to her self-produced debut, *Pretty* [1998], Kidjo had never worked in the old-school manner of tracking most of the instruments at once. "I like it very much live in the studio," she comments. "I wanted to do that for a long time. Most of the time, I hate studios, it's not my culture. I'm much more of a stage or live person than anything else. But the fact that I had all musicians in the studio made the equipment just disappear. It's definitely way more fun, and you can see people coming to your world. I wrote these songs with my

husband, and then you're in studio and you see them grow. It's pretty inspiring, like seeing a child grow up."

Furthering the development of Kidjo's songs was a virtual United Nations of musicians, including guitarists Romero Lubambo (Brazil), Jao Mota (Guinea Bissau) and Dominic Kanza (Congo), bassists Michel Alibo (West Indies) and Ira Coleman (New York), drummer Ahmir Thompson (Philadelphia), kora player Mahamadou Diabate (Guinea), keyboardist Bernie Worrell (New York), percussionist Abdou M'boup (Senegal) and others. The midsized studio was barely able to contain all of the players for the sessions. The size of the studio wasn't an issue, but communication between the players was. "Nobody could speak together and they didn't understand each other," recalls Hébrail. "But as soon as the music started, they didn't need words. It was magical to see the link between Brazilian, American and African grooves. The first 10 minutes were incredible and showed that you don't need words to make music."

To capture the energy of the sessions, Kidjo and Hébrail tapped engineer/ guitarist Clark Germain, who's based in Southern California but commutes regularly to New York for recording dates. Germain has also done a substantial amount of work in Spain, Italy and Cuba, working with such notable artists as jazz pianists Chick Corea and Herbie Hancock, Cuban guitarist Eliades Ochoa (Buena Vista Social Club), percussionist Poncho Sanchez and vocalist Madame Bongo. In 2000, Germain and Bill Schnee were nominated for an Engineering Grammy for their work on David Benoit's *Here's to You, Charlie Brown!: 50 Great Years*. Germain has become something of a specialist at recording acoustic ensembles, so working on the Kidjo project, with its blend of acoustic and electric instruments, was a natural for him.

"The joy of working at Walter's place [Sear Sound, owned by Walter Sear] was the mic choices I had," Germain says. "I used the KM-54 quite a bit, C-12As, and he's got a lot of classic older tube mics that are in pristine shape." Germain had worked at Sear on other occasions and recommended it to Kidjo. Besides the mic selection, he also loves the room's classic Neve board with its preamps that let him get what he calls "the fattest sound possible." Though Sear Sound is well-stocked with the best analog equipment, the ultimate destination of the mu-

sic on these sessions was Pro Tools.

For about a week in the fall of 2000, Kidjo and her cast of international players jammed relentlessly, with players moving in and out of the lineup as the songs' and the musicians' schedules dictated. "Based on the instrumentation, each song was quite a bit different," Germain recalls. "We had a selection built around the za-bar drums, which are very loud. That was very different, and some song ideas were built around the kora [African thumb piano], too. Each day pretty much brought new surprises, making it a challenge and a lot of fun from that standpoint." Naturally, with most of the musicians in one room and only three iso booths, there were some leakage problems. But from his experiences recording orchestras for film scores with no iso booths and from working with jazz ensembles, Germain has learned how to manage the leakage; indeed, to turn it to his advantage by building a bigger sound.

For her part, Kidjo was delighted with how the sessions went. Her only complaint is that a few of the musicians she hoped to have on the record were unable to appear due to scheduling conflicts. "If

I had done all the collaborations that I wanted to," she says, "this CD would have more than 12 songs on it. There are so many gifted artists in Brazil, but I went for

> Most of the time, I hate studios, it's not my culture. I'm much more of a stage or live person than anything else. But the fact that I had all musicians in the studio made the equipment just disappear.
> —Angèlique Kidjo

the ones that were available. I really wanted Caetano Veloso and Gilberto Gil, but they were very busy." Fortunately, Brazilian guitarist Vinicius Cantuaria lived

about a block away in Brooklyn. But renowned musicians such as percussionist Carlinhos Brown and vocalist/guitarist Dave Matthews were also extremely difficult to schedule sessions with.

"Nailing Carlinhos down was tough," she says, "so we decided I would come back [from Brazil] to New York and he would tell me when he was available. When that happened, I just jumped on a plane and did the work there. For Dave Matthews, I was touring with him last summer and had already finished the recording. I gave him the CD and explained the meaning of the song ["Iwoya"], because there were no lyrics on it at that time. I told him that I really wanted him to sing with me when he felt like it. He said, 'You sing a lot better than me; I don't want to shame myself.' I said, 'You can do it,' so he came."

The overdub session with Matthews was also done at Sear Sound about a year after the initial live dates. Overdubbing and editing were done at Kidjo's and Hébrail's home studio in Brooklyn. Their setup consists of a Pro Tools 24 system, Neve preamps, an Apogee converter and Sony C-800G. They installed the equip-

ment in their house in '95, and the bassist/producer has become quite proficient at it. Previously, they had a studio in Paris based around Sony 3348 digital recorders.

"At our home, we did some overdubs [with backup singers] and editing," Hébrail says. "We had hours of music and the editing process took a long time," Kidjo adds. "The songs originally could be 15 minutes or more, so we would reduce them down to between five and three-and-a-half minutes, and finalize the structure. I didn't want to limit the musicians while they were playing, so Pro Tools cut it down."

Mixes and remaining overdubs were done at Bill Laswell's studio in Orange, N.J. Kidjo's final vocals were also done there, along with some accompanying string sections, arranged and conducted by Karl Berger. "Laswell used the RADAR system," Hébrail says, "so everything from the Manhattan sessions was transferred to it. He used Pro Tools as just a 'box,' and that allowed him to record and play back everything very quickly. Also, he added some keyboard parts. Overall, everything went pretty smoothly."

Germain says he normally mixes the recordings when he engineers and, he admits, was disappointed that he wasn't involved with *Black Ivory Soul's* final stages. Nevertheless, he says, "From my standpoint, it was a fantastic project. I loved it musically and all the people were great. We recorded some really unusual tracks and sounds, which is what I love to do. You can record a pop track with a great bass player and a great drummer day in and day out. But the chance to record some really great songs with some really interesting ethnic instruments is what I jump at." ∎

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E AND THE EELS

With the help of his mainstay sideman—drummer Jonathan "Butch" Norton—and a cast of rotating players, Everett started crafting more stream-of-consciousness-type songs, anywhere from uplifting Beatles-like melodies to morbid, gothic-styled subterranean downers. To make things even more interesting, he'd often write on different instruments, such as organ instead of guitar, and he began using unusual combinations of instruments on his albums, similar to a latter-day Brian Wilson.

In fact, Everett thinks of his band's working relationship as being similar to that of Brian Wilson and the Beach Boys'. "On their records," he says, "it was Brian Wilson and anything goes, with an endlessly shifting cast of characters. Then on tour, it was this band, the Beach Boys. And then it got to the point where [Brian] wouldn't even go on the tours. That's my goal: to stay home and find a replacement to go instead. I need my Glen Campbell," he says.

He's only partly kidding. Everett says touring is fun, but he's happiest when working at home in the Los Feliz area of Los Angeles. His studio boasts a Mackie board, a selection of Neve preamp modules, Manley compressors, a Distressor, an assortment of high-quality microphones and a Pro Tools rig. It's no exaggeration to say that he lives and breathes music. "My biggest problem is not having enough time to put out all the different records I'd like to do," he laments. "I've already finished the next two albums; actually, three or four [including his side project *MC Honky*]."

In an era when most artists are pres-

sured to record *more* releases—to get "product" in stores—Everett was told to slow down and chill for a while. But he can't. If he isn't on tour, then he's working on songs to prepare for release. *Souljacker* was actually done when his previous CD, *Daisies of the Galaxy,* came out two years ago. He even considered a double release at the time, but decided that they were very different projects—even though all the songs were written and recorded around the same time.

The eclectic musician tends to live in his own world and doesn't pay much attention to trends or styles; that, in part, may explain why his music is so distinctive. "I don't spend much time listening to the radio because I'm working on so much music myself," Everett says. "Of course, the question is, what is a trend and what's good? Because there's a lot of good modern stuff that's coming out right now. But you have to be able to know what to pick out. I'm not a big fan of modern rock, per se. I'm often unhappy to be a part of it. I think Missy Elliott's 'Get Ur Freak on' is a great record, though. It's one of the few things that makes me stop and pay attention."

Another thing that struck Everett was the similarities he had with John Parish, the co-producer of *Souljacker.* He met Parish, who had done a lot of work with PJ Harvey, in London on the English TV show *Top of the Pops,* and a mutual contact thought they would work well together. Apprehensive initially, Everett became more receptive once he started working on some of the songs for *Souljacker.* "He's like me," Everett says. "Primarily a drummer that ended up being known more for playing guitar, keyboards, and other odds and ends. We both have a similar love for really noisy sounds that make people get up to check their stereos.

"I feel he was a good match and he takes it up a notch from where I go," E continues. "We started collaborating on what became most of the stuff on *Souljacker.* First, we started working through the mail, where he would start things in his basement in Bristol on his 8-track Fostex [MDM]. When it got to my basement, I'd have it converted to Pro Tools, since I didn't have a DA-88. Then I would add stuff to it and it would go through the mail back to him. Eventually, he just came over

to my basement and we worked on the bulk of the album together."

Through much of his career, the multi-faceted Everett has been a one-man band and engineering crew. Since he was 12, first working with a stereo reel-to-reel recorder and eventually progressing to a 4-track cassette deck, he's been making a "new record" monthly, sometimes even weekly. For most of his professional career, he's been fairly hands-on. That has changed recently with the advent of hard disk systems such as Pro Tools. Now, he has someone assisting him with the technical duties: Ryan Boesch, a freewheeling Southerner programming specialist from South Florida. Boesch, who came into Everett's world on the recommendation of Mickey Petralia—one of Beck's engineer/producers—recalls his initial meeting with Everett: "The first day, the guitar player from R.E.M. [Peter Buck] and another guy, Grant Lee Phillips, were there. That was pretty amazing. I thought, 'Wow, the guitar player from R.E.M—this is going to be fun!' We picked up on a song that E had already started doing vocals on and I did a couple of programming things. Then E said, 'Okay, let's mix it.' I said, 'Oh,

okay.' I wasn't questioning it, but I was thinking in my mind, 'We're mixing already?' By 8 o'clock, the song was done and he said, 'Okay, we'll work tomorrow and do the same thing.' Once we got used to each other, it became a natural flow. E's always got something to record."

Still, Everett keeps fairly regular hours, typically starting work around 11 a.m. and finishing by 8 or 9 p.m. "Through those nine or 10 hours that we work, we barely take breaks," Boesch says. "E's actually pretty easygoing, but he doesn't screw around. We're just driving away till it's

done. I'm blown away all the time when working with him. He never has a shortage of songs, and as soon as he gets off a tour, he'll give me a call and I'll head over there."

The way Everett and Boesch work is that they'll record a basic track consisting of vocals, along with piano or acoustic guitar and a click or basic loop. From there, Boesch will start digging for beats and other loops to add to the tune. Then they will search through an assortment of records to find other sounds that they like. Everett leaves the engineer alone for a few hours

to assemble everything into a groove for his review. At some point, a determination is made on how many live musicians should be brought onto the song.

"It's more of a collective effort for everybody," Boesch says. "Of course, E has the final say. But he gives everybody room to do their own thing; it's not like he's the dictator in the room telling everyone what to do. Rusty, who's the bass player now, comes over every day and he has an amazing set of ears. Butch comes over when he can and when we need him because he has kids. He blew me away, especially after I saw them live. I was thinking, 'Man, why didn't we have him on all the tracks?' He's got to be one of the best pop-rock drummers I've ever seen. But on some of the songs, E wanted the programmed drum sound. But the way he does things is really analog-oriented, including all the instruments and beats that come from records on turntables."

When producer Parish was there, the contrast between the outgoing engineer and quiet Englishman were undeniable, but not insurmountable. At times, Parish would sit in the corner and sip his tea while Boesch and Everett would assemble things, making occasional suggestions and comments. "It was pretty funny," Boesch remembers, "but it worked well because we respected each other. I love John—he's fun. He had a lot of production ideas and added guitar parts. He could play just about anything he picks up. Often he'd be listening to what was tracked and grab an instrument and just start playing stuff. E would be on his laptop in the other room and would run in and say, 'That's cool! Yeah, lay that down.' And we'd keep going with it. A lot of *Souljacker* was really spontaneous."

"I like to work quickly," E says. "I do [analyze it] as we're going along and I'm pretty intense about it at the time. But I would go crazy if I had to agonize over every detail for months. I don't know how people do it." ∎

Cool Spins, *FROM PAGE 144*

lurking somewhere between Depeche Mode and Bananarama, providing the perfect soundtrack for all-night cocaine binges and runway model shows. Musically, *Light & Magic* is a bit more dreamy and subdued than the group's previous album, *604*. They still rely on a basic formula of cut-up break beats, unbroken synth phrases and whisper-quiet vocals, but the em-

phasis seems to have shifted from glitzy disco tunes to whimsical pop songs. Standout tracks include the monotonous but addictive "Seventeen" and the aptly titled "Evil," as it is sure to become the guilty pleasure of anyone who hears it. Will people care about Ladytron two years from now? Who knows. But it's a fun idea for the moment, and that's the point.

Producers: Daniel Hunt, Mickey Petralia. Mixer: Mickey Petralia. Additional programming and engineering: Michael Fitzpatrick. Assistants: Matt Fausak, Aleks Tamulis. Recorded in Liverpool and Los Angeles. Mixed at Hollywood Sound (Los Angeles). —*Robert Hanson*

Steve Tibbetts: *A Man About a Horse* (ECM)

The Minnesota-based guitarist's first CD in eight years is one of his best, a typically eclectic and inventive pastiche of styles and sounds. Passages of glistening acoustic guitars and tabla accompaniment merge with dense electric guitar textures and all manner of sonic washes—from industrial-sounding treatments worthy of Ministry, to dreamy ambient soundscapes that fade in and out like hallucinations. As with everything Tibbetts does, there's a strong Asian influence to much of the music—India and Indonesia mostly—but you'll hear echoes of Jimi
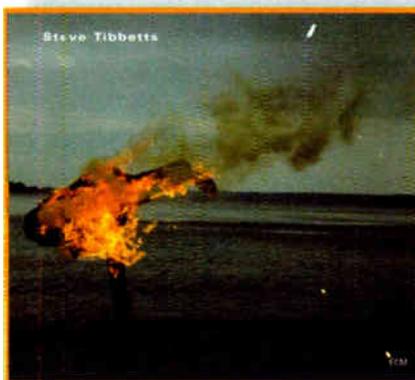
Hendrix and Western folk music sources, as well. Tibbetts is endlessly creative in his approach to layering sounds on this CD, and on the music front, he is ably assisted by percussionists Marc Anderson (a longtime associate) and Marcus Wise, and bassist Jim Anton. It's quite a novel journey all the way around.

Producer: Manfred Eicher. Engineer: Steve Tibbetts. Studio: Tibbetts' home studio in Minnesota. —*Blair Jackson*

Original Sinners: *Original Sinners* (Nitro)

If you loved X in their early Billy Zoom days, Exene Cervenka's latest project will give you some joyous déjà vu. With tracks like "Whiskey for Supper" and "Mourning After," this is a punkabilly treat: very twangy, very thrash and very rythmic. And, of course, what lifts this album up is Cervenka's expressive singing. She's always

had this wonderfully off, tongue-in-cheek, provocative voice. This is a perfect dose of L.A. punk, which is typically a bit, well, sunnier than other scenes. This group mixes surf guitar and psychobilly with its angst, and top-flight engineer Dave Bianco mixed the tracks into a nasty, fantastic uproar.

Producers: Original Sinners. Recording engineer: Andrew Alekel. Mixing engineer: Dave Bianco. Recording studio: Grandmaster Recorders (Hollywood). Mixing studio: Larrabee West (Hollywood). Mastering: Dave Collins/ Marcussen Mastering. —*Barbara Schultz* ∎

L.A. GRAPEVINE

by Maureen Droney

Lots of changes at Hollywood's studio bau:ton-designed Atlantis Studios. Besides Studio A's upgrade last year, when an SSL 9080 J Series desk was installed, Atlantis has recently added gated, underground valet parking for 21 cars in a building that also houses six rented-out production suites. In the main studio complex (where Studio B with its Trident 80B console and 40x16x16 track-

ing space also continues online), 2,200 square feet of construction is under way: a new (also bau:ton-designed) client lounge and kitchen, a producer's office/lounge and a Pro Tools suite with overdub booth.

On the day I dropped in, engineer Neal Pogue (Outkast, Citizen Cope, Lucy Pearl, TLC) was finishing up mixes in Studio A for new DreamWorks artists Boomkat. The Tucson, Ariz.,-based Boomkat, one of the first projects under the leadership of new DreamWorks label head Robbie Robertson, comprises brother/sister team Kellin and Taryn Manning, along with co-producer Martin Pradler.

"It's a very unique group," enthuses Pogue. "When I first heard it, what came into my mind was that they'd brought the '80s back—in a good way. They combine hip hop beats with an '80s flair: soulful, old-school beats with cool melodies on top and great lyrics. It's definitely dance music, but it's got a fresh twist and the coolness of a band like the Thompson Twins. Music has been in what I call a 'General Motors' thing for a long time; you know, the assembly line. It really needs something fresh like the Boomkats."

Neal Pogue in between sessions inside the newly redesigned Studio A at Studio Atlantis.

Pogue headed back to his mix and Atlantis studio manager Michelle Moore took me through the rest of the complex. The facility has retained its theatrical style, a look created by high ceilings, velvet curtains, backlit Lumacite panels, blue, green and ochre coloring, and curved walls reminiscent of some giant creature from the mythical undersea continent the studio was named for.

"[Owner] Jon [Newkirk] was so happy with what bau:ton had done," says Moore, "that the same design and materials will be carried on in the new areas."

The newly built production suites,

NASHVILLE SKYLINE

by Rick Clark

Last month, while I was knocking around Berry Hill's recording scene, I was visiting with a producer friend when a guy bopped in to tell my friend about an open house for a new product called DAMSEL. The person who dropped in happened to be Tom Endres, engineer and co-owner with Mike Purcell of Digital Audio Miracles Inc., the creators of DAMSEL.

DAMSEL stands for Digital Audio Miracles Selective Equipment Liaison. Whew! In a nutshell, it is a Macintosh software-based utility designed to transfer files from a RADAR hard drive (Otari RADAR II and iZ RADAR 24 drives) without an extensive array of hardware.

Endres and Purcell, as it turns out, are two of the more in-demand people to do magic with ones and zeros in the Nashville area. They also are hard believers in RADAR converters, and that has led to a friendship and a developmental relationship with the folks at iZ.

"We, as engineers, try to use the best tool for the job," says Endres. "Unfortunately, we often are forced to jump through hoops. Until we reach a point where everyone can 'play nice,' in regards to file and session formats, we need a viable way to move data without degradation. We need to be creative like we were with 2-inch!"

"Basically, DAMSEL translates proprietary RADAR projects to a common file format (SDII, Broadcast .WAV, .AIFF) on a destination device of your choice (currently large FireWire drives). Damsel does this bit flip exactly so that the translation is a perfect 1:1 copy of the original recorded information," stated Purcell, when I went over to the open house at County Q Productions.

When I told an engineer friend of mine, who works with RADAR and Pro Tools extensively, he cut our conversation short and said, "Give me this guy's number. I would love to try something like that."

In a typical transfer scenario, a RADAR

is hooked up to a conversion box to go from TDIF (the standard digital output of RADAR II) to AES or Lightpipe. The crystal in the RADAR is controlling the clock rate, unless an external source such as a house clock is used. All of this clocking information must be passed correctly through these wires in order for the conversion process to occur and for the destination device to know how to re-assemble (re-record) the audio in the new digital format.

Just the act of passing through all of these wires can introduce jitter (a slight variation in the wordclock rate), which will degrade the quality of the audio and will not allow for accurate reproduction of what was originally recorded. In cases of extremely bad or wrong wordclock configurations, devices will not sync and clicks and pops can be introduced into the transferred material.

"DAMSEL avoids all of these problems that usually crop up in the hours when tech support is unavailable. The other highly appealing aspect of DAMSEL is that it gives you a bit-for-bit accurate copy of your original source material," says Purcell. "Gone is the

L-R; Artist Pat Buchanan, producer/engineer Rusty McFarland and Hum Depot co-owner Tony Harrell.

need for a pristine transfer environment [correct cabling impedance, lengths and runs, stable clock source, correct configuration of devices, etc.]. Most transfers also require someone who has at least a slight degree of proficiency with

NEW YORK METRO

by Paul Verna

With the economy in dire straits, the music business in disarray and the studio industry eroded by high-quality home recording, who would possibly want to build two state-of-the-art recording/mixing studios?

The Germanos, that's who.

"True to form for Hit Factory, we've always managed to build in the worst economic conditions," says Troy Germano, VP of the sprawling New York/Miami complex, and son of Hit Factory founder and owner Ed Germano. "It just naturally happens that way."

So, why build when the rest of the industry is retrenching?

"We believe in the recording studio business," says Troy Germano. "We always have. Some people could look at it in terms of numbers and say, 'Why would they do that?' But we keep this place busy. Right now, a lot of studios in New York City are complaining. Yes, activity's a little bit lower, but we're keeping our seven rooms going. Are they going seven days a week? No. Maybe they're going six days a week, and they're certainly going five days a week. But we believe that when the business comes back, we won't have to sit there and build. This is the time to take advantage of a situation like the one we're in."

The catalyst to adding two studios in an existing space within the Hit Factory's 54th Street headquarters was the closing of four rooms in the company's original location down the street on Broadway. "Since we bought the 54th Street space in 1991, we always wanted to be in one building," says Germano. "It makes it much easier to run the business; it's much more efficient for the clients and for us."

As one would expect from the Hit Factory, the new rooms—Studios 6 and 7—offer the ultimate in equipment,

acoustic design and general comfort. Both are based around 80-input Solid State Logic XL 9000 K Series Super-Analogue consoles, the British manufacturer's top-of-the-line analog product. "These rooms are absolutely magnificent," says SSL North America president

Clients can now choose to book their tracking sessions inside the new Studio 6 at Hit Factory.

Rick Plushner. "To have our latest consoles—the XL consoles—in both of these rooms is a tremendous showcase for us. We expect that the right people will experience the product here, understand what it's all about and spread the word that it's a fantastic piece of equipment."

Prior to officially inaugurating the new rooms with a bash attended by the likes of Eddie Kramer, Niko Bolas and Pat Thrall, Plushner presented Germano with a plaque celebrating the mixers, engineers, musicians and producers who have worked on SSL J Series consoles at the Hit Factory. "The plaque represents the J Series generation, and we see that generation soon to become the XL generation," says Plushner. "Everybody who has worked on a J already knows how to run the XL console. All it takes is a half-hour tutorial on the new feature sets, most of which have to do with the ability to manipulate surround sound, which is very unique in this console. But the users already know the automation, and

SESSIONS & STUDIO NEWS

PHOTO: ALAN MORPHEW

Salt-N-Pepa take over Track Record Studios: (seated, front L-R) engineer Ai Fujisaki and Spinderella, (seated, rear L-R) Sugga B and Brenda Lee, and (standing) A&R representative Kevin Lewis.

SOUTHERN CALIFORNIA
Spinderella (Salt-N-Pepa) and producer Pete Rock took over the North room at Track Record Studios (North Hollywood) to work on the song "Burn 'Em" for inclusion on the *Graffiti Kings* soundtrack. The session was engineered by Ai Fujisaki and assistant Josh Hamilton...Marilyn Manson recently finished their new live 5.1 DVD release inside Studio 2 at Cherokee Studios (Los Angeles). Engineer Jimbo Barton was tapped to mix the project. Also at Cherokee, Tricky was in tracking his next album with engineer Karl Rigas. Producer/engineer Butch Vig and punk outfit AFI were also working on some new material.

SOUTHEAST
Travis Tritt spent the summer hard at work on his latest record at Tree Sound Studios (Norcross, GA) working with producer Billy Joe Walker Jr. The tracking sessions were engineered by Steve Tillisch and assistant Robert Hannon...Last August, Evergreen Terrace worked on their new album at Earthsound Recording (Valdosta, GA) with Lee Dyess engineering. The album will be out later this year on Eulogy Records.

NORTHEAST
Out at Avatar Studios (NYC), SUM 41 spent the summer with producer Greig Nori and engineer Greg Gordon tracking their upcoming Island Records release. Ross Peterson was in to assist...Lundvall Audiophile Recording and Mastering (Ramsey,

World Radio History

"celebrity-friendly" by playing host to stars from Marlon Brando and Anthony Hopkins to Cameron Mannheim, Cindy Crawford and Martin Sheen.

Prior to opening his own company, Feist mixed at Pacific Ocean Post, then for five years at Hollywood's Margarita Mix, where he became a fan of Storyk's work. By 2001, he was ready to build his dream facility, enlisting both Storyk and building architect Eric Rosen to make it happen. The resulting three-room complex occupies two stories in a spacious, gallery-like space featuring natural light and a "modern retro" style, with an open floor plan that also allows for numerous private, client-friendly nooks.

"The rooms were really shaped by John," says Feist. "When we took it over, it was one big space, kind of an empty concrete warehouse. It wasn't obvious where things were to go. I was sure, though, that I wanted to keep the large windows and the light."

Natural light in studios is now common, but windows still provide challenges for acoustic design. At RavensWork, there was also size to consider: The upstairs control rooms, each with two walls

Studio Atlantis manager Michelle Moore

that are basically floor-to-ceiling windows, are very large. "It was tricky," admits Storyk, a veteran of many "natural light" projects. "There were issues with the layout as well as outside windows that forced the rooms, in some instances, to break free of total symmetry. All three control rooms are acoustically symmetrical for direct and first-order reflected sound [i.e., front half of the room]. When possible, complete symmetry—front to back—is recommended. However, given the complex nature of these rooms, by the

John Storyk (left) and Robert Feist surveying the scene at RavensWork.

time reflected sound is in the back of the spaces, it is down in level by 25 to 30 dB. Architectural symmetry can be relaxed in the rear of the room in exchange for other architectural detailing.

"Control rooms, particularly large ones, have been getting more and more reflective during recent years. This seems consistent with recording trends and a desire to make music in spaces that more accurately duplicate where music will be heard, such as our living rooms. Also, when control rooms, such as those at RavensWork, are larger, they can handle a more reverberant presence. The room is more statistical, particularly if the geometry is more complex.

"A lot of people make the mistake of thinking that every design element in a control room is completely acoustic," he continues. "That's just not true. Some shapes have more importance. Some are critical; for example [at RavensWork] we pretty much agreed that the live rooms

would be to the side. That's not uncommon in 5.1 post rooms, because nobody wants to put the three front speakers above a large piece of glass. But many other things can be variable. We work to get a balanced acoustic environment, and then we start going through—very specifically—what the surfaces have to be. Some of them look very simple; but in fact, much of it is acoustic treatment."

Although the complex is fully equipped with Pro Tools, RavensWork's mixing hubs are all Fairlight MFX3plus systems. "I built my first studio around Fairlight, and I really believe a lot of my early success was because of its consistency," Feist says. "Of course, Pro Tools is entrenched and you have to be able to integrate with it. But I still think the Fairlight system is great. There's nothing extraneous; it does one thing really well and really quickly. And it's so many layers deep—a console that would match it wouldn't fit, even in rooms as big as ours!"

Storyk professes to enjoy the design freedom that less—and smaller—hardware allows. "You're not held hostage acoustically by giant pieces of metal," he says. "The room is quieter, it uses less power—you're not forced to do things in a prescribed way. The speakers, of course, still dictate the room, especially in a 5.1, as they should, since the room is all about listening." ∎

Got L.A. news? E-mail MsMDK@aol.com.

the digital transfer process, as troubleshooting digital clocking issues is not an easy issue. DAMSEL only requires someone who can load a hard drive in a hot-swap bay and click a mouse."

How fast is DAMSEL? From what I was told by the product's code geek Ron Jurincie, DAMSEL converts "approximately 30 seconds of audio in one second on a 2001 G4/466 outputting destination files that can be immediately imported into the DAW of choice. Additionally, DAMSEL easily batch-transfers multiple projects from a single RADAR drive."

Judging from the people who attended the open house, the overall enthusiasm for DAMSEL is quite high, and Endres is excited about DAMSEL's future developments. "Bi-directionality will be the next implemented feature in DAMSEL Version 2.0. Just a few interface tweaks and it will be available soon as a free upgrade. This will allow users to translate bit-for-bit accurate conversion back to the proprietary RADAR audio-file format," says Endres.

Endres and Purcell also serve on the NARAS subcommittee, working on archiving standards here in Nashville. For more information on DAMSEL and anything else these self-proclaimed "geeks" are undertaking, check out www.digitalaudiomiracles.com and www.dageek.com.

Between downtown Nashville and Berry Hill is a funky two-room studio called Hum Depot (www.humdepot.com) that is owned by studio session aces Greg Murrow, Tony Harrell and producer RS Field. It is one of those places a lot of cool artists and producers like to go to. The Hum Depot's clients have included Lucinda Williams, Ray Benson, the Dixie Chicks, ZZ Top, Steve Earle, Dan Baird, Steve Forbert, John Kilzer, Todd Snider, Raul Malo (The Mavericks), Steve Cropper, Radney Foster and Robbie Fulks. Producers who have worked there include Richard Bennett, RS Field, David Leonard, Rick Will, Joe Hardy, Chris Farren and Mike Utley.

The upstairs room is outfitted with a Neve 8232 32x24 recording console, a 24-track Sony APR-24 machine, and a solid as-

sortment of vintage and new outboard gear. While Hum has its share of the popular digital gear, the folks there still value the classic stuff. In that spirit, the owners recently installed a 1972 24x16 API console in the downstairs room. Both rooms contain Pro Tools LE and Digital Performer V. 3.0.
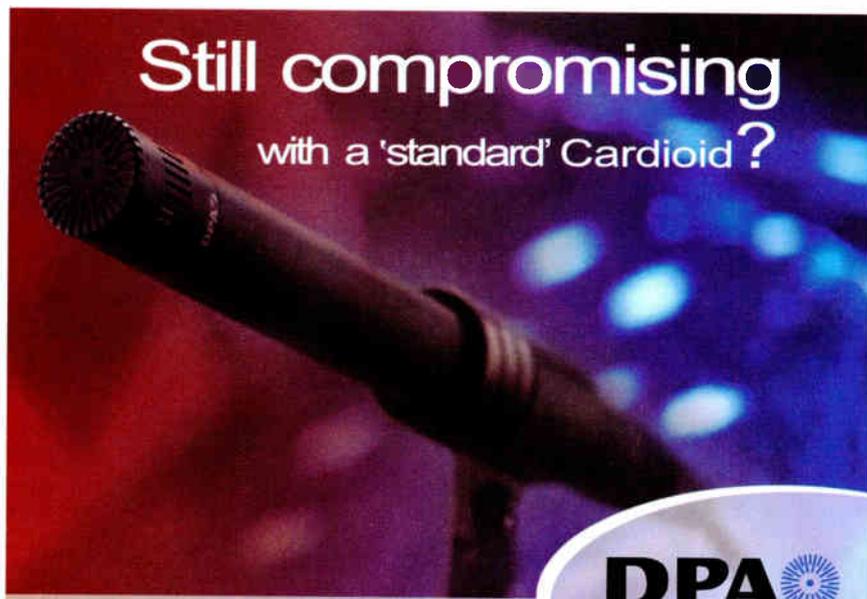
"Basically, we wanted to create a really relaxed atmosphere that had a lot of great vintage gear. It's not your prim-and-proper studio," says Harrell with a laugh. "It definitely has more of a 'rock' attitude."

The most recent project there was a solo album to be released on the Fat Possom label for Widespread Panic keyboardist John "Jo Jo" Hermann. The sessions were engineered by Joey Turner. Cedric Burnside played drums, and Kenny Brown (both of whom play with North Mississippi blues legend RL Burnside) played guitars, while Glen Duncan overdubbed fiddle and mandolin and Nashville session singer Kim Keys sang background vocal parts.

The downstairs room is basically a nonisolated space with the console out on the floor. Its open layout was a primary attraction for Hermann when he set out to find a studio in Nashville. "Jo Jo chose the downstairs room, because it had the vibe and the fact that everyone was going to be in the same room," says Joey Turner. "You see, in the downstairs room, there are no walls. It is open, and the control room and the tracking space are all one [space]. Everyone was standing around the console and cutting on headphones, and it was a real good-feeling situation."

Asked how the tracks sounded, Turner says, "It is similar to Widespread in that it is really jam-oriented, but different in that it also has more of the North Mississippi Allstars because it is has more Southern blues-influenced rock to it, as well."

Later in the day, when I was visiting with producer Jim Dickinson on the phone, he told me that his sons, Luther and Cody Dickinson of the North Mississippi Allstars, played on some of Hermann's album.

In the upstairs room, Pat Buchanan has been cutting his next solo effort. Buchanan is one of Nashville's finest electric guitarists, and that's saying a lot in a town loaded with them. While he seriously can play just about anything, he especially shines at the writing and playing of well-crafted pop rock, as well as being a good singer. Rusty McFarland is handling the engineering and playing bass, and Greg Murrow is laying down the drum grooves.

"We've already completed five tracks and getting ready to do the next five. Pat's covering everything from the rocking-est guitar noise to artsy Brit-pop and every-

thing in between, and we are having a great time," says McFarland. ∎

Send your Nashville news to Rick Clark, MrBlurge@aol.com.

they're very familiar with the channel strips. And, the word that I've gotten from people who've been using the console is that it sounds absolutely fantastic."

Among the improvements the XL of-

fers over the J are full 5.1 channel mix bus, master fader, mix compressor, monitoring and metering; a 6-channel monitor insert, plus support for three external 6-channel sources; LFE filtering for Dolby and DTS encoding; a new surround panning system called Ultipan; an automation computer similar in function to that of the J, but 100x faster; a remote mic preamp system; and a signal path optimized for ultra-high-resolution digital audio.

Plushner says that the XL is the "natural extension" of the J, which has been hugely successful since its introduction in 1994. "One thing the J Series did was bring together the different camps out

there," he observes. "The majority of SSL mixers loved that console, and people who were not SSL users moved over to the J because of its sound quality and the features that it offers. So now we have this huge base of very satisfied engineers who

Inside the new Studio 7 at Hit Factory—the second of the new SSL-equipped rooms.

should graduate to this new product rather nicely."

Although he could have picked from any number of analog consoles for his new rooms, Germano hardly had to look past the XL. "There were many choices we could have made," says Germano, "but there really weren't, because at the end of the day, what SSL offers that nobody else does—and I hate to sound cliché and corny—is service. That's something we've always prided ourselves on, whether it's getting somebody a salad at three in the morning or finding a cable that we don't have in the studio. SSL has provided me with the ability to make a decision based on service. I can't emphasize that enough."

Besides the XLs, each of the new rooms—which were designed by Dave Bell from UK-based White Mark Ltd., in conjunction with Germano—offers a 48-channel Pro Tools MIXplus system (with a roving HD rig in-house, as well), a Sony 3348 HR, two Studer A-827s and a rack of state-of-the-art processing gear tailored for surround mixing. For instance, instead of merely a pair of GML EQs, the Hit Factory provides three stereo units in each room, allowing engineers to process up to six channels for surround mixing. Other outboard gear includes Sony 777 Sampling Reverbs, Avalon 737s and 2055s, Lexicon 960Ls, and Empirical Labs Distressors and Fatsos. Additionally, each room is outfitted with five soffit-mounted, custom speakers designed by George Augspurger.

With the addition of the two new studios, Hit Factory now operates seven recording/mixing studios in New York and six in Miami, for a total of 13 rooms. Six of the seven New York rooms feature SSL

analog boards: the two new XLs and four J Series boards. In addition, the all-digital Studio 5 houses a Euphonix System 5 24-bit, 96kHz console. Also in New York, the Hit Factory runs four mastering suites.

Surround-wise, every room at the Hit Factory can be easily configured for a multichannel mix, but the two new studios are purpose-built for 5.1 work, with large monitors, the XL board (which offers a wealth of surround panning options) and appropriate processing gear. Similarly, the Miami facility also has two rooms with wall-mounted surround speakers.

In New York, Studios 6 and 7 have seen plenty of activity, even before officially opening. In Studio 7—a mix room with a vocal booth—the first eight weeks of the room's active life were spent mostly working on multichannel and stereo remixes of archival Elvis Presley tracks for a large-scale reissue compilation. Studio 6, which adjoins a large tracking area with additional iso booths, hosted a test tracking session by jazz artist Charlie Drayton, recorded by Bolas and Thrall direct to Pro Tools. Since completing the Drayton project, the studio added the Super Remote mic preamp option on the XL console, the first such installation in the U.S.

With Studios 6 and 7 fully onboard and the entire New York operation consolidated within the headquarters, Germano says both of Hit Factory's locations are maxed out. If the studio undertakes any additional building, he says, it will be in a different U.S. city or overseas. "I don't know how many more rooms we need," he says. "I think seven here and six in Florida are enough. We have a healthy business, and we're going to try to keep it that way."

Germano admits that the recording studio business is tougher than ever, with workstation-based home recording taking a large bite out of the pie, and labels with shrinking budgets lobbying commercial studios for lower rates. "People want to make records cheaper and cheaper, and you have to try to accommodate all those artists, because they could become the next John Lennon or Bruce Springsteen or Puffy," says Germano.

At the same time, major artists with big budgets will always need a place to record, and the Hit Factory is likely to remain a top destination. "A Solid State Logic XL is something people are not going to put in their houses," says Germano. "The advent of Pro Tools and workstation recording are very important. I'm happy to see that there's a format that's universally accepted. But you're just not going to find this kind of console in somebody's living room." ∎

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and the monster Faroudja Picture Plus Native Rate Series. There are certainly many others, but these look like they represent both the best David and the best Goliath.

Literally months with these two devices (and the Sharp-made scaler/de-interlacer skulking within the Pioneer panel itself) revealed the following: Clearly, the best way to go is no scaling at all—straight in, direct-mapped. On the 503, this produces a tiny little 640x480 picture in the middle of the gigantic panel, but the picture looks like a freshly cleaned window to another world. I have *never* seen anything else like it at *any* price. But as this pretty much wastes the panel, I was forced to move on.

PIONEER'S BUILT-IN
SHARP SCALER/DE-INTERLACER

The scaler does work. There is some softening, but it does allow you simply to hook up an S-Video feed and watch. The de-interlacer seems to cope with slow-moving action quite well, but many high-contrast, fast-moving items, and *all* scene cuts with high-contrast action, disassemble into very visible interlaced lines, revealing the horrible secret that we are all trying so very hard to hide.

Remember that two things need to be done to get a little old picture on a modern, large *digital* screen: conversion from interlaced to smooth, artifact-free progressive, and the actual re-sampling. And keep in mind that although these tasks are purely digital and done directly within the Pioneer, all in-line processing boxes use *analog* I/O! Sadly, DVI is next to nonexistent so far. So, each box adds two destructive steps: another A/D and D/A. Ain't it a bitch?

ISCAN PRO

This is a cute and powerful little device. Priced right, this de-interlacer actually works, and works quite well. I will refrain from endless tech details here, but I will say this: The 3:2 pull-down performance (dealing with making stuff shot on film act right when shown as video) is actually quite good, as the reviewers have been saying. Motion-artifact management is also good. I never saw this unit tear like the Sharp. If you have a high-bandwidth ("HD-ready") phosphor monitor, you need to buy this tiny box. It will certainly blow away any internal de-interlacer that your monitor could have.

But, it is *not* a scaler. It outputs 640x480 (520p), and so you are left to your own solutions for the final display scaling. On a phosphor monitor, there's no real issue, but on my Pioneer, I ended up looking at the small amount of inevitable softening from the de-interlacing, some more from the extra A/D and D/A passes, and finally a bit more from the Pioneer's scaler. Things were getting pretty squishy. But it was still much bet-

> The NRS lets you tweak and tweeze to your heart's content, and it has far too many variables available for each user memory. Far too many. I tweaked them all. The plasma screams in pain and tries to jump off the wall every time I fire it up. I love it.

ter than letting the Pioneer do everything. The iScan pro produces a warmer, more organic picture with better colors, and has a cool blue LED that tells you when it is doing 3:2 pulldown.

So, if you are looking for a de-interlacer/line doubler that kicks out 520p, this is absolutely your box.

FAROUDJA PICTURE
PLUS NATIVE RATE (NRS)

It wins. Of course. It is by *far* the sharpest—almost too sharp—and the most intelligent and powerful scaler. It is not subtle; this unit has obvious superiority.

At one-third the price of the plasma itself, this box had better deliver, and with its input array, extensive adjustable parameters with memories, and quality of both de-interlacing and scaling, it does. Almost nothing confused its motion-artifact engine, and the detail was amazing, especially when you consider that additional A/D and D/A passes are inflicted on your signal when using the NRS. Better converters?

I must note that the Pioneer 503 stupidly sees the Faroudja's output as a PC signal and forces linear PC gamma, so some serious tweeze is needed for video. And, the Pioneer also forces a 70Hz update rate, which is pretty nauseating. Maybe the 504 won't do these things.

The Faroudja is a commitment, as you order it specifically for the resolution of the display device that you want to use it on. If you buy a new device next year with different resolution, it won't work.

Even considering the angst that most males will endure in committing to such a…umm…well, commitment, the rewards are significant. The NRS lets you tweak and tweeze to your heart's content, and it has far too many variables available for each user memory. Far too many. I tweaked them all. The plasma screams in pain and tries to jump off the wall every time I fire it up. I love it.

All my sources—pro Beta, DV (not with FireWire), DSS, HD terrestrial, DVD), along with analog component and S-Video—hook up to the NRS, and only one cable goes to the plasma, which is real slick, because I am flying the thing three feet out from the wall on a Chief double-scissor, twist-the-thing-any-way-you-wanna mount. And iTunes looks incredible when fed from a nice little Ti-Book. Even Astro seems impressed.

Let me put this as simply as possible: The NRS made friends drop their jaws and stay *way* too late. This is the next best thing to the dream of true-direct, pixel-mapped DVI.

P.S.: WIRE WE HAVING
THESE PROBLEMS?

All of this testing revealed that you *cannot use composite* video at all. The problems are endless. The absolute minimum that you can get away with is S-Video, and you *must* use very good S-Video cables. Regular consumer stuff will generate endless problems and artifacts. The most profound case of this was clearly (actually, not so clearly) the Sharp projector that I reviewed a few columns ago. It had *no* tolerance for anything but the very best in S-Video cables. Anything less produced impressive lines and herringbone artifacts.

So, in a way, nothing has changed. If you're gonna get wired, stick to the good stuff. ∎

SSC is beginning to become aware of the native resolution of his eyes.

Don't cop an attitude. You're there to learn, not to show off. Just because you've been doing remixes at home on your laptop since the sixth grade doesn't mean that you know everything about audio, and it will do you no good to come into a program thinking that way. Although what you can do today on a single computer is astounding compared to even three years ago, there is a lot more to the art and science of audio.

It's difficult to understand how a compressor works until you've actually plugged a live microphone into one and listened to how the sound changes as you adjust the controls. You *can* learn to use audio tools by trial and error (and that's sometimes a good way to achieve creative leaps), but in the professional world, there isn't much time for that. If you know what a compressor is *supposed* to do and how to turn it into a limiter, an expander and a gate, then that dynamics plug-in on your computer will make a heck of a lot more sense.

Learn the language of music. You see those folks on the other side of the glass, the ones with the funny-looking wood and metal things in their hands? Those are musicians. They're usually very well-trained and they communicate in a language—verbal and nonverbal—all their own. They talk about beats, bars, keys, verses, bridges, tempo and codas. They grunt, wave their hands, twirl their fingers in the air and point to their foreheads. If you don't know what all of these things mean and how you should respond to them, you're not going to be of much use to them. And they're not going to be particularly interested in working with you again. The more kinds of music you know—classical, jazz, ethnic and folk, along with rock and rap—the more useful you will be in the studio and the more fun you'll have.

What's the best way to learn music? That's easy: Take lessons on an instrument and play in ensembles. And by instrument, I don't mean a turntable, and by ensembles, I don't mean three bellowing guys in sweatshirts walking back and forth on a stage with a drum machine on the floor. It doesn't matter which instrument you learn—guitar, piano, tuba or xylophone—as long as there are notes and a way to write them down. You can play in a brass quintet, a concert band, a Led Zep-style power trio or a string ensemble. All of these experiences will help you understand the way musicians interact, which is knowledge

that you can take to your side of the glass. And don't forget voice lessons, not necessarily so you can sing, but so you can work with singers. Knowing something about vocal production, projection, breath and intonation is a great advantage when it comes to coaxing the best out of a singer.

Listen, listen, listen. Critical listening is probably the most important discipline an audio program can offer. Being able to tell the difference between echoes and reverb, between +3 dB at 1 kHz and +6 at 5 kHz, between preamp overload and speaker distortion, between an oboe and a clarinet, and between a guitar in tune and one that's not, is one of the best skills that you can offer a future employer.

The school should offer a critical-listening course that has a good instructor, carefully chosen materials, and a neutral, balanced listening environment. There are some good ear-training packages that you can buy to use at home, but nothing beats the feedback that you get in a classroom from the teacher and other students.

And speaking of which, it seems that a lot of people are interested in taking audio engineering courses on the Internet. Because you can get everything else online, from "herbal mixtures" to "NUDE pics of Britney!!," it seems that such a thing is possible. In fact, considering the number of scam artists on the Web, I'd be surprised if something like this *didn't* exist. I personally haven't investigated any online programs, because I think the whole idea of non-contact audio education is silly and about as useful as taking piano lessons by mail order. (Not so long ago, people tried that, too—I've got the matchbook covers to prove it!)

Think about it: How can you possibly afford to try out dozens of different microphone, speaker and processor combinations at home? How can you set up a perfect listening environment all by yourself? How can you play all of the instruments in a band at the same time so that you can learn how to deal with the leakage? And how can you get "remote" feedback on something you've done before you've forgotten how you did it?

A knowledgeable instructor who will provide an immediate hands-on response to what you've done, who will show you what you did wrong and who will put your fingers on the magic button to make it right is an incredibly important factor when you're learning about audio. Equally important is the exchange of

ideas and perspectives that you get from your fellow students. When you graduate and go out into the real world, you'll find the personal contacts you've made in school, among both faculty and students, to be invaluable when you are looking for a job or a collaborator.

Learn to work with other people. Despite the enormous growth of the home-alone studio, most audio projects are still group undertakings. Whether it's concert sound, theme park installation, recording a band or designing a new product, team-

> Ideally, a program will offer a mix of professional teachers and teaching professionals.

work is an essential part of the real world of audio. A school is a great place to learn how to get things done cooperatively. It's low-risk: If you screw up a session, no one from the record company is going to threaten to sue you for the money you've just lost them. And it's also a good place to get a wide variety of team experiences as a leader and as a follower, as well as to find out what your strong and weak points are while working with others.

Find out about the faculty. Do they have real-world experience or are they mainly academic types? You probably don't want to be in a program that is taught entirely by academics. While they may well have a lot to offer audio students—especially in subjects like physics, electronics, acoustics, music theory and musicology—today's audio scene is primarily commercially oriented, and it changes very fast, something that the academic community doesn't do. Ideally, a program will offer a mix of professional teachers and teaching professionals, meaning men and women who've worked extensively as engineers, producers, designers or even session players, and who are good at imparting wisdom to the next generation.

At the same time, beware of schools and instructors without academic credentials. Are the teachers there because they really love to teach or because it's something to do in between gigs? Or do they teach because they can't *get* any gigs? Sad to say, some places will hire "teachers" based on the fact that they can talk the talk, and little more, and that they don't

ask for a lot of money. Uninspiring at best, these folks can be deadly.

Talk to graduates. People who have gone through the program are your best source of information about how useful it is. First of all, if the school can't put you in touch with at least a half-dozen of them, then walk away. But if they do give you a list of alumni, then track these folks down and see what they're doing and how the school helped them get there. If you're dying to learn how to mix live shows and all of the alumni you talk to seem to be testing workstation software, maybe their school isn't the right one for you. Besides being fonts of knowledge, faculty should be able to assist students with contacts for internships and jobs. Graduates of the program will tell you if the faculty was able to give them the time and information they needed to help them on their chosen path or if the teachers just vanished after the bell rang.

Take business courses. Absolutely the worst time to learn about the roles of the manager, the agent, the producer and the record company is when you are about to sign your first production or recording contract. You will be so eager, and so flattered, that someone wants to give you money for your work that you'll be happy to sign anything they put in front of you. But a contract may have clauses in it that are unfair, inappropriate or downright larcenous. You need to be able to ferret out those clauses, object to them and get them removed. If you're not under time pressure (which you will be), you can ask a lawyer to help you, but that may get expensive. If it takes a long time for the lawyers to kick it back and forth (which it will), you'll get more and more anxious that the company will lose interest in you—and it might.

If you have a good grounding in music-business practices before you get into that situation, you can avoid a lot of headaches. Every student today should take a course in copyright law and how it's being redefined by the media conglomerates, the all-music-should-be-free crowd and everyone in between. Knowing how the legal issues surrounding music are evolving is almost as important as understanding where technology is headed. If you know both, you will be way ahead of the game. ∎

Paul Lehrman, Mix's "Insider Audio" columnist and Web editor, teaches in the Multimedia Arts program at Tufts University, where the sports teams are named after a stuffed elephant.

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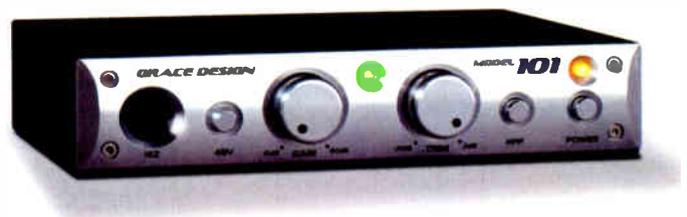
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First in a new generation of virtual instrument technology. Even more tightly integrated with Digital Performer. PowerPC G4- and Velocity Engine-optimized to deliver way more sounds per CPU cycle. One integrated environment with sampling, analog synth emulation, physical modeling, and Gigasampler file streaming. A complete rack of synths for DP3 in a box.
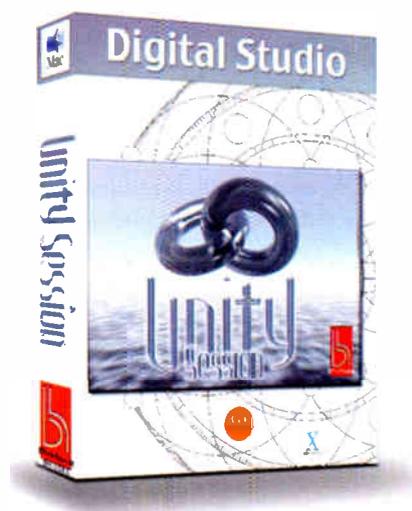
Radikal SAC 2.2

Completely redesigned. Smoother faders. Higher resolution encoders. Dozens of enhancements made specifically for DP3. The Radikal Technologies Software Assignable Controller gives you automated, touch-sensitive mixing. The ultimate hands-on experience for Digital Performer.

Avalon VT-737 SP

Avalon's award-winning "preamp powerhouse". This industry-standard, all-in-one analog dream machine combines an easy-to-use musical Class A tube preamplifier with a harmonically rich opto-compressor (4 dual triode tubes) and a 100% discrete all-transistor Class A four-band passive sweep equalizer. Compressor link for perfect stereo tracking. Unlimited dynamic range from four high-voltage power circuits. Add that Avalon sound to your MOTU studio and take your music to the top. PLUS an exclusive Sweetwater offer: FREE Avalon VP-1 vent panel and T-shirt with every VT-737SP.

BIAS Peak 3

Burn Red Book CD's. Read and write MP3's. Batch process hundreds—or even thousands—of files. Ultra-fast non-destructive waveform editing. Run stand-alone or as an external editor launched directly from within DP. Unlimited undo/redo with complete graphic edit histories for multiple audio documents. Dozens of unique DSP and looping tools like Convolve, Repair Clicks, Loop Tuner™, Loop Surfer™ and Guess Tempo™ and more. Hot swap real-time effects in series, parallel, or hybrid combinations using the Peak's new Vbox™ SE VST™ matrix. Runs native on Mac OS 8.6 thru Mac OS X. Optimized for Apple's G4 Velocity Engine. The ultimate editing, processing and mastering companion for Digital Performer.

Propellerhead Reason 2

Welcome to the Age of Reason. Version 2. Simply put, Reason is the first software synth to equal and surpass the power, glory and attitude of real hardware synths. All the power of hardware samplers, analog synths, drum machines — you name it — without the hassle. A complete rack of sound-generating virtual equipment for your Digital Performer desktop studio.

Tannoy Ellipse 8

Tannoy's new Ellipse 8 monitor is the first of an entirely new generation of studio monitors featuring Tannoy Wideband technology. Frequency response up to 50kHz. Exceptionally wide sweet spot. Discrete power amps. Striking appearance. The perfect monitor for your MOTU-based studio.

Mackie UAD-1 Powered Plug-ins

UAD-1 is a PCI card that allows you to run dozens of sophisticated effects plug-ins inside Digital Performer without bringing your Mac to its knees. What's the secret? A custom-built, monster DSP. It's like adding an extra $20,000 worth of effects gear to the dozens of native plug-ins included with DP. UAD-1 ships with this growing list of powered plug-ins:

Real Verb Pro
The most flexible, natural sounding reverb available. Design your own rooms, down to the smallest detail.

Pultec Program EQ
Stunningly realistic recreation of this classic analog EQ. Dangerous amounts of boost with musical results.

1176LN Limiting Amplifier
Another analog classic reborn inside Digital Performer. Apply liberally with host CPU cycles to burn.

Teletronix LA-2A Leveling Amplifier
This beauty defines "vintage audio gear". If you want warm, authentic analog in your DP mixes, this is it.

Nigel
A complete palette of guitar tones combined with every effect a guitar player could possibly ever need.

CS-1 Channel Strip
Whopping punch on a single DP plug-in insert: EQ, compression, delay and reverb all in one plug-in.
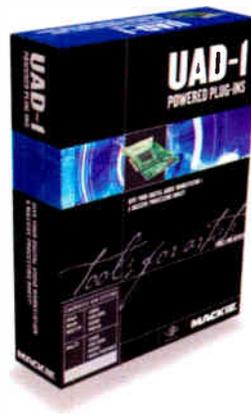
Cool School Interactus

From Cool Breeze Systems, the leader in pro audio interactive training. Cool School Vol. 6 for DP3 is like having a DP product specialist looking over your shoulder, with click-for-click simulations, over 2 hours of movie tutorials and "AutoPlayer" mode. Just sit back and soak up the info.

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Authorized Reseller

Ableton Live 1.5

It's Not Just for DJs Anymore

Within Ableton Live, samples are arranged by song section, eliminating the need to mute and unmute tracks.

Ableton really did its homework when it came out with its loop sequencer Live. The program was designed as a real-time performance tool to play samples, but Live offers much more than what hardware samplers can.

With drag-and-drop ease, you can place multiple loops in each track and have them conform to the session's tempo. The samples—one-shots, loops or extended files—are triggered by computer (QWERTY) keyboard strokes and MIDI Note-On messages. The program has multiple outputs and is compatible with multi-output sound cards.

Samples and effects can be added and removed on-the-fly without causing the program to hiccup. As it plays, Live lets you browse sound file folders and preview samples before sending them to the main mix output. And you don't have to worry about problems caused by running out of RAM because the audio streams from your hard drive.

Ableton recently released Live 1.5 (available as a free update from Ableton's Website, www.ableton.com), which adds support for ReWire 2, the ability to render to disk and includes a powerful reverb.

SEND AND DELIVER

Part of Live's charm is its ability to add and manipulate effects in real time. Besides inserting effects directly into tracks, you can also take advantage of the four send buses. Once there, you can set the send to work pre- or post-fader.

Version 1.5 offers a new way to set up pre-fader effects so that the dry signal doesn't come through. Instead of setting the send to pre-fader and setting the volume fader to the lowest level (in this case, - ∞dB), simply select Sends Only from the track's Output menu. This routes the audio to just the sends and lets you use the track's volume fader and meter to monitor signal level.

KNOW THY TEMPLATE

Creating a new Live Set takes time if you have a complex setup or use a multiple-I/O interface and MIDI controllers. To

get the job done quickly, Live 1.5 lets you create and save a default template to match your specific performance needs. Using a template eliminates the redundant tasks of mapping MIDI messages between Session view and hardware slots, routing inputs and outputs from Live's mixer to your audio interface, or adding effects to specific tracks.

To build a template, begin by defining the parameters in your Set. Then, save it as "LiveTemplate" (one word) in the Preferences folder where the Live.cfg file resides.

PROCESSING ON DEMAND

In Live 1.1, any effects called up in a Set put a drain on the CPU, whether or not they were processing audio. This means that you must choose your effects wisely: Add too many effects and you can bring your computer to its knees.

In Live 1.5, effects require CPU time only when they are processing audio. This is very useful when using effects that require a lot of power, such as reverb: As soon as there is no more audio input to the effect and the reverb tail has died off, Live 1.5 stops spending CPU cycles on that effect. The meter at the right of the control bar shows how the CPU is managing the processing load.

This means that you can use more effects in a Set than before, as long as you don't use them simultaneously. A good trick is to stagger the effects between tracks and run exact copies of the audio file through each at different times. For

example, suppose you have a sample you want to play through a reverb in scene 1 and through the Grain Delay in scene 2. First, add reverb to track 1 and the Grain Delay to track 2. Then, put a copy of the audio clip in slot 1:1 and slot 2:2.

While the clip plays in scene 1, the Grain Delay is not being used and therefore doesn't require CPU time. After the reverb tail has faded, only the Grain Delay will require CPU time. Notice that in this example, there is some overlap of the two effects that will affect the CPU.

Besides the effects included with Live, you can also use third-party VST plug-in effects. Careful placement of effects in each Set will keep you and your computer happily grooving.

TWO-WAY COMMUNICATION

For Live users who have a MIDI control surface with motorized faders, such as Radikal Technologies SAC-2K, Version 1.5 offers bidirectional MIDI capabilities. Live 1.5 can send Control Change messages via MIDI to control fader levels or knob position, which allows you to record automation data with the program and then have it update your controller during playback.

To use a control surface, select the MIDI device that will receive the controller messages using the MIDI/Sync Preferences menu. Now your virtual controls will move in harmony with the real ones. ■

Laura Pallanck is a freelance musician based in Northern California.

Introducing the 2408mk3

**24-bit/96k. DSP-driven mixing and monitoring. Up to 96 inputs/outputs.
On-board SMPTE and video sync. Legacy I/O support.
Same amazing price.**
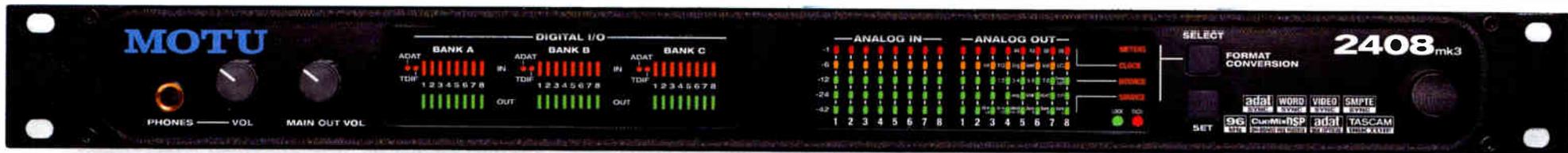
mk3 feature highlights

- **PCI-424 card** — connect four interfaces for up to 96 simultaneous inputs and outputs, or 48 in/out at 96kHz.

- **CueMix DSP™** — a new DSP-driven digital mixing and monitoring matrix with the same near-zero latency performance as today's latest digital mixers. Connect all your gear, including live synths and outboard effects processors, and then monitor and mix everything with your 2408 system—and do it all without a mixer in your studio. Located on the PCI-424 card, CueMix DSP works across all connected MOTU interfaces with no drain on your computer.

- **Legacy I/O support** — connect any MOTU PCI interface, including the 2408, 2408mkII, 1296, 1224, 24i and 308. Mix and match as you please.

- **Video sync** — resolves directly to video with fast lock-up and sub-frame accuracy (no sync box needed).

- **SMPTE sync/generator** — resolve your entire system to SMPTE time code with fast lock-up and sub-frame accuracy (no SMPTE synchronizer needed).

- **Software-switchable input levels** — choose +4dB or -10dB operation separately for each analog input pair.

- **Support for 96kHz ADAT optical** digital I/O (S/MUX) and 96kHz Tascam TDIF digital I/O.

Basic features

- **Expandable 24-bit 96kHz audio interface** for Macintosh and Windows with 24 channels of simultaneous input and output.

- **8 TRS +4dB analog outputs** — perfect for surround.

- **8 TRS analog inputs** with switchable input levels.

- **Separate TRS main outs** and front-panel headphone jack, each with independent volume control.

- **24 channels of 24-bit ADAT optical** input/output (three banks) with sample-accurate ADAT SYNC. Supports up to 12 channels of 96kHz optical.

- **24 channels of 24-bit Tascam TDIF** digital I/O (three banks). Supports 12 channels of 96kHz TDIF.

- **24-bit S/PDIF** digital input/output up to 96 kHz.

- **Word clock** in and out; SMPTE (LTC) in and out; video sync input; sample-accurate ADAT sync input.

- **Compatibility** with virtually all audio software on Macintosh and Windows 98SE/Me/2K/XP.

- **Includes AudioDesk** sample-accurate workstation software for MacOS with 24-bit recording/editing and 32-bit automated mixing/processing/mastering.

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