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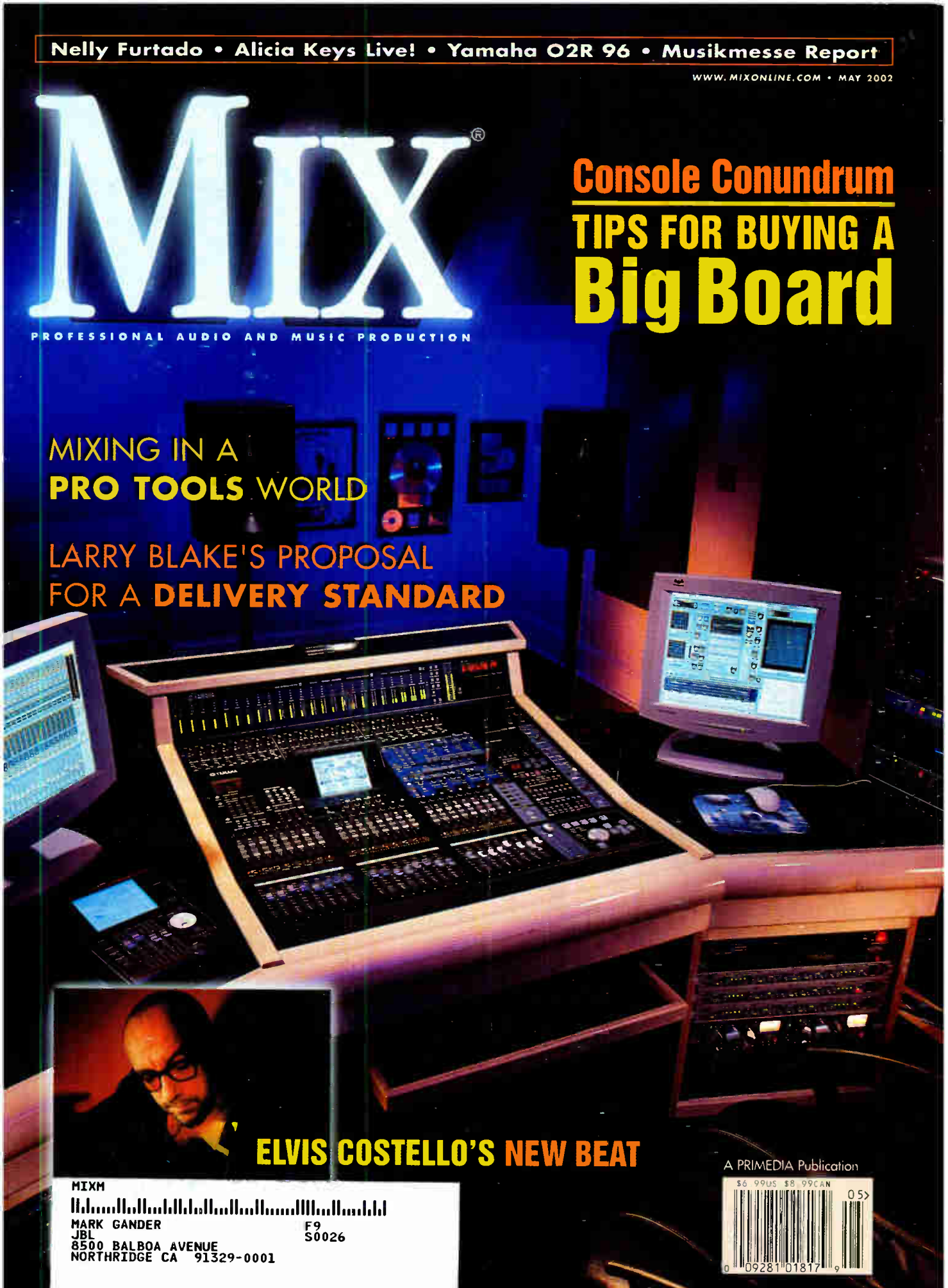

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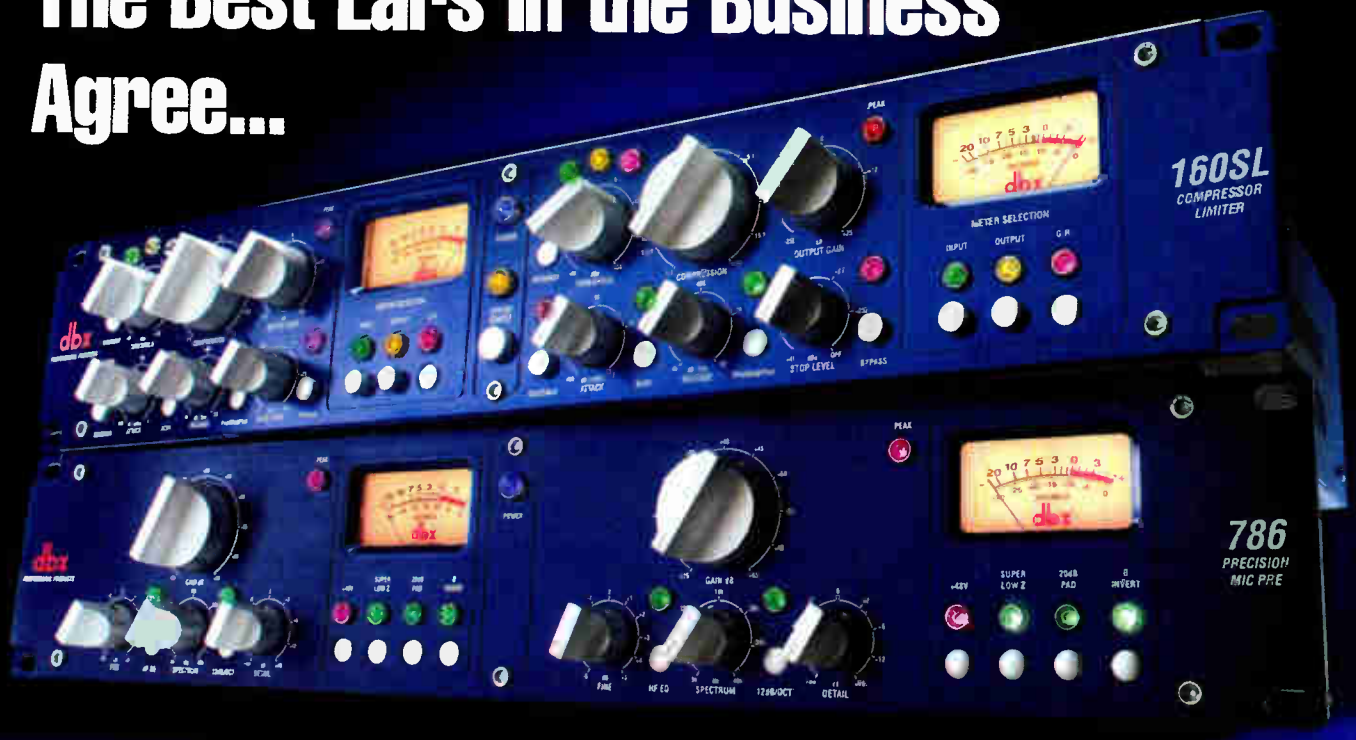

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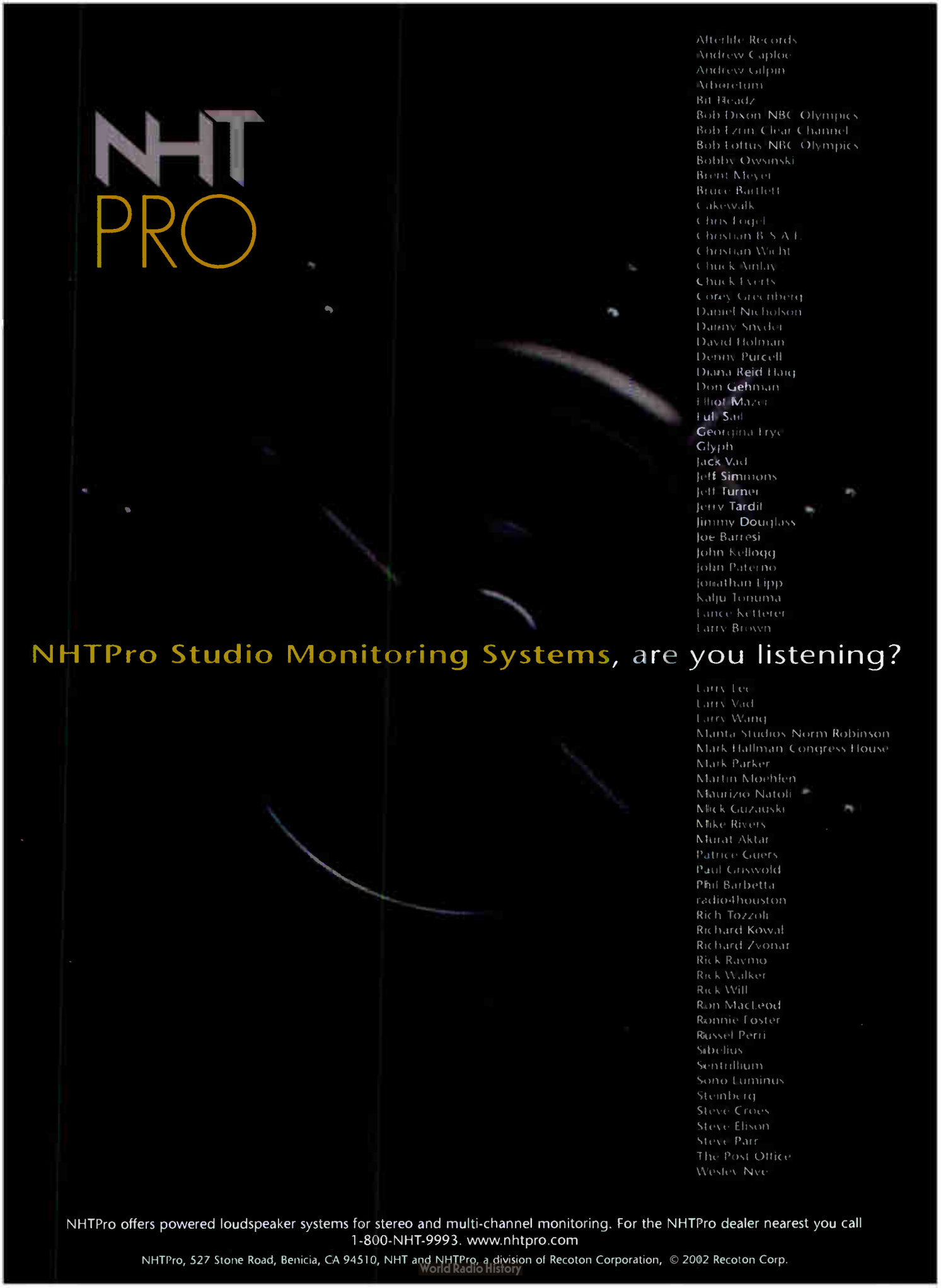

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May 2002, VOLUME 26, NUMBER 6


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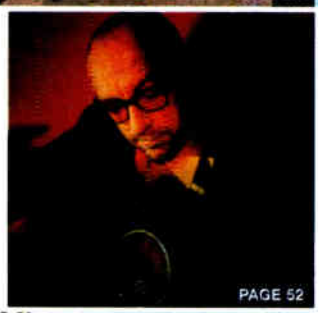
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features

Famed engineer Elliot Scheiner built his home studio, Eyeball, to accommodate 5.1 clients that couldn't afford the high-end studios he usually uses. The new room is centered around a Yamaha DM 2000 digital console and a Steinberg Nuendo system. For more, see page 18. **Photo:** Michael Partineo. **Inset Photo:** Jill Furmanovsky.

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PHOTO: STEVE JENNINGS

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Consolation

The last time I bought a console for my studio was 15 years ago. The board was—and still is—a Soundcraft 600 analog desk (these days, we tout it as "vintage"), and I've done a bazillion sessions on that board since picking up that weighty, 7-foot crate at Leo's Pro Audio in Oakland. Over the years, it has proved to be the right choice for my recording projects, which include music CDs, industrials, books on tape, radio documentaries and scoring dates.

Along the way, the board changed; I've added automation and a hot-rodded Audio Upgrades master section. Also, in moving from tape- to disk-based recording, the way in which I use the console has changed. Typically, the role of that console today is as a monitor desk during tracking to a DAW. But when it's time to mix (in stereo or 5.1), all sorts of possibilities arise, and I often do hybrid mixes, where I combine the strengths of analog mixing (and racks of outboard gear) with the pluses of virtual DAW mixing and tons of software plug-ins. There are no set "rules"; I may mix entirely on the DAW or completely on the 600, or I might send mix stems from the workstation to the analog board (or vice versa).

Every session and every person's style of working is different, so determining the right console for your needs is more vexing than ever. When I was console-shopping back in 1987, the process was difficult. These days, there are even more questions to consider: New or used? Analog or digital? Sampling rate: 48, 96 or 192 kHz? Console or control surface? Large-scale (many faders) or compact (channel layering)? Few or many preamps—or none at all? Is a "name" console important?

When considering a mixer for stereo *and* surround production—LCRS, 5.1, 6.1 or 7.1—the selection process becomes more complex. Points to investigate include multichannel metering options, and methods for surround panning, whether via mouse/screen, joysticks, panpots or some combination of all three. Control room monitoring is another issue: Several companies offer outboard surround controllers for expanding the capabilities of an existing console. However, a true surround production board should have provisions for multichannel monitoring—including the ability to solo or mute any playback channel easily—without tying up subgroups or console buses.

Eventually, we come to the price: Self-financing, leasing and trade-ins are all possibilities, but while you're thinking about money, figure in some extra dough for installation, wiring and interfacing your existing gear with the new arrival. Once you know what you can afford, the *real* fun starts. A/B comparisons between large consoles are nearly impossible to set up, but a couple of hours of critical listening—particularly to channel separation, bus noise and the quality of the equalizers—will reveal much about the character of the product.

In this issue, our Los Angeles editor Maureen Droney talks to a number of studio owners about the console selection process, and finds the decision is never easy—even for those at the top. But one thing is clear: The more you know, the greater your chance of finding the right console.

George Petersen
Editorial Director

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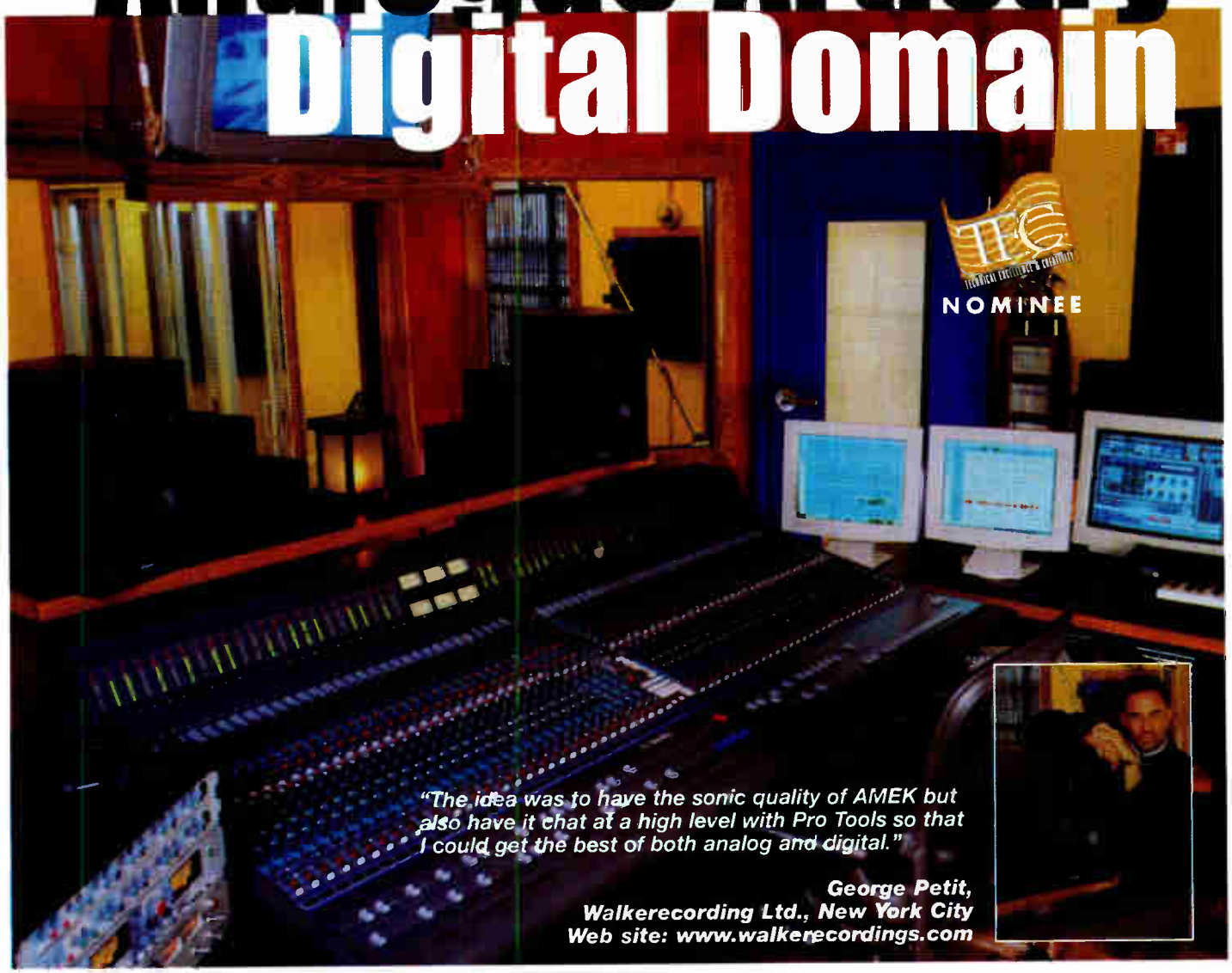

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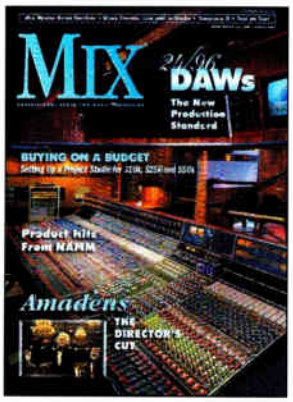

SWEDIEN AGREES: TRUST YOUR GUT

George Petersen's "The Trojan Kilohorse" editorial in the March 2002 issue hit the nail smack on the head! He talked about something I've been trying to get people to understand for many years, and it's more true now than ever before.

I have always loved hyperfidelity. As the editorial points out, it is far more than just being able to buy the new high-res hyperspace for your studio. The responsibility to make sure all your gear is up to the new standard goes with it. I love the comment, "Don't buy into specs for specs' sake!" Very true. Choosing equipment must be a very instinctive and personal process. After you make the initial choice about what equipment you want to assess, listen to it with your hearts and ears, and make the final evaluation with your instincts.

We must develop a willingness to follow our instincts. Gut reactions translated to music recordings are the most believable. If we have good instincts, we must learn to listen to that little voice in the back of our heads or behind our belly buttons and do what it tells us is right.

When tested with sophisticated equipment, two different consoles can measure essentially the same, yet when the same musical source is sent through these two mixers, their musical quality will be very different. I don't mean to imply that manufacturers' specification statements are deliberately falsified. Not at all. There are so many ways to interpret a technical statement that we absolutely must reserve the right to make an evaluation with our own needs, abilities and emotions as part of the process.

Don't let the printed page totally influence your judgment when evaluating music recording equipment. The performance specifications that manufacturers state are merely a starting point for selecting equipment we want to consider. If a computer analyzed all the frequencies and combinations of frequencies in the tone of a few violin notes, would the results tell you what kind of violin it was? The human ear can discern such subtleties almost instantaneously, using exclusively subjective means that are quicker and more accurate than any known test equipment.

The old musical instrument makers didn't measure, they just listened. Stradivarius didn't have a computer. Perhaps his violins would not have been as wonderful sounding if he had had a computer.

Bruce Swedien
Ocala, Fla.

CONVERSION CLARIFICATION

Regarding "Building Your System" in the March 2002 issue, Paul Verna's article is a good primer for putting together a project studio. However, there is one glaring error regarding his reference to the Yamaha 02RV2. He states that ADAT Lightpipe cards for the 02R are only capable of passing 20-bit audio maximum, which is why he suggests using TDIF cards instead.

This is not correct. The ADAT cards are capable of passing 24-bit audio, but the stock A/D converters in the 02R are only 20-bit. So, using the TDIF cards will still only pass 20-bit audio to a DAW.

With different A/D converters, the 02R can handle 24-bit audio. One good example is the Apogee AP8AD card that fits in an available expansion slot in the 02R. It gives the user eight channels of 44.1/48k, 24-bit A/D. This 24-bit audio can then be sent via either ADAT or TDIF interface cards in the 02R for connection to a DAW.

Tom McClure
Via e-mail

APPLES OR ORANGES?

In his otherwise-fine January "Tech's Files" column, "Dynamic Resurrection: The Altec 438" article, Eddie Ciletti states, "Know the difference between peak limiting (fast attack and release) and compression (medium attack and release)." Sorry, but this is not the difference between limiting and compression. Limiting pertains to cut-off of peaks while compression reduces the high-level signals and increases the low-level tones, i.e., it squeezes—compresses—them; and compression, per se, has nothing to do with the attack and release time, which could be fast, medium or slow.

Oliver Berliner
SounDesign Engineers
Beverly Hills, Calif.

THE PRICE IS RIGHT

I enjoyed Stephen St.Croix's humorous slant on the goth/slacker generation (Fast Lane, Jan. 2002 issue)—from a literary point of view—but as I was reading it, the voice I heard narrating was from the "Cranky Old Man" bit that Dana Carvey did on Saturday Night Live (*Back in my day, all we had were bulky $6,000 instruments that made only one sound each, and went out of tune on a daily basis—and that's the way we liked it!)*

In defense of cheaply made all-in-one devices: Granted, your magazine is geared toward engineers and producers, but I think a lot of these new devices that St.Croix mentions are meant to be songwriting/compositional tools—something that makes the creative process flow smoothly, and enables the user to flesh out ideas for a song that'll later get produced "for real." They sound good, they're affordable to those of us who are still starving musicians (who can't *afford a* pool—asbestos-filled or otherwise), and most importantly, they enable the user to make music quickly and intuitively. What the heck's wrong with that? Do you really get *that* offended when a so-called "non-musician" is creating something that sounds like music?

I'm sorry to sound like a disrespectful whipper-snapper, but I've heard St.Croix's sentiments echoed by other people whom I respect, and I can't help but think of these guys nervously watching the proliferation of great-sounding softsynths and FX plug-ins, and they're realizing that for the cost of repairing one of their Leslie horns, they could have the software equivalent of a roomful of perfectly integrated, high-end instruments and recording equipment (no patchbays, no aligning tape heads) that all work wonderfully together, and can be mastered and burned to a CD in one fell swoop.

I respect the impassioned guitar player, at one with his sweat-covered, lovingly crafted, curly-maple such-and-such. But at the same time, something's gotta be said for the grade-school kid who made the life decision to "get into music" because he was inspired by the cool beats and arpeggios he was playing on some battery-powered, all-in-one, beatbox-FX-DJ thing at the music store one day. And it was cheap enough that he could own it—not just *dream* about owning it.

Joe Fry
Via e-mail

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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.

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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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MARANTZ, DENON MERGE OPERATIONS

NEW COMPANY FOR A/V CONSUMER INDUSTRY

Marantz Japan Inc., Royal Philips Electronics and Denon Ltd., announced the creation of D&M Holdings Inc. (Sagamihara City, Japan), a joint holding company based on the merged operations of Marantz and Denon.

Included in the merger were staff changes: Tatsuo Kabumoto, president/CEO of D&M Holdings; Mitsushige Sakamoto, president/CEO of Denon; and Takashi Sato, president/CEO of Marantz.

The Denon and Marantz brand names will be maintained, as will sales, marketing and distribution channels. Marantz acquired the trademark rights and sales subsidiaries operating in Europe and the U.S. from Philips last May.

DVD FOUNDERS PRESENT BLU-RAY DISC

Nine leading companies announced that they have jointly established the basic specs for a next-generation, large-capacity, optical-disc video-recording format called "Blue-Ray Disc." The disc enables the recording, rewriting and playback of up to 27 GB of data on a single-sided, single-layer, 12cm CD/DVD-sized disc using a 405nm blue-violet laser. The disc can also record over two hours of digital high-definition video and more than 13 hours of standard TV broadcasting. The companies involved include Hitachi, LG Electronics, Matsushita Electric Industrial Co., Pioneer, Royal Philips Electronics, Samsung Electronics, Sharp Corporation, Sony Corporation and Thomson Multimedia. These companies plan on licensing the new format as soon as the specs are completed, which is expected around spring 2002.

Blue-Ray Disc's main specifications include: 23.3/25/27GB recording capacity, 36Mbps high-speed data-transfer rate, phase-change recording format, MPEG-2 video-recording format, and AC3 and MPEG-1, Layer 2 audio-recording format.

NONPROFIT CELEBRATES RAY CHARLES

Pictured at Ray Charles' studio in L.A. are: (L-R bock) Blues Lab students Mike Sheridan, Fernando Guzman, artist Ray Charles, Robert Shepherd, Zach Obidie, Delton Smith, Moises Rosales, Joaquin Bynum. (L-R front) Ron Baker, Melvin Williams, Blues Lab founder Dane Gillibrand.

Ray Charles and his recording engineer of 16 years, Terry Howard, were presented with the Blues Lab's Soldier of Blues Award at Charles' recording studio in L.A. The award is presented to those whose career is an inspiration to young blues musicians.

Paying tribute to Charles, high school Blues Lab students from Watts, Compton and south-central L.A. performed a set of his classic songs. Former Guns 'N Roses guitarist Slash joined in on the festivities, remarking that "it's really important that younger cats learn to appreciate the foundation of where modern music comes from."

Founded in 1998, Blues Lab, a nonprofit organization, provides free instruments and after-school jam sessions for disadvantaged youths across the nation.

To find out more about Blues Lab, check out www.blueslab.org.

EDUCATING SPRING BREAKERS

H.E.A.R. (Hearing Education and Awareness for Rockers) teamed up with The National Campaign for Hearing Health (NCHH) on Cancun's beaches during this year's Spring Break. The goal was to teach teens, musicians and music lovers about the dangers of hearing damage and tinnitus. H.E.A.R.'s Street Team passed out earplugs, hearing literature and provided listening tests to willing Spring Breakers.

Above: An MTV crew member wearing ear plugs. Below: MTV Spring Break crowd with performer Ludacris.

"Our Street Team is made up of volunteers —teens, bands, DJs and health students throughout the U.S. who care about their hearing and who want to help us tell their friends and fan base how important it is for their music sake to protect their hearing," commented H.E.A.R. executive director Kathy Peck. Event sponsors included MTV, Sonomax, Etymotic Research/ER20 Earplugs, Aearo EAR plugs, Westone Labs, Future Sonics and Ear-Q Tech Computer Hearing Analyzer.

COMPILED BY SARAH BENZULY

SAE MIAMI OPENS, MEADOWS TO 301

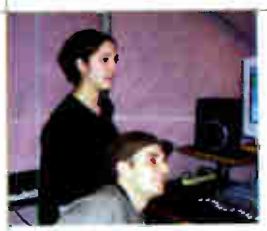
SAE founder/owner/CEO Tom Misner, left, welcomes mastering engineer Glenn Meadows to the Studios 301 team, as Mark Martin looks on.

A ragtag collection of industry journalists gathered in Miami March 1 for the official opening of SAE's 36th recording school. While gathered in the brightly colored, thoroughly modern lobby, following a walking tour of the facilities, SAE founder Tom Misner took the opportunity to announce the hire of venerable mastering engineer Glenn Meadows, who will head up the mastering operations of Misner's Studios 301 (Sydney and Byron Bay Australia, Stockholm, Sweden, and Cologne, Germany), as well as teach at the institute's schools.

SAE Miami, which is being run by Mark Martin, who also heads the Nashville institute, is going full-tilt with its first round of students. Classes are purposely being kept small, and yearlong enrollment is planned for no more than 200, to facilitate one-on-one instruction and hands-on operation. Rooms and learning labs range from music-composition cubicles, to Pro Tools stations, to maintenance benches, to 5.1, Mackie-equipped surround suites, to an SSL G Plus room, all the way up to a showcase Sony Oxford mix stage.

For more information, visit www.sae.edu.

DREXEL U. OFFERS MUSIC INDUSTRY DEGREE



Philadelphia-based Drexel University's College of Media Arts & Design recently launched a bachelor's degree program in music industry, with special emphasis on the business/financial side.

In addition to coursework, students work for Drexel's new music label, MADragon Records, where they manage production, including songwriting and recording, management and marketing. Students also arrange scores for movies done by Drexel film students and produce musical routines for the Drexel Dance Team.

"Our program is unique because it addresses all aspects of the music industry," said one-time Broadway sound designer and sound effects editor for Sony Television, Dr. Barry Atticks, director of the program. "It's important for future musical professionals to have a well-rounded understanding of the business decisions that will affect their professional lives." Check out www.drexel.edu for more.

KNITTING FACTORY HOSTS GIBSON AWARDS

The Edge (Best Rock Guitarist), Adam Clayton (Best Bassist) and U2 (Best Guitar Band) were among the winners at the Orville H. Gibson Guitar Awards held on February 26, 2002, at the Knitting Factory (Hollywood). Rock guitar pioneer Scotty Moore and legendary banjo player Earl Scruggs each received the Orville H. Gibson Lifetime Achievement Award.

Some of the winners include: Dave Matthews (Best Acoustic Guitarist, male), India.Arie (Best Acoustic Guitarist, female), Brad Paisley (Best Country Guitarist, male), Gillian Welch (Best Country Guitarist, female), Keb' Mo' (Best Blues Guitarist), Acoustic Alchemy (Best Jazz Guitarist) and Pete Yorn (Les Paul Horizon Award—Most Promising Up-and-Coming Guitarist). Nominees and winners are voted upon by members of the music media.

Scotty Moore (left) and Earl Scruggs

MIX LOOKS BACK

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

NUMBER ONE ALBUM

For the second consecutive month: Rumours, Fleetwood Mac. Producers: Fleetwood Mac, Ken Caillat, Richard Dashut. Engineers: Ken Caillat, Richard Dashut. Mastering: Ken Perry, Ken Caillat. Studio: The Plant (Sausalito, CA).

NUMBER ONE SINGLES

The Eagles' "Hotel California." Producer: Bill Szymczyk. Engineers: Allan Blazek, Bruce Hensal, Ed Marshall, Bill Szymczyk. Mixing: Bill Szymczyk. Studio information not available.

Leo Sayer's "When I Need You." Engineers: Bill Schnee, Howard Steele. Studios: Studio 55 (Hollywood).

Stevie Wonder's "Sir Duke." Produced by Stevie Wonder. Engineers: John Fischbach and Gary Olazabal. Studio info not available.

CORRECTION

In "Building Your System" (March 2002), the list price of Auto-Tune was incorrect. The correct price is $399 and not $299.

The Focusrite Penta "Field Test" (December 2001) listed the incorrect retail price. The correct price is $450.

Mix regrets these errors.

TEC AWARDS DISTRIBUTES PROCEEDS

The Mix Foundation for Excellence in Audio has announced the distribution of $45,000 from the 17th Annual Technical Excellence and Creativity (TEC) Awards, held last December at the New York Marriott Marquis.

Over half of the proceeds have been donated to the Sound Partners program of the House Ear Institute (Los Angeles) and Hearing Education and Awareness for Rockers (H.E.A.R.), based in San Francisco. The remaining proceeds will benefit scholarship programs at Berklee College of Music, Ex'pression Center for New Media, Middle Tennessee State University, University of Massachusetts-Lowell, University of Miami, University of Southern California, the AES Educational Foundation and the Society of Professional Audio Recording Services (SPARS). A significant contribution was also made to the Marriott Associate Assistance Fund, established to meet the needs of families of Marriott employees directly impacted by the events of September 11, 2001.

"We are proud to once again provide funding for numerous organizations of importance to the pro audio industry's future," said Hillel Resner, president of the Mix Foundation. "Even though the events of 9/11 affected attendance at the TEC Awards, thanks to our sponsors' generosity, we have been able to maintain our donations at approximately last year's level. The industry is to be commended."

The 18th Annual TEC Awards will be held on Monday, October 7, 2002, in Los Angeles, at the Wilshire Grand Hotel. For information on tickets and sponsorships, contact Karen Dunn at 925/939-6149 or e-mail info@tecawards.org. Information about the Mix Foundation and the TEC Awards can also be found at www.tecawards.org.

IN MEMORIAM: DAVID BLACKMER, 1927-2002

David Blackmer, the founder of dbx and president of Earthworks Audio, passed away on March 21, 2002, at his home in Wilton, N.H. A radio-building hobbyist since age 10, Blackmer started in the audio business as a stockboy at Boston's Lafayette Radio in the 1940s, surprising the staff by fixing radios that had been deemed unrepairable. While in the Navy, he learned radar electronics and later studied at Harvard and MIT, followed by jobs at Trans-Radio Recording Studio and Raytheon, where he designed telemetry circuits for the Mercury space program.

When Trans-Radio owner Lou Lindauer formed API in 1968, he turned to Blackmer for help in designing recording products, which led to the development of the VCA and level-detector circuits used in compressor/limiters.

In 1971, Blackmer founded dbx, based on the concept of using decibel expansion (hence the name "dbx") to replace the peaks lost from the limited dynamic range of magnetic tape. This led to much more. Blackmer's VCA and RMS detector changed the world of audio, yielding classic products such as dbx noise reduction, dbx compressors, the subsonic synthesizer, OEM VCAs for automated consoles and circuits for early stereo televisions.

Blackmer sold dbx to BSR in 1979 and stayed with the company for several years. He went on to form Earthworks—initially as a construction company to restore an old mill he bought in New Hampshire—but returned to his love of audio in developing Earthworks' award-winning line of high-performance microphones, Zero Distortion Technology preamps, and its newest products, the Sigma 6.2 time-coherent, 40kHz bandwidth reference monitors.

Besides touching the lives of millions of listeners worldwide with industry-standard products that have stood the test of time, David Blackmer's lifelong quest for excellence in audio remains an inspiration to audio professionals everywhere. He will be missed.

—George Petersen

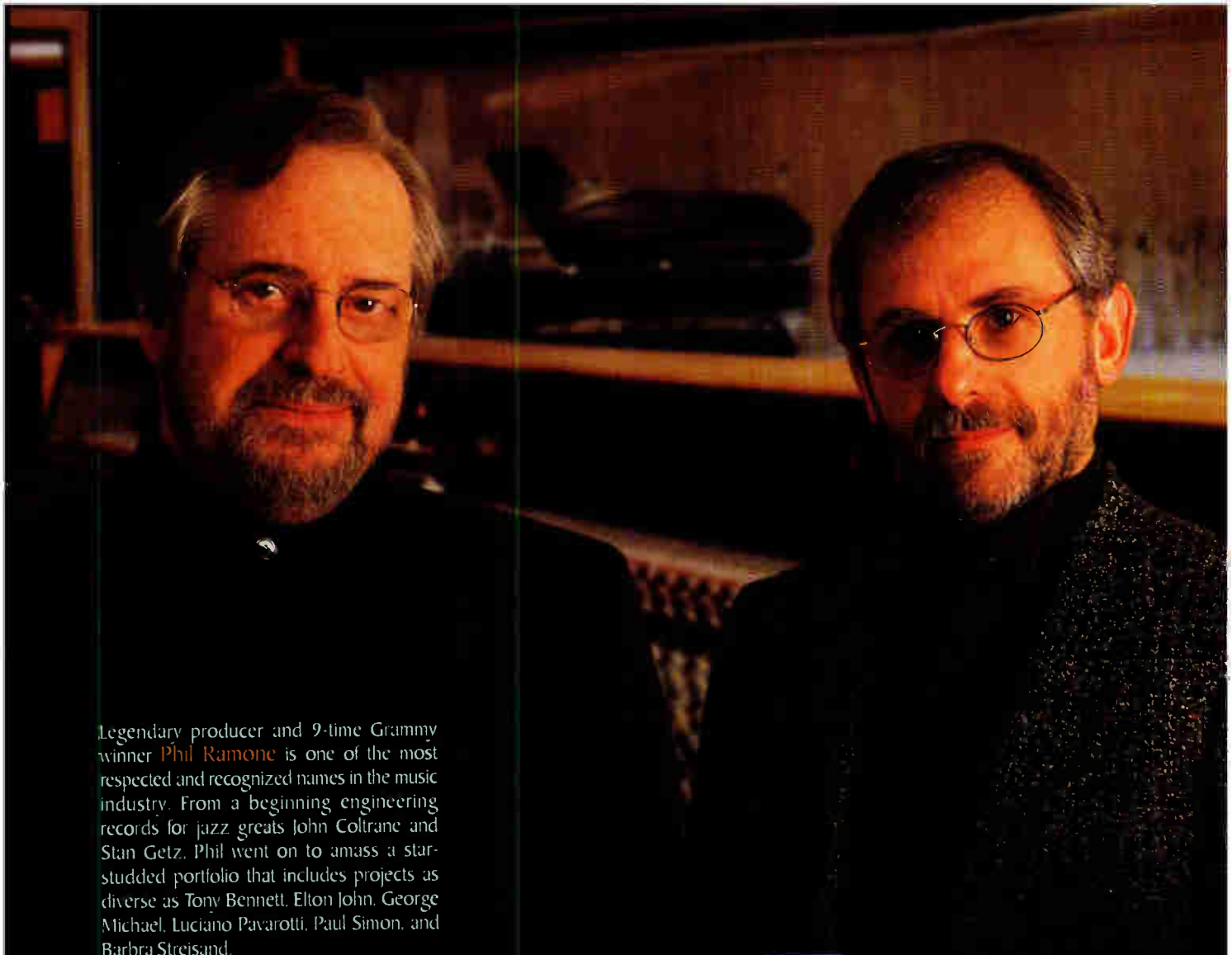
Industry News

Erik Papp

Steve Hardy

Richard Ngo-Tran

Following in his father's footsteps, **Erik Papp** has been named as **Summit Audio**'s (Watsonville, CA) president...**Shure Inc.** (Evanston, IL) has hired three category directors: **Rick Frank** for microphone products, **Scott Sullivan** for personal monitor and phonograph products, and **Bob Rieder** for audio processing products...Recording/mixing engineer **Steve Hardy** has been added to **SOS Management**'s (New York City) talent roster...Veteran mixers **Glenn Navia, Henri Perotti** and **Bill Smith**, as well as music director **Andrew Knox**, have joined New York City-based **HSR Studios**. For these new hires, company founder and CEO Howard Schwartz has rebuilt four of his 15 audio-for video suites ...**Howling Music**, a producer of original music for television commercials, has brought Academy Award-winning (*U-571*) sound designer **Jon Johnson** onboard as chief sound designer...**Richard Ngo-Tran** joins **JBL Professional** (Northridge, CA) in the music industry product manager position...Based out of L.A., **Denny McLane** has teamed up with Nashville-based **BSS Audio USA** as the company's regional sales manager...Working out of Santa Barbara, CA, **Kurt Metzler** is **Sennheiser**'s (Old Lyme, CT) Western regional distributed brands market development manager...New distributor news: **Audient** (Herriard, Hampshire, UK) appointed **ATI Group Distribution** (Jessup, MD), the newly formed distribution division of the ATI Group, to handle U.S. sales and marketing responsibilities for Audient's mixing consoles, surround sound processors and graphic EQs; **Network Pro Marketing** (Los Angeles) is the exclusive North American distributor for **Formula Sound** (UK). The U.S. authorized service center is located in Las Vegas...**Britt Strickland** joins **Griffin Public Relations & Marketing** (New York City) as account executive, where he will work with Griffin clients in the wireless, semiconductor and professional audio industries...**Digigram** (Montbonnot, France) hired **Frank Seidel** as communications manager...**Digidesign** (Daly City, CA) has retained the services of **Chandra Lynn**, new artist and press relations consultant...Get out those address books: **Rocket Network** (San Francisco) opened a permanent UK office and demo facility at: Unit 202 Canalot Studios, 222 Kensal Rd., London W10 5BN; **Crest Audio**'s (Fair Lawn, NJ) new address is: 16-00 Pollitt Dr., Fair Lawn, NJ 07410; 201/909-8700; fax 201/909-8744; and **SurgeX** (Pipersville, PA) relocated to 6131-B Kellers Church Rd., Pipersville, PA 18947; 215/766-1240; fax 215/766-9202.



Legendary producer and 9-time Grammy winner Phil Ramone is one of the most respected and recognized names in the music industry. From a beginning engineering records for jazz greats John Coltrane and Stan Getz, Phil went on to amass a star-studded portfolio that includes projects as diverse as Tony Bennett, Elton John, George Michael, Luciano Pavarotti, Paul Simon, and Barbra Streisand.

Elliot Scheiner, studio engineer extraordinaire, is no stranger to success either, having worked with some of the most-listened-to artists ever recorded: Phil Collins, The Eagles, Fleetwood Mac, John Fogerty, Steely Dan and Sting, just to name a few.

Together, Phil and Elliot have merged their amazing talents on projects with Natalie Cole, Aretha Franklin, Billy Joel and Frank Sinatra.

To accurately capture the essence of an artist, they rely on 40 Series microphones. "The first time I used the 40 Series, I knew that A-T was on to something special," says Phil. "They have an almost magical ability to bring out the best in any performance, while always remaining true to the source."

Take a tip from these music industry legends and try 40 Series microphones on your next session. Who knows? You might just be making musical history – like they have.

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Elliot Scheiner's Eyeball Studio

By Paul Verna

Why do engineers build home studios?

Their motivations tend to fall into two categories. On the one hand are those who—for lifestyle, business or other reasons—create facilities that allow them to do virtually all their work at home. These engineers usually have solid enough track records to ensure that projects will follow them wherever they go.

On the other hand are engineers for whom a home studio is little more than a workshop—a demo room, or a place that might allow them to do minor editing on works in progress in commercial facilities. The engineers' budgets for such setups are usually as modest as their expectations for them.

Then there's Elliot Scheiner. His new Eyeball studio—which occupies a second-floor room in his home in Reading, Conn.—is neither a be-all, end-all facility nor a rinky-dink basement contraption. It is a well-appointed, professionally spec'd studio designed to accommodate a niche within Scheiner's new specialty of remixing old masters in 5.1 channels: projects that simply wouldn't get done on commercial studio budgets.

That means Scheiner continues to do the bulk of his work at his favorite "outside" studios, which include Presence in Westport, Conn., Sony and Hit Factory in New York, and Capitol in L.A.

"The reason I built this room is that, after the September 11 attacks, as things started to more or less get back to normal, I received inquiries about doing a couple of different 5.1-channel projects. People would say, 'I would like to do this or that but I honestly can't afford to spend the kinds of budgets we've been spending to do the major catalog pieces. If I can't do it for *X* number of dollars, I won't do it at all.' I thought it was more important to have catalog out, because this is an emerging market, so I built a room designed specifically for low-budget stuff."

Noting that he went back to Presence to remix R.E.M.'s *Automatic for the People*, Scheiner says, "I didn't build this to put studio owners in jeopardy."

The centerpiece of Eyeball is the first installation of the new Yamaha DM 2000 digital console and a Steinberg Nuendo system. Other equipment highlights include Steinberg DD8 format converters, Alesis HD24 hard-disk recorders, a Yamaha SREV1 sampling reverb, dbx 160SL compressors, five Yamaha MSP10 monitors, an Eventide Orville processor, a Studio Technologies StudioComm 5.1-channel controller, and Monster cabling throughout the studio.

PHOTO: GENE HSU

Scheiner, comfortably at home with his Yamaha DM 2000 console and MSP10 surround monitoring.

Scheiner chose the Yamaha DM 2000 because of its sonic performance, high resolution and extensive channel capacity. Comparing it to other digital consoles tailored to high-end project studios, Scheiner says, "I love this console. It has so many bells and whistles. I wanted a board that gave me more than 24 channels of 24-bit, 96kHz audio, and with the Yamaha, I have 96 full-resolution channels."

Scheiner designed and built the studio himself, with extensive input from Sony Studios VP Dave Smith, who advised him on sonic treatments and other acoustics issues. "Dave took a look at the room and talked about how to treat it sonically," says Scheiner. "He was my main consultant."

The first project Scheiner undertook at Eyeball was a 5.1-channel remix of *Candy Man*, an early-'90s solo album by Toto singer/guitarist Steve Lukather that was originally released in Europe. The surround version will be issued this year by DTS Entertainment as part of a guitar series.

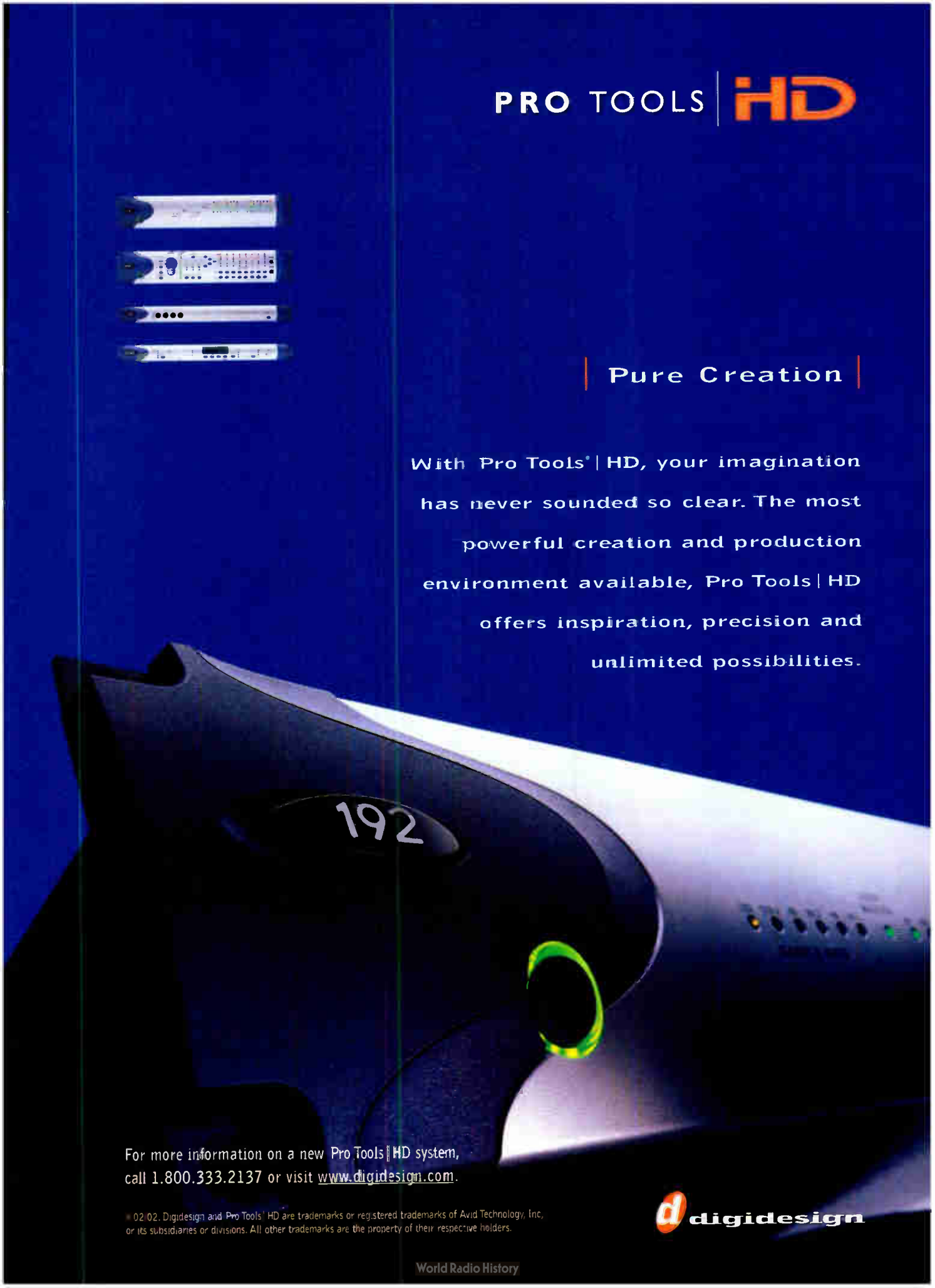
When Scheiner went to check his *Candy Man* mix at Darcy Proper's mastering suite at Sony Studios, he discovered a bump in the upper midrange that indicated a problem in his studio's acoustics. Fortunately, he was able to rectify it easily, and the room is now accurate to Scheiner's exacting specifications.

Since completing the Lukather album, Scheiner has been remixing *Automatic for the People* and Donald Fagen's *Nightfly* in 5.1, as well as doing a new surround version of Steely Dan's *Gaucho* at a higher resolution than his original 5.1 mix—which was among the first projects done for discrete multichannel in the late-'90s. In addition, Scheiner is working at New York's Sear Sound on a new Steely Dan album, which for now will be stereo-only.

Whereas all those major projects are taking place in commercial studios, Scheiner anticipates getting back to his home facility in the near future to remix a Roy Orbison greatest-hits project in 5.1, and a Japanese pop album.

"I love working at home," he says. "I got up this morning, drove my son to school, and went to work. I haven't gotten out of any gnarly clothes yet. That's pretty cool." ■

Paul Verna is Mix's New York editor.



BY STEPHEN ST.CROIX

If Your Screen's Not Clean...

Smoke Gets in Your Eyes

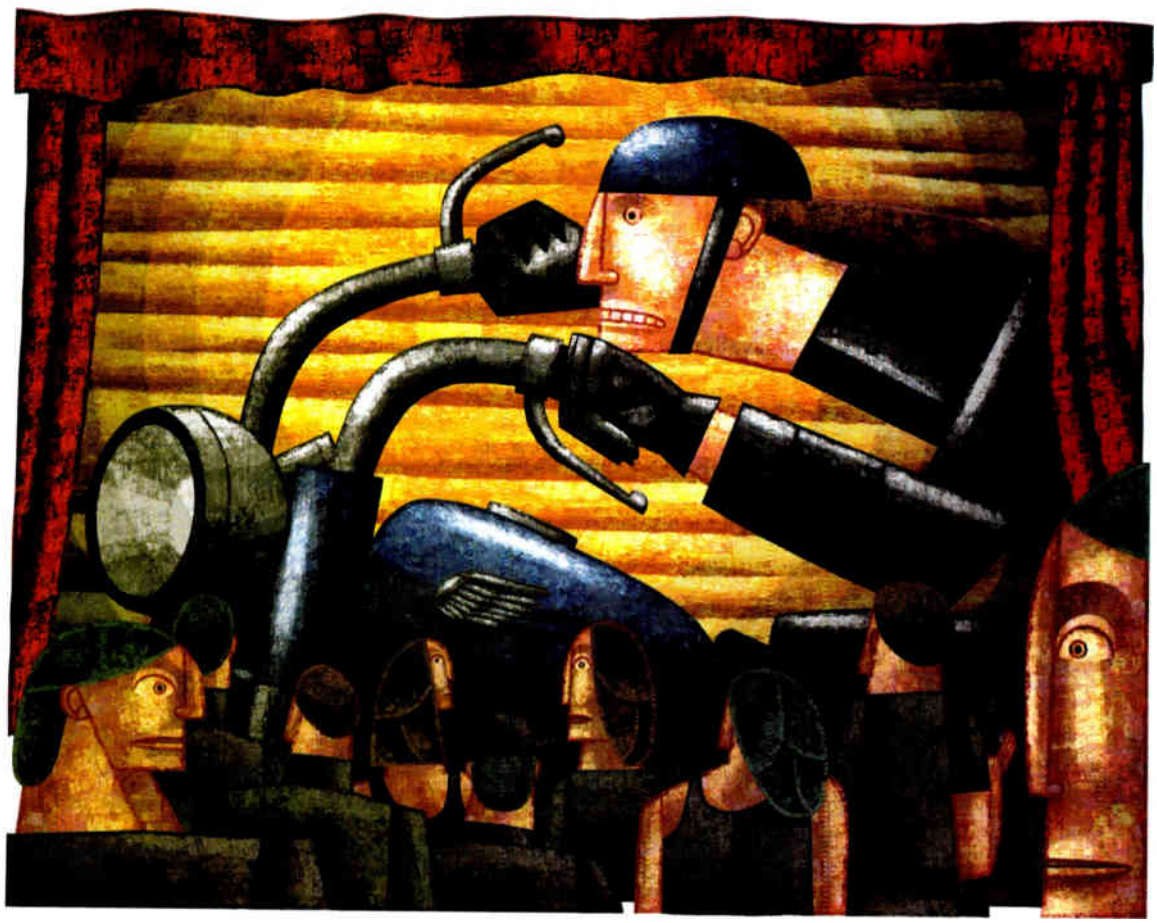


ILLUSTRATION RICHARD DC:WHS

Welcome back. This is Part Three of the two-part series on making what you see look better than what you really have. Those of you who don't feel the need to bring a little light into your control rooms need only skip this last video column, for next month, I shall return to my appointed recording industry pontifications.

But right now, we are going to look at screens. If you hung with me through projectors and plasma, then I bet you can make it through one more. After all, this is for your *studio*, remember? Where there will eventually be as many display devices as outboard processors. And as for the promised (or threatened) line-doubler/de-interlacer material, it will come later. Things got pretty interesting, and in the end, there was no way to fit both that and the info in the screens in one column, even one of these double-length monsters. I chose screens so that you would know what to use with your new projector.

AND NOW, DRIVE-IN MOVIES: SCENES ON SCREENS

All cars were once black, and all screens were once white.

As technology advanced, cars eventually became available in several thrilling new shades of black, and screens in way too many kinds of white. And in the end, as we all know, cars finally shipped in every color that the demented designers could think up. Remember Fiat 850s in slurpy green, fluorescent puce and even Da-Glo safety-vest orange? Or maybe that was before your time.

And projection screens? They remained 10 kinds of white until only a few years ago. But finally, as new projection technologies expanded the potential screen

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market by a thousandfold, certain heretic manufacturers began subtle experimentation with screen surfaces.

BACK TO BIKES

One of my Harleys has 40 coats of alternating blue, aqua and red-tinted clear, masked in patterns over a three-color saran job, all floating over six different silvers and three golds, misted in varying densities and separated by their own slightly tinted sets of clear coats. All this is laid down over a new technology that uses a finely crushed, pigmentless, holographic material that produces rainbows a quarter-inch over the surface in the presence of a single-source light, while changing to a muted, coarse silver under diffuse light.

The actual bandwidth (color spectrum) of the floating rainbow is controlled not by tint or pigment, but by layers of high-Q dichromatic crystals, with each layer's actual crystal angle and therefore the frequency of its resonance (optical bandpass) controlled by a lifting agent that forces the crystals to align anywhere between laying flat and standing straight on end, 90° off the applied surface.

In addition, the words "Harley Davidson" on either side of the gas tank are done in micro-bead—tiny glass spheres that gather light and return it with amazing gain in the same direction that it came from. This is technology evolved from the much larger light-gathering beads used on stop signs and license plates.

Anyway, the final effect of all this is basically a blue bike. A very deep, swimming, 3-D, translucent, iridescent, multilayered, multitinted blue with ghost patterns that appear and disappear as you walk around it or as the light changes, but outside of the insane few who can tell the difference, it's just a shiny blue bike.

Three months of labor and the ultimate in bleeding-edge paint technology to produce a final surface that you either get or don't, depending on your level of interest.

For the past few years, I would come in from a nice summer ride on that bike, have a little dinner, and watch a DVD or maybe a DV of the ride. (A stabilized 16:9 camera with wide-angle lens on a low frame mount produces some pretty impressive mountain road footage.) You have *no* idea how big a chipmunk's eyes get while he decides to run left or right in front of your wheel.

And having been through the painting of that bike, I began to wonder more and more if any of these exotic light-reflecting technologies might be applicable to my screen. I was already using a certain amount of one of these technologies in a unique Da-Lite screen that I picked up a few years ago, about when I painted the blue bike. More on that soon.

WHEN WHITE IS BLACK AND BRIGHT IS BACK

Well, it turns out that while I was riding and wondering, projection screen material technology was undergoing a strikingly similar series of technical advancements. And frankly, after many decades of—well, let's just say "technological stability"—it's about time.

In the world of film and video screens, there is an official "white." It was originally established a few weeks after light itself was invented and has never changed. This "reflectance standard" is magnesium carbonate. It is considered the Holy Unity Gain Stuff, *and* it can be used to cure bacon.

Three months of labor and the ultimate in bleeding-edge paint technology to produce a final surface that you either get or don't, depending on your level of interest.

It provides a matte-white surface with a "gain" of 1, no "hot spotting" and a very wide viewing angle. Nobody uses this stuff, of course, but its characteristics are the established base line for all screen materials and coatings in use today. It is the reference for the color white and the gain of 1: Not too different from an average modern white living room wall, not too different from the screen in your local movie theater.

As video projection became more widespread, higher-gain screens were needed to overcome the dismal amount of light that the original CRT projectors could deliver. The first real advancement was to glue a layer of glass beads to the white screen, just like the reflective surface of a license plate or stop sign.

You understand that "gain" is just a trick, of course; you can't get back more light than you throw at something. What you *can* do is force the light back in the same direction from which it came. Beads act as tiny mirrored lenses, forcing more light back toward the source. This means that if you walk over to the side of a flat white screen with an image projected on it, then you will still see the image more or less normally. But if you do this with a high-gain screen, it will be nice and bright when you are dead-center (with the light source over your shoulder), but as you move off-axis, it will get dimmer rapidly.

So glass bead gain trades brightness for viewing angle. The light is literally taken from the sides and collected in the center. This basic trade-off is one of the most important things to remember, and it must be a primary consideration when you're choosing screens.

It turns out that there are other potential problems with the gain game, as well. Too much gain at the center of the screen becomes noticeably brighter than the edges, and skin tones may shift as this selective reflectivity is typically not flat across the optical bandwidth. In simple terms, it is possible for higher-gain screens to have a more green center and more purple edges. This problem may or may not appear in your control room with any given projector technology, with your given viewing angles and distances. Prices may change without notice. Drugs may interact differently in the presence of alcohol.

Because there are so many variables, and each of them is again modified by the presence of alcohol, I can tell you which plasma panel is the most accurate, and even which projector is the most honest or the most impressive to your clients. But screens? These you have to check out for yourself, like you would speakers.

MY FIRST CUSTOM SCREEN JOB

This would be that Da-Lite screen that I mentioned before. It has a gain of 1.3, and it does this *without* resorting to glass beads. Instead, it uses a very slight pink pearlescent coating that looks suspiciously like a single-coat pearl that I used to use when painting cars. I love this screen. It is warm and accurate and does not "hot-spot" (brighter center), and it has an acceptable viewing angle. Its only real shortcoming is that it is very sensitive to stray light.

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MY NEW CUSTOM SCREEN JOB

There are certainly a lot more choices out there right now, with insane gains and various surfaces optimized for specific projection technologies. Now *there's* a worrying thought...A different screen for LCD and for DLA? And just to keep things interesting, the price spread can exceed 10:1 for any given size.

It is beyond the scope of this month's column, and I am sure well beyond the scope of your interest, to tell you everything that I saw and learned, so I will highlight the single freak discovery, the one with the most radical and the most interesting technology. This is also the one that the screen-dweebs are talking about online. In fact, why don't you drop by yourself and see what their world looks like—a bit different from our own RAP. Try www.avsforum.com/. See if you can spot the equivalent to RAP's Fletcher.

Right now, the freak screen material is certainly the FireHawk from Stewart Filmscreen. These are the people who brought us the now dominant "black enhancement" GrayHawk 0.95-gain screen. To bring you up to speed, this screen is designed to help overcome the poor blacks of today's digital projection technologies by controlling ambient light reflection. It works. With a gain of 0.95, it is noticeably darker than a normal white screen. In fact, the material itself is a mid-gray. Kind of scary looking, actually.

And while black depth and detail are certainly improved with this screen—dramatically in situations with some ambient light, like a control room—it is just too dark for my use, with my Marantz projector. I just don't have enough lumens to be able to sacrifice much brightness for better contrast. And I guess I must not be alone, as evidenced by the existence of the FireHawk.

So, I will focus the remainder of this month on that screen. Keep in mind, though, that there are three entire families of options out there. Basic white systems and their various silky variants with gains from unity to 1.3 (I do like my Da-Lite), high-gain monsters that will return a blinding movie from a 15-watt Easy-Bake projector (check out the Draper M2500 screens), and finally the freaks, which, in this case, turn out to be the old standards, the establishment itself, provider of screens to Hollywood: Stewart.

SHOW AND TELL

I have to admit that when I first fired up the Marantz on the Stewart FireHawk, I thought, "What have I gotten myself into?" It was cold and dark, and though it clearly made better blacks in ambient light, I felt my environment was controlled enough that ambient lightfall was not a pressing problem. And when used in total darkness, the FireHawk's one claim to fame, greater suppression of ambient and therefore crisper blacks, would be moot.

In fact, I was so discouraged that I put it away to reconsider. And away it stayed for more than three weeks. But when my deadline arrived, I knew I had to pull it out and try to explain why it wasn't working for me. And so...

> In the world of film and video screens, there is an official "white." It was originally established a few weeks after light itself was invented and has never changed.

Even with my worries about it being so dark, it was obvious that this screen is pretty clever. Not magic, no shards of broken physics on the floor under it, but pretty clever. It has a background material that is a *very* dark silver-gray, much darker than even their negative-gain GrayHawk. But on top of this extreme negative-gain backing is a sophisticated high-gain surface that yields a final system gain of 1.3, but with a gamma curve all its own.

Talking to Stewart was like talking to a custom paint shop. They are actually aware of and use a lot of these freaky technologies to control how coatings and iridescent crystals stick to their screens. They are clearly using multilayer technologies with different materials in each layer. They unofficially admitted to secrets like controlling the angle of crystal stand-off. For me, it's comforting to think that there's a little bad bike in every good screen.

So when I fired it up again, there was medium-low ambient light in the room, as a plasma searchlight was on in the back. Both the Da-Lite and the FireHawk were up. The FireHawk was clearly darker, and mid-colors seemed faintly silvery-green compared to the Da-Lite. Shadows and the top and bottom blanking bars were pretty impressive, though.

Then I turned off the plasma and added about half as much ambient light with a variable-output halogen using a diffusion filter.

It was then that I realized that I might not have originally understood exactly what the FireHawk is for, or what it does. And that may be because what it does actually changes dynamically as the background light level changes.

Using this ½kW halogen, I spent half an hour changing ambient light, checking and double-checking what I saw. When the room was very bright, the Da-Lite (the brighter screen) died. The image consisted of areas of ghostly milk and other areas of nothing. The FireHawk, on the other hand, just sort of sat there and delivered. There was a totally usable image on screen at a full ½ kW of ambient! The only bad effects were that the image looked colder and darker, and dark shadow detail disappeared. It was weird how little the image changed. In fact, it was *very* weird, almost as if it wasn't projection technology at all.

My standard 1.3-gain pearl acted exactly like a screen, growing predictably more washed as room light increased, until there was almost nothing left. The FireHawk seemed to do this weird sort of crossover thing that almost looked like it *could* break the laws of physics. As I took the room light up, it acted like a screen, but sort of a desensitized one. It seemed to react to ambient about one-quarter as much as a normal screen. As I brightened the room, the Da-Lite began to give up, but the FireHawk seemed to switch to a new mode and finally looked like a huge printed photograph instead. A new experience, to say the least.

All parts of the image were quite a bit darker than the objects in the room, with white being a definite silver-gray, yet the image was intact.

And then I went back to low, and finally no ambient light conditions to recreate the situation that made me originally doubt its validity. And sure enough, I didn't like it that much, even though colors were undeniably more dense and, well, serious, and blacks were amazing.

And then came the Homer Simpson "Doh!" This screen is *way* different from what I am used to, so maybe I owe it a dedicated projector setup. So I set up the Marantz specifically for the FireHawk. Absolutely everything had to be redone, including color and even overall color tem-

—CONTINUED ON PAGE 177

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BY PAUL D. LEHRMAN

The World Above 20k

What Are We Missing?

ILLUSTRATION: ARIL TERRY

Like most of us, when I was a kid, I suffered from a bad case of technolust. Among my favorite reading matter were catalogs from Allied Radio, the monthly *Popular Electronics*, and the publications of the American Radio Relay League, the organization of ham radio operators, of which I was a member—although, at the age of nine, not a very accomplished one. One of my favorite books of theirs was a slight volume called *The World Above 50 MHz*, which talked in vague terms about how hams of the future might be able to take advantage of what were then considered "trash" radio frequencies. Although these high frequencies (or very short wavelengths, as we used to refer to them) might be useable for things like commercial television and FM radio broadcasts, they were not much good for any sort of long-distance communication, which is what hams lived for. Novice ham operators (like me) were allowed to operate voice transmitters way up there around 144 MHz, where they wouldn't bother anyone. Much more valuable to experienced hams was the spectrum between 2 and 30 MHz, because signals at those "short-wave" frequencies could bounce off the ionosphere and travel around the world. Above 50 MHz was of interest only to "experimenters."

Since those days, the VHF, UHF, SHF and EHF ("S" for Super and "E" for Extra, in case you were wondering) bands have, of course, been used for a stunning variety of purposes and are now viciously fought over by a plethora of different wireless services, both real and imagined. With the advent of the communications satellite, short-wave radio (with the exception of propaganda broadcasts into unfriendly nations) went more or less the way of the dinosaur. Congested spectra made signals that did *not* bounce, but instead beamed right through the ionosphere, much more valuable.

Today, we all talk nonchalantly about 700MHz digital television broadcasts, 900MHz wireless phones, 1.9GHz digital cell phones and Ku-band satellites, which use the 13 to 18GHz band. In Europe, research and field testing are going on into frequencies as high as 60 GHz—which would have a great

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future in point-to-point transmissions, were it not that they tend to be disrupted by things like snow.

But you don't want to hear me talk about radio, you want me to talk (if at all) about audio. Just as the radio amateurs of yore considered 50 MHz the top of the useable spectrum, audio engineers and enthusiasts have long regarded the 20kHz upper limit of human hearing as an inviolate parameter, and signals above that simply didn't need to be dealt with. In the days of analog, this proved to be very helpful, because the physics of audio transducers and media—the tape and tape heads, microphones and speakers—made recording ultrasonic frequencies a difficult proposition indeed: Above about 10 kHz, for every tiny increase in high-frequency response, was an enormous increase in cost.

This is not to say that the world above 20 kHz has been completely ignored. Phonograph records have long been—at least in theory—capable of playing higher frequencies; in fact, the ill-fated '70s quadrophonic LP system known as "CD-4" (for "Compatible Discrete," not the other kind of CD) took advantage of this fact by putting the back/front difference signal onto a 30kHz carrier, which meant that signals as high as 45 kHz were being cut into the grooves (even though they did tend to disappear after a few listens).

And there have always been laboratory instruments, both transducers and recorders, capable of handling ultrasonic frequencies. Some of these, like B&K microphones, have trickled their way down into the professional audio world.

In analog audio, the top-end response of a system generally sort of fades away gracefully the higher you go, not unlike the noise floor. In digital, however, because of the need for a fixed-clock frequency, there is an absolute limit, the Nyquist frequency, above which signals cannot be processed, period. Ever since the first digital systems—F1, DAT and CD—put a brick wall up in front of any frequencies over 20 kHz, voices have been grumbling that this really wasn't high enough. Many of the grumblings were objections to the phase distortion that the lowpass filters engendered below 20k, but some were complaints that we were losing "detail" in the higher frequencies, which could never be recovered, and that in order to achieve true "high fidelity," our audio systems needed to stretch further into the ultrasonic realm.

In recent years, as the cost of bandwidth and digital storage has plummeted, those grumblings have become a deafening roar. Much of the pro audio community is now regarding ordinary CDs (which were once described, lest we forget, as "pure, perfect sound forever") with something approaching contempt, while even sub-$1,000 home recording systems are boasting about the superiority of their 96kHz sampling rates so that those of us with plain old 44.1 and 48kHz hardware are feeling left behind.

But do we really need these higher sampling rates? Or is the whole thing, as some say, just a marketing scam to shame us into junking perfectly good equipment and buying all new stuff? Or is it perhaps something that we audio pros have latched onto to make us feel superior to the great unwashed millions who are forced to listen to lo-fi audio that tops out at a paltry 20k?

Do we really need these higher sampling rates? Or is the whole thing just a marketing scam to shame us into junking perfectly good equipment and buying all new stuff?

Well, the question of whether we need to do this actually has to be broken down into three questions: First of all, can we hear sounds above 20 kHz? If not, do ultrasonic frequencies somehow influence sounds that we *can* hear? And if they don't, is there something about higher sampling rates that makes the stuff in the audible band sound better? I'm going to deal with the first two parts this month and then try to tackle the third in another column.

There's no question that there is plenty of sound energy far above 20 kHz in the musical and natural worlds. For some striking evidence of this, take a look at a paper (www.cco.caltech.edu/~boyk/spectra/spectra.htm) by James Boyk, a pianist and electrical engineer at Caltech, which shows, among other things, that the spectrum of a trumpet with a Harmon mute slopes down linearly and smoothly from 2 kHz all the way to *102* kHz—and probably beyond, but that's where his spectrum analyzer quits.

But do those frequencies actually reach us? As I wrote here a couple of months ago, Dr. Chris Halpin, an audiologist at Massachusetts Eye and Ear Infirmary and an erstwhile electronic musician, says that there's no way to measure a human's response to sounds above 13 kHz or so. It doesn't mean we don't hear sounds up there, it just means that they have not figured out any objective means to quantify our sensitivity to them—or lack of it. Whatever it is, however, it's awfully small. According to the tests Dr. Halpin gave me, for example, my sensitivity at 10 kHz is down some 60 dB and plummeting. If the curve were to continue, my sensitivity at 20 kHz would be -120 dB, which is probably comfortably below the noise floor of my nervous system.

Interestingly, the audiologists tell us that we also can't differentiate between dissimilar frequencies in that range. When anything above about 12 kHz tickles the cilia deep in our inner ears, it registers in our brains as "high," and that's about all the information we get from it. It might appear, then, that as long as there is *something* going on in the top octave, it sounds perfectly okay to us.

But surely people have done some hard research to see if we respond to frequencies above 20k, haven't they? Well, a search of the literature actually turns up one—count 'em, one—formal study in this area. A paper presented at the AES Convention in October 1991 by five gentlemen from the National Institute of Multimedia Education in Japan is titled "High-Frequency Sound Above the Audible Range Affects Brain Electric Activity and Sound Perception." (It is preprint number 3207, available from the AES at www.aes.org.) It's quite a fascinating document with some pretty weird results. The researchers stuck electrodes on the scalps of a rather small sample of people—10 men and six women, ages 20 to 34—and played them the recorded sounds of a Gamelan orchestra, a source that is very rich in high harmonics. The subjects heard the recordings through two systems: one with response out to 40 kHz, and the other with a lowpass filter at 26 kHz.

In A/B testing, the subjects could not hear any difference between the two systems. However, the researchers found that six of the 16 subjects showed a marked increase in brain electrical activity, which started anywhere from 20 to 80 seconds after the music started, when they were listening to the 40kHz sound.

—CONTINUED ON PAGE 202

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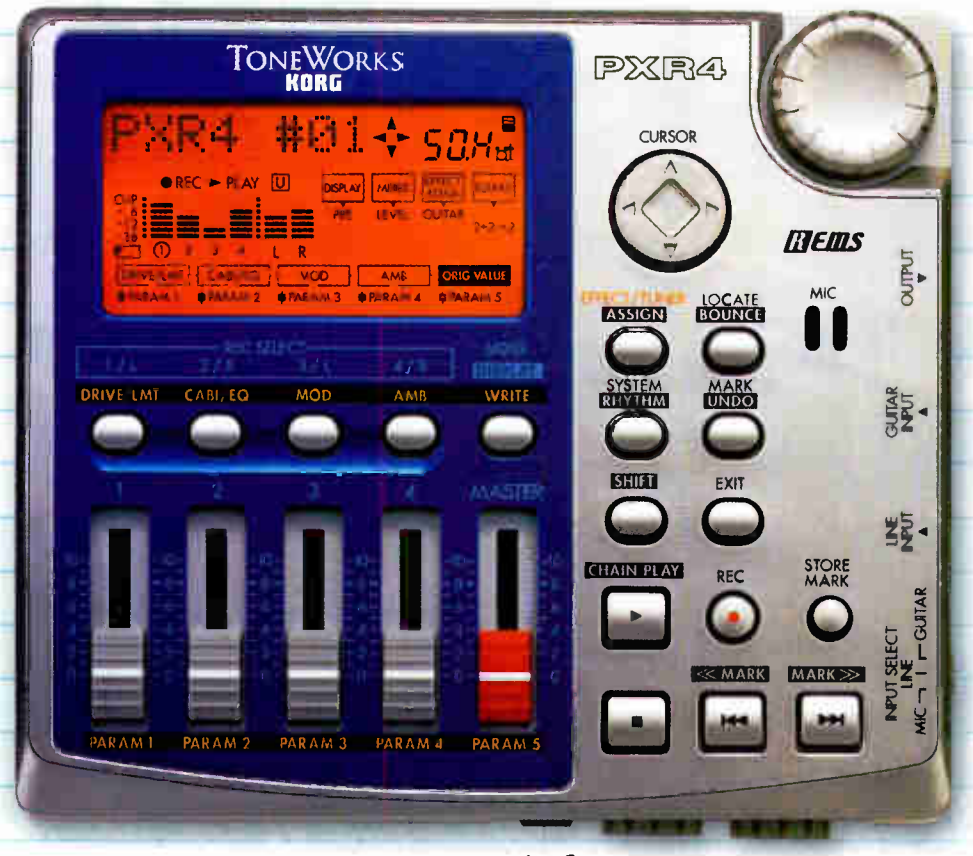

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MIXING In a Pro Tools World

be limited by your imagination. My philosophy is don't sit there lamenting the sound you're given. Fix it. That's your job."

Pensado usually prints his mixes to Quantegy 499 tape (which he endorses, along with Digidesign and SSL) and to DAT. He says the mastering engineers he works with have been largely complimentary of his Pro Tools mixes.

Asked about the quality of the recordings that have been coming to him since the proliferation of Pro Tools, he says, "From an engineering standpoint, it's not great. From a creative standpoint, it's better than ever. But I'd rather work with someone who's really trying new things and failing than someone that plays it safe and gives me a bunch of sterile tracks. The beauty of Pro Tools is that it opened the music field up to so many kids who didn't have access to it before. It was only 25 years ago that if you couldn't hire live musicians, you couldn't be a producer. One of the reasons people hated drum machines so much is that it gave access to a lot more people and made the little club bigger. Pro Tools has given opportunity to a lot of people, and that's going to be very good for our industry in the long run."

BOB BROCKMAN

New York-based engineer and producer Bob Brockman was a recent nominee in the Best Engineered Recording category for Laurie Anderson's fine *Life on a String* CD. He's probably best known, however, for his work with R&B hitmakers such as Mary J. Blige, Babyface, Toni Braxton, the Notorious B.I.G., The O'Jays and many others. Along with his partner in NuMedia Productions, Yaron Fuchs, he's currently toiling over the much-anticipated album by Boston's Wicked Queen.

As a top mixer, Brockman receives tapes that are all over the map in terms of quality, "everything from stellar-sounding stuff to absolute crap," he says. "And it has to do with who's involved in the earlier stages. Unfortunately, I believe the age of the great recording engineers is over. With the corporate nature of the record business and the cost cutting, a lot of producers I work with engineer their own records, and a lot of artists engineer their own records, too. Even the Laurie Anderson record, a lot of it was done by Laurie, because she couldn't afford to hire an engineer to work for a year-and-a-half on her record. And, of course, you have more people recording to Pro Tools because it's cheaper than working with 2-inch.

"You don't expect an artist who's recording their own stuff to be totally on top of the recording aspect of it. But I've found that one of the things that ends up happening in the case of Pro Tools is you have source material that may be very interesting to listen to, but which is often recorded at a really, really low level; it's 10-bit or 8-bit or even 6-bit. When you have a lower level recording at 24-bit, the lower the level gets, the lower the bit resolution. That's just the way PCM works. If you don't record a super-hot level, then you're not getting all the bits in the word resolution, and, consequently, it can sound pretty degraded.

"So that's a problem I find with some projects that are from home studios, started on ADAT and maybe bumped across to Pro Tools. When you're doing a D-to-D transfer, you don't necessarily have the option of increasing the word size. If it's recorded soft to ADAT or soft to Pro Tools, you're pretty much stuck with what you get. So as a mixer, you end up trying to recover it by putting it through tubes and whatever analog processing you can.

"My studio [NuMedia] is set up so that I have 64 inputs into a Harrison Series 10, and we have 48 outputs from Pro Tools, and we have tons and tons of outboard stuff from Manley and GML and API and Neve—LA-4s, LA-2s, LA-3—it's a pret[ty] thick rack. I put *everything* across ev[ery]thing," he says with a laugh. "We use Fatsos, we use Distressors; anything can to try to generate more warmth more analog feel.

"I'm old enough that I mixed for ab[out] 15 years off analog tape through anal[og] consoles before the advent of Pro Too[ls]. But in the past 16 months, I haven't mixe[d] one record on analog. Even rock 'n' r[oll] records that started out on analog got bumped to Pro Tools, and we ended up mixing that way. Digidesign has become the de facto industry standard."

And how does Brockman think it sounds? "I don't think it sounds great," he

"You can't argue about the ease of editing, and the playlists, the tuning and moving in time. I just wish it didn't sound so harsh."
—Bob Brockman

FAILURE WAS NOT AN OPTION

Ed Greene is an industry veteran who has been mixing sound for close to fifty years. He is also a dedicated Mackie user. Apart from the Olympics, he has also mixed the Grammy, Oscar and Emmy awards.

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notes matter-of-factly. "You can't argue about the ease of editing, and the playlists, the tuning and moving in time—all these things you can do to smooth out a vocal performance that you were never able to do on analog tape. There's a great deal of power from a producer's standpoint working in Pro Tools. I just wish it didn't sound so harsh. Sonically, it's not all the way there for me.

"I've heard records that were mixed off analog, or records that were remastered off analog, and even on a 16-bit CD, and you can really hear the difference. There's a marked difference, but these days, no one seems to care. If it's delivered that way, that's the way you have to mix it.

"On this Wicked Queen record, I've really gotten into using the Fatso, which is a tape-saturation algorithm compressor box. I'm recording everything through it—guitars, lead vocals. I've recorded vocals with it and without it to Pro Tools, and the level of clarity and penetration you actually get from the source material is really markedly different. It adds a lot."

Except for his work on Christina Aguilera's *Mi Reflejo* CD, which was digital from start to finish, Brockman still likes to mix down to half-inch, "to put the mix across analog heads to get a little dither into the mix. It's never as gratifying for me to mix off the 2-bus of Pro Tools as it is to bring up everything separately into a big console and mix it onto half-inch. I hear the difference." His current tape of choice in that regard is BASF 900, "which has great clarity but also low-end saturation. When you go to half-inch, you really hear how the low end integrates, as opposed to 24-bit DAT, which is pretty much exactly what's coming off Pro Tools."

Like many mixers, Brockman has also worked on hybrid projects that combine Pro Tools and 2-inch analog. "On this new Gabriella Anders album, where she's working with The Roots rhythm section," he comments, "the bass, drums and guitar were cut to 2-inch and then the vocals and the percussion and keyboards were done in Pro Tools. So that was a situation where we were running Studer 24 and Pro Tools was chasing. The producers really wanted to maintain that analog sound for the rhythm section."

Brockman also laments the fact that Pro Tools is not compatible with some other popular formats, such as Logic Audio. "Logic plug-ins are great," he says, "but, unfortunately, they don't work with the DAE engine. What ends up happening when you have to convert the output engine from, say, MOTU to DAE, is that the plug-ins get blocked out. So if that's a cool delay or chorus and it's part of the production, you can lose it. Also, the plug-ins sound different played out through a MOTU engine vs. a Digi engine. That's a big problem."

He concludes with a paraphrase of Rodney King's famous remark: "I wish everyone would just get along."

JACK JOSEPH PUIG

For the past several years, Jack Joseph Puig has been one of L.A.'s first-call mixers. Working out of his own fabulously equipped room at Ocean Way (you loved it on the cover of the October 2000 *Mix*), Puig has worked with a wide array of artists, including No Doubt, the Black Crowes, Collective Soul, Five for Fighting, Green Day, and many, many others. When we spoke recently, he was in the midst of doing mixes for Sheryl Crow and the Counting Crows.

"Most of what I get these days are Pro Tools sessions, and what I've done is I've created a sheet that goes out to people before they send me the Pro Tools information," he says. "On that sheet is a very detailed explanation of what we want: For example, we explain that it has to come condensed to 64 voices. We don't want it to come with more than 64 voices, because then we have the headache of trying to figure out what everything is and how we're going to deal with it. We also ask people to give us a rough mix of the session. So in Pro Tools, you have to leave two voices [out of the 64] to print to.

"We have a lot of issues with labeling," he continues. "I'm not someone who wants to spend his time hunting for stuff. I generally demand that either the producer or someone from the band is around to help me find things. With analog, you usually only have 24 choices, or say, 48 choices; but with Pro Tools, there's

PHOTO: DAVID GOGGIN

"It's to the point now where you've gotta learn it; there's no way around it. 'Cause it's not going away."
—Jack Joseph Puig

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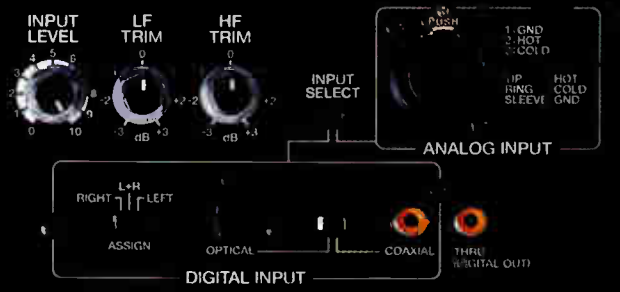

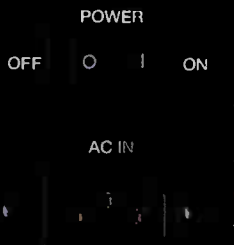

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almost an unlimited number of choices. You have these layers, and which is the right performance? That's a real, real problem. The problem with having to go through all that is expensive and you're taking time that should be used to mix the record looking for stuff."

Like Brockman, Puig believes that "the sound of analog, without a doubt, is still superior. There's no question about it. I'll get projects in and throw the faders up and it'll sound great, and I'll say, 'How did you record this?' 'Oh, we did it on 2-inch first.' Every single time.

"I just did a test myself: I recorded two sides for a band on Maverick called Ebo, and what I did was I recorded simultaneously to 2-inch and to Pro Tools. And the difference was *dramatic*. I could pick out the better-sounding analog one with my eyes closed—that one, that one, that one; never missed it. It was really telling. And, unfortunately, all these plug-ins that are analog simulators basically just take off the highs. They just make it woolly and dull. Their concept of what analog does is not right in my opinion."

Does transferring a 2-inch tape to Pro Tools affect the sound much? "The Pro Tools holds it as well as it can. It's never the same as playing it from analog, but when we made the jump to 24-bit Pro Tools, it at least became do-able; it became acceptable. Obviously, if you've got a rack of Prism or D/D converters, which are quite expensive, it becomes that much better, but when we eventually make the big jump to [Pro Tools] 96 and so on, it's going to be amazing."

All Pro Tools sessions are *not* created equal, Puig has learned, and when he has multiple sessions coming in recorded at different studios under different conditions, he notes, "The clock is extremely important. The length of the cables that carry the superclock to the 888 and the quality of the BNC connectors are extremely important. If you get the cables the right length, which basically means all the same length, and you get a great BNC connector and a great clock, that alone makes a big difference. What *really* sounds great is if you have a Sony HR machine and you leave it in 'input' and then use it for the converters. That's awesome, but expensive.

PHOTO: DAVID GOGGIN

"The problem that I hear with digital is that it's very shallow; there's not that much dimension to it." —Nick Launay

"One of the most important things about all-digital stuff—whether it's 3348 or Pro Tools—is the kind of level you're able to put on there, because, obviously, you want to use all the bits. The kind of level the analog console feeds is really too much for it sometimes. And that's one of the biggest issues of digital and analog meeting on a daily basis in professional recording studios. What I do is align my Pro Tools systems for a lower level. I used to do that with other digital recordings that were really hot, and even analog once in a while. Because if you get the front end too hot, you're f***ed; you run out of headroom."

Puig says that about 85% of the work that comes through his door now is on Pro Tools. "There are people holding out with 3348s—some old-timers—but that's not going to last. You can't do half the stuff you can with Pro Tools, and now it's getting to the point where people are used to coming to the session and saying, 'Can we move this, can we do that? Can we fix that?' And all those things are nearly instantaneous with Pro Tools. It's to the point now where you've gotta learn it; there's no way around it. As an assistant engineer and an up-and-coming engineer, if you don't know how to run Pro Tools, get out! 'Cause it's not going away."

Puig believes that the combination of analog gear he favors and the new digital plug-ins has actually expanded his sonic palette, allowing him to make better records. "What I'm discovering is that there are digital equalizers and compressors that, when married with the analog stuff, sounds great. Like the way an L1 would talk to an LA-2 is different than how a C1 talks to an LA-2, etc. The kind of curve that it does, maybe combined with a 550A or combined with a Pultec or whatever, creates a sound of its own that can be really cool. I like to look at all the possibilities."

NICK LAUNAY

When we caught up with producer/engineer/mixer Nick Launay, he was finishing the tracking for the latest disc by Ameri-

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MIXING In a Pro Tools World

can Hi-Fi at Sunset Sound, and was getting ready to move over to Atlantis Studios to mix the project on the SSL 9k there. Then it was off to Melbourne, Australia, to continue work on Nick Cave's new CD. That's the way life is for the globe-trotting Launay: Though English, he works all over the world, has a home in L.A., but also seems to have a special affinity for Australian bands. Among the groups he's worked with are INXS, the Living End, Midnight Oil, Gang of Four, Killing Joke, Kate Bush, Silverchair and Public Image.

Launay is basically still an analog guy: He likes to record bands, as a whole group, to 2-inch. That's how he's making the American Hi-Fi album. Still, he notes, "I love Pro Tools, and I use it a lot. In the case of [American Hi-Fi], they've got an incredibly good drummer and they're all great musicians, and there was no need to go in there and move kick drum hits and all the things that Pro Tools lets you do. We actually thought of doing the basic tracks and then going to Pro Tools, but we decided not to; there's no need to. It's nice to be able to say that.

"I'm always open to new things, but I always put sound first," he adds. "I do find it extremely frustrating that Pro Tools doesn't sound better than it does, and that to my ears digital doesn't sound very good—still. What is it, 18 years now? Those who think it sounds great haven't used analog, or if they have and they really can't hear the difference, they perhaps need to change careers; the difference is enormous.

"The problem that I hear with Pro Tools, and with digital in general, is that it's very shallow; there's not that much dimension to it. I don't think people really looked into that aspect of it. I think they put their tones up and see the frequency response, and they try to get it *technically* correct, where what they *should* be doing is trying to understand why when you record on analog, it sounds more three-dimensional—even if you're dealing with a mono signal. It has something to it that has depth that you don't get on digital, and I frankly don't know what that is. But my ears hear it.

"With digital, everything sounds like it's in two dimensions; everything sounds like it's right up close, even if you've got a drum sound with a lot of drum ambience. When you record it on analog, it feels like you can feel the room; there's a depth and warmth that's very pleasant to listen to. Something gets lost when you go to digital. The sonic depth is missing."

To compensate, when he does mix Pro Tools sessions, "I do whatever I can to make it warmer and to bring in some of that depth. I might put the whole thing through a Fairchild at the end. I'll use as many Pultecs and Motown EQs as I can. I try to use the best A-to-D converters I can find. If I can get a hold of them and I have the budget, I'll use Apogee converters. I think they're the warmest. They might take a little punch out, but that's easier to get back in mixing than the warmth.

"I never record directly to Pro Tools; I never have. I like to set up a band all in the same room, playing off each other. If they're a guitar band and they've got two guitar players, well, they have to play directly to the drums at that time; it's like a live performance. We do takes until they get it right. Then I'll slice on 2-inch; I'll edit between the best takes. The end result might be a 2-inch multitrack that might have up to 30 edits on it, just to get the best performance.

"Once I get the basic band takes on 2-inch, sometimes I'll transfer it to Pro Tools for overdubs and vocals...and we just suffer the loss," he says with a chuckle. "I'll make slaves in Pro Tools or I'll mix the 2-inch to stereo guitar pairs and drum pairs, etc., and then continue in Pro Tools, doing overdubs and vocals. Then, at the end of the day, I'll sync the two up and I'll play my original backing band track off analog. That's the way I've done the last five or six albums."

Though he generally engineers and mixes the albums he produces, Launay is not shy about getting help with the Pro Tools work. "When I started getting into Pro Tools a few years ago, I thought, 'This is crazy. I'm staring at a screen all day. All the things I love about making music are not there any more. The capabilities of this incredible piece of equipment are fantastic, but I'm beginning to lose track of what we're really trying to do here.' So I decided I should employ a Pro Tools engineer, and that was a really good decision for me. It lets me spend my time doing what I want to do and what I do best—concentrating on the song and getting the best performances." ■

Blair Jackson is Mix*'s senior editor.*

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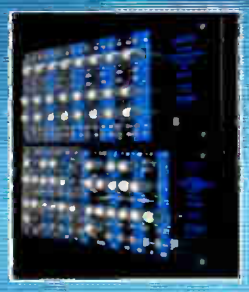

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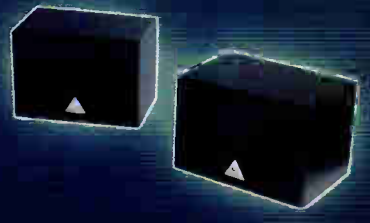

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The Agony and the Ecstasy

Of Choosing a Console

By Maureen Droney

Purchasing a console, especially a big-ticket one, has never been easy. Previously, choosing *which* console to buy wasn't that difficult: There weren't that many out there, and they didn't perform that many functions. For your high-end studio, you picked from among two or three manufacturers and bought the latest, biggest, baddest, sexiest model you could afford. For your mid-priced studio, you bought used. For your demo room, you got some small version of a live mixing board.

Today, with prices of large-format consoles approaching seven figures, and shakeups in the leasing business narrowing options, studio owners have to put a lot more thought into what they need from a desk. As for that demo room—well, it's now a full-fledged studio, capable of turning out a finished product. And among the decisions for it are: Do you even *need* a console? If you do, there's a bewildering array of choices.

The Studio Owner's Tough Decision

In the high-end market, sometimes success comes from sticking with the tried and true. Kevin Mills owns Larrabee Studios (L.A.), which, during the past 10 years, has grown from two rooms to three facilities with seven rooms. Mills has mainly avoided the agony of console indecision; his core business traditionally has been mixing, and he has stuck with Solid State Logic. When he decided to also get into the tracking business two years ago, he purchased a facility, now called Larrabee East, already fitted with two classic Neve 8078s that were left in place. Presently, Larrabee North houses three SL9000 Js, while West has hung on to Studio A's popular E Series and is in the process of upgrading Studio B to SSL's latest, the K Series.

"I've had people suggest certain consoles," Mills comments. "For example, Fletcher at Mercenary Audio in Boston has been trying to talk me into the Rupert Neve 9098, which he absolutely loves. And, certainly, the new Neve console has its admirers. But we purchased our first SSL in '79, when there was only one other in the city, and because of that, we've pretty much developed an SSL mixing clientele. We've just extrapolated on that, especially since the J Series, which, because of its sound quality, won over a lot of people who didn't like SSL.

"Until we got Larrabee East, though, I wasn't aware of the amount of people who still wanted to mix on Neve 8078s. Studio X there has been one of our most successful rooms. I get calls asking if I'm ready to sell [the consoles], but instead I'm adding on. We made the 32-in tracking console a 40-in, and we're getting new Martec Flying Faders for it, because a lot of the people who want to mix in there want them. There were other options, but I'm not trying to sell people on new technology. I'm just trying to provide something they want to work with."

About his decision to be one of the first to take possession of SSL's latest incarnation, Mills says, "Buying the K was a natural progression. I still do not own a digital console, even though people tried hard to convince me. Digital technology is a completely different dynamic for the recording studio investor. Look at our Studio B with its E Series, which still works great. People love it, the room is booked. Or take the 8078s, which were built in the 1970s. Good analog consoles maintain their value and their functionality, whereas digital technology can go from being extremely expensive to being worthless in a second. What's a 3348 worth now? A Mitsubishi X850? You can't sell them. The same occurs with other digital technology.

"The average studio owner buys a console and finances it over four years. But you count on there being residual value after four years, and that you will get return on your money over more years. There was no way I could buy a $700,000 console that I knew had a high probability of being worthless at the end of four years. You can't make money that way. So I went with the J in 1998, and the K is the same technology, just improved—better bandwidth, better functionality, a much faster computer that will support lots of new software and better suited to surround mixing."

That said, Mills admits that in his business, surround capability is not presently a necessity. "To be perfectly honest," he states, "it's completely unimportant. Our Studio 3 is one of the only fully 5.1 surround mix rooms with large monitors in L.A., and in three years, we've never turned on the system. Although I think that's going to change, and certainly I want to be prepared for it."

Mills offers the opinion that certain vintages of analog consoles are more likely to maintain their value. "Everybody knows that there are certain bad years for a car," he asserts. "For consoles, the same is definitely true. When you have a lot of SSLs, you find that there are certain years that, for whatever reason, just don't sound as good. The G that we had in Studio A at West was just not one of the good Gs. It always sounded thin. We put in a J, but now, since we were redoing A, we decided to go with the K. Meanwhile, the old E in Studio B is clicking on all cylinders, and if it's not broke, you don't fix it."

The fact that the K Series is not backward-compatible with the J for mixing is

not an issue for Mills. "Generally, our clients want to do their recall in the same room that they did the original mix in," he says. "And, certainly, if I'm going to invest in a new console, I'd rather it be the next generation."

About his brand loyalty, Mills comments, "Some people get different consoles, and if they have a clientele that likes them, that's great. My clientele is more, 'I need a J to mix on. I've just got a call to mix for four days and I need to get in somewhere where studio issues aren't a concern. I want monitors that I'm used to, a Pro Tools system that doesn't crash, and well-maintained consoles that I can just sit down and work on.'

"These days," says Mills, "we are constantly focused on one thing: offering more for the same price. Costs go up, but if you have the volume of business, you pay down your debt and you run the business conservatively and efficiently, you can do it. I firmly believe that, upcoming, the key to profit is all about value-added. There's going to be a shakeout, and to stay in this game, you're either moving forward or you're falling behind."

> It's true that the lifespan of some digital technology can be equivalent to a laptop. If you have clients that want to work on it, that's the chance you take.
>
> —Troy Germano

The Hit Factory New York and The Hit Factory Criteria Miami comprise 13 studios and six mastering suites. Although not a total Solid State Logic operation, SSLs definitely dominate their landscape. In April of this year, the New York operation will take possession of the East Coast's first two K Series.

> I'm not trying to sell people on new technology. I'm just trying to provide something they want to work with.
>
> —Kevin Mills

"We do have other consoles," notes CEO Troy Germano, "two Sony Oxford digitals, one Neve 8078 that was part of Criteria in Miami when we acquired it, one Neve VR, and two Euphonix System 5s, which we are currently building rooms for. The two 9000 K Series will be going into two new studios at our 421 West 54th Manhattan facility."

Germano doesn't agree that the music industry isn't ready for digital consoles. "The Sony Oxfords have a following," he says, "and they do very well. We were the first in New York with it, back in January of '98. And when we completed our renovation of The Hit Factory Criteria in April of 2001, we opened Studio F, a new room built for another Oxford.

"We have a lot of clients who are very loyal to the Oxfords, and we're going to try to develop a clientele for the Euphonix System 5," he continues. "But we're also very excited about the SSL K Series. It really is an enhanced 9000 J, and for our needs, that will be ideal."

Germano agrees that surround capability is not a key factor in his console decisions. "It's not a big part of our business, but it's important to us," he offers. "We will be equipped for it. Obviously, the J Series can handle 5.1 mixes, and the K Series can handle all formats. We're prepared, and if it becomes a big part of our business, that will be a pleasant surprise. For us, the important features on the K Series are the remote mic preamps and the faster computer. Those are what people are going to be attracted to right off the bat."

In The Hit Factory's quest to stay on the technology forefront, Germano has made concessions to the digital world, but he's adamant that an analog SSL remains the industry workhorse. "It's true that the lifespan of some digital technology can be equivalent to a laptop," he acknowledges. "If you have clients that want to work on it, that's the chance you take. Because we have multiple rooms, we are able to try new technologies, but it can take a lot of persuading and work sometimes to get others to understand the benefits of a digital console.

"That's why I still feel the best consoles

for what we're doing, day in and day out, are the 9000 Series. SSL provides great service and support, they build a great product and they listen to what their clients have to say. We purchased our first console from them in 1984. We've now purchased 25 consoles; that says a lot."

Issues are different on the Central Coast; Chicago Recording has 12 studios in two different buildings, servicing clients in music, television and radio commercials, audio for picture, surround mixing and DVD authoring. In 2001, CRC also opened the soon-to-be three-room Glenwood Place in Los Angeles. According to executive VP Hank Neuberger, CRC accommodates that diverse work with a variety of consoles, including Neve, SSL, Harrison, AMS/Neve Logic, Euphonix, Yamaha and Amek Rupert Neve.

"Different markets have different needs," he contends. "In our music rooms, the clientele likes to see Neve and SSL consoles. In post-production and audio for picture, the clients are not as locked in. For those markets, we tend to let our staff engineers have a lot of input into what tools they need to satisfy their clients. That makes for a little different purchasing decision; we can go with a more individualized approach. It's the engineer's needs that I'm primarily interested in."

For Neuberger, the physical footprint of a desk also comes into play, as does post-production's more ready acceptance of digital consoles. "Post-production has moved into digital consoles a lot faster than music recording," he notes. "We've had excellent results with digitally controlled consoles in that area for a long time: our Harrison 10 and our Euphonix 2000 and 3000. Those engineers are doing back-to-back sessions and need to be able to instantly recall intricate setups; when that type of product came out, it was a big breakthrough. I also think they've embraced digital consoles in that area, because a lot of our work in those rooms ends up on video, which is virtually all digital now. The clients are expecting that their audio is handled in a digital domain as much as possible also."

CRC owns two digital Euphonix System 5s, and according to Neuberger, has been very successful with them. "Control rooms for post tend to be a little smaller," he explains. "One of the great things about the System 5 is that the 8-module buckets have only two wires coming out of them: a power cord and an Ethernet cable. We were able to build our own custom frames that not only coordinated with the look of the room, but could be customized to maximize the space. We got a smaller footprint with a very sophisticated group of functions.

"It's ironic, really," he comments. "In a music room, the mixers still like to be spread out across the room; they still like consoles with 72 or 80 I/O. Post mixers don't have any of that [type of] hangup. With digital and digitally controlled analog consoles, you can get 80 inputs on a very small desktop. Actually, with the Euphonix, you can do 80 inputs on one fader! Having 24 faders that give you ready-access to 96 inputs is a real asset with the Logic or the System 5."

> It is something we've been sensitive to in the past two years, making sure that anything we buy has the necessary busing and monitoring facilities for surround.
> —Hank Neuberger

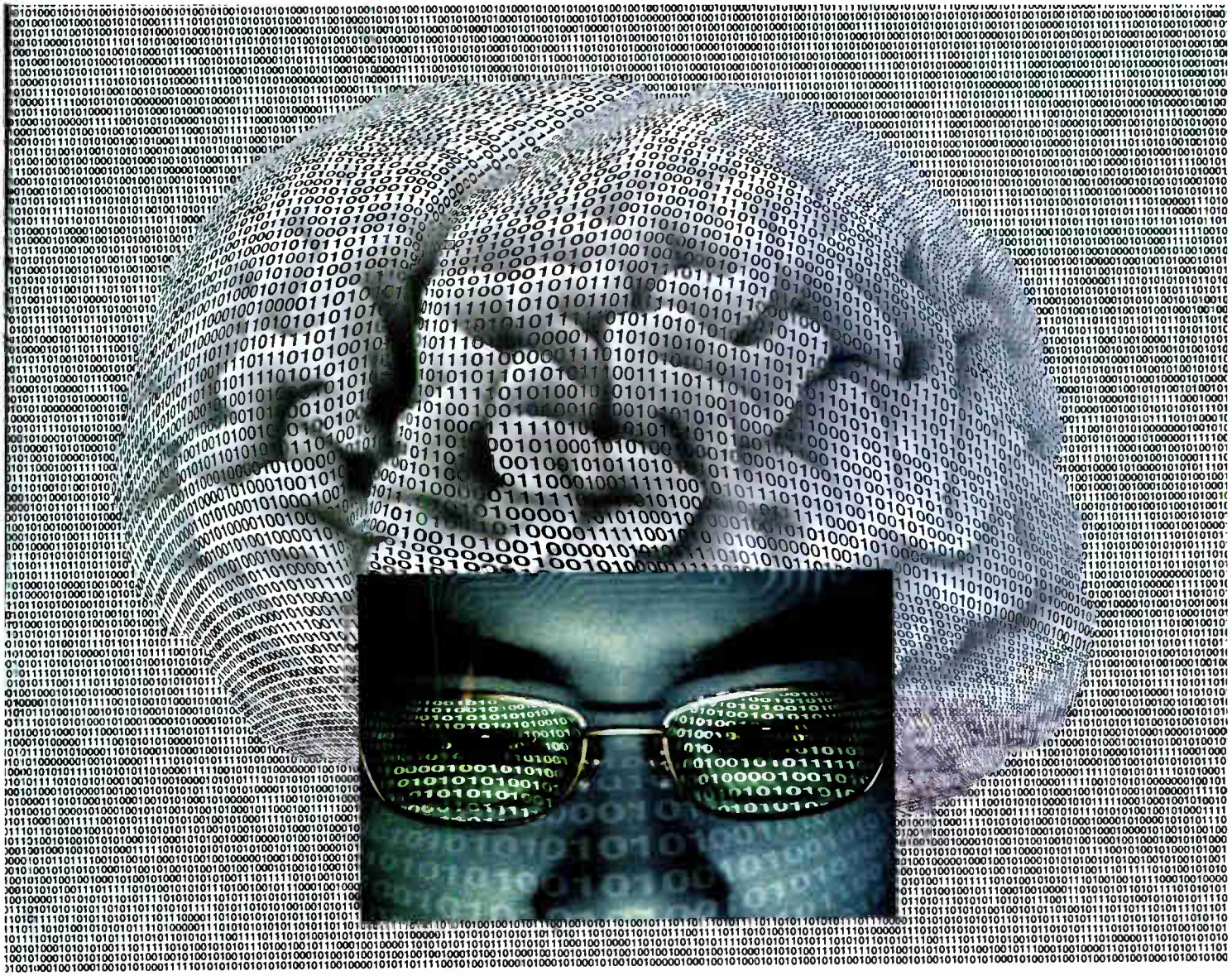
Neuberger finds the easy interface to hard disk recorders another plus for digital consoles. "These kinds of studios have relied on hard disk recording even longer than music rooms, so interfacing those recorders with the consoles readily has been a plus. Music studios still like analog consoles, and I don't blame them. When you're patching dedicated effects in and out—this vintage compressor, that particular mic pre—it makes sense to keep your audio in the analog world. But for post, digital consoles definitely are an advantage."

The Robb brothers: Bruce, Dee and Joe

> For a number of years, we've traded a shortage of inputs and functions for sonic quality. But it got to the point where we realized we couldn't continue to make that trade-off and be competitive.
> —Dee Robb

At CRC, surround capability is increasing in importance, but is still not a primary concern—analog or digital. "Out of our 12 Chicago rooms, we have surround capability in three," Neuberger says, "although we can set it up in any room. It is something we've been sensitive to in the past two years, making sure that anything we buy has the necessary busing and monitoring facilities for surround."

At Glenwood Place, CRC's L.A. branch, the consoles are a System 5, an Amek/Rupert Neve 9098 and, upcoming, an SSL 9000. "Different tools for different jobs," says Neuberger. "The



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CHOOSING A CONSOLE

System 5 is set up with a D-to-D link to a large Pro Tools system. It's perfect for mixing to picture and surround. The 9098 we put in because we think it's the best-sounding console Rupert Neve has ever been associated with; the golden ears guys really loved the sound of it and also feel that its automation is state-of-the-art. The SSL 9000 is a proven, accepted, top-of-the-line choice, especially in the Los Angeles market. You have to listen to your customers. If that's what they want, then that's what we have to give them."

For some time, The Village Recorder in West Los Angeles has been a fully Neve facility. But, according to CEO Jeff Greenberg, remaining all-Neve was not the primary reason he decided, in October of 2001, to make The Village one of the first to take delivery of a Neve 88R. "We wanted to go with whatever had the best sound," he insists. "We really hadn't even planned to upgrade, because a lot of people, especially our film clients, liked the VR Legend that was in Studio D. But when we started listening, the 88R sounded so beautiful that we just had to do it. It was important to me to be able to say to our clients that we are providing them with the best-sounding console made today."

To facilitate his decision, Greenberg sought the opinion of engineers he respected, such as Al Schmitt, Steve Kempster and Nathaniel Kunkel, even sending Kunkel to England to assess the 88R prototype. "They all agreed that it sounded great," he says. "Al Schmitt has gone on record as saying it's the best-sounding board he's ever heard.

"Robin Porter at Neve was involved with the construction and design of the original 8048s with Rupert," he continues, "the last board that Rupert really worked on. And the 88R is Robin's design all the way through. We had a lot of confidence, and also we had a part in it. We had mod-

THE PRE-OWNED OPTION


Dave Malekpour, president of PAD

Dave Malekpour is president of Rockland, Mass.,-based Professional Audio Design, a supplier of new and used audio equipment, including both large- and small-format consoles. PAD is also the exclusive U.S. agent for certified pre-owned SSLs, and provides factory-trained technicians who can rework the desks. Recently, PAD has supplied pre-owned SSL G Plus consoles to Cherokee and Music Grinder Studios in Los Angeles, as well as a Neve VR60 with Flying Faders to Bennett Studios in Englewood, N.J., and, in the San Francisco Bay Area, a vintage API to bassist Les Claypool of Primus.

"From our position, we see everything—new and used—that's out there," Malekpour comments. "Because in today's market, there are so many kinds of studios, when we get a call from someone who's looking for a console, I try to help them fully understand the goal of their studio. For example, we have clients who do original music composition for high-profile television ads. They're set up like a traditional recording studio, putting instruments and vocalists through a console, but they don't necessarily have to please customers who are buying studio time. Then there are commercial studios that make their living selling time to whoever wants to come in, with a lot of that time bought by producers and engineers who drive the choice of where to work.

"The console is still, in most cases, the primary part of a recording studio. It's where everything is brought together and the work surface that everybody gathers around. We'll see people who put in a Sony DMX-R100 or a Mackie D8B, but they'll put it into some kind of giant console-type surface because that's what people are comfortable with. It's not just about making an impression; it's that there are four or five people who all need to be involved in decision-making. They need a place to sit and be a part of it."

The next step is getting the options you need for the money you have to spend. "The question should be, 'How am I going to be working?'" Malekpour continues. "'Do I work all-digital, in which case a small digital console may be really useful, or am I recording a lot of microphones and instruments where I want some musical coloration'? Typically, in a DAW environment, people are buying lots of front-end equipment. But, instead of buying tons of outboard preamps and EQs, an alternative might be to find a good, used analog console.

"We also have customers who have a 9000 J studio who want to create a second room. Because of budget constraints, or because they don't want to compete with their main room, a pre-owned 4000 G Plus can be a great environment. It provides a comfort factor; people understand how to get around on it and they know what the end-results will sound like. Having equipment that people are familiar with is definitely a driving factor in the used market.

"A program like ours gives people a particularly good reason to buy a second-hand console. If you buy one that's been serviced or even upgraded, with all the kinks worked out, and you can get a warranty, it's the best of both worlds.

"It's not going to be as cheap as buying something off eBay, but some of those things you buy 'as is' will become nightmares for a long time to come. There's a lot of attractiveness when you see something going for five percent of what it was originally. Chances are, though, parts are unobtainable, the price of them is very high or working on those consoles is very difficult due to the way they were manufactured."

Malekpour is confident that large-format consoles aren't going to disappear anytime soon: "Analog consoles can have extremely long residual value; some of the ones we're selling today are from the early '80s and people still want them. We have finance companies that will only do three years on some digital products, but we can get five-year leases on analog consoles that are 10 years old."

—Maureen Droney

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Technology with soul.

ules out to us two years before the release of the desk so that Al and Steve, among others, could listen. They did listen, they made suggestions and a lot of those suggestions were executed. When we got to the stage of final listening, which I would never buy without doing, we really felt that the product was extraordinary."

Besides pure sonics, other criteria for the choice were familiarity of operations and flexibility for the console to work well in applications from rock music recording to film mixing. The 88R's remote 1081 mic preamps were also another factor; The Village's package included 36. And for Greenberg, unlike for some other decision-makers, surround capability was a primary requirement. "We do a lot of television and film mixing in that room," he comments, "and we needed to be able to handle all the variations of stereo and surround."

Being one of the first to purchase a newly designed console is a bold move; Greenberg sees the 88R's uniqueness as a plus, but not as a deciding factor. "The fact that the 88R was unique was not part of my criteria," he states. "But I do feel that with so many SSL 9000s in town, they are bound to start weighing on each other. Again, our decision was ultimately about the sound. The vintage Neve that I have in Studio A has been called, by many people, the best-sounding console they've ever worked on. I wanted to have something good enough for those people to go back and forth on, and I think that's something we've done."

We do a lot of television and film mixing in that room, and we needed to be able to handle all the variations of stereo and surround.
—Jeff Greenberg

Traditionally, Cherokee Studios in Los Angeles has made stubbornly independent console choices. "We've always prided ourselves on the sonics of our consoles," says VP and co-owner (with brothers Bruce and Joe) Dee Robb. "So for a number of years, we've traded a shortage of inputs and functions for sonic quality. But it got to the point where we realized we couldn't continue to make that trade-off and be competitive. The possible solutions, such as sidecars, were not at all elegant. We even toyed with the idea of constructing a console, which we've done before and know is a horrific experience. None of those options seemed reasonable.

"We had two things to accomplish: We didn't have a viable mix room; the only console we had with a lot of inputs was the Otari Advanta DSP desk, which just isn't universally accepted. We also wanted to upgrade our tracking room.

"At the time we started looking, the Neve 88R wasn't yet available, so it really came down to an SSL 9k or a G Plus. SSL made several studios available for us to do mixing, and we also polled our regular clients and people like Toby Wright, who, although he liked to track on our A-Range, had never mixed with us. Interestingly, the people that we polled liked the 9k better for tracking but heavily preferred the G Plus for mixing. And that was our reaction, too. With the G Plus, there is definitely a sound, and it's one of the rare occasions where I have to say that adding a sound is not a bad thing! Normally, our feeling has been that we want everything—the recorder, the monitors, the console—to be as transparent as possible. So, in a way, there are a lot of things about the SSL that go against our philosophy of 'less is best.' But the fact is, for the mixing process, you put your program up on the G and there's this sound that's really good. And this isn't very technical to say, but there's also a bigger gratification factor with the G Plus: you crank the EQ, and it really does what you want it to.

Having decided on a G before SSL began building the Classic, the only option was to buy used, and a deal was struck to have the desk they decided on—the "Bluestone," formerly owned by The Hit Factory—completely refurbished by Professional Audio Design. [See Sidebar, "The Pre-Owned Option," for more on Professional Audio Design.] Cherokee is another facility actively involved in surround mixing, so that capability was a necessity. The Bluestone G had already received some surround mods at Hit Factory, and Cherokee also added a PAD surround monitor matrix.

For the tracking room, the Robbs felt it was important to achieve the kind of transparency they'd enjoyed with their Trident A-Range desks. Before deciding on an API Legacy, they went through an extensive round of blind testing with different manufacturer's modules. "We listened to everything, and we could always tell which was the A-Range," says Robb. "When we listened to the API, we thought the API guys and our engineer were tricking us—having us listen to the same thing twice. We couldn't tell them apart, and that was very exciting. The other aspect was that once we switched in the equalizer and the dynamics, it brought in all of the wonderful API character. We pretty much on the spot decided that was the way to go.

"Even though we'd listened to modules, we were nervous until we actually had it in the room and turned on, because sometimes things change when you put it all together in a big console. But after the first session, we high-fived each other. It sounded great. We also love the functionality of it. It doesn't have quite the automated features of a 9000 or the 88R, but it's a really intelligent tradeoff. It has the relatively pristine signal path we wanted: Only three amplifiers in the chain as opposed to 16 or 18, and those three are discrete. Paul Wolff, the chief designer, real-

There are still a lot of unresolved issues with digital, not the least of which is being boxed in by sampling rate.
—Leslie Ann Jones

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ly did an incredible job. It has the features and functionality that the A-Range didn't, but we were able to keep the high sonic level, so we're thrilled."

Up in San Rafael, Calif., on Lucasfilm's Skywalker scoring stage, Leslie Ann Jones, director of music recording and scoring, has been evaluating the options. "You have to look at a finite amount of time for use of a console now," she comments, "not only as a business decision—depreciation and how soon you can make your money back—but also just in terms of usability. We've made the decision to go with another analog console. There are still a lot of unresolved issues with digital, not the least of which is being boxed in by sampling rate. We have clients who can't take advantage of high-sample recording formats because they choose to mix on digital consoles that are 24/48. Personally, as an engineer, I never want to get boxed into that. Nor do I want our clients to be. An analog console allows you to go to any format. We do have another room in the music and scoring department that has a Euphonix System 5, but I'd rather keep that as an alternate for now, for several reasons, including sample rate and familiarity.

"For us," she continues, "there are only two choices: a Neve 88R or an SSL 9000 K Series. We have been a Neve facility for a long time, and our clients tend to be more audiophile. They're not the typical function-oriented SSL G and E Series users, so until now, we were never able to consider SSL as an option. That's changed with the 9000 Series. I think the 9000 K and J users are more fidelity-conscious than the traditional SSL user, and that's more our marketplace. Also, SSL has done quite a lot of research and work in this area, and their consoles are used on many scoring stages.

"Both of those consoles have very flexible 5.1 capability straight out-of-the-box, but we still need a scoring panel with a flexible matrix—which they both offer—but, of course, adds to the cost. We're also looking at remote mic preamps, another extra charge. Because of the music that we do, and who our clients are, there are things that end up being options for us, such as gold switches, that a more traditional recording studio might be able to forego. Other options for us have to do with scoring, like being able to split the auxes up between one side of the console and the other, so that if you have an orchestra on the left side of the console and a rock band on the right, you effectively double your amount of sends."

As far as footprint goes, the decision has been made to stick with 72 inputs, with the possibility of adding a digital sidecar. "A small Sony or the new Yamaha would provide us with some instant recall of panning and the kind of radical stuff that people working on 5.1 mixes sometimes want to do," Jones says. "You can't do that with an analog console, but you don't need 144 inputs for it. You only need a dozen or so to cover those things in a mix that you might want to fly around the room or do radical EQ changes with."

Given all the above considerations, ultimately, according to Jones, a major deciding factor will be the final price of the console and its options package. "Being Skywalker Sound notwithstanding," she states, "we have a finite amount of money to spend and we have to spend it as wisely as we can. We are looking at something that's going to last five or six years before we make a switch. We're hoping by then that digital consoles will become such that we can put them in and not worry about limiting our clients' options." ■

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

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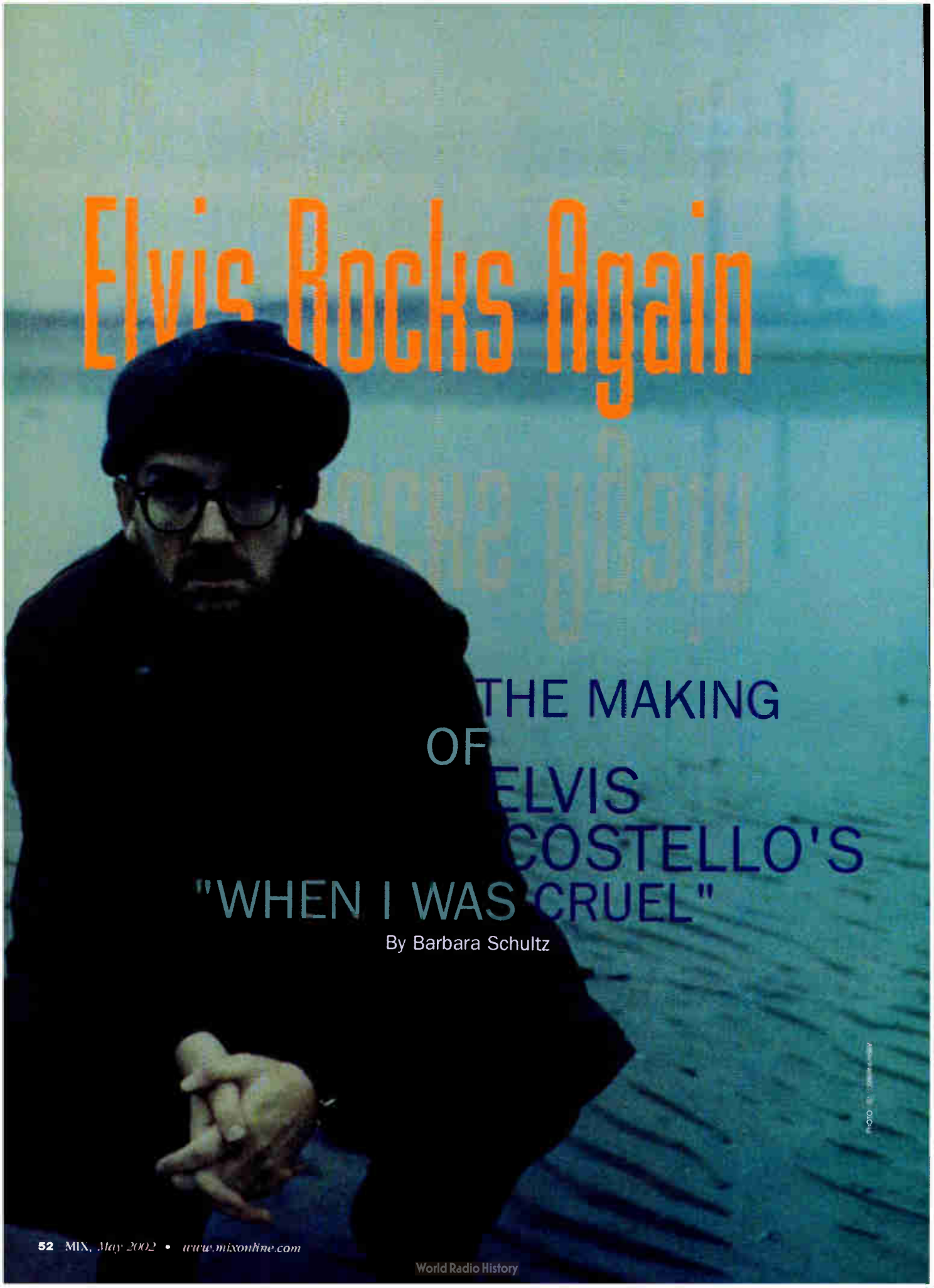
Elvis Rocks Again

THE MAKING OF ELVIS COSTELLO'S "WHEN I WAS CRUEL"

By Barbara Schultz



The recording room and main control room, with its Neve VRP Legend console, at Windmill Lane Studios.

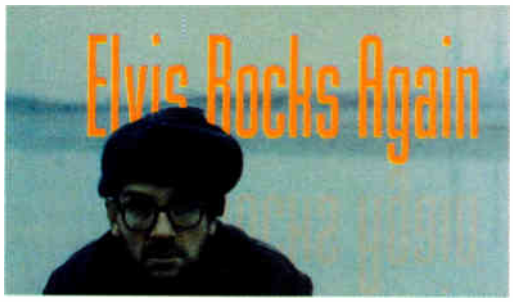
Elvis Costello is a mighty resilient artist. Next time you find yourself sweating the small stuff, think about this: The song Costello and his co-producers mixed at the end of the sessions for his latest release, *When I Was Cruel* (Island), is titled "The Imposter vs. the Water Tide," because, he says, "The weekend that we recorded it, seven feet of water came into our storage space and destroyed all my guitars. Hopefully, some of them will be salvageable. We did lose a lot of instruments and amplifiers, and sadly, the little 15-watt Sears Roebuck amplifier, which was the sound of this record, will probably not survive, but I think I got my money's worth out of it. It was an impulse buy in Red Bank, New Jersey. I just saw it in a shop window, and it lasted till the last day of the session. It was starting to complain that day. Little did it know that its days were numbered." He displays a surprising sense of humor under the circumstances, but maybe that's because, for Elvis Costello, the spirit of his work has always been at least as important as the tools.

In fact, pre-production for *When I Was Cruel* began as much with the pursuit of a feeling as with firm ideas about sounds. "I decided I wanted to make something like a rock 'n' roll record, but I didn't want it to go like one that I'd made in the past," Costello explains. "In other words, you go into a room, and you teach people rhythmically what you think it goes like, and they interpret that, and, obviously, they feed back to you a lot of ideas of their own. That's been very productive, and, obviously, when I had a band of my own [The Attractions] and we toured all the time, we worked the different permutations of three chords or nine chords or however many chords we were using, and different rhythms, pretty well. We made a lot of records, and many of them pretty good, I think, but I don't have that setup anymore. I don't have a regular band, so I was trying to find something that gave that propulsion to the music.

"So, I started messing around with some really simple machines, kind of kids' drum machines, really. I described it as having a thing with big, orange buttons on it—if it had big, orange buttons, I'd probably like it—and a really cheap little sampler that runs on batteries, so that means you can take it anywhere and record anything.

"I pretty much had the blueprint of certainly a good half of the record, either having just written in the way I've always written—just with a guitar or a piano, though in this case, it was all on the guitar—or the ones that were particularly rhythmically propelled, they were really integrated with these kind of big, stupid machines. They're big, bold strokes machines, incapable of any sort of subtlety. So, I had demos of me sort of bashing the songs out, and it was thrilling, because it was like rebounding off of a band the way you do at the very beginning."

As you can guess from Costello's description of his working method, the sounds he was working toward during the writing process were much more rhythm-driven and somewhat more electronic than the type of music he's normally associated with. When he was ready to dig deeper into the actual sounds and arrangements that would end up on the album, Costello reassembled a production team that he had worked with recently on some film music. Costello and the



three members of the technical team—engineer Ciaran Cahill, assistant engineer/editor Kieran Lynch and engineer/programmer Leo Pearson—are collectively referred to as The Impostor, and each is credited with co-producing the album.

"We tried to work as a team, and nobody was the boss particularly," Costello says. "Obviously, I'm governing the thing, from the point of view I'm writing the songs and I know what I want to hear, but I allowed them responsibilities for different areas. Ciaran Cahill took care of the engineering, and Kiaran Lynch of the editing and housekeeping, and Leo Pearson more of the rhythm processing. If we created a sound and we wanted it twisted a little bit to give it a little more character or a little more grit, Leo usually had that job."

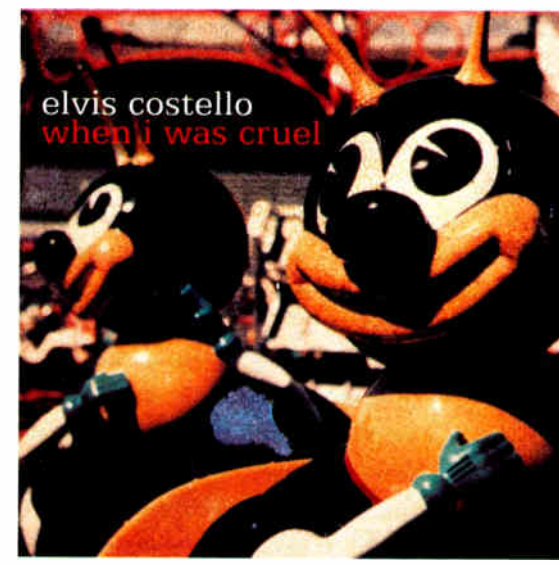
"Elvis liked what we were doing," says Pearson, who has done programming for Irish groups The Corrs and U2. "He hadn't worked a lot, or maybe ever, with MIDI stuff and digital, and he got a bullet out of some of the sounds we were getting together."

The team went to work in Dublin, Ireland's, premier facility, Windmill Lane, to develop their ideas and track with a band: Pete Thomas on drums, Cracker's Davey Faragher on bass and Steve Naive (who joined the sessions close to the end) on piano/keyboards.

"I didn't really intend for there to be any other musicians on this record," Costello jokes. "I thought I'll only call anybody else when I run out of fingers myself. And then, by coincidence, I suppose, the other person I have to thank for bringing the other arm into the music—apart from the fact that I would have run out of technique as an instrumentalist—was Bob Dylan. He came and did a show outside of Dublin, and I was asked to open for him. If that hadn't happened, I might not have put the band together to play that show. And because coincidence brought Pete Thomas and Davey Faragher to Europe at that time, and I was able to ask them to do that show with Steve Naive, who lives in Paris, we found ourselves in the situation of having a rock 'n' roll combo in Dublin at exactly the same time as I was going to go in and record the proper versions of these songs I'd been working on at home."

The recording sessions were fast and furious, by design, because Costello believes strongly in the importance of immediacy and momentum in making a rock 'n' roll record. The group were after quite a variety of sounds, however, so a number of approaches were used.

"Elvis would have a kind of a seed or an idea—a demo he'd recorded in his kitchen—and the song was taken from there," explains Ciaran Cahill, who has known Costello since Cahill was the assistant engineer on *All This Useless Beauty* six years ago. "Then Leo would start off getting a groove together, picking out some sounds, and we just kept layering. On the album, there are many different approaches to recording, from putting the band in a room and letting them go at it full-tilt, to looping up something that Pete Thomas was playing."



Recording was through the facility's 72-input Neve VRP Legend console, using Amek mic pre's as well as the pre's in the board. "We recorded to 2-inch on a Studer A827," Cahill says. "We used lots of very nice, posh microphones on the drum kit: Neumann U47s and [AKG] C12s as overheads, and then standard [Shure] B58 on the snare drum, 87s on the toms and one U47 being heavily compressed by an 1176 URE] compressor. Guitars and everything after that we used basically Shure Beta 58s, and for vocals. Especially for vocals. A lot of the vocals were done in the control room."

"The setup in the live room pretty much just stayed the same, and the setup in the control room, as well," says Lynch, who, in his three years as a staff engineer at Windmill Lane, has worked with artists including U2, The Cranberries and R.E.M. "We had the drummer right down at the dead end of the room with loads of screens around him," says Cahill. "We had the bass player next to him with his amps screened off from the room, and then we had Elvis in a kind of booth of screens with a vocal mic and whatever DI he needed for guitar, and sometimes they'd all play in the room together. Then he'd come in and lay down the guide vocal in the control room with us."

There are songs on the album like "45," "Alibi" and "Tear off Your Own Head (It's a Doll Revolution)" that are vintage-rocking Costello: stuttering, slamming distorted guitar, jungle drums and the almost tongue-in-cheek bounce of Steve Naive's keyboards. But as Costello intended, *When I Was Cruel* also takes him into some new territory, such as on the album's sultry, complex title track, which even contains a sample(!).

PHOTO: CIARA MCCORMAC

From left: engineers Ciaran Cahill, Leo Pearson and Kieran Lynch

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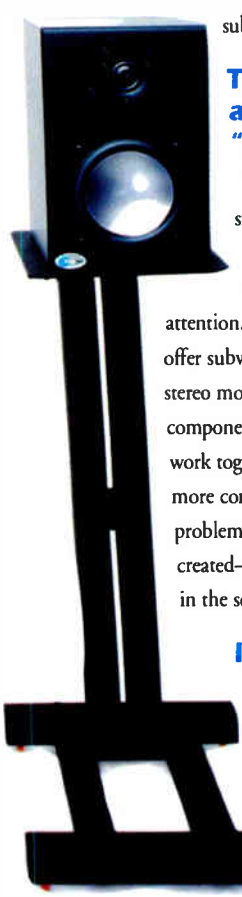

The truth about the "hole" truth.

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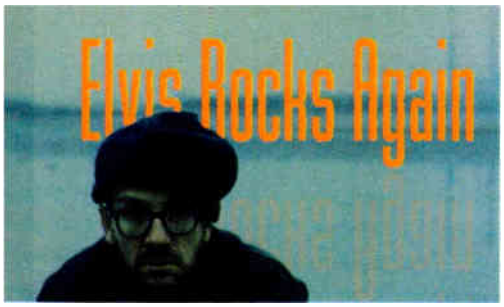

"It started with a '60s Italian pop record by Mina," Costello explains, "and it's a two-bar loop that's just put through this little kind of kids' sampler, and there's a little bit of backward bass that's also on that, and me sort of humming a little Serpentine melody, which, again, is sort of switched backward, and then I play my Ferrington baritone guitar through a couple of distortion effects, and a Fender bass direct in across that, which is kind of playing the timpani line. And to that we added a little clip of Steve playing a little French Impressionist kind of piano, and Bill Ware of the Jazz Passengers playing vibraphone."

The vibes were recorded at a separate session that took place in New York at Avatar Studios last September. Engineer/producer Kevin Killen, a longtime friend of Costello's, was recruited to record the vibes and a horn section that included Roy Nathanson on alto sax, Jay Rodriguez on tenor sax, Curtis Foulkes, on trombone, and Frank Lacy on trumpet and trombone.

"An unusual thing that happened," Costello says, "was that I had invited Frank Lacy to play trombone on 'Spooky Girlfriend,' and his agent said when I made the booking, 'You know, Frank plays trumpet,' which I didn't know. I said, 'Well, maybe he could bring the trumpet,' because I really hadn't thought of having trumpet in this section, but that turned out to be the wild card. It brought some kind of raw sound to it that I'd never heard before on the trumpet, and I love the way it sounds. It's exactly the sound I had in mind, and I didn't know I was missing the trumpet line till it was there...Some of those lines, particularly on the song '15 Petals,' have a little East African, Arabic kind of feel to them. It's sort of slurred; rude is the only word I can think of to accurately describe it."

Killen miked the horns with Neumann U87s and 67s. He recorded to a Studer A800 MkIV 2-inch machine, locked to a Pro Tools session of the tracks that Costello and his bandmates had recorded back in Dublin. For longer projects, Killen usually brings along quite a lot of his own outboard gear, and his own ProAc monitors, but in this case, time and vibe were of the essence. "I brought four Hardy M1s," he says, "and I used the [SSL 9000 J] console mic pre's and those. This was such a fun-filled session—and we literally only had the horn section for about three hours—that I thought I should probably just make sure everything is working, and Avatar is a really good studio; they've got great maintenance there, and I know the rooms sound really good, too."

One factor that definitely affected the vibe of these sessions was the strong emotions in the studio not two weeks after September 11. "It was an odd atmosphere in the town," Costello says. "In fact, Bill Ware had to go inside the disaster zone to retrieve his vibes from The Knitting Factory, and we very nearly didn't make the session, because the police originally weren't going to let him take the van in there. I was really delighted to see everybody. Some other musician friends of ours came, too, and it was a fabulous session."

"We had discussed at length as to whether the session would even happen in New York," Killen recalls. "He had planned it prior to September 11, and when that happened, he obviously had some second thoughts as to whether to come over and whether the musicians would be available or anybody would be up for playing a session. But we talked it out and came to the same conclusion that it would be great for everybody to immerse ourselves back into music again. When people showed up that day, everybody was really happy to play and to do something constructive."

Costello brought the horn and vibe tracks back to Dublin to mix with his coproducers on the Neve at Windmill Lane. "We had gone digital to sort out arrangements and whatnot, but we didn't do a lot of mixing in the digital domain," Pearson says. "We came straight back [from Pro Tools] out to the Neve console. When you're using keyboards in certain places, and atmospherics, it's really easy for it to sound crappy through digital, you know?"

"Most of the distortion came from Leo's guitar pedals," Lynch adds.

During the mix, varying amounts of reverb was added with one of the studio's EMT plates. The engineers also employed some AMS delay, the Line 6 DL4 and one of their favorite pieces of gear, the SPL Transient Designer.

"We occasionally put [the Transient Designer] across the vocal," Cahill says. "It sounds really interesting. It will add or subtract 15 dBs of attack to the sound, or add or subtract 24 dBs of sustain, so you can make a rock drum kit sound like a hip hop drum machine."

"All hail the Transient Designer!" Pearson exclaims.

Also during the mix, one of the album's longest songs was split into two separate tracks. "The two 'Dust' songs started off as one song," Lynch says, "and the band jammed on a basic groove, and then when we listened to that, Pete had been drumming a swing pattern over a straight pattern and decided to do a swing version of the song as well. Both versions were used as one song, but then, eventually, it was split up into two separate versions of the song."


PHOTO: JILL FURMANOVSKY

The last song to be mixed was a hybrid of the two versions of "Dust"; that's the song that became the memorial to Costello's dearly departed guitar collection. It will be used as a B-side to the single version of "45," which is actually a single about singles (among other things).

"The other important thing [about the mixing process]," Lynch points out, "was not worrying about spill. If something was going down that was passionate and had a vibe and had emotion and carried the message or idea of the music, that's more important."

"Definitely, in the mixing phase," Pearson says, "there were other mixes of tracks that were more sonically correct but that just didn't have the same vibe to them. And we want to tip our hat to Elvis for hammering that home." ■

Barbara Schultz is Mix's senior associate editor.

DAVID KAHNE, M-POWERED.

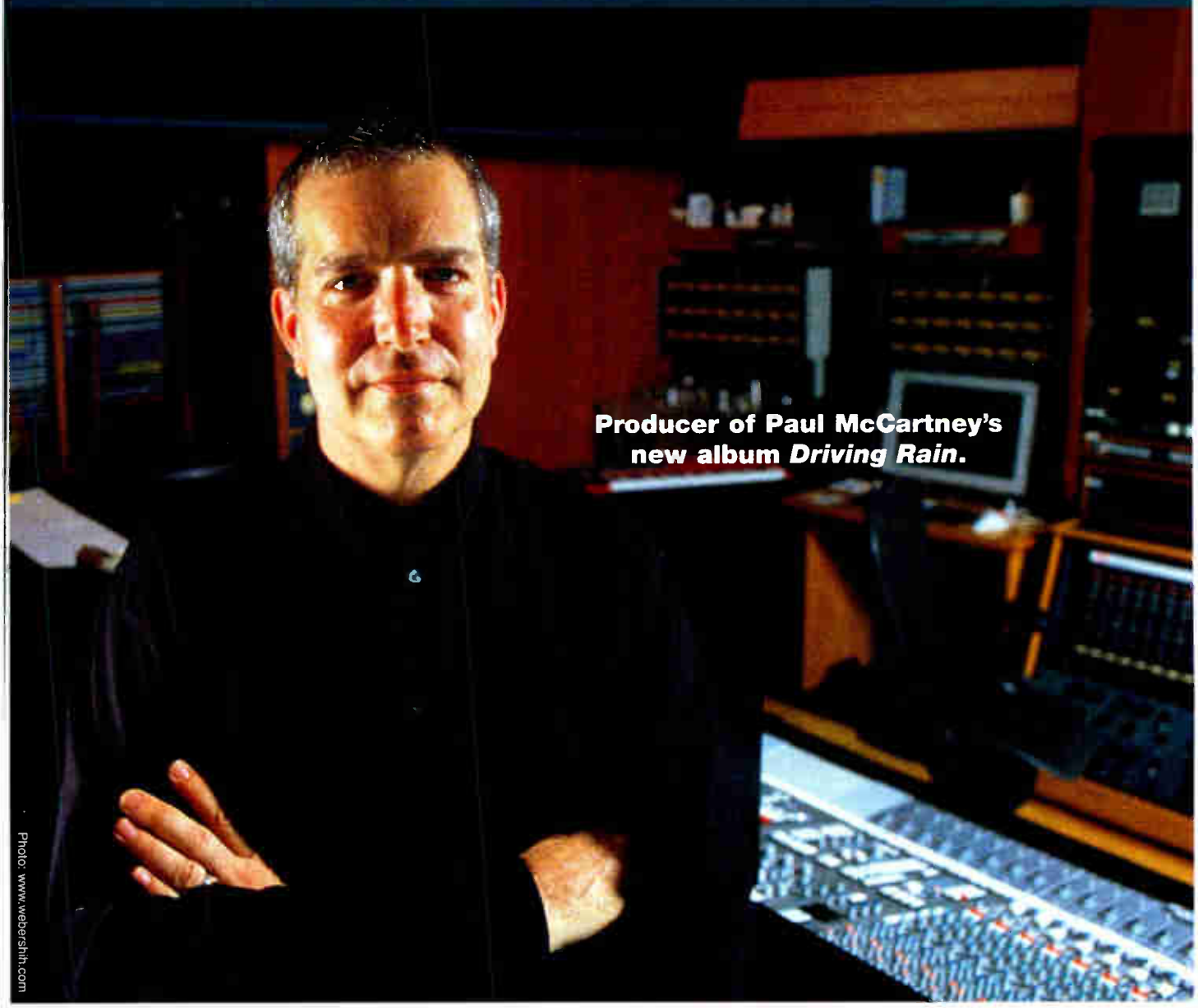

Photo: www.webershih.com

David Kahne is one of the most trusted producer/engineers in the music business. In fact, David's ears are so good that it seems everyone wants to borrow them. Paul McCartney did for his latest recording, *Driving Rain*. David has also loaned his lobes to the likes of Shawn Colvin, Sublime, K.D. Lang, Fishbone, Soul Coughing, The Bangles, Sugar Ray, and Matthew Sweet - just to name a few.

Needless to say, people take notice of David's choice of audio cards. **David uses the M-Audio Delta 1010 audio card in his studio.** The critically acclaimed Delta 1010 has become a staple item in pro studios because of its ability to thrive in so many environments. From Mac to PC, from audio/sequencing programs to soft synths and soft samplers, the Delta 1010 is the card increasingly found behind the scenes. (The slim price tag helps, too.)

All of M-Audio's Delta audio cards offer low-latency drivers, clearly superior fidelity, and compatibility with today's most demanding audio applications. Whatever your needs, M-Audio makes a card that fits your budget and exceeds your expectations of what a digital audio card can be. A Delta card and your favorite program will form a system that challenges everything your ears know about professional-quality sound.

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Big Show, Big News!

PRODUCT HITS OF FRANKFURT MUSIKMESSE

By Sarah Jones and George Petersen

Audient Azfec

SPL MMC1

The annual Musikmesse/ProLight+Sound show, held in Frankfurt, Germany, from March 13 through 17, 2002, is nothing short of gargantuan, filling more than a dozen halls with the latest in musical instruments and audio gear. Given its size, Musikmesse offers a little bit of everything, from an entire exhibition hall of accordions, to some very AES-looking halls devoted to high-end audio from distinctly non-M.I. suppliers, such as Meyer Sound Labs, Trident Audio, Neumann, Nexo, DPA, Apogee Sound, Midas, Nagra, Funktion-One, Turbosound, etc.

Taking place just a few weeks after this winter's highly successful NAMM show, there was some concern whether this year's Musikmesse would offer much in the way of new products. However, this concern proved to be unfounded, as the Frankfurt show had no shortage of hot debuts—both pro and M.I. Here are a few highlights...

PRO CONSOLES

The most talked-about product at Musikmesse was Yamaha's 02R96, the long-awaited successor to its revolutionary 02R digital console (see spotlight on page 60).

Not all consoles were digital. **SPL** (www.soundperformancelab.de) unveiled its MMC1, a no-compromise, fully discrete analog console for stereo/5.1/6.1/7.1 mastering. Designed with DVD-A and SACD specs in mind, and priced around 64k euros (approx. $55,000 U.S.), the MMC1 is centered around two large, backlit, multichannel potentiometers for adjusting playback monitor and master output levels. A logic-controlled patchbay (with four memories) handles various routings/sequences of multichannel outboard gear for insertion into the master outputs, allowing the engineer to compare different combinations/orders of processing (compression, EQ, harmonic enhancement, etc.) instantly. All switching uses gas-filled relays, and active processing is via SPL's Supra discrete 120-volt(!) opamps with 150dB dynamic range and 34 dB of headroom. Eight large VU input meters and an RTW 10800 visual surround monitor (offering correlation, phase, surround analysis, vectorscope, RTA and 8-channel peak output metering) are standard.

SOFTWARE

The biggest news in softwareland had to be **Steinberg's** debut of Cubase SX. Although it's called Cubase,

Korg KP-2

Steinberg Cubase SX

CreamWare Noah

Quested F5 and F19

Cubase SX is an entirely new program with a powerful new software engine, which is based on Nuendo technology but geared toward music creation and production. Cubase SX features intelligent MIDI Input and processing tools, new virtual instruments and effects, graphic automation of every parameter, scoring, 5.1 mixing and unlimited undo/redo, all within a new graphic interface. It integrates VST System Link for combining computers for additional processing power. Cubase SX will support Windows 2000/XP and Mac OSX; a variety of upgrades from Cubase VST are available. A bonus: Cubase VST users who upgrade to Cubase SX can use VST System Link to create a network with both applications.

We got a sneak preview of SONAR 2.0, the latest version of Cakewalk's (www.cakewalk.com) multitrack recording/editing software introduced last year. This upgrade features the Cyclone DXi Groove Sampler, a software synth that lets users manipulate and combine individual slices of Groove Clips and ACID loops. Cyclone DXi can also extract and remap loop rhythms, and trigger up to 16 groove pads in real time with a MIDI input device, keyboard or mouse. SONAR 2.0 also offers ReWire 2.0 support, 64-bit DirectX 8 audio-mastering effects, a multiport graphical drum editor, a new Synth Rack for more flexible integration of DXi software synths, global MIDI control surface support and support for Yamaha Open MIDI Plug-in Technology (see below).

In addition to announcing that it's now distributing Samplitude, Emagic (www.emagic.de) showed Phat Channel, an extension unit for the Logic Control system that offers 32 additional V-Pots, providing direct access to parameters of a track, an audio instrument or Logic Platinum plug-ins. One cool Phat Channel feature is Split mode, which allows different editing functions to be spread across different displays and V-Pots, ideal for plug-in or instrument editing.

Propellerhead Software (www.propellerheads.de) showed Reason 2.0. One of the coolest new features in the addition of the Malström Graintable Synthesizer, which combines granular synthesis with wavetable synthesis, and offers a variety of filters and two modulators/LFOs. Also new in Reason 2.0, the NN-XT Advanced Sampler, with automatic pitch detection and mapping of samples; enhanced sequencer features including Zoom, Line and Eraser tools (and the ability to break away and resize the sequencer); The Orkester NN-XT Sound Library, featuring orchestral samples ranging from single woodwinds to complete string sections; and, of course, support for Windows XP and Mac OS X (including Core Audio, Aqua GUI and any MIDI interfaces recognized by Mac OS X).

Yamaha caused a stir with the debut of its Open Plug-In Technology (OPT) for the control of MIDI devices from within music software and sequencing products; it's designed to provide seamless integration of hardware control surfaces, synth editors and other MIDI tools via GUI-based editors for the devices. The format is based upon the Microsoft COM (Component Object Model) interface for compatibility with Microsoft Windows 9.x/ME/2000 and XP. A royalty-free SDK is avail-

TECHNOLOGY SPOTLIGHT

YAMAHA 02R96 DIGITAL CONSOLE

In 1995, Yamaha kicked off a not-so-quiet revolution with its original 02R, a 20-bit/48kHz digital console with moving faders, instantaneous reset of all console parameters, dynamics on every channel, two internal effects processors, 24 analog inputs and 16 digital tape returns for a total of 40 inputs. Its feature set was not so radical—certainly, other digital consoles offered more, but it was the 02R's under-$10,000 price tag (about 50-times less than competing products!) that changed the audio industry almost overnight. Now, for about 10% more than the original 02R, Yamaha unveils its next generation—the 02R96.

It would have been fairly straightforward for Yamaha to simply update the existing 02R for 24/96 production. However, the 02R96 updates every aspect of the console, with more than five times the processing power of the original 02R. Many of the 02R96's key features are shared with Yamaha's recently announced DM2000 (profiled in the January 2002 *Mix*), such as 24-bit/96kHz audio, improved high-res mic preamps, Sony 9-pin (P2) and MMC control, surround monitoring and DAW integration. Yet, the 02R96 retains the same modest footprint as the original 02R. The control surface and user interface were enhanced for a more analog-style, hands-on operation, and 16 assignable user-defined keys speed production tasks. The 02R96 offers 56 input channels and adds a direct out function for routing the signal from any channel directly to any digital or analog output.

Surround features include 5.1 panning, multichannel monitoring and bass management. The assignable joystick control has smooth 128x128 resolution, and a divergence parameter can adjust the hard/phantom center ratio for each channel. Also standard is 32-bit internal processing and a comprehensive range of 96kHz-compatible stereo effects—several of which are designed specifically for surround.

The console's 24 100mm motorized channel faders can be instantaneously layer-switched to control any of its 56 input channels or integrate directly with DAWs such as Digidesign Pro Tools, Steinberg Nuendo and Emagic Logic Audio. The 02R96 ships with Yamaha's Studio Manager software, providing external Mac or PC control and management of all console parameters.

Customization options abound, ranging from the comprehensive meter bridge to a wide range of 24-bit/96kHz-capable Mini-YGDAI I/O cards for ADAT, TDIF, AES/EBU, mLAN and analog interfacing. The 02R96 is also compatible with third-party cards from Waves and Apogee. And finally, the built-in cascade ports allow two 02R96s to be linked for 112-channel operation.

The 02R96 is set for June 2002 deliveries. For more information, visit www.yamaha.com/proaudio. —*George Petersen*

able; Cakewalk and Sonic Foundry are some of the first partners. Visit www.yamahasynth.com for more details.

SIGNAL PROCESSING

More and more plug-ins are being developed for TC Works' (www.tcworks.de) PowerCore. DSound's V12 Multichannel Valve Interface plug-in offers the warmth of classic tube interfaces in a simple-to-use software emulation. Up to eight channels are available, with a master saturation control. 24/96 is supported.

Three years ago at Frankfurt, **Korg** (www.korg.com) blew us away with its Kaoss Pad Dynamic Effect/Controller. Now Korg has taken the concept of this brilliant XY-axis pad/signal processor one step further: The new KP-2 Kaoss Pad greatly expands the palette of built-in effects and adds an onboard sampling function (up to six seconds at 44.1 kHz for each of the two sample keys).

Highly regarded for its excellent signal processing, **TC Electronic** (www.tcelectronic.com) unveiled the M300 Dual Engine Processor, a digital reverb/multi-effects unit that retails at an amazing $299 and includes 99 user presets and 256 factory settings.

INSTRUMENTS

Noah, from **CreamWare** (www.creamware.com), generated a buzz on the show floor. The software-controlled hardware synth offers analog (subtractive), FM, vector *and* wavetable synthesis, plus new physical modeling technology for guitar and bass sounds. And if that's not enough synthesis to keep you up all night, there's an option for sampling and PCM, plus Noah features plug-in technology for even more instruments, and offers extensive editing and effects. The basic package comes with nine instruments, including Minimoog and B3 emulators. Noah is available in both rackmount and keyboard versions.

On the heels of the Winter NAMM release of its Grand Piano VST instrument, **Steinberg** (www.steinberg.net) introduced the Virtual Guitarist from Wizoo. Playable via MIDI, the Virtual Guitarist is actually two instruments, acoustic and electric. Included are 20 virtual players offering different popular guitar sounds, styles and phrasing. There's even intelligent fret noise.

VirSyn (www.virsyn.de) showed TERA, a software-based integrated synth workstation with 16 modular synths, sequencing and a mixing console with an effects rack containing up to 48 individual

—CONTINUED ON PAGE 172

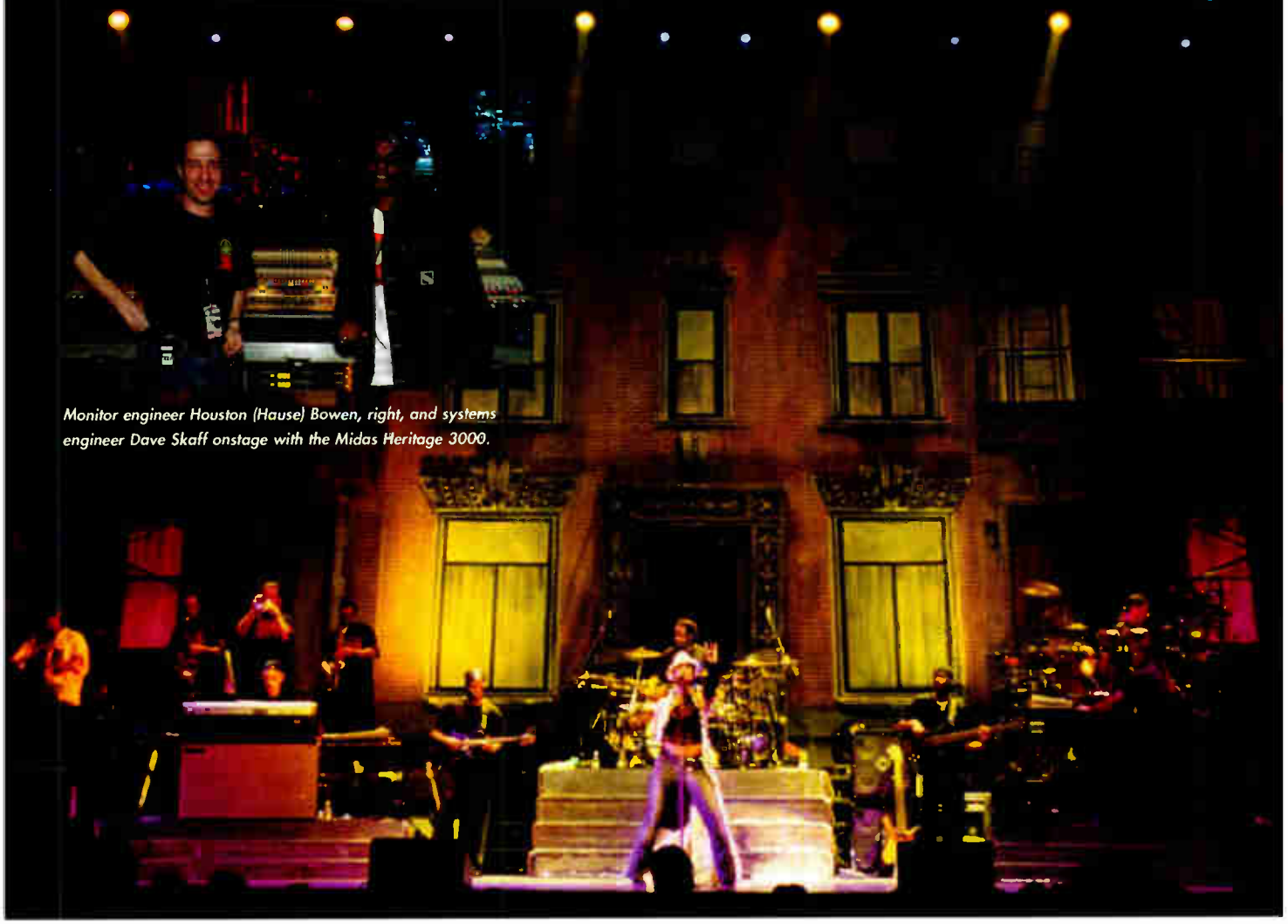
Alicia Keys

FALLIN' FULL SPEED TOWARD STARDOM

by Sarah Jones

FOH engineer Gregg Mann at the mix position in Oakland's Paramount Theatre.

PHOTOS: STEVE JENNINGS



Monitor engineer Houston (Hause) Bowen, right, and systems engineer Dave Skaff onstage with the Midas Heritage 3000.

Alicia Keys was probably born in high gear. The 21-year-old R&B singer/songwriter was singing Broadway tunes at age four and writing songs at 14. (One of her first compositions even appears on her debut album, *Songs in A Minor*.) A classically trained pianist, she studied choir at the Professional Performance Arts School in Manhattan; after graduating high school at age 16, two years early, she attended Columbia University for a mere four weeks before leaving to pursue her music career. Keys was approached by various record labels but eventually signed with Arista Records in 1998; a year later, she followed Arista founder Clive Davis (the legend credited with discovering such diverse artists as Janis Joplin, Bruce Springsteen and Whitney Houston) to his new label, J Records. Last year, *Songs in A Minor* debuted at Number One on the *Billboard* 200 Album Chart, and with both Video Music Awards and American Music Awards under her belt, six Grammy nominations and a movie deal in the works, there was no turning back. The high point came this February at the Grammys, where Keys took home five awards, including Best New Artist and Song of the Year (for "Fallin'"), Best R&B Song, Best Female R&B Vocal Performance and Best R&B Album. At last count, *Songs in A Minor* had reached worldwide sales of approximately 7 million.

Touring between awards shows, Keys has been appearing at mostly mid-sized venues (3,000 to 4,000 seats) and had completed 26 shows on the road since January by the time *Mix* caught the final night on the U.S. leg of her tour, at the Paramount Theatre in Oakland, Calif., in early March. Sound for the tour was provided by Clair Bros.

NO-FRILLS MONITORS

Monitors were mixed by Houston (Hause) Bowen, who's toured with Alicia Keys for the past year. Bowen brings plenty of experience to the tour; he's mixed for Mya, Usher, Faith Evans, Lauryn Hill, Taylor Dayne, Freddie Jackson, Chico DeBarge, *The Chris Rock Show* and *Showtime at the Apollo*. He has 12 stereo mixes on his Midas H3000: "In addition to Alicia on vocals and piano," says Bowen, "there are three background singers, three horns [trumpet, alto sax and tenor sax], bass, guitar, keyboards, drums and a second percussionist." The musicians are all on Future Sonics in-ear monitors (IEMs) with Shure wireless transmitters, with horn wedges and sidefills for the dancers and Freaky Nasty, a wild little guy who comes out on stage every now and then to work the crowd up.

Bowen says he is adding few effects to the monitor mixes. "[Alicia's] mix has mostly her [voice and piano] in it, with rhythm guide track; I'm using gates and compression," he explains. The same goes for the other musicians' mixes: dynamics control, spare effects. Bowen says his biggest challenge on this tour has been dealing with RF interference in some states, but mostly he's concentrating on helping keep the show tight: "I'm mostly

focusing on keeping the rhythm section locked onstage," he says.

BRINGING STUDIO SKILLS TO FOH

Originally hailing from the New York studio scene, FOH engineer Gregg Mann honed his mixing chops at the now-defunct Media Sound Studios in Manhattan before spending seven years at the Apollo Theatre, where he mixed everyone from Ray Charles to James Brown. He's also worked with Angie Stone, Erykah Badu, Gladys Knight, Ornette Coleman and New Edition. Last June, Mann left his gig mixing for BET in order to tour with Keys.

For Mann, who's also mixing on an H3000, vocals are king: "The thing that makes her show, the whole thing, is the vocals," he says. "So, I'm constantly fighting to make sure her vocal and the background vocals are not behind the music, that they're even or in front." He also applies this philosophy to the backup singers: "Her backgrounds have to be right there with her; the way the musical arrangements work, they might be carrying the whole front part and she's ad-libbing around it," he says. "[Then] they're actually the lead, and she's like the ad-libber. And for that moment, if the backgrounds played the background role, it wouldn't have a lot of feeling; it would be off. So I fight all night to make sure that the instruments are full and right there, but the vocals are never lost. Because the worst thing in the world is when you go to hear a group and you can't hear the singers."

Keys sings into a wireless Shure SM58. "She started on an 87 before I came onboard, but it was far too bright for her," explains Mann, who notes that the 58's warmer tone helps balance a slight boost in Keys' voice around 2 kHz. Impressed by the Audio-Technica mics he had been using on awards shows, Mann was planning to try an Audio-Technica ATW 73X for the next leg of the tour. "The A-T's bottom end meshes well with her high end," he notes.

Mann is a big fan of the Manley VoxBox voice processor for compression. "I tried it on Alicia, and it's perfect, because it has a mid cut and I can cut right at that 1k/2k area for her, just knock off a dB or two in that range, and it smoothes her out really well," says Mann. He treats the three background singers similarly, running their 58s through a Summit stereo compressor.

Alicia Keys calls the office for latest sales figures on her multi-Platinum debut album, Songs in A Minor. (The phone booth is a stage show prop.)

Mann adds reverb to just about all of the musicians, but in small doses. "I'm using a Lexicon 480L, a PCM80, a PCM90, a Yamaha 990—I have a lot of reverbs out there—but it might just be a little something here or there." Other tricks? The Eventide H3000's Micro Pitch Shift chorus effect gives the background vocals a slight double. And Mann shares an old studio

trick that he uses on Keys' vocals: "I use a very short delay on Alicia, a really short delay, like 125 ms, which is equivalent to a 15 ips tape slap. You never hear the delay, but it's a little double, a thickener for her."

THE "OTHER" STAR

Mann explains the mic setup for Keys' piano: "We have a Countryman tape, it's kind of like a contact mic; then I have two Sennheiser 421s in the sound hole, because the contact tape is really mid-heavy, and so I need something to give it top-end sparkle. So I use a combination of both, but I'd say it's 75 percent contact tape and 25 percent 421s. I really like condenser mics on the piano, but the piano sort of came at the end of the tour—we had a Rhodes and other setups—and I felt dynamics were safe." For the next leg of the tour, Mann says he's going to try condenser mics on the piano.

Mann keeps Keys' piano sound natural, touching it up with a dbx compressor and the Midas' onboard EQ. "There's compression and straight-ahead EQ—I don't use any effects," he says. "I don't even use reverb, because most of the time, the rooms have their own natural ambience to them, and if it doesn't, then I'll put a little bit of reverb, but most of the time I don't."

EVEN P.A. COVERAGE

Providing the best listening experience possible for everyone in the audience can be especially challenging in some mid-sized theaters with large overhangs, like the Paramount, where Mann's FOH position is against the back wall, underneath a long, shallow overhang. "I cannot make it sound in my face [at FOH] and not hurt the people in the first 20 rows," he says. "As far as this hall is concerned, it has a low-end kind of rumble going on because of its dome-type ceiling. The overhang kills all of the high end and the presence for me. But if I walk five rows from my position, all of the high end starts to come back, and it sounds great. And you go all the way forward and you start to really get it, and everything's there."

As configured for the Alicia Keys tour, the Clair Bros. I-4 line array system includes four "5 degree" and four "10 degree" cabinets per side (five and ten degrees being the cabinets' vertical dispersion pattern; horizontal dispersion is a uniform 90 degrees). In addition, four I-4b cabinets and two S-4 subwoofer cabinets per side are available for supplemental low end. Amplifiers included Crest 10004, QSC 9.0, and Crown MacroTech models.

"The reason we're carrying both the I-4b and S-4 sub cabinets is the wide ranging size and shapes of the theaters we've encountered on this leg of the tour," explains Clair Bros. systems engineer Dave Skaff. "When space is at a premium, the I-4bs, which are normally flown, become the platform for four to five I-4 cabinets. It's quite a lot of P.A. in a very small package!"

"I've found that the system covers all the spaces evenly," adds Mann. "Fundamentally, it's giving me a full range of coverage throughout the spectrum. It's working like a home unit; you can have a smaller system, it doesn't have to be a wall of speakers any more."

Mann seems to speak for everyone on tour when he talks about what the future holds for Alicia Keys: "I think there are going to be some big moments coming," he says. "I've seen the growth already, and then I think the next level's going to be incredible. The best is ahead." ■

Sarah Jones is a technical editor at Mix.

High-Tech, Smart Tech

THE REDONDO BEACH PERFORMING ARTS CENTER

When you think of likely bastions of cutting-edge audio technology, Redondo Beach, Calif., isn't first on the list. But those old images of a sleepy beach town populated by unemployed surfers don't hold water anymore. Location, location, location: Some 15 miles southwest of downtown L.A., today's bustling Redondo is part of the upscale South Bay, next to hip Manhattan Beach, old money Palos Verdes and a busy high-tech business corridor. It's also home to the Redondo Beach Performing Arts Center, a multipurpose venue currently undergoing a $9.5 million renovation, with approximately 10% of the budget earmarked for a very forward-thinking sound design.

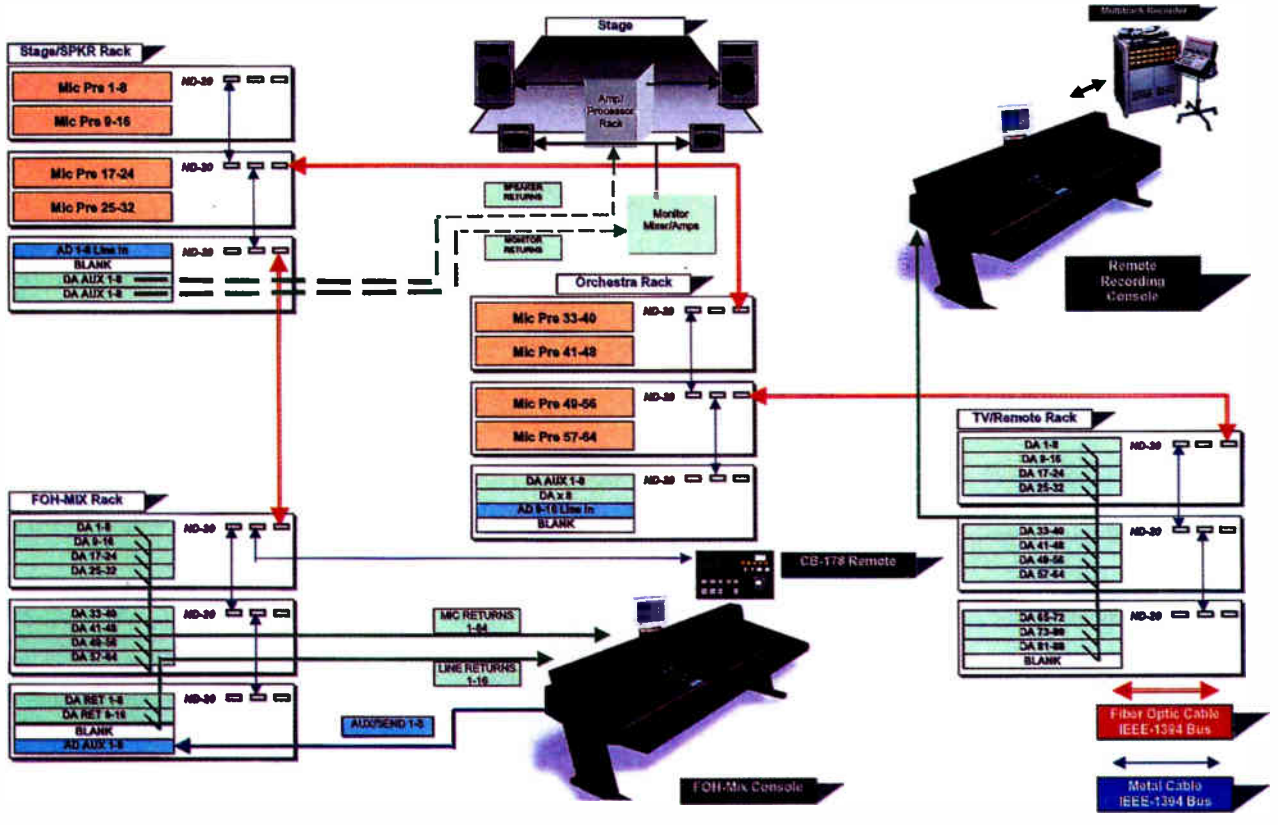
Multipurpose is putting it lightly; while RBPAC's main client is the highly successful Civic Light Opera of South Bay Cities, in any given year the venue plays host to pop, rock, and jazz concerts, church group programs, multi-ethnic cultural performances, modern dance and ballet, body-building championships and a Distinguished Speaker Series presenting the likes of Margaret Thatcher, Garrison Keillor and Madeleine Albright.

Jack Meyer, technical director, and Kevin Bleuer, head audio engineer, have been with the 1,457-seat facility since its transition, more than 10 years ago, from high school auditorium to public performance space. "It was in total disrepair back then," recalls Meyer, "a stripped shell of concrete with worn out seats. Now we house the largest civic light opera in Southern California, with

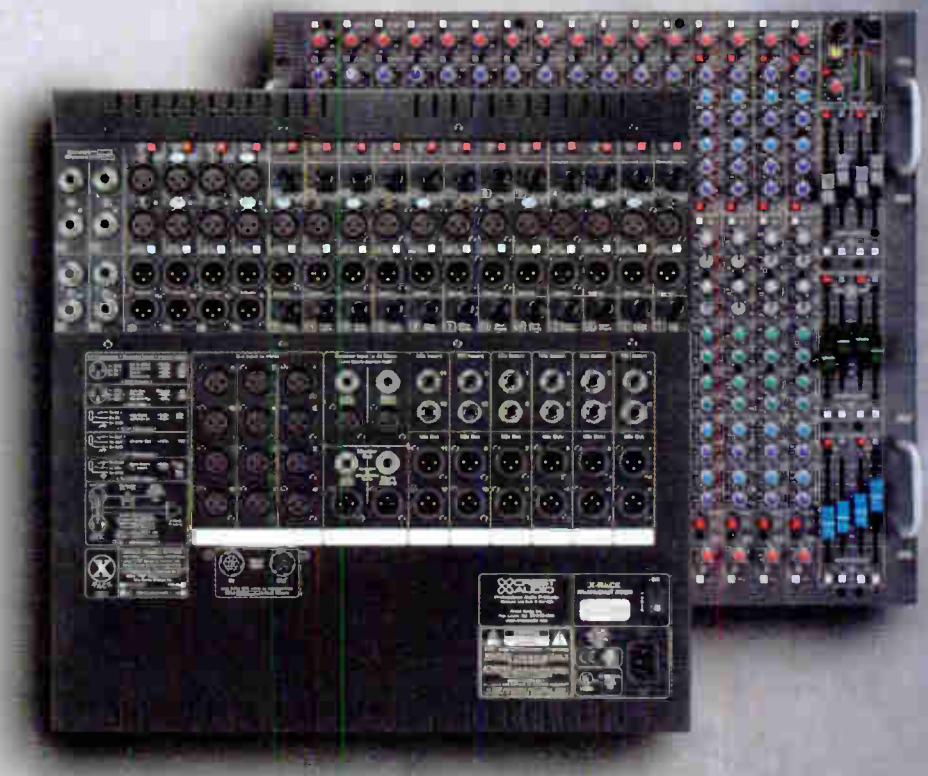
Kevin Bleuer (left) and Dan Palmer

By Maureen Droney

64 Mic Preamps, 24 Line Inputs, (16 Line In, 8 Aux/Sends), 88 Channel Feed/Remote Recording



A RACK MIXER BUILT TO PERFORM LIKE A PRODUCTION CONSOLE.



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18,000 subscribers and two back-to-back Ovation Awards for Best Musical (Large Theater)."

Four months out of the year the CLO presents full blown, Broadway-style productions such as *Evita*, *A Funny Thing Happened on the Way to the Forum* and *West Side Story*, and Meyer and Bleuer credit that company's sound designer, John Feinstein, with much input into the new system design. The rest of the year, RBPAC is a rental house, making maximum flexibility paramount. "The goal was to enable *everything*," continues Meyer. "Our clients are producers and concert promoters. What appeals to them is less time in the building and less equipment to rent, so we want to provide or facilitate as much production as possible. Most events don't have time to re-evaluate the building and adjust for different kinds of functions. The ultimate goal here is a system where, with memorized settings, we're able to flip a switch and have a complete configuration change."

Brainstorming that goal led to a sound system, designed by Veneklasen Associates and installed by Thomas Gregor Associates, that uses fiber-optic lines, an Otari ND-20 audio distribution system, and a Yamaha PM1D digital console with BSS SoundWeb for digital distribution and processing to the QSC PowerLight amps driving Renkus-Heinz CT Series loudspeakers.

Previous RBPAC sound installations had been plagued by environmental issues, such as salt air corrosion and RF from the venue's close proximity to business complexes, so fiber-optic cabling was an obvious component of the plan. "It's much easier to pull, we don't have hundreds of analog pairs going every which way, and it's a lot easier for troubleshooting—either it works or it doesn't," comments Bleuer. "Fiber also eliminates the issues of shielding problems and ground hums, as well as the radio interference we have here with companies like TRW all around us. Of course, with fiber, the quality of the installation is key."

Thomas Gregor Associates' Christian Hugener, along with project manager Eric Motley, oversaw the fiber installation as part of the overall engineering and fabrication package. "We have our in-house people who are trained to terminate and test the fiber as a part of the network process," he explains. "We have the proper test tools and procedures to ensure the fiber meets its bandwidth and loss requirements. It's a very labor-intensive process; it's not simply stripping a wire and crimping it or soldering it. When you strip back the fiber and fuse it or glue it into its socket, it needs to be polished. You need a 'scope to see how clean it is; you are physically looking at a piece of glass. Then you need special tools that allow you to put signal through the fiber and test for bandwidth and dB loss. It's also critical how you go from the fiber side to the copper side."

Digital distribution from multiple networked locations was next on the wish list for RBPAC's install, but it wasn't until Bleuer hooked up with Otari representatives at an AES show in 2000 that a practical solution presented itself—the Otari ND-20 audio distribution system.

"We were trying to find a digital solution," Bleuer explains. "It's kind of a leap of faith, because it's so new in live installations, but it's the next logical step. We looked at CobraNet and other

"Awesome. But isn't that a bit much for the Acapulco Room?"

M1D
22.9" w x 7" h x 8.5" d
(582 mm x 178 mm x 216 mm)
‹ 40 lbs (18.1 kg)
Max Peak SPL › 123 dB
Self-Powered

M2D
39" w x 12.1" h x 17.5" d
(991 mm x 307 mm x 445 mm)
‹ 120 lbs (54.5 kg)
Max Peak SPL › 136 dB
Self-Powered

M3D
54" w x 20" h x 30.5" d
(1372 mm x 508 mm x 762.5 mm)
415 lbs (188 kg)
Max Peak SPL: 145 dB
Self-Powered

Note: M1D and M2D specifications are preliminary and subject to change.

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M SERIES

"One thing I learned from Bill Graham is that collectively, our ultimate goal is to please the audience. No matter how big, no matter how small."

Meyer Sound

systems, but they were mostly being used in multiroom venues. The latencies in those systems were as much as 12 or 13 milliseconds, which—for our size house—would have resulted in unacceptable propagation delays. The more we researched, the less it sounded like digital distribution would work for us. We were heading back to wire when someone told me about Otari's new product, which they'd used at the Sydney Olympics."

Otari's ND-20 is now at the heart of the install. Using Yamaha's mLAN protocol (an extension of Apple's IEEE1394/Firewire technology), it provides the capability for I/O locations fitted with remote mic preamps and AD/DA converters, as well as word clock distribution.

"Our basic gain structure is all set up through the Otari ND-20," Bleuer notes, "using its CB178 remote, which is hot-pluggable from the mix position or from any of the other ND-20 rack locations. The CB178 can interrogate any box on the network, and can make adjustments such as trimming gain, inserting a pad or limiter, or activating phantom power assignments. It essentially controls all mic pre parameters remotely. Working this way, we find we're actually doing very little in the way of gain structure in the board itself. For the most part, everything comes in from the ND-20's D/As at line level with very low noise."

Two 40-in/8-out ND-20 fixed setups are mounted on each side of RBPAC's stage, with fiber-optic network connections also installed in the orchestra pit and at the rear of the stage for a portable ND-20 rack. Another ND-20 hookup is installed on the loading dock to facilitate remote recording and television trucks, and an optic port onstage allows for a digital monitor split as well. The fourth ND-20 hookup is at the main mix position in the rear control booth.

"Early on, I was pushing for the ND-20 because it seemed exactly what we were looking for," Bleuer comments, "but this hasn't been done before, and as we went along we discovered additional requirements. Otari has been great about thinking it through with us and accommodating our specific needs.

"We actually had code written at Otari Japan specifically for RBPAC's installation," recalls Dan Palmer, Director of Product Development and Marketing for Otari. "We made some specific requests to our R&D group there for fine-tuning the RBPAC system, and the engineers in Japan turned it around in one day. Rick Seegull [Otari Technical Operations Manager] and I hand-delivered and installed the firmware the next day. We knew that they were preparing for a show opening and we wanted to make sure that everything went perfectly."

With the imminent installation of mLAN cards to the Yamaha PM1D desk, which runs dual, synchronized DSP engines in "mirror mode" for redundancy, signal will stay digital through the output of the console. Although RBPAC has a substantial outboard rack available, the staff finds that the PM1D has eliminated the need for most outboard equipment. "It's a very popular board," Bleuer asserts. "I think the fear factor for digital consoles in live applications is diminishing very rapidly. And that's one of the real strengths of this system. Not only do we have the flexibility of configurations—

Lighter. Smaller. Better. (they cost less, too)

innovaSON Digital Live Consoles

Three Configurations, Sized to Fit Any Event: Imagine a digital live console that suits your professional needs perfectly. Great sound. Advanced technology. **innovaSON**, the world leader in digital live mixing technology, offers consoles for virtually any live mixing application.

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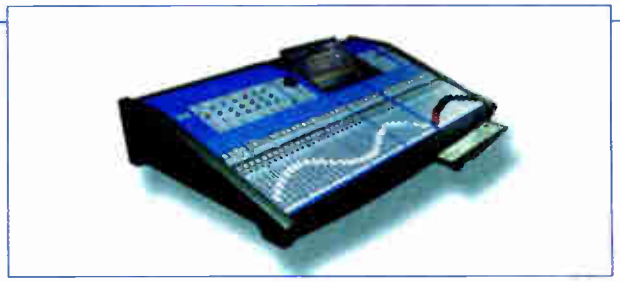
Compact Live

- 32 channels - each with 4-band fully parametric EQ plus hpf, compressor/limiter, gate/expander
- 40 (32 mic/line + 8 line) physical inputs, each digitally routable to any of the 32 channels via a digital input patch matrix
- 12 Group/Aux busses plus LRM or LCR
- 16 Outputs- (expandable to 48) - each with 8-band parametric EQ, compressor/limiter, gate/expander and digital delay (up to 1.3 seconds)
- Optional Stage Box - for expanding to up to 72 (total) physical inputs (available to the 32 digital channels) with digital transmission on coax cable
- Link Function - for linking two or more Compact Live consoles

— Starting at $46,000 (Only 44.5" x 27.6" x 7.9" and a scant 77lbs)



Essential Live

- 48 channels - each with 4-band full parametric EQ plus hpf, compressor/limiter, gate/expander
- 48 (40 mic/line + 8 line) physical inputs, each digitally routable to any of the 48 channels via a digital input patch matrix
- 20 Group/Aux busses plus LRM or LCR
- 24 Outputs (expandable to 64) - each with 8-band parametric EQ, compressor/limiter, gate/expander and digital delay (up to 1.3 seconds)
- Optional Stage Box - for expanding to up to 72 (total) physical inputs (available to the 48 digital channels) with digital transmission on coax cable

— Starting at $72,000 (Only 67" x 27.6" x 7.9" and a slight 132lbs)

Large Scale Live

- 96 channels (48 per layer) - each with 4-band full parametric EQ plus hpf, compressor/limiter, gate/expander
- 120 (96 mic/line + 24 line) physical inputs, each digitally routable to any of the 96 channels via a digital input patch matrix
- 48 Premix busses
- 20 Matrix busses
- 3 Master busses, LRM or LCR
- 24 Outputs (expandable to 144) - each with 8-band parametric EQ, compressor/limiter, gate/expander and digital delay (up to 1.3 seconds)
- Optional Stage Boxes - for expanding to up to 168 (total) physical inputs (available to the 96 digital channels) with digital transmission on coax cable

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Distribution from the desk to the QSC PowerLight amps and the Renkus-Heinz speaker system is driven through yet another digital network: BSS Audio's SoundWeb.

"It may seem a bit like overkill to have three discrete digital systems," admits Bleuer, "the front end, the controller and the back end, but we wanted to make it so you could use one of the systems, or any combination of them, without requiring that you use the other parts. If someone wants to use our distribution system, but with their own mixer, they can. They can use our speakers and output system but run their own snake."

That ability to easily accommodate outside mixers and equipment was a major design element in the system. Almost any configuration of analog or digital is possible; for example, a show loading in can interface an analog console, or even bypass the fiber system by running standard copper cabling through a plastic "beverage" line to the stage. An alternate center FOH position equipped with data hookups is also available for those who choose not to use the dedicated back wall control booth.

Working with changing technology presents new challenges, and the term "bleeding edge" comes up when speaking with any of the contributors to RBPAC's sound system. "Veneklasen's contribution was substantial," credits Bleuer. "Jack Shimizu, the system designer, was willing to work with us on the direction we wanted, even down to accommodating specific products and model numbers. Then he had the task of implementing the system, with all of it being fairly modular. For example, we brought them the idea of using the Otari system, and it was their job to make sure it was viable."

"It's probably one of the first digital distribution systems that is modular," Shimizu, who has been involved in numerous large fiber-optic installations, states. "Although it's been done by other companies, by the time you got on the digital bus and off of it, most of them have a latency of about 14ms. The Otari system processes the info a lot faster.

"This was all brand-new—all run in (the ND-20's native) Firewire mode," he continues. "Which is great because it's hot-swappable. As soon as you plug an ND-20 box in, the system recognizes it's there. With other systems out there, if you've unplugged, you must shut the system down, reconfigure and bring it back up."

While RBPAC continues to be open during construction for regular clients such as the South Bay Civic Light Opera, the official post-renovation opening is scheduled for October 2002. It will be full steam ahead then. "Before we began planning for the renovation, we asked the powers that be what they wanted to do here," says Meyer, "It was, 'Do you want to do musical theater, concerts, lectures, dance?' The answer to everything was 'Yes,' so that's the production system we've designed—maximum flexibility for maximum marketability." ■

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Model	Watts @ 2Ω	Watts @ 4Ω	Watts @ 8Ω	Watts Bridged
AP6040	N/A	2000 x 2	1250 x 2	N/A
AP6020	2000 x 2	1300 x 2	800 x 2	4000 @ 4Ω
AP4040	N/A	1200 x 2	750 x 2	2400 @ 8Ω
AP4020	1200 x 2	750 x 2	475 x 2	2400 @ 4Ω
AP2020*	600 x 2	450 or 600 x 2	250 or 400 x 2	1200 @ 4 or 8Ω
AP800*	400 x 2	260 or 400 x 2	160 or 250 x 2	800 @ 4 or 8Ω
A4.4	N/A	1200 x 2	750 x 2	2400 @ 4Ω
CR12	400 x 2	575 x 2	400 x 2	1200 @ 8Ω
CR5	N/A	250 x 2	170 x 2	525 @ 8Ω
SR-300	N/A	150 x 2	110 x 2	N/A

*AP2020 and AP800 can be configured for maximum power at either 2 or 4 Ohms

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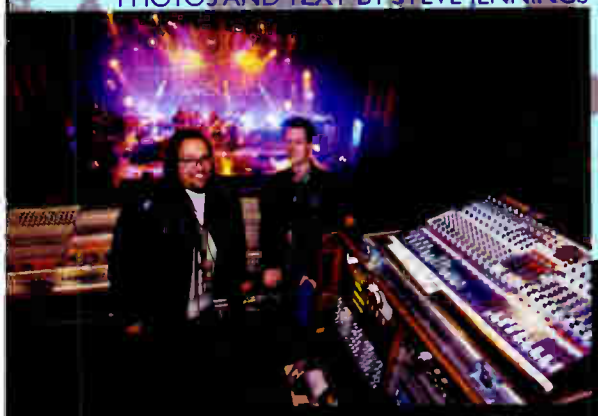
Nelly Furtado

Nelly Furtado sings into a wireless Shure Beta 58A and is using Ultimate Ears UE-5 in-ear monitors (IEMs). Onstage mics are all Shure, primarily Beta models, with SM81 condensers on cymbals and hi-hats. Kick drum is double-miked with a Beta 52 and a Beta 91.

With her first Grammy® at the age of 23 (Best Female Pop Vocal Performance for her single "I'm Like a Bird"), Nelly Furtado has more than lived up to her early promise. A first-generation Canadian from Victoria, B.C., Furtado grew up in a musical family, performed in Portuguese and English by age four, and recorded and performed throughout her teens, playing trombone in a jazz band and dancing in musicals. Influenced by rap, bossa nova, hip hop, R&B, techno, and the work of such unique and diverse talents as Jack Kerouac, Prince, Leonard Cohen, Marvin Gaye, Andy Warhol and Portishead, Furtado has developed into a self-assured and versatile songwriter—her first album, *Whoa Nelly!* (DreamWorks Records, 2000), picked up a total of four Grammy nominations, including Song of the Year. *Mix* caught Furtado's two sold-out shows at San Francisco's Warfield Theatre in February, one of 40-plus stops on her first U.S. tour as a headliner.

PHOTOS AND TEXT BY STEVE JENNINGS



FOH engineer Jeffrey "Luge" Holdip (far left) has been mixing FOH for 21 years, most recently for Canada's Big Sugar. For Furtado, Haldip is running 44 inputs through a Midas Heritage 3000 console and is using a relatively modest selection of outboard gear. "The one special thing that I carry all the time is the Avalon 737," he says, referring to the VT-737SP tube preamp/compressor/EQ. "Nelly has a spike [in her voice] around 2 to 3 kHz, so I just sidechain it out using the Avalon. It's very smooth, and it doesn't affect anything else." Holdip follows the Avalon with an XTA DPA 200 processor, which offers additional EQ, time align and limiting functions.

For effects, Holdip uses an Eventide H3000, two Yamaha SPX 990s, a TC Electronic M2000 and a TC D•Two delay. All compressors are BSS DPR-404 4-channel compressor/de-essers, and gates are by Aphex.

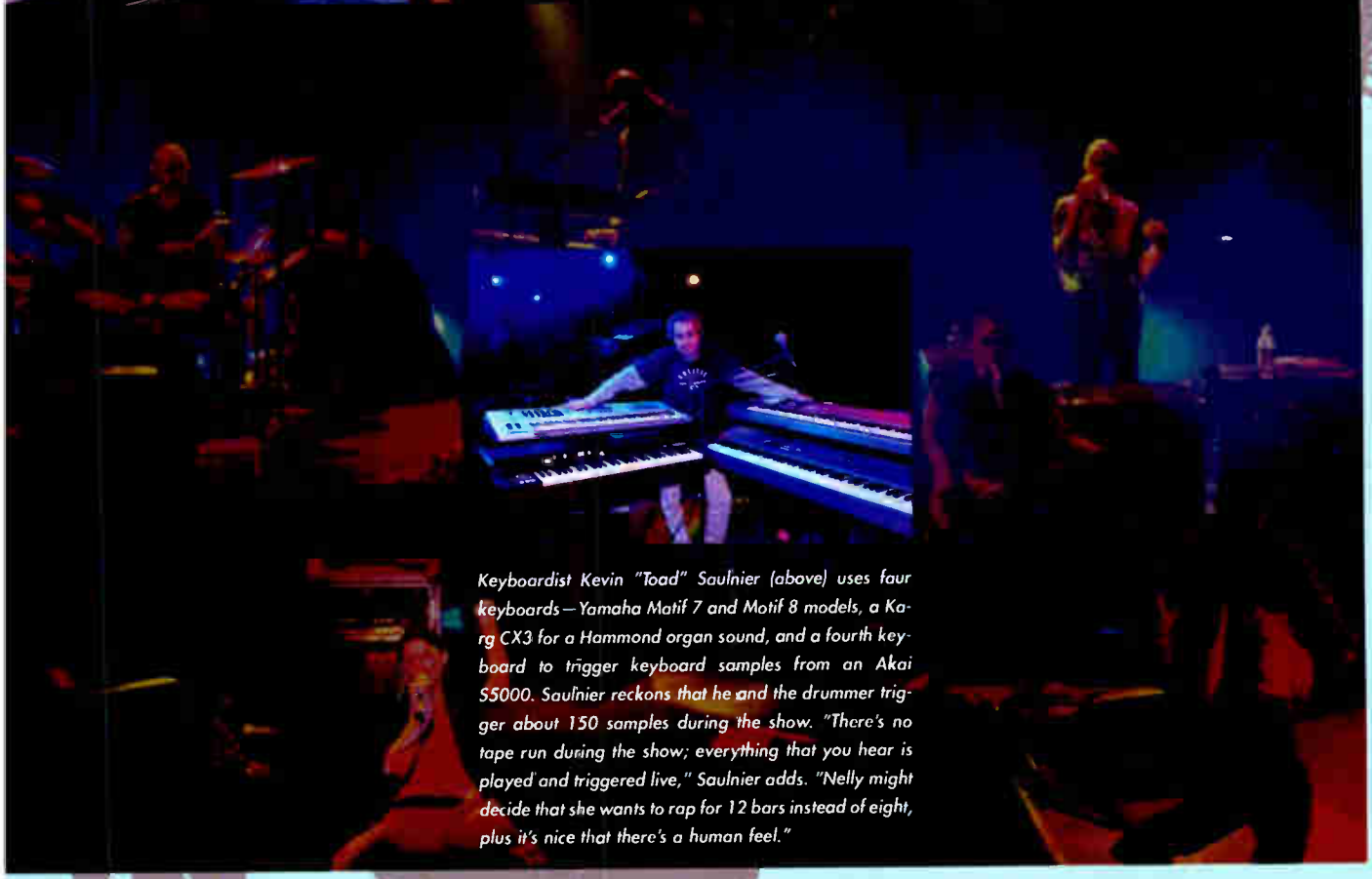
The P.A. is an Electro-Voice "mini X-Array" system from Sound Arts of Winnipeg, Manitoba. "It's the next generation from the E-V Delta Max, basically," explains systems engineer Damon Hill (right). "Same box, different drivers."

The main P.A. is supplemented with frontfills. "It's mostly vocals just for the front raws," says Hill. "We EQ them so that it's more of a top-end thing, just to get the vocal across, and we also put the whole mix through them at a lower level."

Monitor engineer David Retsan (left, with systems engineer Jamie Howieson) is using a Midas XL250 console to create both traditional wedge and in-ear mixes. "There's not too much different on this tour from others I've been on," says Retson. "But there are a lot of musicians onstage, and we're splitting between in-ear mixes and wedge mixes; from a gain standpoint, that can sometimes be a little bit trying." In-ear systems are all Shure PSM600 Series, and Retson carries backup beltpacks preset to each frequency in use.

Retson equalizes both wedge and sidefill mixes with Klark Teknik DN 300 stereo EQs, and uses K-T 9848 digital crossovers for the dual-12-inch Jason Sound wedges. Amps are all QSC models.

In his outboard rack, Retson has BSS 404 quad compressors and a Lexicon PCM90 for vocal reverb. "I also have a 'floater' reverb that I use to give the snare some body," Retsan explains. "I also throw some reverb on the classical guitar, to fatten it up for the guitar player, who's on wedges."



Keyboardist Kevin "Toad" Saulnier (above) uses four keyboards—Yamaha Matif 7 and Motif 8 models, a Korg CX3 for a Hammond organ sound, and a fourth keyboard to trigger keyboard samples from an Akai S5000. Saulnier reckons that he and the drummer trigger about 150 samples during the show. "There's no tape run during the show; everything that you hear is played and triggered live," Saulnier adds. "Nelly might decide that she wants to rap for 12 bars instead of eight, plus it's nice that there's a human feel."

New Sound Reinforcement Products

JBL VERTEC SUBWOOFER

JBL Professional (www.jblpro.com) has introduced the VERTEC™ model VT4880 dual 18-inch subwoofer, which is designed as a purpose-built arrayable subwoofer to supplement the VT4889 full-frequency line array cabinet. Weighing 129 pounds, one VT4880 delivers a maximum peak output of 138dB SPL (1 meter) and has a 1,200-watt AES system power rating. Containing two JBL 2258H 18-inch dual voice coil, Direct-Cooled™ cone transducers with Neodymium Differential Drive®, the VT4880 features advanced construction techniques and hybrid materials for an exceptionally rigid, lightweight enclosure. The cabinet also features JBL's roadworthy DuraFlex™ finish and weatherized component transducers.

See JBL at NSCA Expo booth #1107

BSS DIGITAL SIGNAL PROCESSOR

BSS Audio (www.bss.co.uk) has introduced the ProSys PS-8810 digital signal processor, a 2U, rackmount, fixed-path digital processor with eight inputs and 10 outputs. The ProSys PS-8810 offers a wide range of signal processing functions, including EQ, gating, compression, auto-mix and delay, and all outputs have dedicated processing paths. All ProSys functions may be set up and controlled from IQ for Windows, and presets may be recalled via a PC, contact closure or the PS-8810's own internal events scheduler. In addition to Crown's IQ communication protocol, the ProSys PS-8810 is optionally compatible with CobraNet audio networks.

See BSS at NSCA Expo booth #1111

A-T DEBUTS ARTIST ELITE MICS

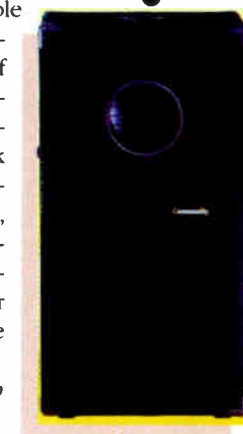
Audio-Technica (www.audio-technica.com) has introduced four new handheld microphones (two condenser, two dynamic) as part of the new Artist Elite™ Series. Models include the AE5400 Cardioid Condenser Microphone, a true condenser, large-diaphragm design that exhibits linear and uniform off-axis response, and includes a switchable 80Hz highpass filter, a 10dB pad and a multilevel windscreen. Other models in the range include the AE3300 Cardioid Condenser, the AE6100 Hypercardioid Dynamic and the AE4100 Cardioid Dynamic. All models are supplied with A-T's new AT8470 Quiet-Flex™ stand clamp. Prices are $579 for the AE5400, $439 for the AE3300, and $289 for the AE6100 and AE4100.

See Audio-Technica at NSCA Expo booth #2015

COMMUNITY SUBWOOFER

Community (www.loudspeakers.net) offers the MVP40 subwoofer for use with any fullrange MVP Series system. Measuring 34x18x15 inches (HxWxD), the MVP40 contains a single 18-inch woofer capable of handling 300-watt RMS/750W program, and has a maximum output of 123dB SPL at 1 meter. Frequency response is 40-250 Hz. Ruggedly constructed and covered with durable black carpeting, the internally braced enclosure features a socket stand and pole, rubber feet, recessed handles, ¼-inch input connectors, and a perforated, 16-gauge steel grille. Interlocking corner protectors facilitate easy stacking. The MVP40 is priced at $684.75.

See Community at NSCA Expo booth #2000



QSC RAVE GOES 24/48

QSC Audio Products Inc. (www.qscaudio.com) has upgraded its RAVE digital audio transport system to accommodate 24-bit/48kHz audio. Enhancements to both the QSC hardware and the CobraNet™ protocol allow RAVE/s-24 to provide 24-bit/48kHz A/D and D/A converters. Using an SNMP (Simple Network Management Protocol) browser, users can configure CobraNet bundles to transmit up to seven channels of 24-bit audio instead of the default configuration of eight channels of 20-bit audio. In addition to defining a 24-bit network, users can also configure, route and monitor network-bundle assignments and conductor-priority levels via an SNMP browser. When using two RAVE analog output units as master and slave in a redundant network, it is now possible to combine their outputs to provide a single audio signal to the destination audio device.

See QSC at NSCA Expo booth #2219

MACPHERSON SCHOLAR SERIES SUBWOOFER

MacPherson Inc. (www.macpherson-inc.com) has introduced the Scholar Series Model 118 subwoofer in Installation and Road versions. Compact (just over 23 inches high) and designed to be configured in multi-cabinet arrays, the Model 118 Road version features a bandpass design with critically damped tuning, heavy-duty thermoplastic skid rails, epoxy finish and two handles per side. The Model 118 Install version is available with and without 16 threaded-attachment points. Both versions do not require special processing and may be driven from a standard electronic crossover highpass output.

See MacPherson at NSCA Expo booth #918

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New Sound Reinforcement Products

SABINE SPREAD-SPECTRUM WIRELESS MICS

The SWM-5000 wireless microphone system from Sabine (www.sabine.com) is reportedly the first wireless microphone system with True Diversity 2.4GHz spread-spectrum technology, which allows up to 50 units to operate within a single location. Available with handheld, lavalier or headworn microphones in 1- and 2-channel models, SWM-5000 wireless systems include Sabine's FBX Feedback Exterminator® (a compressor/limiter and an intelligent de-esser) and Sabine's Mic SuperModeling™ feature, which modifies the standard capsule (an Audix OM-3) to sound like one of several well-known dynamic or condenser mic elements. Users may save and recall up to 10 presets per channel on the receiver, and retrieve custom settings on-the-fly. Programmable LCDs for each channel indicate RF and DSP status, and the system features a front panel lockout facility. Each transmitter is supplied with Switchcraft TA4F connectors and a rechargeable NiMH battery; the handheld microphone clip doubles as a charger stand. Accessories include rackmount antenna distribution for up to six receivers and a low-profile extension antenna.

See Sabine at NSCA Expo booth #1923

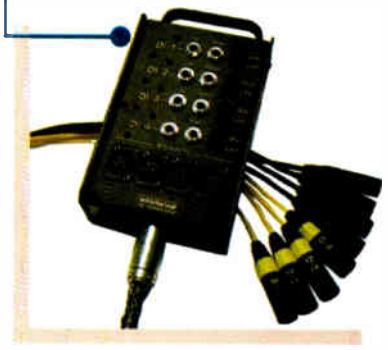
HAFLER'S THX-APPROVED SR2800 AMP

Hafler has introduced the THX-approved SR2800 live sound/fixed install amplifier, a new Class-G circuitry amplifier based around Hafler's patented Trans•nova platform. Capable of delivering 700 watts per channel (or 1,400 watts into a single channel), the SR2800 features balanced combo XLR and ¼-inch inputs, NOMAD protection circuitry, MOSFET outputs, five-way binding-post speaker connections, variable-speed dual fans, a regulated switching power supply and a five-year warranty.

See Hafler at NSCA Expo booth #2413

WHIRLWIND MEDUSA® MULTISNAKE

Whirlwind (www.whirlwindusa.com) has introduced the Medusa® MultiSnake, a versatile direct box/multichannel mic snake combination. Available in various lengths for use as a main snake or as a sub snake in larger systems, the unit combines four premium direct boxes with a Medusa 4-channel mic snake into a single 8-input stage box measuring only 9.5x5.25x2.5 inches (HxWxD), including handle. The heavy-duty steel stage box features a wire-mesh strain relief and internal cable clamp; the Whirlwind multipair cable ends in a multichannel fan out featuring laser-engraved connectors. Custom options are available, such as SnakeSkin®, multipin disconnects, integrated cable reels and more.



See Whirlwind at NSCA Expo booth #1214

CREST ADDS LQ-12P POWERED SPEAKER

Crest Audio (www.crestaudio.com) has added the LQ-12P Powered Speaker to the LQ Series of injection-molded enclosures. The bi-amplified LQ-12P features a trapezoidal polypropylene cabinet containing a 12-inch woofer with a 4-inch voice coil and water-resistant cone, and a 2-inch titanium diaphragm-compression driver coupled to a 1-inch Quadratic Throat Horn. Powered by two integrated amplifiers, the LQ-12P features an internal electronic, two-way crossover with CD horn EQ, level matching, active bass boost and subsonic filtering. The system has a dispersion pattern of 90°x45° degrees (HxV), frequency response is 61-18k Hz ±3 dB, and maximum output is 130dB SPL @1 meter. Connections are via one balanced combo female XLR/¼-inch phone jack and one balanced male XLR. The LQ-12P weighs 56 pounds, features extensive ribbing and bracing, and has a vinyl-coated perforated metal grille. Available in dark gray or black, the LQ-12P has mounting inserts top and bottom and a built-in standmount.

See Crest at NSCA Expo booth #1718

EAW INSTALL SPEAKERS

The UB2199-WP from EAW (www.eaw.com) is a weather-resistant, two-way, fullrange loudspeaker designed for continued outdoor exposure. The enclosure is made of black polypropylene and features a foam-backed, stainless steel grille. Input connectors are Neutrik and barrier strip, and all exposed metal parts are treated with a weather-resistant powder-coating process. The UB2199-WP has a 1-inch exit high-frequency driver on 90° conical waveguide and a 12-inch low-frequency driver. EAW has also introduced the MQH1346e three-way, fullrange installation loudspeaker system. Designed to be used singularly or in horizontal arrays, the MQH1346e is a fullrange version of the MQ1346e that incorporates new MF and HF drivers. The MQH1346e may be used with or without the MQ1312 subwoofer (or any other low-frequency system) for extended low-frequency operation.

See EAW at NSCA Expo booth #2615

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PHOTOS: STEVE JENNINGS

WILLIE NELSON

Touring in support of his latest release, *The Great Divide*, Willie Nelson played four sold-out nights at San Francisco's famed Fillmore Auditorium this past February.

"Willie's vocal mic is an Audix OM5," says FOH engineer Bobby Lemons (below). "We started using them about four years ago, and they work really well for him. The proximity effect is not pronounced, so he can back out of the mic and you don't lose all the low end. And they stay pretty constant, which is really good for this show—we play both indoors and out."

The production is carrying 16 Showco Prism® "Blue" cabinets and four subwoofers. Thanks to the merging of Showco and Clair Bros., Lemons has been using some of Clair's new 96kHz/24-bit digital crossovers. "I can do 5,000-seaters outdoors and any theater there is with this system," he notes.

At FOH, Lemons is using a Harrison HM5 board. "We don't have a full drum kit anymore," he says. "We also got rid of the B3 and the double amps, so I've only got 18 inputs; it makes it much easier on this end, and the low onstage volume helps make it all work." For processing Nelson's voice, Lemons is using a Summit TLA-100 compressor coupled to a BSS DPR-901. "That smoothes out his voice really well without killing the sound," explains Lemons. "You want it to sound like him, but you also want to smooth it out." —*Steve Jennings*

Bobby Lemons

INSTALLATION NEWS

The Victorian Arts Center, a five-theater complex Center in Melbourne, Australia, is using a dbx DriveRack™ system consisting of three DriveRack 482s and a DriveRack 480R Remote to control portions of the facility's large P.A. inventory. With theaters ranging from the 376-seat George Fairfax Studio to the 2,800-seat Melbourne Concert Hall, the venue regularly hosts all types of music and theatrical performances, from rock concerts to Broadway productions...**The Raue Center for the Arts, in the Chicago suburb of Crystal Lake, has installed two Soundcraft consoles**—a 32-channel Series TWO and a 40-channel Monitor2, both provided by Interstate Electronics Company, a leading Chicago systems integrator. In its first few weeks under its new name, the 810-seat former movie and vaudeville house presented Bill Cosby, *Festival of the Voice* choral event and a production of *Annie Get Your Gun*...**ARX has supplied an extensive list of audio equipment** for the banqueting and conference facilities in the new Crowne Plaza Hotel in Beirut, Lebanon. ARX distributor Doummar Freres Sarl supplied over 40 PowerMax Series loudspeakers, plus UltraSub, Micro Max 1, Ambience 5 and AmbiSub models.

TOURING NOTES

Crossroads Audio Inc. has been purchased by the trio of Stewart Bennett, Robin Magruder and Ed Spoto. Established in 1972 by Chuck and Diane Conrad, Crossroads Audio offers professional sound, lighting and video sales, "dry-hire" rentals and full-service event production. The company's rental inventory includes a complete Meyer M3D self-powered line array system, a 56-channel Tascam DA-88/38 multitrack digital remote-recording package, and Yamaha, Ramsa and Allen & Heath large-format mixing consoles...**JC Productions of Naples, Fla., recently purchased a Nexo Alpha system** and debuted the system at the annual Party in the Park, which attracts up to 16,000 people. JC Productions took delivery of 10 M3 mid-high packs, 16 B1s and 16 S2 sub-bass cabinets, with Nexo NX241 digital crossovers, as well as four Alpha E and four B1-18s for supplemental fill...**Australian Concert Productions Pty Ltd., based in Brisbane, recently purchased an Electro-Voice X-Line line array system** and is using it for the Australian leg of Rod Stewart's current world tour. Other recent X-Line purchasers include Britannia Row, which used the system for the Brit Awards (British Popular Music Awards) in February. ■

STEELERS GET LOUD WITH EAW

Heinz Field in Pittsburgh, the 65,000-seat home of the Pittsburgh Steelers, has installed an EAW KF900 Series loudspeaker system for the main P.A. cluster, which is capable of outputting 106dBA SPL—as measured at about 750 feet. QSC Audio power amps and BSS Omnidrive FDS-366 digital signal processors drive the cluster, and the sound system also includes a BSS Soundweb network, a Soundcraft K3 mixing console, and Shure and Telex wireless systems.

SHUBERT THEATRE ADDS SERIES FOUR

Boston's 90-year-old, 1,600-seat Shubert Theatre recently purchased a 32-channel Soundcraft Series FOUR mixing console, provided by local dealer Boston Light & Sound. Union soundman James R. McCartney notes that the new board features eight auxes with individual pre/post routing, enabling him to provide feeds for the press, assistive listening systems, dressing rooms, backstage area, etc.

HOLLYWOOD PALACE CATCHES THE WAVE

Delicate Productions of Camarillo, Calif., has installed a Martin Audio Wavefront system in the Hollywood Palace. The main system for the 1,450-capacity Palace consists of six WaveFront W8C compact 12-inch, three-way, mid-high cabinets and three WaveFront W8CS compact, 15-inch, horn-loaded bass cabinets. Two delay arrays, each with two W8C mid-high cabinets and one W8CS bass cabinet, are suspended mid-theater to cover the back section of the 425-seat balcony.

CADACS REVEAL ALL

The Full Monty, which opened at London's The Prince of Wales Theatre in March, features two Cadac Live Production Consoles as part of Mike Walker's sound design. An 83-input Cadac J-Type Live Production Console is situated at FOH, and a 39-input F-Type located underneath the stage serves as the monitor/sub-mixer for the show's 12-piece rock band. ■

Did someone say more monitor?

EAW's new **SM129z** and **SM159z** are true, professional stage monitor systems designed to cut through the sonic clutter of instrument amps and live drums.

The heavy-duty woofers and new, neodymium compression driver sound clear and crisp right up to peak output (a robust 131.5 and 130.8 dB SPL, respectively). Our world-famous horn designs give them a wider "sweet spot" and optimal enclosure venting extends LF coverage without straining the woofer. And the asymmetrical crossover/filter network ensures flat response without any EQ at all.

Designed for usability as much as for sonic fortitude, the enclosures feature input/output panels on both ends for cleaner daisy-chains. The stout grilles and over-built Baltic birch enclosures will survive years and years of abuse. And they can even double as main systems when needed.

Even with all the technology we've packed into these boxes, the SM129z and SM159z are remarkably affordable. So call 1-800-992-5013 or visit ***www.eaw.com/gate/mmz/*** to find your local EAW dealer and get ready to hear exactly what you sound like. (That's a good thing, right?)

EAW

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EAW is the worldwide technological and market leader in the design and manufacture of high-performance, professional loudspeaker systems

BY OLIVER MASCIAROTTE

Weighing Your Backup Options

Platforms and Possibilities

ILLUSTRATION: MIKE CRUZ

Back in November, we looked at midrange tape formats. Big, fast and a bit spendy. I know that, for many of you, a thousand dollars is a serious chunk of your annual equipment budget. Still, you need to back up your stuff. But how, without breaking the bank?

As I've mentioned before, one of the cheapest ways to do the backup boogie is to use another disk. Head on over to Buy.com and do a quick search for "Home," then "Computers," then "Storage" and then "IDE Hard Drives." At $200 a pop, 80GB IDE disks make a great container for disk-to-disk backups. This assumes that your computer can handle another drive. If not, then factor in the additional cost of a Host Bus Adapter (HBA) and the time needed to get the beast configured properly. You can also pick up a USB enclosure for an additional $100 and put those extra USB spigots to use. The potential downside of that solution is backup time, as USB 1.x is slow, slow, slow. While USB 2 and 1394 are quite speedy, in many cases, they might also require yet another expense in the form of a HBA.

One hidden liability of using additional disks as backup is all that extra disk space sitting there on your desktop, staring you in the face! Unless one possesses a steely, ninja-like will, one tends to use up every last byte of available space. Whoops, still no backup.

For slightly more moola, you can go to an offline solution that's reasonably priced, long-lived, rugged and proven technology to boot. I'm talking about QIC, a most ancient tape format that may just fit your backup bill.

I know, in the past I've dissed quarter-inch tape, but that was before the current slow recovery. The word of the day is *value*, and QIC has that in spades. QIC is a venerable format originally based on a Quarter-Inch tape Cartridge, hence the name. In 1972, the tape wizards at 3M introduced the QIC linear format for storing info from telecommunications and data-acquisition applications. At the time, it competed with half-inch, open-reel tape, those things you always see spinning in the machine room in '50s sci-fi movies.

In 1995, Imation launched improved QIC, or Travan technology, and Seagate partnered with them to develop drives based on this standard. The family has grown from its original 400MB QIC version to the current implementation, providing 10GB native capacity. Though based on and backward-compatible with QIC, Travan is an evolved version based on 0.315-inch tape. With compression, a Travan drive can do up to 85 Mbytes per minute, nothing too impressive, but hey, these things are cheap! Three hundred smackers will buy you an internal ATAPI mechanism and, for an extra $100, you can get a FireWire or USB external.

Unlike the DDS format against which it competes, Travan is a simple concept originally designed, from the ground up, for data storage. The cartridge is sim-

air-conditioning noise

reverberation

wind noise

traffic rumble

Clean Dialogue

Connected to Pro Tools using just a simple USB cable, the DNS2000 is the most powerful noise suppressor for film production, dubbing, remote and studio broadcast. It eliminates traffic noise, air conditioning, tape hiss, and general background noise from dialogue recordings and live transmissions. It will even suppress excessive reverberation. Its Remote Control Software provides a fast, intuitive user-interface, over 200 channels of processing, and full timecode automation capabilities.

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THE TLAS FOR THIS MONTH ARE . . .

DDS: I assume y'all know about DAT, and DDS is simply a DAT that's been adapted for recording computer data rather than for audio.

ADR: ADR, or Advanced Digital Recording, is a modern data-tape format developed by Philips through their former subsidiary, OnStream. The company and its format have had a rough time since its inception. Headquartered in The Netherlands, OnStream Data B.V. is a new company, founded on May 1, 2001, by acquiring the intellectual property and other assets from OnStream Inc., after they ceased business on March 16, 2001. With so many choices in the tape-backup market, it's anyone's guess if ADR will provide a compelling value proposition. For more background on ADR, see "Bitstream," August 2001.

ilar to a large, metal Philips cassette. The tape never leaves the cartridge and is only touched by the recording head. The stationary head in conjunction with a short, straight tape path means that the drive mechanism can be simple, with few motors and moving parts. Another advantage over DDS is the format's incredibly long life. This puppy just won't die, whereas DDS and ADR, another cost-conscious alternative, have no clear future.

Currently, there 12 to 15 million QIC drives in use, several times more than all other formats combined. Of those, 10 million are Travan. Last November, Seagate and 3M announced a new, seventh-generation iteration of the Travan platform scheduled to double the native capacity to 20 GB and boost the throughput to 120 Mbytes per minute.

While Seagate and 3M work their elves hard, the folks over at Exabyte haven't been sitting around drinking frosty mugs of Oasis, at least not during business hours. They're preparing the next generation of their value-oriented product, the VXA-2. Spec'd at 80GB native capacity with a 360Mbyte per minute throughput, OEMs are currently evaluating the SCSI mechanism for shipment later this year. These improvements come at an unexpected price, about the same as a VXA-1! Granted, this is a good bit more than a Travan drive, but, as with most things in life, you get what you pay for. To sweeten the deal, the cost of VXA media is coming down as well.

Whichever format you choose, there's a flavor of tape for every taste and budget. And Travan, the long-lived value leader, is the clear choice for the cash-strapped fader jockey of today. So, if you're still making excuses for your lack of a disaster-recovery strategy, then march yourself over to the nearest retailer and pick up a Travan. ■

OMas claims this column was written while under the classic influences of the Dave Brubeck Quartet's Time Out *and Delos' hybrid SACD of Antonio Vivaldi's* The Four Seasons. *For advice, links and back issues of "Bitstream," visit www.seneschal.net.*

ESI

The answer you've been looking for

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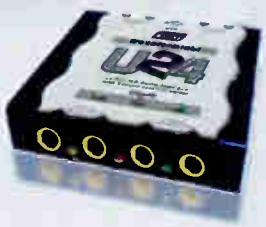
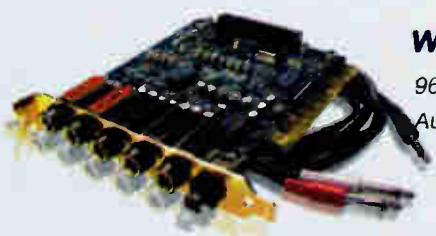
Premium 192kHz 8 channel Integrated interface

WaMi Rack 192L
96/192kHz 8 channel Integrated interface

Waveterminal 192X
Premium 192kHz 8 channel Audio Interface



Waveterminal U24
24bit USB Audio Interface with Sample-rate Converter



Waveterminal 192L
96/192kHz 8 channel Audio Interface

GIGAPort AG
USB to Analog 8 channel Interface

Waveterminal 192M
96/192kHz Analog 8 channel Audio Interface

GIGAPort DG
USB to ADAT Digital Interface

Ego Systems Inc.

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New Hardware/Software for Audio Production

TC WORKS SPARK 2.5

Enhancements in TC Works' (www.tcworks.de) Spark Version 2.5 audio editing application include an improved edit window with two cursors to simplify navigation and editing and the implementation of scrubbing. Also new is a user-definable effect matrix size in the Master screen, a mono audition function, and support of OS X and multiprocessor systems. TC Works celebrates its fifth anniversary by offering the upgrade for free to all Spark 2.0 users.

STEINBERG WAVELAB 4.0

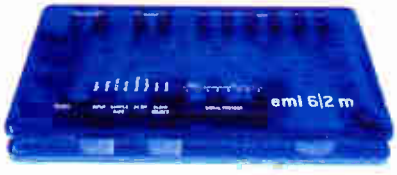
Steinberg's (www.steinberg.net) WaveLab 4.0 sound design audio editing application for Windows now features ASIO and WDM driver support, Data CD and Mixed Mode CD burning, real-time and offline monitors, a back-up tool, label editor, meta leveler and more. The software also comes with a new set of plug-ins including NaturalVerb, the Q mastering EQ plug-in, a multiband compressor, the Spectralizer enhancer and Apogee UV22 dithering processing.

SPECTRASONICS STYLUS GROOVE

Spectrasonics (distributed by Ilio Entertainments, www.ilio.com) introduces the Stylus native plug-in that combines original "groove creation" elements with a customized interface that expands the capabilities of Spectrasonics' Groove Control system. Stylus comes with nearly 3 GB (tens of thousands) of elements covering a wide variety of genres, including R&B, trip-hop, acid jazz, trance, funk, alternative, rap, drum 'n' bass and more. Loops can be remixed in real time and are presented in Spectrasonics' Groove Control versions, which provide independent control over pitch, tempo, feel and pattern without using DSP.

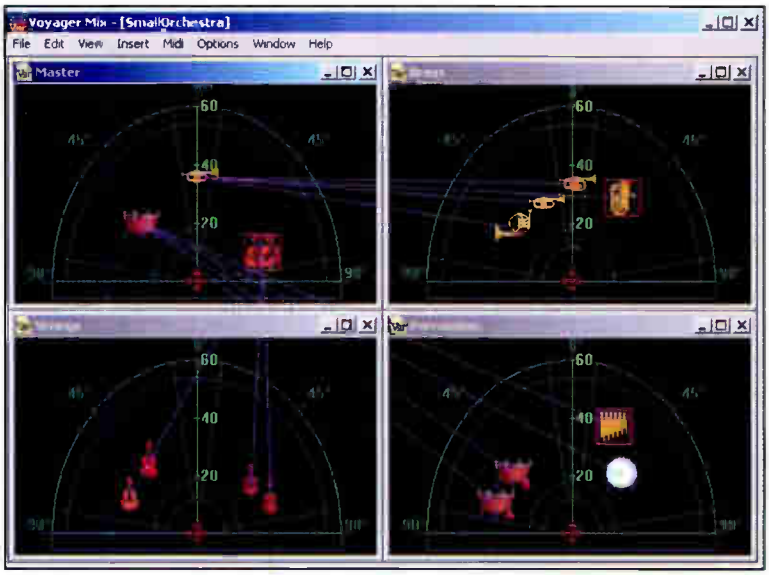
EDIROL SUPERQUARTET HQ

Now shipping, Edirol's (www.edirol.com) SuperQuartet HQ (High Quality) software synth provides a variety of piano, guitar, bass and drum



EMAGIC EMI 6|2 M

The EMI 6|2 m from Emagic (www.emagic.de) is a 6-in, 2-out, 24-bit/96kHz USB audio and MIDI interface. Ideal for mobile recording and notebook computers, the interface is approximately the size of video cassette and draws its power via the USB port. The EMI 6|2 m provides six analog recording and two analog playback channels, and two RCA jacks that can be used as either S/PDIF or MIDI I/Os; the unit also has two additional USB ports. A built-in headphone amplifier facilitates monitoring.



sounds. The plug-in works with both VST and DXi host applications and Cakewalk's Music Creator—an included basic DXi host application. Features include three drum sets (expandable to 128) and 67 instruments (expandable to 384), with 16-part multi-instrument playback, 128-voice polyphony, chorus and reverb effects, 24-bit/96kHz processing performance and customizable editing parameters.

VOYAGER GRAPHIMIX 01

Voyager Sound Inc. (www.voyagersound.com) introduces GraphiMix 01, the first in a series of audio mixing software applications designed to enhance control of MIDI-compatible hardware such as mix consoles, sequencers and PC sound cards. GraphiMix is based around a user-definable onscreen soundfield with icons that represent individual sound elements, and it uses the position or state of the graphic icons to set controls such as gain, pan and effects, adding functionality to hardware while providing a universal control surface. Features include support for multiple stereo and surround mixes, drag-and-drop operation and full feature presets with scene and state recall. GraphiMix 01 is now available for $129 from the Voyager Sound Website; GraphiMix PRO (slated for deliveries this month) includes extra features such as Voyager Sound's Audio Wizard.

SONIC SOLUTIONS AUTHORSCRIPT 3.1

Sonic Solutions (www.sonic.com) released Version 3.1 of its AuthorScript set of developer tools for integrating DVD, Video CD (VCD) and Super Video CD (SVCD) creation into video applications. New features in this upgrade enable applications developers to address the needs of the rapidly emerging market for home DVD recording, including OpenDVD Support, Edit-on-DVD, transcoding, direct burning to disc and and a virtually unlimited number of menus. QuickTime movies are now supported, and DVD+R/RW drives are supported with AuthorScript's integrated DVD burn engine.

UPGRADES AND UPDATES

Digidesign will market and distribute DUY plug-ins in the Americas; in other Digi news, the **DigiDrive FireWire 80** hard drive is now shipping. The drive offers 80 GB of storage for a list price of $575, and supports 24 tracks per drive, with a maximum of two drives. Visit www.digidesign.com...**Wizoo offers a new service for musicians:** At www.wizoosounds.com, users can download instruments for their samplers, using a secure credit card payment...**New Cakewalk Loops CD titles from include** "X-MIX Studio Loops 2: Techno & Progressive House" and "Loops of Hazzard Country String Essentials." Drop by www.cakewalk.com for details...**SurCode MLP, Minnetonka's latest software** encoder, incorporates the Meridian Lossless Packing algorithm, with the same interface as other SurCode applications. For more info, go to www.minnetonkaaudio.com...**Midiman will distribute AMG's sound libraries.** The AMG catalog includes many low-cost CD-ROMs in formats such as REX, WAV and AIFF. Visit www.m-audio.net for details...**New from MARCAN** (www.marcan.com), the **Primera Composer series of CD/DVD combo duplicators** handle a variety of media formats including CD-R, DVD-R, CD-RW, DVD-RW and General Purpose (GP) DVD. Compatible with Windows operating systems (including XP), Composer systems copy and print up to 60 discs per hour, with prices starting at $2,495...**Waves is shipping the new Masters and Platinum bundles for** Native and Pro Tools HD TDM systems. Go to www.waves.com for more info. ■

Preview

TC M300 DUAL-ENGINE PROCESSOR

TC Electronic's (www.tcelectronic.com) M300 Dual-Engine Processor combines a dedicated stereo reverb with a multi-effects engine. Available effects include flange, phase, tremolo, delays and reverbs, with 256 factory presets and 99 user memories, all selectable via the front panel or MIDI. Additional features include 24-bit AD/DA conversion with a 24-bit S/PDIF input, MIDI In/Out, MIDI clock tempo sync, pedal control of tap tempo and global bypass. The built-in power supply adapts to any AC voltage. Price: $299.

OKTAVA RIBBON MIC

Russian microphone manufacturer Oktava (www.oktava.org) has introduced the ML52, a true ribbon microphone featuring a double-ribbon filament and a fixed figure-8 pattern that is almost completely uniform at all frequencies. The Oktava ML52 is suitable for use in any situation where a warm, rounded sound is desired, and adds sparkle to string and brass instruments with a smooth vocal sound. Frequency response is 20-20k Hz and max SPL @ 1 kHz is 135 dB. MSRP: $799.

AKAI PAD CONTROL SURFACE

The PD16 USB/MIDI Pad Control Surface from Akai Professional (www.akai.com) is a self-contained unit that connects to computers and samplers via USB and/or MIDI. Features include 16 MPC-spec pressure/velocity-sensitive drum pads that generate note-on with velocity when tapped, a Bank key that switches between two separate banks of sounds and a fader that outputs MIDI control changes. Parameter settings, such as MIDI Note Assign, MIDI Channel, MIDI Control Change, etc., can be assigned from the computer via USB. The PD16 is powered via a computer's USB port or an included AC adapter, and a supplied PC/Mac CD-ROM contains pad setups and driver software.

PRIMACOUSTIC ACOUSTIC PANELS

Primacoustic (www.primacoustic.com), the acoustical division of CableTek Electronics, offers Freeport!™, a highly effective absorbent acoustical panel designed for temporary or low-cost acoustical correction. This sturdy, lightweight portable system features Primafoam™ high-density, open-cell, fire-retardant acoustical foam for maximum absorbency. Each Freeport! panel section measures 24x48 inches (WxH), and is height-adjustable from 5-6 feet high.

PRESONUS 4-CHANNEL GATE

The PreSonus (www.presonus.com) GTX44 4-Channel Frequency-Dependent Gate/Expander uses a digital sidechain processor to control gating/expansion while maintaining a high-quality analog signal path. Adjustable gate parameters include attack, release, hold time and range, with a variable ratio control on the expander section and ducking on each channel. Adjacent channels of the GTX44 can be linked. Rear panel I/Os include XLR and ¼-inch TRS. Additional features include +4/-10 switching, a key input for externally triggered gating and a Flip button that reverses TRS polarity. Price: $599.95.

M-AUDIO REFERENCE MONITORS

Midiman/M-Audio's (www.m-audio.net) Studiophile SP-8B are bi-amped reference monitors featuring an 8-inch woofer and a swivel-mounted, 1-inch silk tweeter that allows users to adjust imaging. Additional features include Ferrofluid cooling and magnetic shielding. The SP-8B has an extended frequency response of 33-22k Hz. MSRP for the SP-8B is $599.95/pair. The optional SP-8B subwoofer has an 8-inch woofer driven by an onboard 120-watt amp and M-Audio's Stereo Bass Management System. The SP-8S is $499.95.

TL AUDIO UPDATES IVORY SERIES

TL Audio (www.tlaudio.co.uk) has replaced its Ivory Series product range, first introduced in 1998, with the new Ivory 2 Series: the 5001 Quad Valve Preamp (shown), 5013 Dual Valve Equaliser, 5021 Dual Valve Compressor, 5051 Mono Valve Processor, and the 5050 Mono Mic Preamp and Compressor. Key improvements include optional 24-bit S/PDIF digital outs (44.1/48kHz selectable) and a wordclock input. In addition, there is a new discrete mic preamp design for the 5001, 5051 and 5050, which also includes a 30dB pad switch and added hard- and soft-knee compression modes on the 5021, 5051 and 5050. All models offer improved line-level noise performance and enhanced levels of valve drive.

AURALEX SONIC ISOLATORS

MoPADS from Auralex Acoustics Inc. (www.auralex.com) provide sonic isolation between monitors and speaker stands/meter bridges/shelving/etc., improving the monitoring system's accuracy. Each set of MoPADs includes four MoPAD monitor stands and four wedge adjusters, enough for a pair of monitors. The MoPAD Wedge Adjusters can tilt the monitor to four positions: 4° or 8° or flat (0° tilt). MoPADS can also be used to isolate CD burners, turntables and other delicate electronics from vibration.

YAMAHA PC POWER AMPS

Yamaha (www.yamaha.com) reintroduces the PC Power Amplifier Series with two high-output models, the PC9500N (925 watts per channel) and the PC4800N (475 watts per channel). Based on Yamaha's energy efficient EEEngine technology, the amps offer high output with low power consumption. The two-rackspace amps have 31-step detented level controls, 10-point LED metering, dual variable-speed fans, and XLR/Euro-Block/Speakon connections. Options include a security cover and Yamaha's mLan or CobraNet™ networking.

ART 31-BAND GRAPHIC

The Applied Research and Technology (www.artproaudio.com) HQ 31 is a 31-band EQ with Feedback Detection Circuitry™, a set of LED indicators that show which EQ band has the greatest energy. Features include 45mm center-detent sliders with selectable boost/cut range of 6 or 12 dB, and balanced XLR, ¼-inch and unbalanced RCA I/O connections. Additional features are high/lowpass filters, analog level-metering, variable input controls, signal-clip level indicators, ground-lift switch, internal power supply and selectable line voltage. Price is $299.

ESOTERIC 12-SPEED TURNTABLE

Designed for archiving/restoration, Esoteric Sound's (www.esotericsound.com) Rondine 3 is a 12-speed turntable that provides 33, 45 and 78 rpm and nine other fixed speeds. Featuring a low-mass Rek-O-Kut TranScribe arm for audiophile performance, the unit will play discs up to 17 inches in diameter, and accepts standard cartridge head shells. Features include a low rumble belt drive system and vibration-absorbent feet. A Super Strobe feature ensures that speeds from 16.7 to 90 rpm are accurate. Price: $1,200.

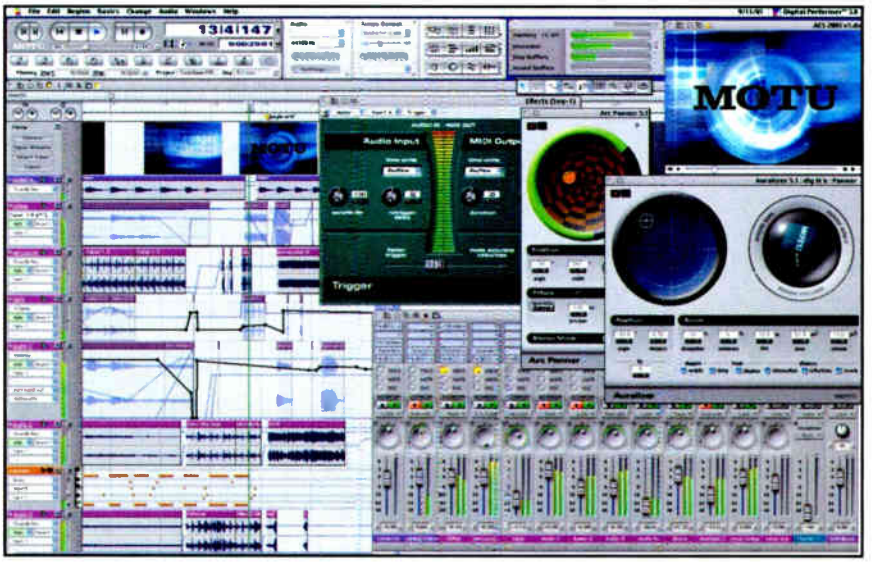
HOT OFF THE SHELF

Mackie adds two new 24-bit plug-ins for the Digital 8•Bus Mixer. Final Mix ($399) is a professional stereo mastering plug-in that offers multiband compression, 6-band parametric EQs, and editable key and crossover points. The DSR-1 de-esser ($299) is a frequency-controlled 3-band dynamic processor that reduces sibilant and popping sounds. Both Final Mix and DSR-1 are specifically designed for the Mackie real-time OS 3.0 and Mackie Universal Effects (UFX) card. Call 425/487-4333, or visit www.mackie.com...***11 Questions To Ask and Answer Before Building or Remodeling Your Studio*, published by Pro Audio Design** (PAD), offers a point-by-point discussion of the fundamentals of positioning a commercial recording studio for success. To receive your free copy, call 781/982-2600, or visit www.proaudiodesign.com...**Megatrax Production Music has released a five-CD set of original production music,** entitled *Movie Showcase Vol. 4-8*. Recorded in 5.1 surround at Sony Studios London with the 80-piece Philharmonic Orchestra and Chorus, the new collection covers virtually every genre of contemporary Hollywood-style film music. Visit www.megatrax.com...**Steinberg and Wizoo offer Urban Atmospheres, the first volume of a professional surround library for Nuendo.** Consisting of indoor and outdoor environmental urban soundscapes, the library covers six DVD-ROMs (over six hours total playing time). All events are several minutes long, are recorded in 5.1 at 24-bit, 48kHz resolution, and are laid out as separate Nuendo projects for instant use. Contact Steinberg at 818/678-5100, or visit www.steinberg.net...**Liberty Wire & Cable offers custom cable assemblies—any cable, any length, any termination.** Common audio assemblies include AES/EBU, audio snakes with XLR or RCA connectors, and mic and speaker cables. Most assemblies ship within 48 hours. Call 800/530-8998, or visit liberty cable.com...**The *Just Kids & Babies* CD from Nightingale Music** contains 99 jam-packed tracks that feature over 750 vocal-production elements of just kids and babies. Including individual kids and group laughing, crying, screaming, singing, reciting nursery rhymes and talking, the CD also contains a "Words & Phrases" section that features 35 tracks of kids being funny, whiny and simply adorable. Call 416/221-2393 or visit www.nightingalemusic.com. ■

BY ERIK HAWKINS

MOTU Digital Performer 3.02

Native 5.1 DAW Comes of Age



Frame-accurate Quicktime scrolling, comprehensive surround mixing and a new editing window displaying audio and MIDI tracks together are among the new features in DP3.

Mark of the Unicorn's Digital Performer has been a staple in my production studio ever since I connected MIDI instruments to an 8MHz Mac SE computer. That was about 10 years ago, when the program was for MIDI sequencing only. Since then, Digital Performer has evolved into a fully integrated audio production powerhouse.

DP 3, as Version 3.x is dubbed, is true dual-processor-compatible, sports an updated look, and has many new utility bars and tools. There's a new Editing window where MIDI and audio tracks can be viewed side by side, with independent vertical zooming on each track and frame-accurate Quicktime movie scrolling. And, MOTU has gone to the wall with its surround sound implementation, creating a fully integrated surround mixing system right inside Digital Performer.

Retail for DP 3 is $795. Upgrading from an earlier version of Digital Performer is $149. If you are currently using a competitor's product and want to change over to Digital Performer, then MOTU also offers a "competitive" upgrade for $395. This price is the same for upgrades from AudioDesk. Upgrading from 3.0 to 3.1 is free for registered owners.

I tried out DP 3 on a Mac G4 450MHz machine with 704 MB of system RAM. This machine has a Digidesign Pro Tools|24 MIXPlus system installed that I ran Digital Performer through, in both its native and DAE modes. Additional tests were done on a Mac dual-G4 800MHz machine with 896 MB of system RAM and a MOTU 2408 interface. The single-processor machine was running OS 9.0.4, and the dual-processor had OS 9.2.2.

SMOOTH CHANGES

DP 3 ranks as one of the best-looking digital audio sequencers on the market. The program's new appearance is based loosely on the OS X "Aqua" screen motif. Almost every window has artfully shaded elements that make for a visually pleasing 3-D environment.

The main control bar (the one with the transport keys and timecode display that has been part of Digital Performer since its beginning) now has several new pop-out panels (see Fig. 1). These "drawers," as MOTU calls them, expand out of the control bar's right side to provide quick-access controls for the session's tempo, audio settings and active windows. In past versions, reaching these controls required searching through command menus on the main menu bar. While I didn't use the tempo and audio settings drawers much, I did find the quick keys of the windows drawer invaluable.

Of course, DP 3's changes are much more than cosmetic—major work has also gone on under the hood. The audio engine gets a huge power boost thanks to true dual-processor support. This means that all CPU processing demands are dynamically split between both processors (as opposed to one processor handling MIDI and the other audio). Tests on the dual 800MHz machine proved that Digital Performer does scream with two processors, and this kind of power is practically a necessity with today's CPU-hogging plug-ins and virtual instruments. Another big improvement is that the program now handles automatic voice allocation. This is a wonderful time saver that effectively kills the old convention of needing to assign individual voices to each track: From Digital Performer's pool of 96 mono voices and 64 stereo voices, the program dynamically assigns its voices to the tracks that need them. (Priority goes from the top to bottom track in the Arrange window's track list, and mono tracks can steal voices from stereo voices.)

Digital Performer has always let you assign just about any keyboard shortcut to any action. So, it has always been easy to create a set of shortcuts that might, for example, reflect another digital audio sequencer's shortcuts. But the ability to save and quickly recall entire shortcut sets wasn't possible until now. In DP 3, with the click of a mouse, the program's shortcuts can mimic Pro Tools, Emagic's Logic Audio, Steinberg's Cubase or Opcode's Studio Vision. You can also save your own shortcut sets for instant recall. The ability to switch sets with such ease makes Digital Performer a real chameleon in the land of shortcuts for digital audio sequencer keyboard shortcuts. I would like to see onboard QuickKey implementation for executing regularly performed multi-action tasks.

It's now possible to set the playbar, or "wiper" as it is sometimes called, to remain anchored to one spot while the sequence data scrolls behind it. (This option is available in the Sequence Editor, MIDI Graphic Editor and the Drum Editor.) The playbar's default position is centered, but this can be changed by pressing Option and clicking

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on it and then dragging the playbar where you want. If you prefer the old paging type of scrolling, this is still available. Auto-scrolling is easily disabled by clicking off the yellow arrow on the active window's menu bar. This feature lets you keep auto-scrolling on in some windows and off in others, very convenient for editing a loop in the MIDI piano roll or Drum Editor window, while the song plays forward in the Arrange window. Zooming is now centered at the playbar, which is invaluable for keeping your place as you zoom in and out of edit points.

Most of my music production applications depend on OMS as their MIDI communications extension. Digital Performer has, for the longest time, preferred FreeMIDI as its MIDI communications extension. Though an OMS Emulation mode was implemented for Digital Performer in years past, I never had much luck with it. However, full OMS support was introduced in Version 2.6, and I am happy to report that this feature works better than ever in DP 3. It seemed as if FreeMIDI didn't even need to be installed on my computer; DP 3 just picked right up on my OMS studio configuration and went with it.

NEW TRICKS

The new Sequence Editor window represents a big leap forward in the program's user interface. MIDI and audio tracks can be displayed side by side in this window, and each track can be vertically sized (see Fig. 2). There was a window that looked similar to the Sequence Editor in previous versions; however, it only showed MIDI or audio tracks, not both at the same time, and independent track sizing was not available. MIDI controller data for the MIDI tracks and automation data for the audio tracks and plug-ins are superimposed over the tracks' respective MIDI notes and waveforms. This information can be manipulated via breakpoints and drawing tools. If you are used to working in the Pro Tools Edit window, then you'll feel right at home in the Sequence Editor. It's great for seeing how MIDI events and waveforms line up. A frame-accurate (synchronized to the Conductor track) Quicktime movie track can also be imported directly into this window, greatly enhancing Digital Performer's score-to-picture friendliness.

Figure 1: DP's pop-out panels expand from the control bar.

A new tool palette now follows the windows. It can be positioned vertically or horizontally and offers a wealth of new editing tools that change to match the currently active window. Some of the better new utensils are the shape tools for drawing or reshaping data according to a variety of contours. These tools are active in the Sequence Editor and MIDI Graphic Editor windows. The shapes offered include straight lines, free, random, parabola and spline (with an adjustable center point). Additional periodic shapes available are sine, triangle, saw tooth and square. What is especially cool is that the periodic shapes can be snapped to the sequence's grid. This is excellent for creating pulsating, tempo-locked MIDI controller data that, with a little work, can be harnessed to produce MIDI sound effects similar to Korg's Karma synth.

Other tools include a handy cross-hairs selection tool, magnifying glass, scrubber and rhythm paint brush (for painting in notes in the Drum Editor). The only gripe I have regarding these tools is that the cross-hair can be difficult to see on cer-

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tain monitors against the new gray backgrounds. However, the fact that controller data displayed in the Graphic Editor can be viewed in three different formats (classic Points mode, Vision-style colored bars and audio style break-point automation lines) does help clarity.

The Drum Editor window (see Fig. 2) looks better than ever. Though it was first introduced in Version 2.7, it seems to fit in better aesthetically with DP 3. It allows the viewing of tracks on a grid-style editor, complete with drum machine-like LEDs at the top of each bar that flash as the bar is passed. Grid size may be freely adjusted but looks best set to a standard sixteenth-note value. The events on the grids can be displayed as just the note, the note and velocity, velocity and duration, or free (which shows the notes not quantized to the grid). Below the grid area is a controller view and editing area that function much like the Graphic Editing window—the same tools and viewing formats apply. But one of my favorite features of the Drum Editor has to be that each note of a track is its own track. That is, an individual note can be easily muted or quantized for an entire track independent of all the other notes on that track—sweet.

MIX MASTER

The Mixer window hasn't changed dramatically since Version 2.7, but because it is so nicely implemented, it's worth mentioning again. MOTU began introducing control-surface profiles in Version 2.7 in order to give us real-world controls over the onscreen virtual mixer. They wrote a plug-in for my old favorite, Mackie's HUI, and have added many more since then. DP 3 accepts profiles for Radikal Technologies' SAC-2K, JLCooper's MCS-3800, Tascam's US428, CM Automation's Motor Mix and Event Electronics' EZbus, all written by the companies themselves. Presently, only the HUI profile ships with DP 3, but the other profiles are available for download from the individual manufacturers' Websites. MOTU plans to include many of these profiles with Digital Performer in the future.

There are 32 stereo buses available, and each mixer channel can pack up to 20 inserts. MIDI and audio channels sit side by side on the mixer, and MIDI channels, like the audio channels, may be controlled via a control surface. The MIDI channels permit MIDI effects inserts that operate just like audio plug-ins, only they don't eat up DSP resources because they only generate MIDI data. MIDI effects include echoes, groove quantize, deflaming, time shift, transpose and arpeggiator. Having MIDI effects that function identically to audio plug-ins is a great way of working. The mixer's automation modes are comprehensive and include Overwrite, Touch, Latch, Trim Latch and Trim Touch. My only disappointment is that there are only four mono aux sends. This seems rather skimpy for such a powerful mixer—a few more, and at least two stereo aux sends would be appreciated. Also, a much-needed Solo Latch feature has been implemented in Version 3.1.

MOTU has woven a wonderfully complex yet flexible surround architecture into DP 3, with the intent to create a platform that would support almost any surround format that develops in the future; currently, the supported formats include quad, LCRS, 5.1, 6.1, 7.1, 10.2. A feature called Audio Bundling lets you create preset groups of inputs, outputs and buses that are then available wherever I/O and bus assignments are made. This unique system allows you to easily reroute a session to handle different surround formats. It's especially useful for creating surround stems when asked to deliver the stems in several different formats.

Each channel of the surround mixer can have its own surround panner. DP 3's stock

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DP3 ships with over two dozen MAS plug-ins. Of these, five are new surround plug-ins and another five are new stereo effects. Though I can't cover all these plug-ins here, a few deserve mention. From the new surround plug-ins, the Feedback Delay Surround Edition is stunning, providing an interface where you can draw what path the delay taps take as they move around your speaker array. A handy Surround Speaker Calibration plug-in is available, complete with delay trims to compensate for speaker distance. From the new stereo effects, Quan Jr. does a wonderful job of bit crushing your audio to produce some really dirty sounds (all the way down to 1 bit). Trigger is a plug-in that converts audio peaks to a MIDI note; perfect for replacing and augmenting drum sounds.

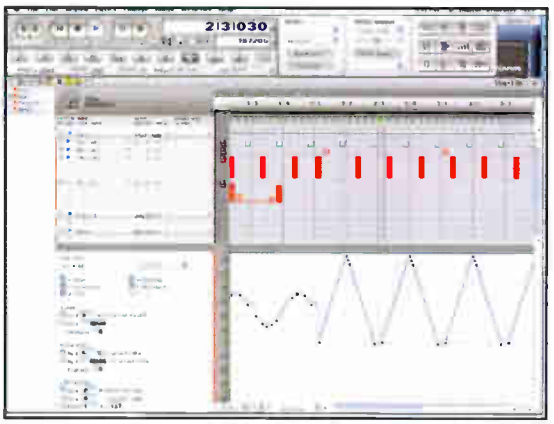

Figure 2: The new-and-improved Drum Editor window

OMF Interchange files can be exported and imported by DP 3. This means that Digital Performer sessions can be effortlessly transferred to Pro Tools. Because I often compose in Digital Performer and mix down in Pro Tools, this feature is a huge plus. No more bouncing audio files down, one by one, and then importing them into a Pro Tools session and assigning each file a track. Just save the DP 3 session as an OMF Interchange file and open it in Pro Tools. I can even reverse the process if needed. Furthermore, while Version 3.02 exports basic audio regions and start times via OMF, Version 3.1 also includes full automation data as part of the OMF file. Version 3.1 also boasts drag-and-drop OMF file support. DP 3 continues to function well in DAE mode (though I did run into a few minor plug-in incompatibilities). Pro Tools HD support is promised in 3.1.

TAKE NOTE

Several virtual instruments support direct MAS connections—that is, the software instrument is open in the background and its audio outputs and MIDI input channels show up in Digital Performer. I tried Retro AS-1 by BitHeadz. It worked well, and latency was not noticeable. A nice touch was that all of Retro's patches are published to Digital Performer, making patch selection a snap.

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Using ReWire to route a software synth's audio into Digital Performer is also an option. Propellerhead's ReBirth will reportedly work as a sound module when used with ReWire and OMS. (The straight sound module operation is not available with FreeMIDI.)

Though I am happy that stand-alone virtual instruments work with Digital Performer, instruments that can be inserted right on an audio channel—such as VST instruments—are much more convenient (mainly because they require far less setup). However, in order to use VST instruments in Digital Performer, you need a VST wrapper plug-in. One of the most reputable of these wrappers is AudioEase's VST Wrapper (Version 3.07). I tried it out with Steinberg/Waldorf's Attack drum module and PPG Wave 2.V. The implementation was very good, and the VST instruments showed up after being inserted in the MIDI and audio tracks just as expected. Not surprisingly, the instruments' multiple outputs weren't addressed, but the PPG Wave's multi-timbral capabilities did work.

DP3 continues to work well with Digidesign hardware (such as the Mix Core card and 1622 interface) in DAE mode, but if you want to run DP3 in MAS mode using the Digidesign Direct I/O ASIO driver, don't expect stellar results. The Direct I/O driver does not work well with DP3 and causes severe latency and track playback delay problems (which can only be solved by changing DP3's internal buffer settings to very low numbers, resulting in a huge drain on the computer's central processor). If you are the type who likes to switch between using DP3 in DAE (to take advantage of TDM processing) and native (to take advantage of VST effects and instruments) modes, then I suggest picking up one of MOTU's FireWire interfaces. Since these interfaces don't require PCI slots like the Digidesign cards, they can run separately from your FireWire bus with no conflicts.

For notation, some important improvements have been made in the QuickScribe window. More musical symbols have been added to the tool palette, including dynamics marks. You can now zoom in up to 700%, and intelligent Dynamic Hand Splitting has been added for transcribing real-time performances. Also, Synchro Arts' much applauded VocAlign software has been integrated right into Digital Performer. REX file support is implemented in 3.1, as is multi-undo with branching and the ability to play back digital video via FireWire directly from Digital. And, to go along with all these new features, an entirely revamped, 1,000-paged manual is included, which is indexed for easy reference and is quite essential.

DP 3 is an impressive application and a single review hardly does its wealth of features justice. My only major complaint is that to get the best results with VST instruments, I needed to use MOTU audio hardware. But besides this, the program is robust, intuitive and amazingly powerful. The surround architecture is impressive, the OMF compatibility invaluable, the MAS plug-ins sound solid, the new tools are extremely handy, the Drum Editor is definitely cool and the new Sequence Editor deserves big kudos. I continue to be amazed at the great things MOTU cooks up, and this most recent overhaul of its flagship digital audio sequencer is no exception.

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INPUT MODULATION STAGE

There are 13 different preset input modulation effects that work on the spectral-analysis data. The dramatic overall effect of this control panel (and the rest of the effect stages) is dependent on the plug-in's analysis settings. Like all of Spektral's effect stages, you can link/unlink the left and right channels with the L button and bypass the stage entirely with a touch of the B button. Input modulation preset effect names run from Deterioration, which "punches" holes in the spectral frames in a pseudo-random way, to Jello-mold," where all frequencies are inverted and governed by a threshold level setting. My favorite is Imprint, in which a "spectral sieve" allows frequency bands to pass through only when they cross an adjustable amplitude threshold.

WATCH THE SOUND CHANGE

All the subsequent process stages in Spektral are graphical-editing matrix windows and a great way to visualize changes. Frequency is represented on the vertical axis, but the horizontal axis now represents gain or delay time, depending on the window. Using the mouse, you can drag individual bands up and down or sweep through the different matrix windows for dramatic sound changes. Clicking and dragging the mouse within a Matrix Editor window draws 2-D "shapes," contours that convey a visual representation of all the parameters you are changing at one time. Using Spektral is always a sonic experiment, because you cannot think of it as a single-purpose tool (like a reverb or a compressor). So I used these shapes as references for moves and treatment moments I liked. I do wish for some sort of Undo function—maybe a "last move/re-move"-type feature, because I found myself spoiling a great effect by going just one tweak too far!

For all effect stages of Spektral, when the Automation tool is engaged, all gestures continuously output MIDI and automation data. All parameters, knob and switch settings, including the parameter settings of the 64 presets in the Global Control box, are held as recall data.

ATTENUATION MATRIX

The Attenuation Matrix is next in the chain of stages, and is a graphical filter bank that controls filters for all of the individual frequency bands. Imagine controlling 512 bandpass filters with only a mouse. I had fun drawing curves for a lowpass filter over and over, lifting the high-frequency point a little bit higher with every successive redraw. I was effecting a drum loop, and this simple filter opening and closing sounded much more interesting than just using an LFO or envelope follower to trigger a lowpass filter.

DELAY AND FEEDBACK MATRICES

Delay and Feedback matrices, the next two stages, are the meat and potatoes of Spektral. Spektral will allow delay times of up to 12 seconds, depending on your DAE's RAM heap allocation.

A tempo grid can be laid on top of the Delay matrix by selecting a grid size of quarter, eighth, eighth triplet or sixteenth note. You can Snap to Grid so that your gestures always pop to the nearest subdivision of the song's tempo. Sync to Host Tempo slaves the whole grid to your sequencer, or you can free-run the delays by typing in any bpm tempo.

The Feedback matrix is only active when there is delay running, and produces the coolest feedback because you can continuously control which frequencies feed and which do not. You must be careful when approaching 100% on the right edge. There is a Mute (panic!) button if you get in trouble. You can click on the Freeze button, which mutes Spektral's chain at the Attenuation matrix and then sets all feedback frequencies to 100%. This "frozen moment" is a nondestructive, infinite loop playing whatever sound you've captured. Just as in the Attenuation stage, carving out narrow notches of frequencies is easy to do in the Feedback matrix; this produces a tunneling effect within the feedback loop.

MORE EDITING TOOLS

You can select one of four different Edit mask overlays for the matrix windows. Edit masks are window magnifications of more useful frequency areas of the audio bandpass. I mostly used the logarithmic mask so that the low frequencies took more vertical-screen pixels for better resolution; you can, at any time, switch to Linear. There are two more editing masks that increase low-frequency screen resolution even more. This is a good feature, but I think it would be helpful if all the matrix windows had more resolution in general (bigger windows), and you could apply different edit masks to different matrix windows at the same time.

IN CONTROL

The Global Control Box is the place to store snapshots of all parameters and static-edit matrix gestures. There are 64 preset locations in this active memory that you can rename. Presets are saved along with session files in PT. In this box, there are Dry/Wet and Effect Gain knobs; Global Effect Bypass and Mute switches; and the aforementioned Freeze button. There is a Bank Browser for loading Spektral program files (as if they were synth patches) from hard disk into the active memory. You can load here, for demonstration, a collection of specially designed presets that process a companion set of sound samples.

EDITOR PANEL

The Editor panel has five sub panels: File loads and saves programs; Editor applies specific transformations to any of the edit matrix windows; Control modifies up to three Spektral parameters via a programmable LFO; Settings, where analysis settings for transformation and resynthesis are set; and About is about N.I. and the program's creators.

In the Editor panel, I especially liked the Editor Transformations where instant changes can be applied over and over with repeated mouse clicks. The Quantize transform works on the delay matrix and snaps your last gesture to current tempo grid. Smooth will smooth any roughly drawn line until it is straight, and Average calculates the average between two points on a line. The Flip/Mirror buttons flip the "x" values with the "y" values. Function Generator superimposes pre-made saw tooth, random, sine or square waves over any already-rendered shape.

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Thanks also to Chris Borgia, Kent Clelland and Mate Galic at N.I.

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

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BY BARRY CLEVELAND

BLUE Baby Bottle

Studio Cardioid Condenser Microphone

Every microphone created by Baltic Latvian Universal Electronics (BLUE) is a work of art, visually as well as sonically, so it's hardly surprising that the company prefers designations such as Dragonfly, Kiwi, Cactus and Bottle, rather than model numbers.

BLUE's latest is the silver and sparkly black-colored Baby Bottle. Billed as a smaller and less sophisticated version of the company's flagship, multi-capsule, tube Bottle, the Baby Bottle does look like a diminutive version of its parent, but the two are actually quite different. For starters, the Baby Bottle is not a tube mic; it employs solid-state, Class-A discrete circuitry with a transformerless output. The Baby Bottle has a fixed-cardioid pickup pattern and significantly greater sensitivity than the Bottle.

The Baby Bottle uses an edge-terminated, single-membrane, large-diaphragm capsule. The hand-built and hand-tuned capsule is constructed using a 6-micron mylar film, sputtered with a combination of (99% pure) 24-carat gold and aluminum, tensioned to a custom brass backplate. As with the Bottle, the capsule is enclosed within a lollipop spherical grille. Optional are a Baby Shock shockmount and a Baby Pop metal-mesh windscreen. The mic includes a velvet pouch and a classy cherry-wood box. As an added bonus, the manual is well-written and full of useful information.

I used the Baby Bottle on several sessions, usually with an Aphex Dual 1100 discrete Class-A tube preamp, but also with the pre's in my Yamaha 03D digital mixer for comparison. JBL LSR28P near-fields were used to monitor the direct signal and playback (ADAT and Digital Performer).

The first thing I noticed was that the Baby Bottle is extremely quiet. (Self-noise is rated at 5.5 dB, A-weighted.) The next thing was the mic's very high output level, considerably hotter than a typical large-diaphragm condenser, providing lots of additional headroom. Sonically, the Baby Bottle has a very full, rich sound, with a little bump (at approximately 2 kHz) that slightly emphasizes upper mids. The pickup pattern is fairly wide, with a very gradual loss of level as you get further off-axis.

I used the Baby Bottle to record two female vocalists. The first voice was not particularly rich or resonant, and though the mic sounded very natural, it emphasized the already too prominent upper mids. On the second richer voice, the Baby Bottle sounded considerably beefier, delivering a warm but clear sound that made the vocalist sit up and take notice. The Baby Bottle sounded even better on male vocals, picking up the most subtle articulations and textural nuances, while simultaneously delivering a full and well-balanced sound. However, the proximity effect increases significantly at around 1 inch from the grille, so deeper voices need to be careful when working close-in.

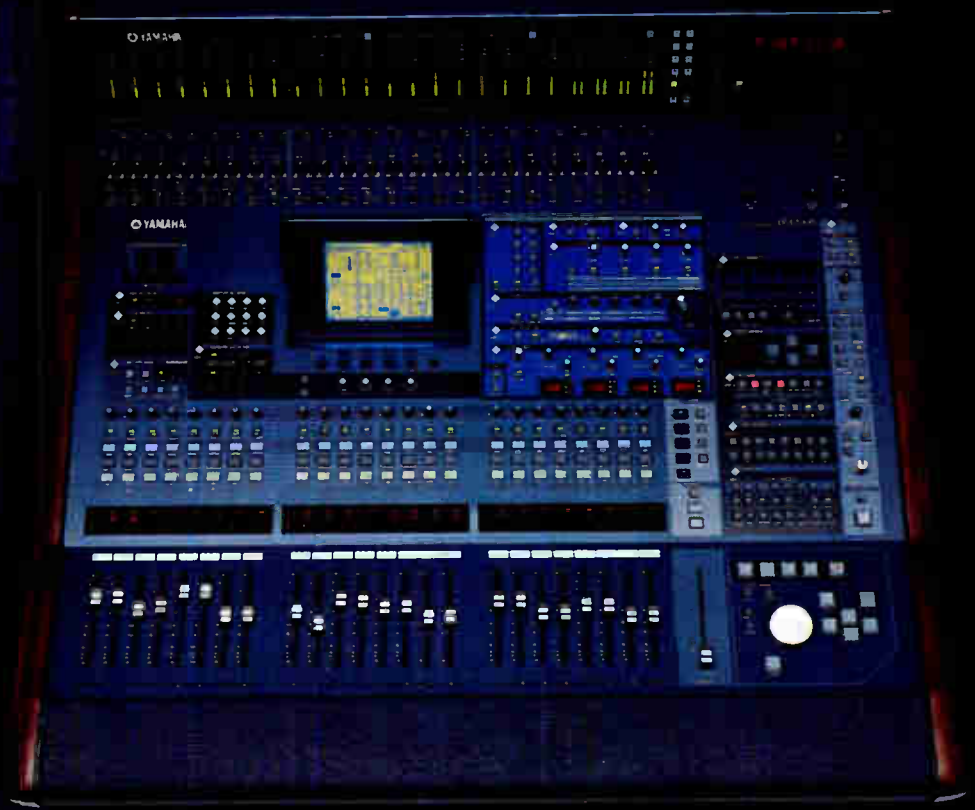
Next, I recorded several acoustic instruments. The Baby Bottle sounded great on both steel and nylon-stringed acoustic guitars, particularly when placed slightly off-axis and a few inches away from the sound hole. The steel-string sounded especially nice, with an ideal balance of lows and high mids, and just the right amount of finger sound that adds presence and realism. The mic also sounded quite good on autoharp and nickleharpa (an Eastern European bowed instrument that uses levers to fret its many strings), both of which can be difficult to record because of their complex harmonics.

The Baby Bottle also handled a variety of hand percussion instruments quite well. One instrument in particular—a ceramic doumbek with an unusual combination of high rim sounds and a massive bottom end—was captured wonderfully, with both sounds blended in perfect proportion. Last, but not least, the Baby Bottle did a fine job on electric guitar. When placed against the grille of a Rivera R-112, it performed equally well on both clean and distorted settings, and placed about a foot back, it sounded fantastic, with just the right blend of air and punch.

At $649, the Blue Baby Bottle is a tremendous value. It is an extremely versatile and beautifully made microphone that's built to last, and sounds as good as large-diaphragm condensers that cost much more. If you are unfamiliar with BLUE microphones, then check out the entire line to hear what all the fuss is about—and you might as well begin with the Baby Blue.

Baltic Latvian Universal Electronics, 766 Lakefield Rd., Suite D, Westlake Village, CA 91361; 805/370-1599; fax 805/370-1549; www.bluemic.com. ■

Barry Cleveland is a San Francisco Bay Area-based recording artist, engineer and producer (www.barrycleveland.com). He is also the author of Creative Music Production: Joe Meek's Bold Techniques *(www.artistpro.com), a book about the visionary British producer's contributions to the art of recording.*



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Snapshot Product Reviews

AUDIO-TECHNICA 30 SERIES CONDENSER MICROPHONES

Audio-Technica's 30 Series condenser mics offer extended frequency response, high-SPL handling, excellent dynamic range and low self-noise—at an affordable price. The newest additions to the line are the large-diaphragm AT3035 cardioid ($349) and the small-diaphragm AT3031 cardioid ($259). A small-diaphragm omni (AT3032) is also available. All three are fixed-charge backplate, permanently polarized condensers requiring 11 to 52VDC phantom power; each includes -10dB pad, and 80Hz, -12dB/octave bass roll-off switches.

The AT3035 is a side-address design with a 6.7x2-inch, 13.8-ounce body and an attractive pewter-look finish. The mic ships with a simple, yet effective shock-mount that holds the body securely with a definitive "click."

In the studio, the AT3035 proved surprising. Despite its low cost, the mic was extremely smooth, to the point of being almost ruler flat from 50 to 15k Hz. If you're looking for a mic with attitude, weird vocal bumps or excessive top-end boost, then this one isn't it. Instead, the AT3035 puts back a near-identical picture of what's in front of it, while providing an impressively low self-noise of 12 dB. It was ideal for recording a fairly bright 12-string, where mics with a more "traditional" condenser top end would have yielded a brittle sound. Recording tenor sax, the opposite was true: Here, I chose a mic with more edge, while the AT3035 was very nice—smooth and natural—on alto and soprano sax.

The AT3035 excels on female voices, providing the right blend of close-in proximity effect for fullness, with a linear HF response that was never shrill or edgy. On male vocals, the AT3035's flat response meant reaching for the EQ to add a slight (2 to 3dB) presence boost to increase intelligibility. In either case, working in closer than 6 inches or so, I did need to use a stocking-screen filter, as the LF roll-off was a bit too much for vocal pops—it's better suited for wind noise or general bass filtering, for drum overheads and the like. Also, the AT3035's off-axis response was excellent—I never had to worry about the mic's character changing when singers moved around while tracking.

The AT3031 is a small-diaphragm cardioid, in a familiar, probe-style 5.7-inch-long package that's just over ¾ inches in diameter. Overall, the AT3031 exhibits a more typical condenser mic response, with a gentle +2dB HF rise that kicks in from 9 to 15k Hz, and then levels off and extends out to 20 kHz. Its unpadded 148dB SPL handling capability and wide response scream out for percussion applications, and the AT3031 was spot-on for drum overheads and close-up on hi-hat, yet retained plenty of LF moxie for near-field recording of a 28-inch Paiste symphonic gong—the proximity effect combined with the mic's sub-40Hz response for a powerful, thundering result.

Next up for the AT4031 was capturing overdubbed harmonic grace notes on a Taylor acoustic guitar. Here, the extended top end was a real plus, while the mic's stated 16dB self-noise (this spec seems very conservative) combined with the ultra-clean sound of an Aphex 1100 preamp revealed some weird clicking noise, which turned out to be the guitarist's wristwatch!

Audio-Technica might have made a mistake in categorizing its 30 Series for "home and project studio" use. These are quality engineering tools that can hold their own in any pro environment—stage, studio or broadcasting.

Audio-Technica; 330/686-2600; www.audio-technica.com.

—George Petersen

TUBE-TECH SMC 2B STEREO MULTIBAND COMPRESSOR

Tube-Tech has updated and improved its SMC 2A Multiband Compressor by adding a balance control, useful for fine-tuning the stereo image of 2-channel program material. Served by a continuously variable pot, the balance control on the SMC 2B (the updated unit's new model number) provides ±1.5dB maximum gain adjustment for its final amplifiers. This is accomplished by varying the tube-cathode resistance to ground, so that no additional circuitry is added to the audio path.

In all other respects, the SMC 2B ($4,395) is identical to the original SMC 2A. For the uninitiated, the tube-based, dual-channel unit incorporates three independent stereo opto-compressors. Each compressor serves its own frequency band, the bandwidth of which you can adjust by tweaking the unit's two adjustable crossovers. Each compressor also has its own continuously variable threshold, ratio, attack, release and makeup gain controls, and an 11-segment LED display shows gain reduction for the band. Global controls include master gain and a Bypass switch.

The addition of a balance control puts the finishing touch on what was already an incredibly flexible, pre-eminently transparent and sweet-sounding compressor.

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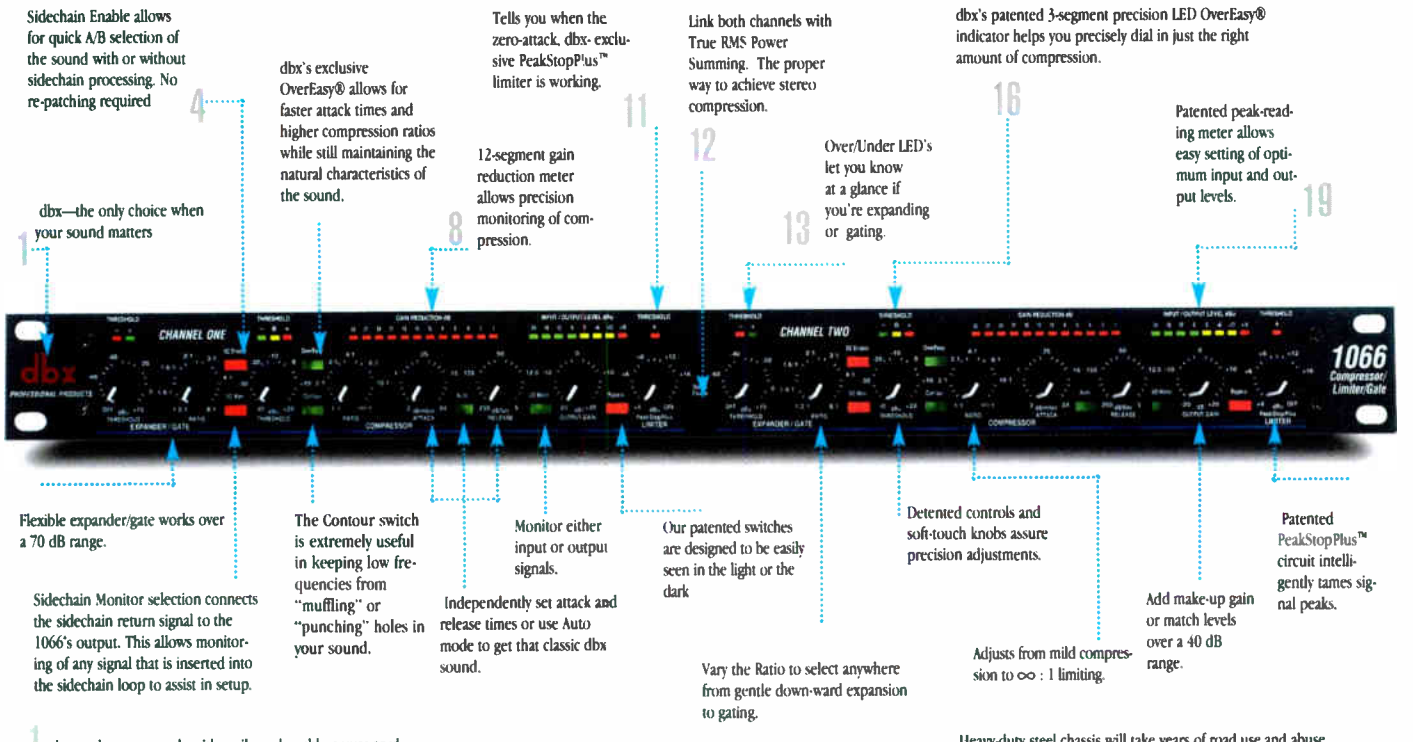

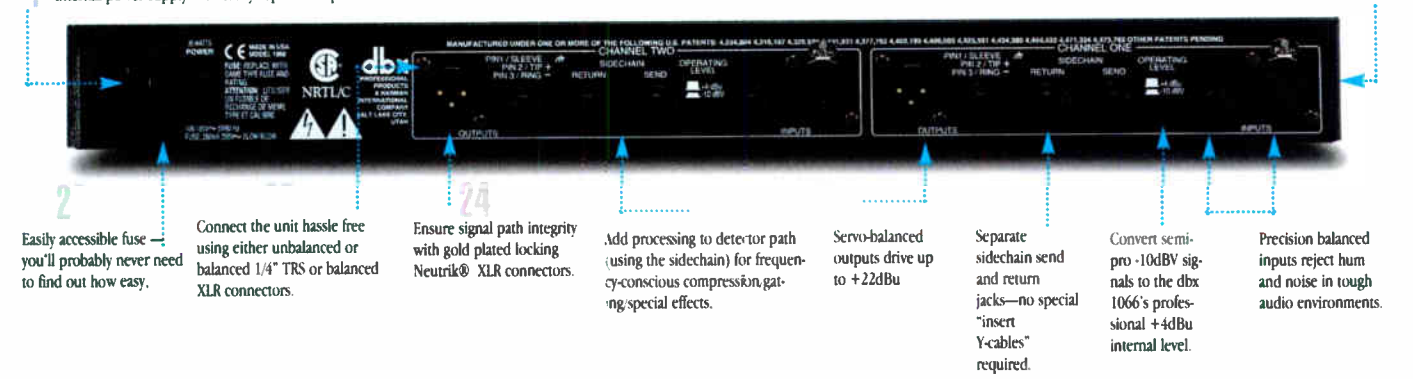

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The SMC 2B provides considerable headroom and handles percussive, broadband, stereo program material without pumping even the slightest bit. Bottom line: The SMC 2B is the best compressor I've heard for mastering applications.

Dist. by TC Electronic; 805/373-1828; www.tube-tech.com.

—Michael Cooper

PRESONUS DIGIMAX 8-CHANNEL MIC PREAMP, A/D CONVERTER

PreSonus makes a great multichannel mic preamp, the M80, retailing at $2,300. Unfortunately, that's a sizeable chunk for a lot of people, so PreSonus has followed it up with DigiMax, an 8-channel mic preamp that also includes eight channels of 24-bit A/D conversion via Alesis ADAT Lightpipe or (optional) 48 or 96 kHz S/PDIF or AES formats, along with two direct box inputs and onboard analog signal processing, with independent peak limiting and a frequency EQ Enhance™ circuit on each channel. DigiMax retails at $1,699.95.

With its machined, thick, aluminum slab front panel, 20 illuminated push-button switches and 27 status LEDs, DigiMax is a work of art. Also on the front panels are eight concentric pots for channel gain and limiter threshold, as well as switches for setting the pad-in/out, 32/44.1/48kHz sample rate, and internal/external clocking. Channels 1 and 2 also provide ¼-inch high-impedance direct inputs and polarity reverse.

The designers obviously ran out of room within the one-rackspace chassis, so they opted for a beefy, linear external power supply that connects to the main rack unit via a 6-pin XLR for a solid connection. The rear panel also has eight XLR inputs, eight ¼-inch balanced TRS analog outputs, plus an 8-channel Lightpipe digital out, wordclock in/out, 8-channel AES/EBU/S/PDIF output on a 9-pin D-sub (breakout cables with conventional connectors are optional) and individual phantom power switches for each mic preamp. The rear panel location of the phantom switches is inconvenient, but that's the price you pay (or save) when so much is crammed into a tiny chassis. Even so, some type of recessed switches would be preferable, as the switches are easily bumped when reaching to the back of the unit to make connections or set phantom power.

In the studio, DigiMax was ideal, either as a multichannel front end for a workstation or in a conventional studio configuration as a remote preamp for tracking drums. The limiter relies on a variable 0 to +24dB threshold control and a combo of peak and RMS detection at the same time, but it worked!

The limiter was especially useful on hihat, where a simple hat ride pattern can suddenly explode with loud open cymbal hits. I also like to be able to leave the limiters engaged for live tracking, when levels can change suddenly—the limiting was audibly inconspicuous. I was less impressed with the enhance circuit, which puts a -3dB cut in the 250 to 5k Hz range; occasionally, it worked on drum overheads, but without more available parameters, it wasn't nearly as slick as the preamps and limiters. Incidentally, all outputs are active at all times, so the digital and analog outs can be used simultaneously—great for tracking to two different media at the same time or mixing/monitoring a live show (analog) while tracking to disk or ADAT.

At $1,699.95, DigiMax would be a great deal just as an 8-channel preamp, but add in the direct box inputs, A/D conversion, transparent limiting, multiformat outs and more, and DigiMax is nothing less than a bargain.

PreSonus Audio Electronics; 225/216-7887; www.presonus.com.

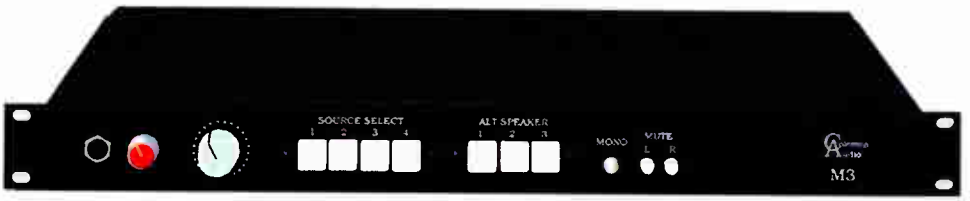
—George Petersen

COLEMAN AUDIO M3PH CONTROL ROOM MONITOR MODULE

Today, you can record, overdub, process, mix and master entirely from a computer screen. Yet, as we move away from the traditional console concept, we still need monitoring control for playback volume, muting, mono checking, switching between several sets of reference speakers and selecting from various playback sources.

One possible solution to this situation comes in the form of the Coleman Audio M3PH. Housed in a single-rackspace chassis, the M3PH offers four stereo inputs, three alternate speaker outs, a main volume attenuator, a mono sum to check phase, left/right mute switches, and front panel headphone output with independent level control. All connections on the rear panel are balanced XLRs, and the AC cord is an attached 2-prong type.

The main point behind the M3PH is signal purity. The signal path is almost entirely passive—no VCAs here! All switching is passive. The volume is controlled by a 10kΩ stepped, ganged attenuator that tracks with an accuracy of 0.05 dB. The only active circuits are the headphone amplifier and a necessary summing amp used for combining the left/right sides for mono listening. Other than those exceptions, it's nearly as close to straight wire as it gets, and the audio performance is impeccable.



My only complaint with the MP3H is a lack of a power switch and pilot light to let you know it's powered up. Also, because the unit is passive and designed for balanced I/Os, if you're powering an unbalanced amp (or active monitors), then you can't use the usual "connect pin 3 to ground" adapter—you'll need a cable that lifts the low side of the output and leaves it floating; otherwise, you'll run into phasing problems.

In a DAW-based audio room (or video/post suite), the Coleman MP3H provides a pro solution to monitoring hassles. Retail is $850. The company also offers a selection of other monitoring accessories, including outboard stereo and quad VU meters, an active surround level

controller with individual mutes on the 5.1 channels and more. Check 'em out!

Coleman Audio: 516/334-7109; www.colemanaudio.com.

—George Petersen

SUMMIT AUDIO TD-100 TUBE DIRECT BOX

Over the past 23 years, Summit Audio has established itself as one of the industry's premier suppliers of high-performance tube gear, and Summit equipment is found in major studios and touring racks worldwide. Along the way, the company also branched out into cutting-edge, solid-state equipment, such as its award-winning Element 78.

Conscious of its "great, but pricey" reputation, Summit has embarked on a new series of affordable, half-rack products. The first arrival in that series is the TD-100, a tube direct box retailing at $495, a hybrid design using a 12AX7A/ECC83 to drive the input section, with the output section driven by a discrete transistor circuit utilizing ±24-volt rails.

As a direct box, there's little mystery to the TD-100's operation, although it does include features not found on other direct boxes. The front panel has switches for power (the power supply is internal—no wall wart here!), ground lift and input polarity reverse, rotary controls for input impedance and output gain, indicators for power, signal presence and overload, a ¼-inch input jack and a paralleled jack for outputting to an instrument amp.

A variable impedance control (10k to 2 Megohm) tweaks the input loading to match any source—synth or guitar/bass pickups. Other than spending 30 seconds or so to find the optimum impedance load for your instrument, everything else is plug-and-go.

The back panel has a fused IEC power cable socket, XLR mic level output, ¼-inch TRS line-level output (for balanced or unbalanced connections) and a ¼-inch headphone output jack. The latter is convenient for using the TD-100 as a practice amp or for privately checking pedal setups, tone, etc., onstage or in the studio.

Overall, this is a great direct box, combining an ultra-clean discrete stage with the added desirable second harmonics of the tube input. Although its performance on guitars and basses (new and vintage, active and passive) was exemplary, using it on synths only made me wish I had two TD-100s for laying down stereo patches. Priced at $495, this made-in-the-USA gem is built like a tank and soars like a Learjet.

Summit Audio: 831/728-1302; www.summitaudio.com.

—George Petersen

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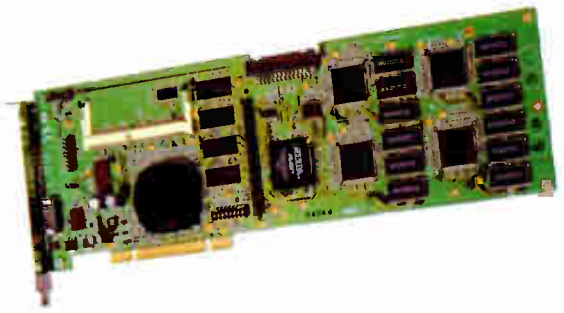
TC POWERCORE

Now in Version 1.6, the TC PowerCore brings to native DAW users the kind of high-end processing and expandability that was once only reserved for TDM systems. PowerCore is a full-length PCI Mac/PC expansion card that ships with a healthy bundle of TC's world-famous effects, including MegaReverb, Chorus/Delay, Vintage CL, VoiceStrip, EQSat and the PowerCore 01 virtual analog synth. The Mac version also includes SparkLE—a lite version of Spark that handles basic sample and 2-track editing/mastering.

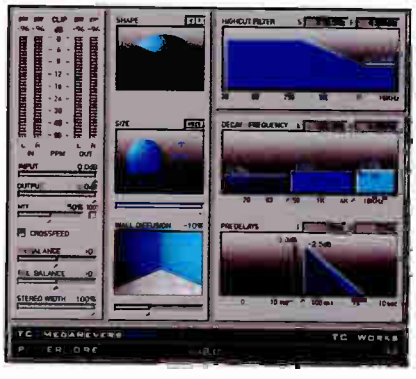
Installation is totally straightforward: Install the card, load the drivers/plug-ins from the included CD-ROM and you're set. PowerCore works with all VST 2.0 applications (Cubase, Logic, Digital Performer, Wavelab, Deck). I tested PowerCore on a Mac G4 450 with 768 MB of RAM, running Cubase 5.0r2 and the (included) SparkLE with OS 9.0.



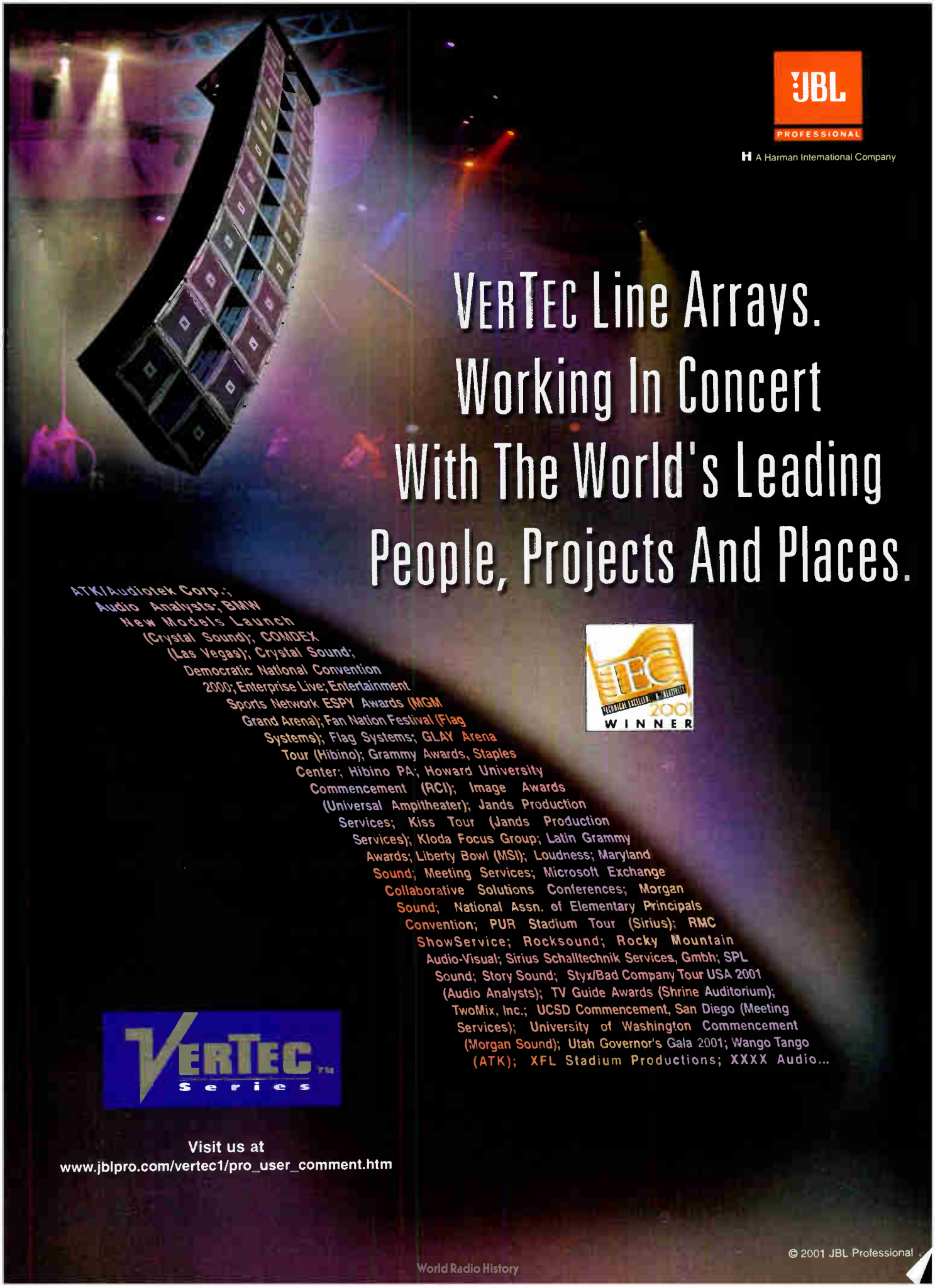
As far as the plug-ins' overall sound, I can't say enough good things. For the first time, you can get pro-sounding results out of native DAWs. MegaReverb is probably the best-sounding native reverb on the market, and the VoiceStrip is almost worth the price of admission on its own. Hardened studio rats with an ear for higher-end Lexicon and UREI units won't be swayed that easily, but most project studio owners will be in plug-in heaven.

Within Cubase, PowerCore worked fairly well, with a few exceptions. Most notably, there are some latency problems when PowerCore effects are used as sends. In this instance, the delay (a result of pokey PCI bus speeds) must be manually tweaked by inserting the TC Delay Compinsator plug-in (also included) on every audio channel that is *not* using a PowerCore effect. (As a quick fix, you can route these channels though a group bus and add the Delay Compinsator as an insert.) Additionally, when activating or using more than one PowerCore plug-in at a time, there were several instances where the unit produced a few seconds of feedback that usually faded away. And to TC's credit, as I've updated their software over the past few months, the problems are getting resolved.

When I was using the included version of SparkLE, the PowerCore was totally solid—it didn't so much as hiccup. Spark includes four master effect inserts. For test purposes, I loaded different PowerCore plug-ins into each slot, and the system performed flawlessly. So, obviously, the core technology is sound, and the problems I experienced were confined to Cubase.



The MegaReverb allows users to shape their sound with controls for room size, shape and wall diffusion.



Some future system enhancements include an emulation of the Sony Oxford EQ for the PowerCore, as well as a collaboration with Access, the makers of Virus keyboards. Also TC's TC MasterX3 plug-in (a stripped-down software version of the TC Finalizer designed for the PowerCore) is currently shipping.

TC Works; 805/373-1828; www.tcworks.de.

—Robert Hanson

HOSA TECHNOLOGY PBP-362 LIGHTPIPE DIGITAL PATCHBAY

No pro would consider working in an analog studio without a patchbay, so why does the concept of a digital patchbay seem so foreign, given the proliferation of multiple digital I/Os in our production environments?

Designed to emulate the operations of the half-normaled analog patchbays we're all familiar with, Hosa's PBP-362 is a modular, multifunction, Lightpipe patching system that puts all of a studio's ADAT Lightpipe (or S/PDIF optical) sources and destinations within fingertip's reach.

The single-rackspace PBP-362 is designed around patching modules, and the $325 unit includes one MFO-363 half-normal module with six patch points, an AC adapter that powers up to four modules and blank plates that cover the three unused slots. Extra 6-point modules are $250 each, and Hosa also offers an $85 1-in/2-out splitter module for dividing one Lightpipe signal into two identical feeds.

In most cases, the PBP-362 works just like a half-normal analog audio bay, with front and rear panel optical connectors, and all the top jacks designated as outputs and the bottom jacks as inputs. (Obviously, the reverse applies to the rear panel jacks.) Internal jumpers let users custom-configure the patchbay to their needs, whether they prefer a simple rear-to-front jack connection or the factory default where the top rear links to the top front while it's normaled to the bottom rear jack. Here, the normaled connection to the bottom jack is automatically diverted directly to the lower front whenever a lower-front connection is made.

With no physical connection between the front and rear jacks, the PBP-362 actually creates a "clone" of the signal. Therefore, the usual patchbay practice of connecting everything to the patchbay and using short cables to route the signal should be avoided, because this would create a clone of the cloned signal, which, in some cases, could result in added jitter. Also, to avoid clocking errors in multiple feed situations, everything in the system should be slaved to one master clock source, although that's just good audio practice in general.

In my studio, I have no shortage of optical feeds, both S/PDIF (DATs, CD players, CD recorders, computer audio cards, outboard DACs, and ADCs and DAW I/Os) and ADAT (M-20s, XT-20s, ADAT-Edit, Pro Tools ADAT Bridge, etc.), and with the growing number of optical feeds in any studio, the Hosa PBP-362 makes sense.

Note: Speaking of Lightpipe interfacing, Hosa also makes the OGC-361, a 2-piece, bi-directional uplink/downlink system that transcends the 30-foot limit on Lightpipe transmissions by boosting level at the source to an appropriate level for glass-fiber transmission, using SC glass terminations. Retail is $499, and numerous glass-fiber cables (up to 100 meters) are available for long-run Lightpipe installations.

Hosa Technology; 714/736-9270; www.hosatech.com.

—George Petersen

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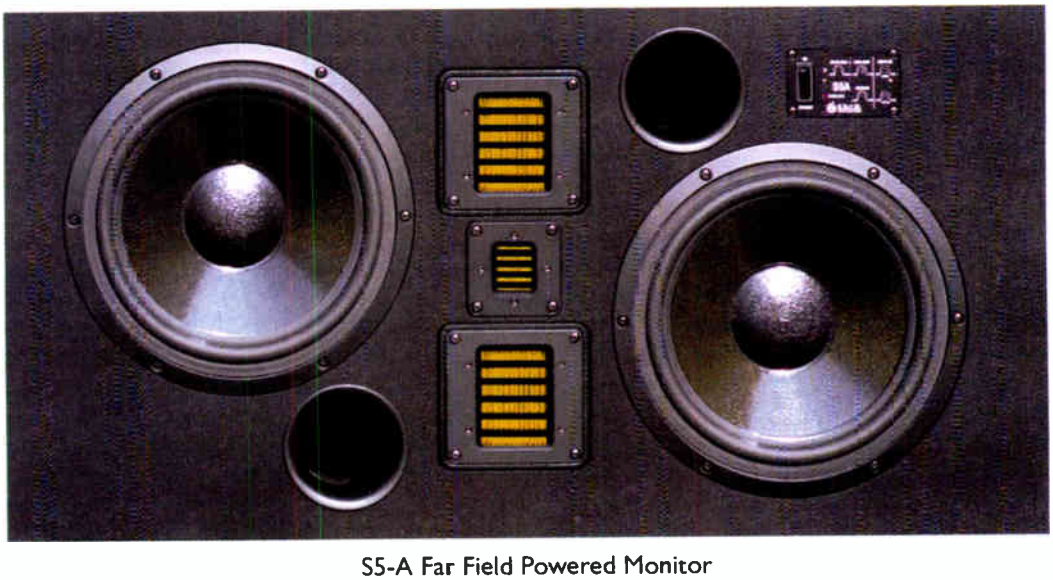

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BY EDDIE CILETTI

A Bit of DIS and DAT

HHB Mods, ADAT Tweaks and SMD Repairs

Greetings, Earthlings! This month, I've got a voltage tweak for Alesis ADATs, a headphone amp boosting mod for HHB's PDR1000 PortaDAT and tips on replacing surface-mount chips using conventional tools.

GET SMALL

Last year, one of Paul Lehrman's "Insider Audio" columns discussed the effect of mass production and miniaturization on the repair industry. While we've enjoyed more powerful and affordable toys, the miniaturization process has reduced the serviceability (or financial practicality of repairing) many high-tech products. This trend hardly encourages people to consider service as a profession. On the surface, this may seem an acceptable trade-off, but many audio designers and manufacturers began their careers in the service industry, ours in particular, because of vintage circuitry's popularity.

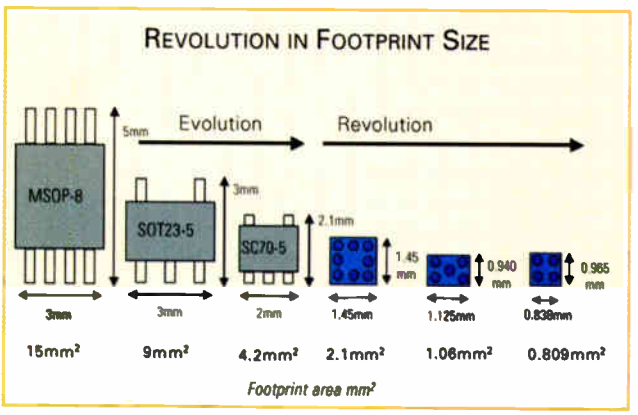

Figure 1: Shrinking technology. The evolution of the Surface-Mount Device (SMD), courtesy of National Semiconductor.

The current technological wave squeezes entire circuit boards of discrete components—circa 1990—to less than a handful of ICs, most in the form of Surface-Mount Devices (SMDs). These components can be difficult to replace—especially when compared to a vacuum tube or an IC op amp—but the next wave (micro SMD) may render circuit board repairs a thing of the past. See Fig. 1 for the evolution.

Last year, one of my online geeks sent me a can of nuts followed by a Sony instructional video about using conventional tools to replace surface-mount components. Sure, 99.99% of you will never change an SMD, and it's not my goal in life, but the refined skill has saved money on specialized tools and minimized the need to replace very expensive circuit boards. I will share some SMD tips later in this column. The repair biz ain't over yet, but if you're over 40, go to the drug store and buy some reading glasses...

ADAT PS TIPS

Fortunately, most repairs don't require swapping SMDs. Here's a fairly simple solution to a common ADAT service issue.

Whenever multiple ADATs are in the shop at the same time, I check them as a System in a Master/Slave configuration. In a recent case, I immediately noticed that the machines didn't fast-wind at the same speed. Once mechanical variables are eliminated—rubber tire in good condition, no reel-table friction (see November 2001 *Mix*) and a happy reel motor—then the problem may be caused by the power supply voltage, which determines fast-wind speed. A variation of 1 volt in either direction can have a dramatic effect.

Figure 2 shows the front section of an ADAT-XT's main processor board, viewed from the left side. Connect a voltmeter's negative probe to either of the black wires on the power connector and measure each color pair; the voltages should be very close to those indicated here and on the figure (-31.16, +8.4 and +20.5 volts), the 20.5V orange pair being responsible for reel-motor speed. One pot on the power supply board adjusts all voltages at once, but don't make any adjustments yet.

Note: The power supply is in a separate compartment on the machine's underside. The voltage adjustment is typically glued. Dissolving the glue can damage the pot, so it is highly recommended that a new 1k-ohm pot be installed first. The supply will protect itself from an over-voltage condition, and the unit will not power up if the voltage is too low, but a scratchy pot will cause erratic, potentially damaging behavior. Users without technical expertise should forward this knowledge to their local service professional. Replace the pot rather than risk damage with a glue-dissolving solvent. This adjustment applies to all *ADATs*, except the M20 and Studer V-Eight. Additional details for this and other models in a future article.

HHB PDR1000 HEADPHONE AMP

My first experience with the HHB PDR1000 PortaDAT was a product review. Because NXT Generation (www.nxtgentech.com) is the authorized U.S. service center for HHB products, my contact with the machine has been minimal. Lenny Manzo of Film Services Inc., a Massachusetts-based rental company, contacted me because users were complaining that

FOR THE MIX THAT KILLS

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the headphone amplifier was not loud enough before distorting. This apparently has been a complaint for some time, especially when using the popular Sony MDR-7506 headphones. HHB once published a list explaining that lower impedance headphones would yield higher output levels but also higher distortion; high-impedance headphones would deliver less level and less distortion—but never a solution. The table shows mostly current headphone models and how their impedance varies.

Dennis Charney at NXT kindly forwarded the documentation. In Fig. 3, notice the "build-out" resistors (R-493/R-605 and R-494/R-6076) between the headphone amp and the jack. Each pair adds up to 32 ohms; the resistors serve a dual role—as protection against short circuits as well as being part of a muting circuit. Using 32-ohm headphones will reduce the available voltage by 50% or 6 dB.

In rental applications, Sony MDR-7506 headphones are the norm, so Lenny Manzo asked if a modification would make the PortaDAT drive them better. The DC resistance of the Sony "cans" is 70 ohms. That, plus the 32 ohms internal, is 102 ohms total, creating a voltage divider that delivers about 70% of the signal to the MDR-7506. That's not really the problem. The headphone amp is a surface-mount, dual op amp operating from a single 5-volt supply. (Note that resistors R-310 and R-311 "bias" the op amp to live halfway between 5 volts and ground. Original voltages are shown at the lower op amp in reverse video.)

Without resistors, the amplifier is capable of delivering 44.6 milliwatts (RMS) to 70-ohm headphones. With resistors, the power drops 3 dB to 21.8 mW, not enough of a difference to justify removing the parts in question; doing so would compromise the integrity of the unit and disable the Muting feature. What the unit really needed was a greater voltage swing, and within minutes of perusing the schematics, I had an alternative.

As you may know, most audio op amps run on bi-polar power, typically plus *and* minus 5 to 24 volts. The chip in question—NJM3414M—can run on 15 volts total or ±7.5 volts. Because other op amps in the PDR-1000 use bi-polar 5 volts, I borrowed "-5 volts" from pin 13 of PK-301 (the DC-to-DC converter) connecting it to the "-V" leg of the headphone amp (pin 4), removing R-310 and R-311 before powering up. Now the op amp swings nearly 10 volts peak to peak, delivering 87 mW to the Sony cans a full 6 dB louder than the unmodified version. This should satisfy most metal heads on location.

Note: This is not a user mod, because it requires major disassembly; in fact, the level of miniaturization could cause severe brain fatigue. In addition, power conservation is ultra-critical in a portable unit, and no study was made to determine how this mod affects battery life.

Figure 2: Measuring the ADAT-XT power supply from the main board connector, with the top cover removed.

SERMON ON THE MOUNT

In an ideal world, all major components would be in sockets, but a cheap socket combined with poor soldering can decrease reliability. Compared to replacing a vacuum tube or a "socketed" IC op amp, a large surface-mount device has many more connections handling frequencies beyond dog and bat ears. Confidence in your troubleshooting skills is one matter—a willingness to purchase an 80-plus pin IC, plus all the gear necessary to replace, it is quite another.

Surface-mount removal equipment can range from $100 to $1,000, depending on your needs and skills. Peter Florance—of www.audio-services.com in Virginia Beach, Va.—forwarded a Sony technical video on this subject that shows several methods for SMD replacement. He also suggested the free sample kit available from www.chipquikinc.com, or a full-sized kit can be purchased from most suppliers (such as MCM Electronics). I chose the least-destructive technique—one that you would never have suspected would work, starting with Fig. 4a. This is but one method of removing and replacing surface-mount devices.

WICKY WIRE

I start with Chem-Wik™ rosin-treated, copper-braided mesh that is one-tenth of an inch wide (part number 10-100L). Placing the braid between the soldering iron and the chip legs, the rosin helps sol-

IMPEDANCE OF COMMON HEADPHONES

IMPEDANCE	HEADPHONE MODEL
12 ohms	Sony MDR-F1
24 ohms	Sony MDR-V500 DJ, MDR-V700 DJ, MDR-V900
32 ohms	AKG K-44, K-55, K-66; Beyer DT-231; Grado RS-1, RS-2, SR-40, SR-60, SR-80, SR-125, SR-225, SR-325; Sennheiser HD-500
40 ohms	Beyer DT-131
44 ohms	Fostex T-5
45 ohms	Sony MDR-V600
50 ohms	Fostex T20RP, T40RP
60 ohms	Audio-Technica ATH-M40fs
64 ohms	Sennheiser HD-570
66 ohms	Audio-Technica ATH-D40fs
70 ohms	Fostex T-7; Sony MDR-V6/V7506
75 ohms	AKG K-270s
80 ohms	Beyer DT-250 ("Lo" option)
100 ohms	AKG K-70, K-100, K-301
120 ohms	AKG K-401, K-501; Sennheiser HD-590
250 ohms	Beyer DT-150, DT-250 ("Hi" option), DT-831
300 ohms	Sennheiser HD580-1, HD-600
600 ohms	AKG K-141M, K-240M; Beyer DT-770pro, DT-990pro

Headphone impedance variations. Generally, impedance trumps efficiency because it takes so little to drive a pair of headphones to full power. Headphones are listed from low to high impedance, yielding greater to lesser sensitivity, respectively.

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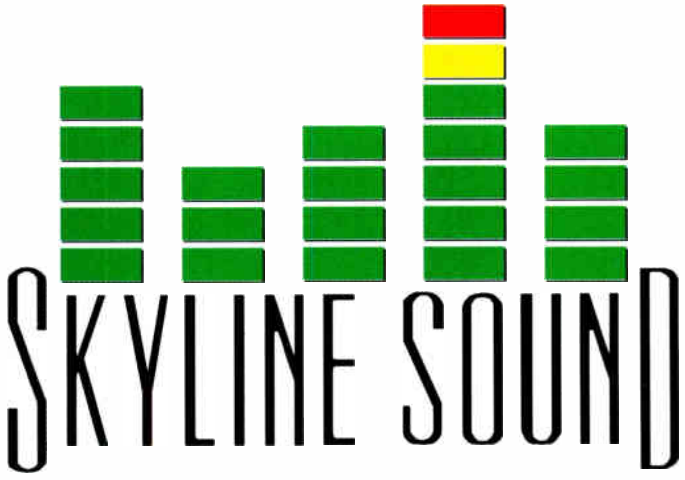

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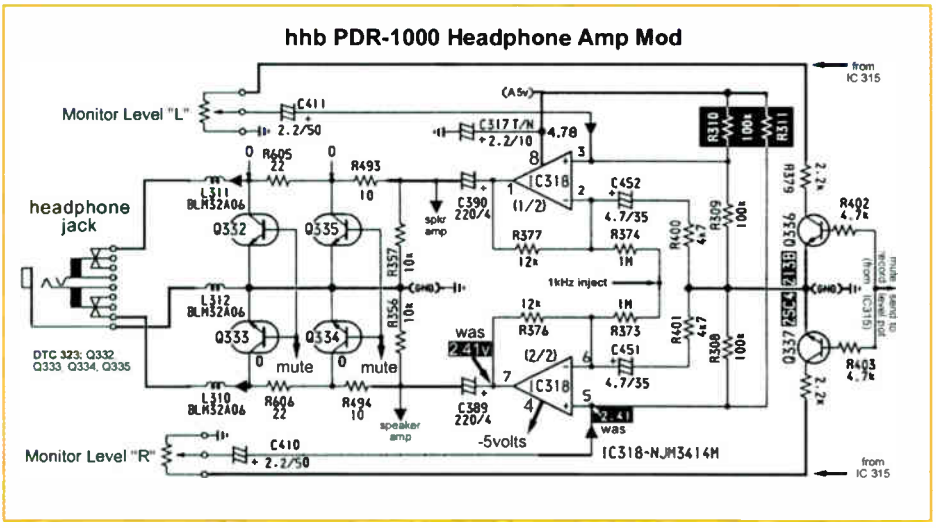


Figure 3: HHB PDR1000 headphone amp schematic. Parts to be removed are in "reverse video." Note new power connection to pin 4, the lower half of the op amp.

der flow away from the Printed Circuit Board (PCB). The degree of success depends on a number of factors, of which the quality of the PCB cannot be discounted. Time and pressure must be minimal with no movement, especially with cheaper boards, otherwise traces will be damaged. The task is to remove solder, but sometimes adding solder to the iron tip improves heat transfer and wicking action, while minimizing the urge to apply pressure.

The next step is to determine the efficacy of the solder-removing process. Using a magnifier, I place a jeweler's screwdriver between the IC's legs. If just a little twist pops them loose, then the chip is ready for removal. If not, then more wicking may be required. A heat gun can also be used to warm the area; a prying tool under one edge of the chip helps to let you know when the chip is ready to pop. Be gentle. Any radical force could pull traces off the board. (See Figs. 4b and 4c.)

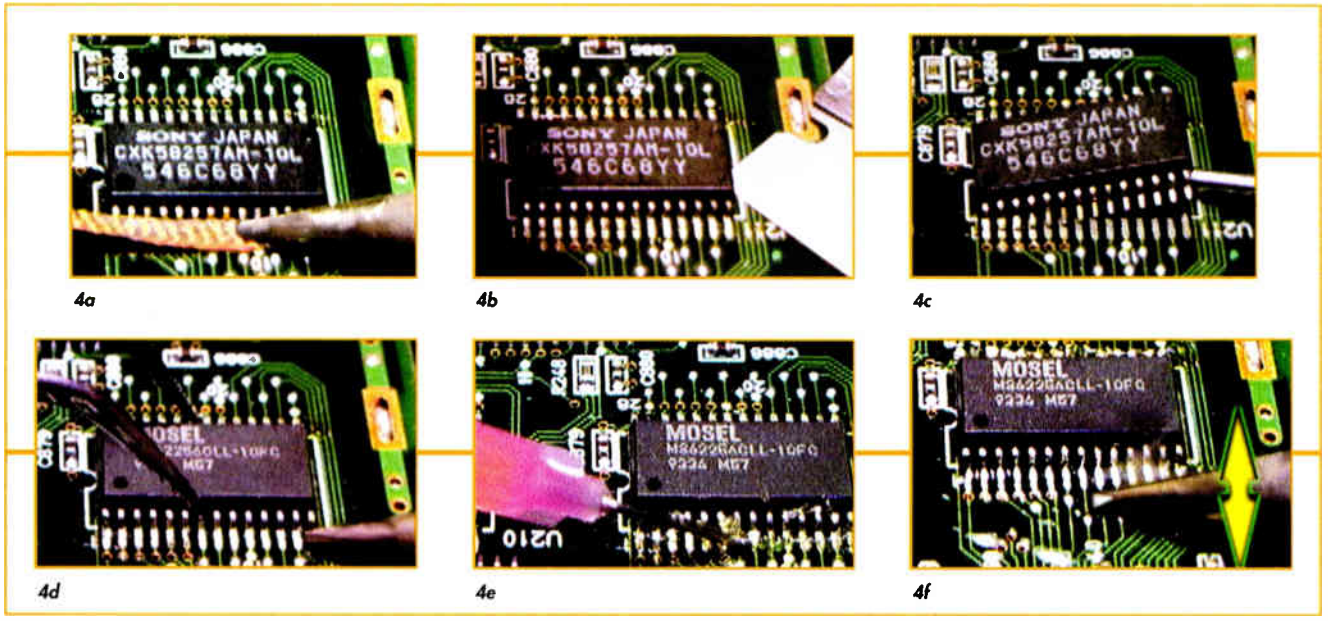
Clean off the area if necessary, and apply flux to all traces; then "tin" the two diagonal traces with solder (Figs. 4d and 4e). Align the new chip, solder the two diagonal legs, and then apply additional flux to all legs. The iron tip should be clean and have fresh solder. The trick is to quickly "kiss" the legs with the iron tip, modulating toward and away from the legs (Fig. 4f). Again, this is not a "friction" thing—no pressure required. Solder will flow to the desired area, and if you're a fast "kisser," then it will do so without shorting the pins. Again, you would never think this technique would work, but it does. Shorts can be undone with the help of gravity and improved technique, or with the copper braid.

A ROSE BY ANY OTHER NAME

Troubleshooting at the surface-mount level requires a bit more chutzpah because more is on the line. Large SMD chips are not cheap—$50 to $250—but whole PCBs can be $400 to $800! There is always a chance that the new part won't solve the problem, but "progress" can be defined as not going backward but rather teaching an old dog a new trick.

My thanks to Dennis Charney and Peter Florance for their help. ■

Eddie can be found trying out new magnifying glasses at www.tangible-technology.com.



Figures 4a-4f: Four steps in the process of removing and replacing surface-mount devices. 4a) Desoldering braid and standard iron. 4b) As dangerous as it looks, the razor blade is only used to assist chip "lift," as heat from a gun (not seen) is applied. 4c) A screwdriver is substituted to assist chip lift-off. 4d) The chip is "tack soldered" at each end for pin alignment. 4e) Flux is added to all legs. 4f) A simple "kissing" motion (yellow arrow) allows solder to flow to each pin without causing shorts.

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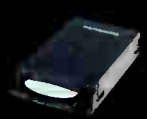

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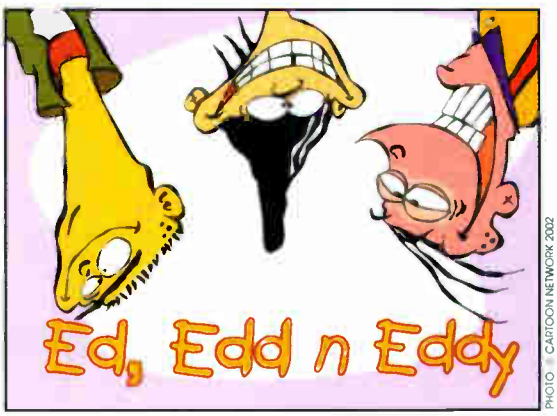


PHOTO © CARTOON NETWORK 2002

Cinesonic was created by Bill Sheppard and Dean Giammarco, two guys who had a ton of work on their hands and nowhere to complete it. By a strange twist of fate, they found an old movie theater complex in West Vancouver that turned out to be a perfect match to their needs.

"We had the work but not necessarily the facility to start pulling off some of the bigger projects we were getting," explains partner Giammarco. "We had a heck of a time finding a place to do the work we had. For the past six years or so, we had been going down to San Francisco to finish our feature mixes. Wherever we went, we would spend half a day to a day just setting things up to do our mixes. We started looking around, and when we found out this place was available, we decided to go for it."

The Cinesonic building has a lot of history in its walls. Originally built in 1965, the Twin Cinemas packed the house regularly for three decades before it was forced out of business in the late '90s. "I grew up watching movies here," says founding partner Sheppard. "I can remember coming to matinees and watching *Sinbad* and *Godzilla* films on Saturday afternoons."

Within six months of finding the space, and after some construction, installation and rewiring, Sheppard and Giammarco had Cinesonic up and running. The 30,000-square-foot facility is spacious and comfortable, and is a hip blend of retro film gear and the latest automated editing, mixing and routing technology. Amazingly, all of the machines that were left behind from the movie house were in good working order. The only thing that didn't work was the ice machine, which, of course, Sheppard and Giammarco fixed immediately.

"The great thing was realizing as we started playing with the equipment that everything was working," says Giammarco. "It was just little tune-ups here and there. The way the equipment started working together was very encouraging. We worked for two weeks straight on a feature dub without a single crash. There wasn't a single bit of downtime."

The centerpiece of the facility is the dub stage, which was modified from its pre-existing function as a movie theater into a full mixing stage. Sixty seats were removed from the center of the room and a level floor poured in the middle to accommodate the Digidesign Pro Control console and work area. Once things began to take shape, the two partners had to pinch themselves to make sure that they weren't dreaming. "We laughed a lot of the time," recalls Sheppard. "We sat in this room giggling, knowing we had stumbled upon something that's incredible."


PHOTO: DBC

Theatre 2, the two-position ProControl mix stage at Cinesonic

Both partners are extremely happy with their modular Pro Control console. The newest piece they've installed is the Edit Pack, which has a built-in keyboard, trackball and joystick for 5.1 panning, allows the use of Pro Tools short-cuts for automation and importing audio, and features better metering and other cool features. "What's great for us," says Sheppard, "is that both Dean and I edit as well, so to be an editor and understand your way around Pro Tools, and to be a mixer and understand mixing is the best of both worlds. It's the perfect crossover, because we can do absolutely anything on the editing side and everything is 100 percent automated so you can do anything mix-wise. It opens you up completely creatively, where you're not stifled by anything."

The modular and expandable capabilities of the board allow the pair to split up the console so that they can both work at the same time if necessary. All routing for outboard gear is run through the Z-SYS patching setup for sharing effects. Instant recall of patches allows someone to come

—CONTINUED ON PAGE 133

Composer Spotlight

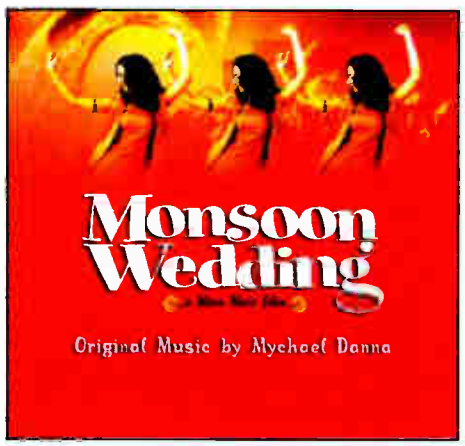
Mychael Danna, Globe-Trotting Visionary

By Bryan Reesman

Canadian film composer Mychael Danna has invented a highly diverse career for himself. Because most of the films Danna works on delve into intense feelings and states of mind that require equally enigmatic musical support, his scores rarely meet conventional Hollywood expectations.

"I think filmmaking fulfills a lot of different purposes," Danna says. "There are movies where people really want to go to the theater and just see [and hear] something that they expect. There's a certain comfort in that predictability. And there's nothing wrong with that. That's one genre of moviemaking, and it's a pretty big one. But there are other things that films can do, and that's where I spend most of my time, [with those] other kinds of films."

Those other kinds of films span a wide range, from the fascinating stories of director Atom Egoyan—Danna has



scored all his feature films, including *Exotica* and *The Sweet Hereafter*—to Mira Nair's erotic *Kama Sutra* and Joel Schumacher's edgy *8MM*. In scoring Ang Lee's short BMW film *Chosen*, Danna composed a baroque/Tibetan score for baroque orchestra, a heady challenge he relished. Such eclectic, arty choices have allowed the Toronto-based composer to indulge in exotic explorations, which seems natural because he has a composition degree from the University of Toronto and some background in ethnomusicology.

"I've ended up [finding] that I've been able to work with different kinds of music," he observes, "from Moroccan music in *8MM* to American old-time music in *Ride With the Devil* to European medieval and Persian music in *The Sweet Hereafter*. *The Ice Storm* had gamelan as well as Native American [instruments]. Mira Nair's new film, *Monsoon Wedding*, I recorded in India. The film I'm working on now [Atom Egoyan's *Ararat*] is taking me to Armenia. I've just never felt that there was any reason to be limited to choosing Western orchestral music to score films with. Not only can you expand that into different places to draw from as your musical source, but also different times."


PHOTO: JAG GUNDU

Mychael Danna

While many film composers work intensively in home or personal studios, Danna uses his to flesh out his compositions before recording and mixing elsewhere. His films usually require him to record musicians in various international locations and then bring back the results to exploit further.

"For this project in Armenia, I'll be recording [musicians] into Logic Audio, and then there will be a lot of manipulation of the audio files," explains Danna. "In fact, that's almost where the writing will happen after I record, because they're folk musicians. I generally tend not to throw scores in front of folk musicians, although I did on *Monsoon Wedding*. I wrote out everything in India earlier this year, and then we recorded into Pro Tools in Bombay and just tracked it like a normal recording session with each instrument coming in separately—recording sitar, recording bansuri—one instrument at a time. They were just playing from scores, so I already knew exactly what I wanted and where I wanted it.

"But this film has a very Armenian kind of theme, so the idea is to weave a tapestry out of folk songs and melodies that will be played by folk musicians," he continues. "I'll be taking what I find and going with that. I've done a lot of research into Armenian music, so there's certain folk songs I know I want, and there are certain instruments that I know I want and where those things generally are going to go, but I'm keeping it pretty open in that sense, too. There's also going to be an orchestral element to this score, and I've written quite a bit of that now, but I'm still waiting for some of it, too. I know one or two of the main folk song melodies I want to use, but there might be other ones that I'll discover when I'm there."

Danna likes to be able to compose and record music into his Mac or Titanium laptop while watching digital video, even when on location, and his assistant, Andrew Lockington, has created an interesting setup that allows him that luxury. A Sony DVMC-DA2 box hooked up to the computer converts analog video into a digital signal (and vice versa). "It connects up to a computer via FireWire," explains Lockington. "What I did was scanned in the movie and turned each reel into a DV file that is stored on an external

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The Art of Data Management and Archiving

Part 3, A Modest Proposal for a Single Delivery Format

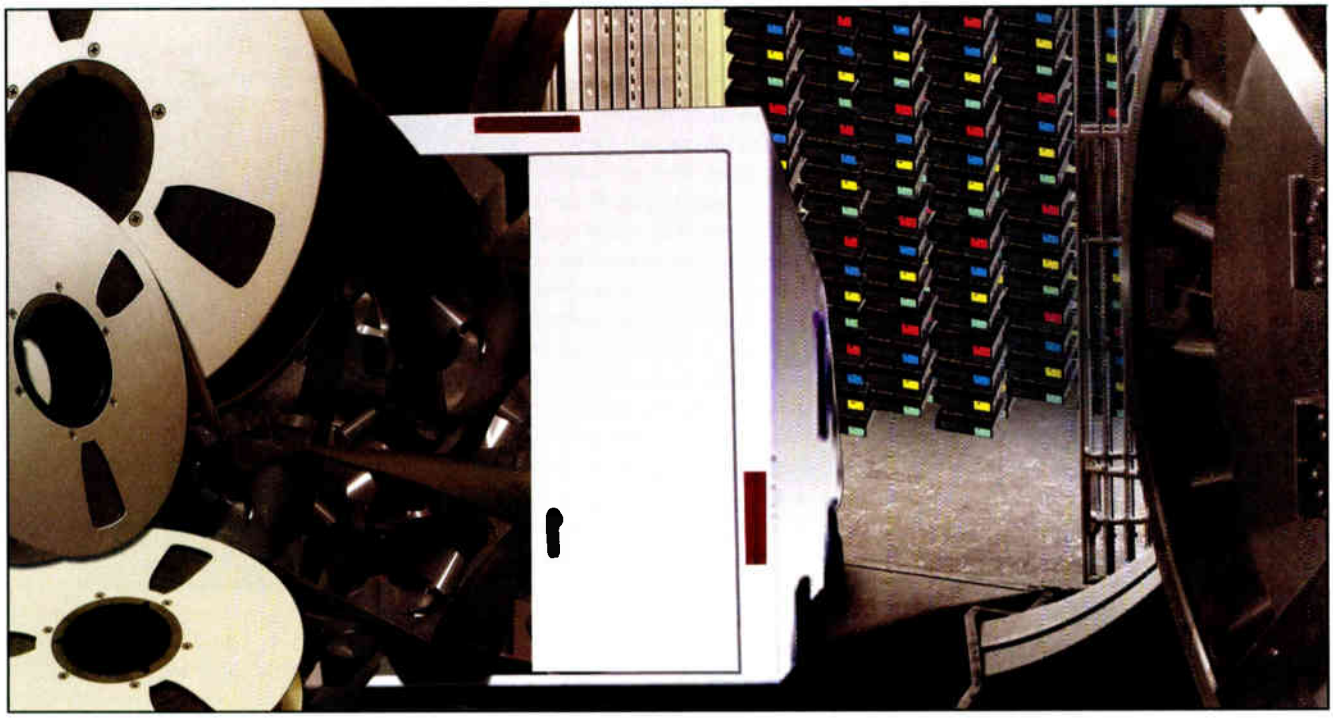

ILLUSTRATION: LIZABETH HEAVERN

By Larry Blake

For the last four years, in order to be as comprehensive and safe as possible, I have been backing up my mixes to multiple formats—2-inch, 35mm mag, DTRS, etc.—from the master 24-bit hard drives.

These string-offs are in addition to the extensive data backups that I consider to be the true masters. Salting away audio files allows multiple copies to be made easily, compared to the complicated setup, alignment and patching required to transfer files to linear mediums. This complication has the effect of making those transfers precious in my mind. Precious as in, "If something happens to them, this will be a BIG pain to redo."

This point was driven home when I was talking with the person to whom I had delivered a recent film. They said that one of the sets of stems on 2-inch tape was lost on its way to the vault. How so, I asked? It fell off the back of the delivery truck, and the 5,000-foot rolls were last seen bouncing down Melrose Ave.

This would be a horrifying story were a) it not so funny, and b) those tapes the master-masters. But it is and they weren't. This month's column is the last of a three-part series about the philosophical and practical issues involved in archiving film mixes in this era of hard drive recording. As I hinted last month, I believe I've come up with a simple solution for an industry in which all studios are headed down different digital roads, and are unwilling to cut the apron strings to analog recording.

The chief engineers of the largest film studios in California should all get together and agree on a single data tape format (plus software) on which to back up their audio. I believe that the logical data format is Super DLT, which in its current configuration stores 110 gigabytes on a tape costing approximately $150. Super DLT drives are less than $5,000 and have the benefit of being backwards-read compatible with the DLT tapes that studios have been using to store DVD data. DLT has been around for a while and is stable, mature and very reliable.

I am specifying a tape format because the media is a) rugged—no head crashes to worry about, and b) cheap. While there is the disadvantage of not being playable, note that there's no playable archive medium larger than the current 5.2-gig magneto-optical standard, which is usable only in the one-reel/eight-tracks-per-2.6-gig-side paradigm. Therefore, it does not lend itself to making copies of all of the data associated with the dozens of tracks, spread across the six-or-so reels that comprise a feature film. You can only copy eight tracks for a reel at a time: s-s-l-l-o-o-w-w. And MO cartridges are more expensive than salting away SCSI or Firewire drives, which give one the ability to play back 24-plus tracks per drive. The scope of the "standard" that I'm talking about is only for the archive medium; if someone wants to add MOs, hard drives or space on a server for this data, go for it. There is strength in numbers.

Insofar as software is concerned, I think the obvious choice is Retrospect because it is by far the most widely used backup program in the industry. I say this in spite of my personal preference for Mezzo, which is a more comfortable fit for my feeble brain. It might be possible to have both considered "official,"

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since the cost of the software is very small.

Let me describe what would happen in my scenario. When a film mix is finished, the recordist would make, from the master hard drives, up to five sets of tapes containing everything from the final mix and beyond: stems, printmasters, M&Es, home video mixes, etc. Most films would need only one tape; 110 gigs contain a lot of 24-bit/48kHz tracks. (Approximately 110 of them, in fact, for a two-hour film.)

In an absolute worst-case situation—a mix designed for the 16-channel B-chain of the future, a 200-minute running time spread across 11 reels, two minutes of slates and tones at the head of each track, 64 tracks of stems, 16-track printmasters and M&Es, etc., etc.—you would still be pressed to need a fourth tape for each set!

The five sets of tapes would be distributed among everyone who will have a need today or tomorrow to access the soundtrack of the film. The first set would go in Box 1 of the sound inventory. The second would go to the East Coast for geographic separation; most of the major studios use National Underground Storage, which is built into a mountain in Pennsylvania. Back in California, the third and fourth sets would go to the home video and special projects departments, since they have to reformat the mix for alternate versions such as airline and television release. The fifth would be sent to the European headquarters for distribution to the foreign-language dubbing territories, although M&E-only sets would probably be the rule, since they have no use for the stems.

The European office would also be responsible for sending back across the pond four sets of tapes containing the dialog stems and printmasters of all dubbed versions. This set would be a maximum of six tapes, assuming a worst-case situation of 30-plus dubbed versions for children's films. More often than not, it would take up just three tapes.

The remaining items to be backed up are the units that lead up to the final mix. In the case of most films these days, we're talking about the premixes and final mix sweeteners. Few films go wider than 40 eight-track premixes, so we're probably talking three tapes for each premix set. Going back a little further, the original "units" of sound effects, Foley and dialog that went to the stage should also be salted away, and two tapes would almost always be sufficient.

As I wrote last month, music merits its own separate archive because of its need to be accessed for soundtracks. (Also, it's usually handled by a completely different editorial department than dialog and sound effects.) One tape would be more than enough for everything.

Last but not least, we need to consider the future of the original production sound recordings. These mate literally and philosophically with the picture negative trims in that they contain everything which was shot but was not included in the final cut of a film. Should there be any re-editing in the future, these primary source materials are essential. Since the variety of production sound media (with DAT, 1/4-inch, DVD-RAM being the most popular) is at an all-time high, we have to face the grim reality that most of these mediums will have a limited lifespan. (Do you think you'll be able to buy a DAT or 1/4-inch deck in 10 years? I doubt it. Will the ones then in existence still be maintained? I wouldn't bet on it.) I think it's essential that we start recording *and* archiving production masters in the same file format as the final mixes. Regardless of the original recording medium, one of our 110-gig tapes could do the job.

> *I just don't believe that in 2013, you're going to find 2-inch tape and 35mm mag film in use.*

Because there is limited, if not unlikely, use for all the pre-final mix material, two sets would be sufficient, one for the West Coast vaults, and the other for NUS. Note that this style of multiple backup of pre-final material is never, *ever* done. Except for the production recordings themselves, most of this material is given scant consideration.

So, let's recap the grand total: five sets of the stems, printmasters, etc., one tape each set. Two sets each of the original production recordings (one tape/set), dialog/effects/Foley units (two tapes/set), music (one tape/set), premixes (three tapes/set), and foreign-language mixes (three tapes/set). Total tapes: 25.

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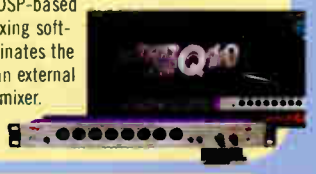

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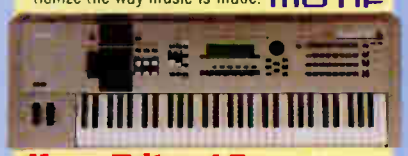

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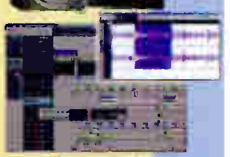

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MENTION CODE MMX4

these tapes until one looks at the total cost: $4,000. As they say on the cover of *Mad* magazine: Cheap. Multiple copies of *every sound* associated with a film at less than the price of making one mag copy each of just the 2- and 6-track printmasters.

The bigger picture is this: Within a few months there would be one of these backup stations on every mix stage and a few at every sound editorial company. It doesn't matter what hardware or software those places are using today for backup—if they want to supervise or mix a film for a major studio, delivery of elements on Super DLT would be mandatory.

Glancing across the film sound community in the U.S., I counted about 70 rooms that could qualify as serious re-recording venues for film or television. I also came up with an equal number of systems that would be needed to cover sound editorial and transfer rooms. Add to this approximately a dozen drives for each studio, spread throughout their home video, special projects and IT departments, and you have another 90. Add in another 90 for to cover the main dubbing territories. Total number of back-up stations needed to cover Film Sound on Planet Earth: 320.

The cost savings inherent in this industrywide changeover would be astronomical. Today, if a studio transfers all print masters and stems to 2-inch, it costs over $30,000 to make two sets of just the final mixes and printmasters. According to today's analogphiles, this is the most archivally sound procedure. I disagree.

First of all, this recording, no matter how good of an analog recording it is, in the best of circumstances *does not sound like what the director heard at the final mix*. It drives me nuts to hear these dubs referred to as "archival masters." And what do you think the circumstances will be like in 10 years when these tapes are pulled out to be migrated to a new format? Transfer them again to another analog medium? Again, I just don't believe that in 2013 you're going to find 2-inch tape and 35mm mag film in use.

Second, as we found out at the beginning of this column, each of those transfers takes a long time, and they're very precious. So, if one is lost or damaged (i.e., bouncing down Melrose Ave.), you're out a lot of money and work.

The procedure I've described would be a no-brainer: Load up all the drives with the stems and printmasters and drag the data over to the copy window. Come back in four hours and you'll have a data-verified copy of everything. Do this four

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This speed and "reliability of transfer" will definitely come into play (in five? 10? years) when these tapes will have to be migrated to a new format, either because of changes in software, hardware or operating system. Or simply, as is so often the case, because things will improve radically.

We can hope that the first migration will be to some new storage medium that's not only playable but stores more than a terabyte in the size of your wallet. It's probably going to happen, but it ain't here yet and there's no use waiting for it. The need is *now*.

It has been interesting to see how the major studios have tipitoed into the world of digital audio with their deliverables. Some have addressed it head-on and smartly, others have ignored it entirely, and most of them hedge their bets, paying a certain amount of lip service worship to analog film and tape.

If the use of digital data tape containing the original mix files seems to be a no-brainer for archiving today's digital mixes, it is of equal value regarding the first 75 years of film sound. I would view the industrywide acceptance of an archiving standard as a starting bell for the industry to transfer their sound vaults for what we can only hope would be the last time.

Although some studios have gone through their catalogs three times, I believe that, in almost all instances this will be the first pass that would use top-quality A/D converters at 24-bit resolution, recording as files instead of linear pieces of multitrack tape (analog or digital). This legacy material will then migrate as data easily, in the background, without knowledge or regard of sample rates, tape speeds, timecode frame rates, ad nauseum.

And last but not least, the middle ground: movies that have been mixed onto hard drives in the last five years and have been archived on some other format. This standard would not only give studios the opportunity to migrate these "first-generation" files to the new medium, it would be the right time to also convert them to more widely used audio file formats. For many people, yours truly included, this might possibly include migrating a shelf of data tapes filled with Sound Designer II files to (many fewer) Super DLT tapes filled with Broadcast WAV files. The audio file and disk formats will be key issues in the setting of this new standard.

ADDRESSING THE CONS

Let me do an advance "devil's advocate," anticipating the arguments against this idea. "It would be a violation of antitrust laws for studios to get together and unilaterally set a standard." I can't imagine that this is true, since they would not be fixing prices or inhibiting trade in any way. And while other companies would be free to write their delivery specifications differently, why would they?

"You can't do this renegade, informal setting of standards. You have to wait for some official SMPTE standard to be handed down." Why? We're talking about taking off-the-shelf hardware and software and using it to do what it was designed to do. Nobody's inventing anything. Again, the post sound companies bidding on a studio film won't care that it is or isn't a SMPTE standard; all they will know is that they *have* to hand over these tapes.

"What is the archival lifespan of these tapes?" Quantum is claiming 35 years, but, as I said earlier, we should be migrating to another medium long before that. However, I don't doubt that DLT tapes will hold up for much longer than the 10-

year limit the industry should set on the next level of migration. By that point, the storage corollary of Moore's law should make for some very attractive options.

"What about software changes? That always gets you." This is true, and it would be important to have a central clearing-house on a Website that would inform the industry of changes in the acceptable backup software and operating system versions. A solution that has worked for me is to stick with a software version for as long as possible. Both Mezzo and Retrospect (not to mention Apple) have undergone major upgrades recently, and this would be a good time to make the initial rules. (That is, once they introduce their v *n*.1 upgrade!)

This type of industrywide transfer from old to new mediums has already happened once in film history, in the early '50s, when all recording and mixing changed over to magnetic film and tape from optical film. Of course, then there were only 25 years of sound films to draw on, and only monophonic films at that.

As industry legend has it, during the optical-to-mag transfer fest 50 years ago, masters from a well-known studio were transferred to ¼-inch tape without a sync pulse. That was Day One of the Era of Bizarre Sync and Transfer problems. Here, now, in Year 50, things have continued to get more and more complicated, and no matter how much any of us thinks they know, there's always something around the corner to change.

I think this proposed plan fires on all cylinders: It's the simplest, cheapest and best solution to the industry's archiving problem. Six months of talking and testing would be enough for the very small film sound community in Hollywood to come up with a common set of specifications.

It would be beautiful if the delivery requirements of the major studios were rewritten this fall to state that any film printmastered after January 1, 2003, would have to be delivered exclusively on Super DLT tapes.

Which would, on that day, become the 35mm mag of the future.

If you agree or disagree, let me know at P.O. Box 24609, New Orleans LA 70184, or via the Internet: swelltone @aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that the most critical data is stored in the form of seafood.

Cinesonic

FROM PAGE 124

and do a fix-up from a different show while the other mixers are out having lunch, and have everything back to normal before they return.

Working in a variety of studios and environments motivated Sheppard and Giammarco to create a highly efficient, comfortable space to complete their projects. Right from the start, they emphasized consistency as their goal, exemplified by the design of their editing suites to be exactly the same so that there is less time spent adapting to the layout of each room.

Each of the four Pro Tools editing suites is equipped with 03D mixers for instant recall of patches, making it easier for the dialog editors to get up and running quickly after others have used the room. The all-digital suites are sensibly designed, with PMC speakers and a large Sony Wega monitor inset into the walls, helping to create a minimal clutter workspace. All machines, including Bryston power amps and Mac G4 computers, are located behind the wall for a quiet working environment, and are stored in rolling racks for quick change-overs if necessary. Each room has

Z-SYS routing for ease of access to the outboard gear, with instant recall patches for individual sessions and users.

A decision was made early on not to have a central computer room. "In the past," explains Sheppard, "working in places with centralized computer rooms was really handy in some ways, but we find it easier and cheaper, cabling-wise, to send stuff over Ethernet. Now you're able to keep things centralized through the Ethernet and patching, as opposed to having the machines side by side and doing hard patches. You're not swapping drives anymore; you can do it over the Internet so fast. The only thing we do have centralized is all the V1 video serving."

One of the jewels at Cinesonic is the 450-seat screening theater, which is equipped with a JBL/Crown 5000 Series THX-approved monitor system. "It's really great, because we can come in here after we've done a show and play it back," enthuses Sheppard. "We installed bi-phase motors on the old 35mm projectors so we can actually lock Pro Tools and Tascams to it, and we can play it back right off the mix. Because it's an old room, it's a much different style from what they're building now, but we figure if it sounds good in here, it will sound great anywhere. It's still running on all the old film gear, with the original Altec amps."

PHOTO DBC

Bill Sheppard, left, and Dean Giammarco, owners of Cinesonic

One of the other antiques left behind was a platter system for 35mm screening, a superior system to the old reel method, which involved lots of change-overs, techie time and room for error.

Cinesonic's layout is essentially the same as the original theater. Editing suites were constructed in the entrance/ticket booth area, and a large Foley room was created behind the dub stage screen. There is a large office area and additional suites equipped with Avid Media Composer 9000 for features and Final Cut Pro for television work.

The concession stand/lobby area was transformed into a recreation room for clients and staff, complete with a comfy viewing area, cappuccino bar and lots of games, including shuffleboard, air hockey

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and foosball. Producers love it so much that they often have their screening parties here once their project is wrapped.

"The bowling alley is right beside us and the driving range is right behind us," says Sheppard. "When clients are here, there's lots for them to do while they're having lunch or waiting to hear a mix. The beach is a five-minute walk and the mall is right there if they need to go shopping."

In addition to feature films, Sheppard and Giammarco are having a blast mixing and creating sounds for the hit cartoon show *Ed, Edd and Eddie*, which is currently in its fourth season. "It's an excellent show to work on," says Sheppard. "It's fun and the producer/director, Danny Antonucci, wants something new every time, and he pushes us to our limits. He doesn't settle for second best, and he makes us work for it. Nothing in the show is from a library."

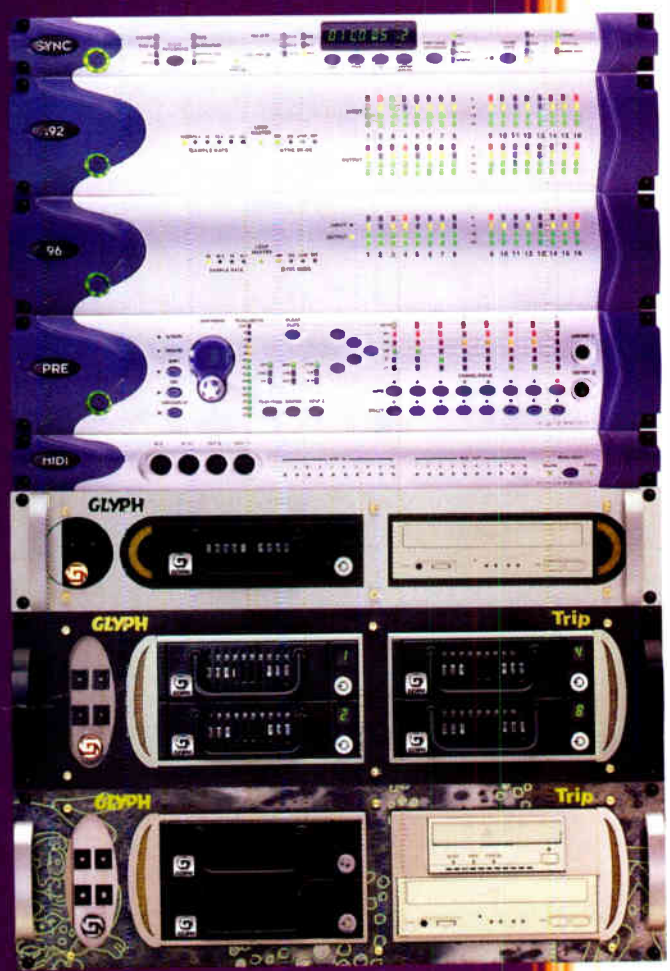
PHOTO DBC

The lobby area has been reconditioned to serve as a working concession stand. Refills are free.

Although their bread and butter right now is coming from TV work, the pair ultimately would like to focus on feature mixing. They have recently completed mixing for two feature films, including *Dead Heat* and *Liberty Stands Still*, both of which were shot in Vancouver, and which would normally have been taken down south and mixed in Los Angeles. "What we're trying to do is say, 'If you're here saving money on your production, why don't you stay and save money on your mixing as well?'" says Sheppard. "In terms of Vancouver, I think there's room for an option."

For now, the Cinesonic partners are content to let the buzz for the studio build by word of mouth, rather than via an expensive advertising campaign. They're also not opposed to working on short films and giving a break to emerging filmmakers, knowing that these people could be the big players of tomorrow. Like two big kids in a huge candy store, they're just having fun. ■

Tim Moshansky is a freelance writer based in Vancouver. He has recently released the third edition of his book, The A to Z Guide to Film Terms.



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Mychael Danna

FROM PAGE 125

FireWire drive." Using Logic, Danna can then open up the DV file (a Quicktime file is also possible) and watch it while working inside Logic.

"The main advantage of that is we wanted them to be able to watch the movie on the laptop, all by itself, if they wanted to," continues Lockington. "And if we had scanned it in at a higher compression rate, then as you make the Quicktime window bigger on your screen, the resolution would disappear. That's part of the reason we had such a large file [5 to 6 gigabytes per 20-minute reel]. With DV, you don't have a choice. It automatically scans it at a certain level, and if you're viewing it at a smaller window level, it's still the equivalent amount of information. It's just using the CPU to break it down."

Now, Danna can record digital audio right onto the internal hard drive of the Titanium, allowing him to improvise music while watching the video. "It's very similar to if you were working with a video machine," says Lockington, "but there are no sync problems, no delay in one thing synching to another, because it's all inside the computer. So, once you set the sync point, then it will be in sync exactly the rest of the way. It works really well. We were a little bit surprised that it worked, actually."

Danna's basic writing studio in Toronto is equipped with a Mac G4 with Logic Audio 4.6.3, a Mackie D8B board and Genelec 1031A speakers. When asked whether he plays his samples on keyboards or chops them up, he says he has done both, but nowadays, Logic allows him to do it all. The composer owns many keyboards, but their individual importance varies from project to project. "Sometimes it's pencil and paper, sometimes it's mocking up," Danna says. "Right now, I'm using the Roland XP-5080. I had a bunch of Roland samplers—the S750s and 760s—to mock up orchestral stuff, and now most of it fits onto the 5080. I still like the Roland library. I have GigaStudio, but I find I don't use it very much because the Roland samples are the ones that I find are the best for mocking up.

"I think you can get better accuracy with other libraries, but I never synthesize acoustic instruments here," Danna continues. "I synthesize them only for the purposes of a mock-up. Things always get re-recorded, so if I'm mocking up an orchestra, it's only to be thrown away and

replaced by a real one. If I didn't have a budget to use an orchestra, then I would probably not go for that size of a group. I don't want to try and spend my time synthesizing acoustic instruments. That's why I like the Roland samples, because they give you a quick idea of what's going on. They're probably not incredibly accurate, but [they are] good enough."

Danna owns numerous electronic sound sources, from a Virus to a D-50, and the main keyboard he uses for triggering is the Roland A90. The composer also owns vintage gear like Poly-6 synths and old Revox tape recorders. While Danna possesses a lot of processing gear, he notes that a lot of it remains unused today because of the proliferation of plug-ins. "But the things I still use quite a bit are the LXP-5 [and] Lexicon Prime Time," states Danna. "I like the old, dirty stuff. I use a Quantec QRS almost exclusively. It's my favorite reverb. It's from the '80s, but it just sounds amazing."

Danna does not mix or master in his studio, nor does he have Pro Tools. "For *Ararat*, I'm recording bits in Armenia, bringing them back into the computer, and then I'm writing the orchestral part, which will then be recorded in London. We'll be mixing in London, so I'll be bringing over the finished folk music audio files, probably dropped into Pro Tools, because we'll be recording the orchestra into Pro Tools."

When it comes to recording and mixing his Canadian productions, Danna often works at the state-of-the-art CBC facilities in Toronto with Ron Searles. His other main engineer is Brad Haehnel, who is Los Angeles-based. He uses both of them for recording and mixing; which one depends upon where the project is. The composer has also used a few music editors over the years, including Tom Milano.

The one recent exception for mixing in his writing studio was Mira Nair's *Monsoon Wedding*. "I did mix here because it was an extremely low-budget film, but it's unusual that happens," Danna remarks. "I don't even have a center speaker here. When I did *Monsoon Wedding*, I had the Mackie D8B—in fact, that was the first project I used it on—and I rented a center speaker. The desk is made for surround mixes, so it was really fun. I did everything from start to finish on that, and I think it turned out really well."

Although Danna has been at his studio space for 10 years, he has never named it because he does not think of it as a studio.

Taking a break from Ararat *in America (from left): dhol player, director Atom Egoyan, Danna, and two deduk players.*

"It's just where I work," he says. The composer lives in a high-rise condominium overlooking a lake. He lives in one unit and then has another for composing, complete with an office, an assistant's room and the studio. "So it's kind of home, but I get in the elevator," he observes.

Did he face many challenges in converting a conventional apartment space into a studio? "None at all," Danna replies. "There's a huge living room, which had floor-to-ceiling windows that look out over the lake, which is why I'm still here, even though I've run out of space. The view is amazing, and it's different every day. I look at the Toronto Islands, which are somewhat unspoiled [areas], so I look out at trees and water. That's what you want to look at when you're working. There's glass all over the place, which any acoustician would wince at if he saw it, but I don't care. The view is more important than the acoustics." Because he only

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records keyboard parts here, that fact is not a sonic pitfall.

"As far as work, it's just fantastic," Danna beams of his studio. "I've got everything just the way I want it. Everything has nice wood. I've got good work lamps. I've got two 17-inch monitors for the Mac and another one for the Mackie. The workspace is really comfortable and very efficient. But as far as being in a condominium, I don't record here, so I don't need any acoustic treatment. And I don't monitor loud at all."

During the course of his lengthy career, Danna's aural adventures have taken him around the globe, and modern technology has allowed him to venture to exotic locales independently. "We're using a studio that's in Armenia, but I'm bringing all my own stuff," he reveals. "We're basically using a Soviet-era studio space, which will sound great. I've worked in these Soviet-era studios before, and the space is amazing." But the technology leaves a lot to be desired, hence the need for his Titanium setup and bringing his own mics.

"I'll be able to be self-sufficient to a large extent, depending upon what I find when I get there," Danna explains. "I end up doing that a lot. In Morocco, I ended up setting up in a big, empty hotel room [for *8MM*], and I brought my own power and everything. That's where I end up a lot, looking for these less-traveled paths as music sources."

While this laborious process makes things more interesting, it also invariably makes more work for the composer. But he believes that the end results are worth the trouble. "When [the score] works, and it's very well-considered and conceptualized, you can see something that really helps the understanding of the film and helps the theme of the film in a very elegant and thought-provoking way," Danna concludes. "I'm really against the idea of throwing world instruments into a score just because they're the flavor of the moment. You better have a very good reason for choosing your instruments. You need to think very carefully [about] what it is you're trying to say and what instrument can best say it, what connotations all those instruments have."

Traveling the world and absorbing new cultures in a quest for fresh sounds certainly spices up his scores. "I find that it's the thing that gets me most excited," Danna declares. "I love learning about new kinds of music, listening to nothing but Armenian music like I've been doing for the past two months now. And to me, that's what the process of filmmaking is all about—just immersing yourself in a different world for a while. Hopefully, I'm able to transmit some of that in the music that I make." ■

PHOTO: NAN GOLDIN

Members of the Verma family and visiting relatives pose for a family portrait just prior to the wedding ceremony in the Mira Nair film Monsoon Wedding.

Bryan Reesman is a contributor to Mix.

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KODO'S "MONDO HEAD"

A WORLD RHYTHM CONNECTION

By Blair Jackson

It's a beautiful afternoon in the spring of 2001, and I'm up at percussionist/producer Mickey Hart's ranch studio in northern Sonoma County, Calif., listening in on tracking sessions for the new *Mondo Head* CD by Kodo, the extraordinary Japanese drum troupe. Now, if you've ever seen Kodo perform—and they tour incessantly, often playing at symphony halls and on university campuses around the world—you know that they are an intensely disciplined and formal group. Their taiko drum pieces unfold with an almost military precision, as they tap and pound large and small drums to create layer upon layer of intricate, often hypnotic patterns. Though their music is not written in the traditional sense, it *is* learned, and it has an inviolable structure—much of its power derives from the genius of its mapped-out formality. It is, in a sense, classical Japanese drum music.

But you don't travel to Mickey Hart's ranch to make by-the-numbers music. Hart's specialty is spontaneous creation and jamming, as he's shown on innumerable great percussion records he's made and/or produced since the mid-'70s. A true world music pioneer, and always a restless spirit, Hart likes to break down barriers between cultures and musicians, mixing players and timbres in unpredictable ways, knowing that there's a universality in rhythm that transcends nationality or the specifics of instrumentation.

So here are 10 members of Kodo, most in their late 20s and early 30s, none of whom speak English, wandering around Hart's property between jams, looking extremely relaxed. A few sit by the pond that is just across the way from the studio building. A couple of others are hanging out in the immaculately kept Japanese garden between the studio and Hart's house. And two or three sit in the control room to watch the setup for the next hour's work—overdubs by master percussionists (and longtime Hart associates) Airto Moreira (from Brazil) and Giovanni Hidalgo (from Puerto Rico). A video crew is also wandering about, shooting bits and pieces for a possible DVD up the road. The group's translator is very busy, between explaining Hart's instructions about the music and communicating with studio personnel.

As has been the case for nearly all of Hart's projects, veteran engineer Tom Flye is behind the Neve V Series console in the control room, at this moment checking to be sure that the little room above him is miked properly for Moreira's over-

—CONTINUED ON PAGE 152

INDIGO GIRLS

BACK TO BASICS

By Elianne Halbersberg

Twenty years, nine full-length albums and thousands of miles later, Amy Ray and Emily Saliers agree that being in the Indigo Girls is still not a job and sure beats having one. "Oh my God, I'm so thankful every day!" says Saliers. "Before we go onstage, after we leave the stage, all the time! It's an honor and privilege to work with Amy, for all the people we've met who have mentored and inspired us, a million things have happened for us that I can't believe. We work hard, we've made sacrifices, it's hard and uncomfortable to be in the public eye sometimes, but we've been lucky to have a network and resources for our social activism, to get people together on issues. So as much as musically, for our activism, I'm thankful for what this career has brought to us. It's astounding."

Over the course of two decades, the Atlanta-based singer/songwriters have become best known for two-part harmonies layered over their Martin guitars. Interspersed between these melodies, however, they've enjoyed the luxury of experimentation, both in the studio and in concert. They've expanded their instrumental vocabulary to include a variety of instruments such as mandolin, harmonica, electric guitar, banjo and bouzouki. There was a solo album, *Stag*, for Ray in 2001, and even a walk on the harder side of musical genres with their previous release, the 1999 *Come on Now Social*. But by the time the duo began tracking that disc, Ray already knew that she wanted to return to their signature acoustic sound. What she didn't expect was that it would take until 2002 and the release of their latest album, *Become You*.

The Indigo Girls at Tree Sound (L to R): Amy Ray, Carol Isaacs (piano, accordion, keys), Robert Hannon (studio chief engineer), producer Peter Collins, engineer Glenn Matullo, Emily Saliers, Clare Kenny (bass) and Brady Blade (drums).

"I'm sort of a split personality," she says. "I've been thinking about this for five years. I'm happy to do both kinds of records, but in the back of my mind, I knew I wanted to go back to basics. Emily wasn't into it for a while, but I was constantly bothering her! When she's ready, she's ready. I wanted to do a no drums or anything album, like [Springsteen's] *Nebraska*, and she wasn't interested. But I love the band we play with, so it's not like I had to compromise my vision. It's the rootsy record I wanted, with the beat and bass parts that Emily wants."

Foremost on the priority list for making *Become You* was that the musicians track live, together. Recording began in September 2001, at Tree Sound Studio in Norcross, Ga., with producer Peter Collins, who had worked with the Indigo Girls on the 1992 *Rites Of Passage* and in 1994 on *Swamp Ophelia*. "Peter was originally a folk singer," says Saliers. "He has a good musical ear and is a really good friend of ours. When we were ready to start recording, he gave us a friendly call to see what was going on, and Amy said, 'Let's ask him to come to rehearsal to hear the songs and give us some guidance,' because we sometimes need a mediator. We decided to have him come in for two days, and he suggested musical hooks here, accordion there, Latin beat there—they were great structural and musical ideas. Amy and I said, 'We can't make this record without Peter,' so we begged him to stay."

Ray also suggested another friend, Glenn Matullo, to engineer. "He's one of my favorite acoustic engineers," she says. "I heard a lot of the stuff he had done in Atlanta and my choice of him was based on the type of record this was going to be. His work with Shawn Mullins, his use of compression on vocals, his decisions on how to mike things—he gets the truest sound of instruments of any engineer I've ever worked with, and he's very fast. He doesn't waste time or kill the vibe."

Matullo, a graduate of Ohio University who relocated to Atlanta in 1992, worked in audio production at CNN prior to becoming an assistant engineer at Nickel and Dime Studio. During his five-year stay there, he established contacts in what was then a thriving acoustic scene, and assisted on an Indigo Girls project, thus beginning his relationship with Saliers and

—CONTINUED ON PAGE 154

CHRIS ISAAK'S "WICKED GAME"

By Maureen Droney

Chris Isaak's fans always knew he'd be a star. Mostly it was that voice: brooding, melancholy, impossibly romantic. Then there was the attitude: hip, cool, stylish, but also very working-class, very regular guy. Everything isn't always on the surface with Isaak, and his music and his performances reflect that.

Isaak and his band, Silvertone, built a loyal following in the San Francisco Bay Area club scene in the '80s, but their modern rockabilly style was always out of step—both visually and musically—with the trends. The '80s were about dance music and big snare rock, so while Isaak's first two records received critical acclaim, they didn't sell very well. That didn't seem to matter much to Isaak. He continued paying dues and working with the same producer—Erik Jacobsen, an industry vet who'd shepherded classic hits by The Lovin' Spoonful.

Isaak's third album, *Heart Shaped World*, seemed destined for the same small-time fate as the first two, until film director David Lynch made the inspired decision to prominently place "Wicked Game," with its haunting guitar melody and supremely sexy vocal, in his 1989 movie *Wild at Heart*. Propelled by the movie and a Lynch-directed video, the angst- and reverb-laden "Game" became a Top 10 hit, turning *Heart Shaped World* Platinum and, finally, turning Isaak into a star.

"Wicked Game" sounds so organic, so present, and so natural that even studio cynics may be surprised to learn it was largely a studio creation, an early example of what can be achieved with samples, loops, and a relentless, perfectionist vision.

Tracksheet for "Wicked Game"


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TRACK SHEET

9TH AND PARKER • BERKELEY, CALIFORNIA 94710 • (510) 548-8600

ARTIST: C. Isaak — TITLE: Wicked G. Mix

CLIENT: Warner Bros. — PRODUCER: [illegible] — ENGINEER: [illegible] — ASST ENG: [illegible]

DATE 11/29/88 REEL 9 — 24 TRACKS 30 IPS — LEVEL +5/222 NR

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24

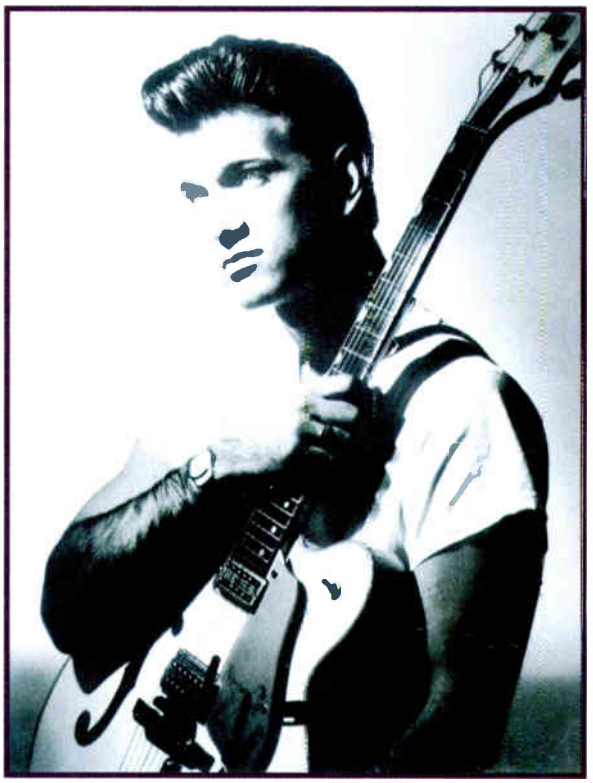

PHOTO AARON RAPPOPORT

Bay Area-based engineer Mark Needham has worked with Isaak on almost all of his records, as well as on the music for Showtime's *The Chris Isaak Show*. The making of "Wicked Game" was particularly fresh in his mind when we spoke, as he and Isaak had recently teamed to recut the track for its use in a Jaguar car commercial.

According to Needham, "Game" had been kicking around for several years before the definitive version was put together. Many incarnations had made it to tape, but none felt quite right. "That song had a long life," he deadpans, "a real long life. Chris had played it with the band many times, and we'd recorded a bunch of different versions, with different arrangements. But we never thought that the drum track had the metronomic feel that we really wanted. That was something it really needed, especially in the verses, to convey the song."

Isaak again recorded "Game" with Silvertone among some tracks cut in 1988 at Berkeley, Calif.,-based Fantasy Studios. The team then adjourned to the now-defunct Dave Wellhausen Studios in San Francisco's Sunset District, where they settled in and began cutting and pasting. Kenney Dale Johnson's drum tracks were sampled into an Akai DD1000 sampler (Needham calls it an "ancient forerunner to Pro Tools"); then they began making loops and reinventing the groove.

"I'd been doing stuff with the early Eventide H3000s and other boxes," Needham recalls. "Sampling was still in a primitive state, but we were making loops using samples and triggering them off MIDI. For 'Wicked Game,' the samples came from various 24-track outtake versions that

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FIRST WE LISTEN

we were never really happy with. We'd take six or seven different brush patterns and make loop patterns we could trigger off a MIDI note."

Rowland Salley's bass guitar tracks were also compiled from previously recorded versions of the song that were sampled. After samples were loaded into the Akai, MIDI tracks were built with Mark of the Unicorn (now MOTU) Performer software. Finished loops were dumped back to an MCI JH-24 analog 24-track on Ampex 456 tape at +6 level. Johnson then came back in to overdub cymbals. "As I remember," remarks Needham, "we gave him a fake kick pedal so that he could feel like he was actually hitting something a little hard to play along with. We were trying to keep the live feel so it didn't sound programmed, but it had that precision and regularity, which really helps make the verses work."

Outboard preamps, direct to tape, were preferred for the overdubs, and Wellhausen's Soundcraft board was used only for monitoring. "We had four [Neve] 1073s that I'd gotten Chris to buy early on," Needham says. "We also had some Massenburg preamps that we'd rented from Stephen Jarvis."

Guitars are key to the song. Isaak himself played two acoustics: one standard and one in a Nashville-style high-strung tuning he'd picked up from Night Ranger's Jeff Watson. The haunting lead was by Silvertone's guitarist at the time, James Calvin Wilsey; that, too, was painstakingly crafted. Although Wilsey's melody had been written and played with the live tracks, the version that appears on the record was put together from numerous tracks overdubbed over a period of a couple of weeks, then comped and refined piece by piece.

One of the subtly cool sounds on the track is a MIDI'd string sound triggered by the lead guitar. "Jimmy's Strat had a custom MIDI setup," notes Needham, "and he played the underlying string pad that goes along with the guitar. [Keyboardist] Frank Martin also played a little sustaining part along with it. It's the only keyboard part on the song; you hear it like a little drone."

Another striking effect on Wilsey's guitar, which was played through a 1964 Fender Deluxe amp miked with a Shure SM57, is a long, quarter-note, triplet delay that swells up at the end of certain notes. To create it, his mono guitar track was sent to a TC Electronic 2290 for pre-delay, then fed to an Eventide H3000 stereo Rich Cho-

rus program. The effect is that the mono guitar hit swells up into the delay, then spreads out into the stereo chorus to create a kind of pad. Needham rode the effect up at each spot by hand, then automated it and printed onto a track of the MCI.

The major hook of the song is the interplay between Wilsey's guitar and Isaak's vocal. Needham recalls a Sanken C-41 mic on the vocal, through a Massenburg preamp/EQ, and an English EAR (Esoteric Audio Research) compressor. Isaak got that really big vocal sound singing in the tiny control room using speakers instead of headphones.

"He was singing to the speakers, really soft," Needham explains. "If you listen really carefully, there's a change in the cymbal sound every time the vocal comes in, because you're hearing the bleed of the cymbals through the monitors into the vocal mic."

Reverb on the vocal was a Lexicon 480 with a modified version of the Snare Plate program, which Needham frequently used on Isaak. "I'd take the pre-delay down, set the room size at 35 meters and the overall delay probably about two seconds," he says. "I'd also take the high frequency off down to 5 or 6k. As a general rule, I'd be sending to the chorus from a separate fader [a split of the vocal] running first to a pre-delay, then to the 480, which I'd ride up at the end of the line."

The almost subliminal backgrounds that whisper, "It's only it's only gonna break your heart," were a fortuitous accident. According to Needham, "The singers were friends of Chris', not professional background singers. We sampled them also and flew them in manually from either an H3000 or a Publison [Infernal Machine]—I can't remember. They had a really nice, unslick kind of sound, which was what we wanted, but there were also some pitch problems. It was before Auto-

Cool Spins

The Mix *Staff Members Pick Their Current Favorites*

Joey Ramone: *Don't Worry About Me* (Sanctuary)

No need to work at being objective about these last solo recordings by the dearly departed Ramones frontman. The first track, a punk/pop cover of Louis Armstrong's "What a Wonderful World," is worth the price of admission on its own. And it speaks to the tone of Joey's work on this album, and throughout his career with the band: This gawky, sweet, hard-rocking recluse was punk's true optimist. His lyrics are full of his special, sick humor and joy, and the music continues his love affair with simple, early rock 'n' roll (with deafening guitars, of course). Produced by Daniel Rey, who worked on many of The Ramones' later albums, this release sounds like nothing less than a great, lost Ramones album, so crank it up! They don't make 'em like this anymore.

Producer: Daniel Rey. Recording and mixing engineers: Jon Marshall, Daniel Rey and Joe Blaney (mixing on title track). Recording studios: The Magic Shop, Water Music, Baby Monster and Loho (all in New York City). Mixing studios: Green Street Studios and Jarvis Studio (title track). Mastering: Howie Weinberg/Masterdisk.

—Barbara Schultz

Chris Isaak: *Always Got Tonight* (Reprise)

How *does* he do it? Chris Isaak pretty much laid out his romantic vision and his basic

—CONTINUED ON PAGE 156

Tune of course, so we just kept them really soft in the track. It came across as sort of whispers, where you almost can't hear what they're singing."

Mixing was at the also now-defunct Amigo Studios in Hollywood, on an early Neve V console with Necam automation, to ¼-inch Ampex 456 tape also at +6. A last hook added during mixing was the way that Isaak's "cry" fades off into echo near the end of the song. "There was that long, quarter-note, triplet delay that kind of goes off into infinity," Needham remembers, "that I used on high sustained notes. And then I used the Sound Hoarder program on the Publison as a sampler to offset his note a little bit in time. I moved it a little further back so that there were two tracks of it and we could crossfade it up, make it go really long and then off into the echoed delay."

So there you go. All of you who thought Isaak was merely a rockabilly purist, well, he's much more complicated than that. The art of the "Wicked Game" saga was making such a laborious process sound so completely natural, doing whatever it takes to deliver the full potential of a song. Luckily, the painstaking process that created the original wasn't needed in the recreation for Jaguar. "Yeah," laughs Needham, "Pro Tools made it a lot easier to do it this time around." ■

KODO

FROM PAGE 146

dub. One difference between this session and the last one I'd seen at the ranch, about two years earlier, is that it's being recorded completely to Pro Tools; at this point, it's a surprise when I go to a studio and there *isn't* a Pro Tools rig on hand. Hart and Flye explain that Pro Tools is perfect for this recording because there is going to be so much editing later on—the plan is to take various long studio jams, add outside percussionists, cut those jams into more manageable "song" lengths and structures, do additional overdubs in Japan, and then more editing and mixing. There's a lot of experimentation at every session, and Pro Tools makes that more financially feasible, too, because they're not burning reel after reel of 2-inch tape—a Mickey Hart tradition for more than 30 years!

Once the setup is complete, Moreira makes three passes at an overdub on a very calm and spacey percussion piece.

He's blowing bubbles and humming through a miked tube that is dipped part-way into a bowl of water. It makes an eerie, unearthly sound that cracks up Hart and Flye in the control room. "It is the music of the water people! They are singing to us!" Hart says with a laugh. But it's no joke—it's just what he and Moreira were looking for, and two young Kodo members listening intently on headphones in the control room nod approvingly. (Ultimately, this piece did not make it onto the CD; perhaps it will emerge on some future release.) Moreira next moves into the iso room adjoining the control room, and Flye cues up another jam, this one a fast rhythm assault dominated by some of Kodo's larger drums. Moreira listens to it carefully for a minute or two and then slowly moves toward a Beyerdynamic mic and eases himself into the jam with a handful of shakers, playing against the prevailing beat and adding rattling cascades over the din of drums. Giovanni Hidalgo has been listening carefully to Moreira and then he gets into the act, too, first unleashing a marvelous finger fusillade on a set of tablas in the iso room—it sounds like a torrential rain falling on a tin roof—and then switching to another set of tuned hand drums, known as *duggies*.

Kodo producer Mickey Hart relaxes between sessions at his Northern California ranch.

And so it goes for the next hour or more. There is little discussion; just the master percussionists, sometimes joined by Hart, feeling their way through a forest of drums, bells, shakers, bowls and exotic instruments that defy description. Then the action shifts to the main recording room and the players from Kodo become involved, laying down a pair of new jams. On one, Hart gets the ball rolling by tapping out a pattern on an Egyptian tar, then wordlessly urging the other musicians to join in and create what evolves into a spell-binding weave of rhythm. The video crew goes about its work, capturing the birth of this utterly new music, and the smiles on the musicians' faces as the jam picks up steam and the subtle interactions between the players become more sophisticated. Inside the control room, there's some concern that not every instrument is being picked up adequately, and a couple of times Flye runs out mid-jam to set up another mic. Between takes, Hart loudly comments, "Ah, yes, making the engineer scramble—that's my favorite part! Tom's going to get all sweaty; actually, he's *already* sweaty. It's been three straight days like this—he must sleep like a log!" Flye doesn't look up; he's too busy patching. But he's used to the gentle ribbing *and* the demands of what are so often very unpredictable sessions.

"That's just Mickey," he says later with a chuckle. "Spontaneity is his thing. This is his usual mode of operation. This has been interesting because Kodo has made a number of very traditional records; it's quite a discipline. They tend to write a piece, write down all the parts, rehearse it for quite a while and then play it. But with this album, one of the reasons they chose Mickey is because they wanted to step out. So Mickey did everything he could to get spontaneity out of them, and I think it worked quite well. They really loosened up."

"I'm 'The Zone Man,'" Hart offers, smiling. "I take them to 'The Zone.' They wanted to go there and I was happy to oblige. Our approach on this is real simple: You get the best-sounding instruments and mike them really well, make 'em sound like a million bucks; that's Tom's job. Then you get the right people who are simpatico with each other, who understand the spirit world, like Airto and Giovanni and Zakir [Hussain] and Michael Hinton. When you've done that, then you've set the stage for magic and you get the good vibe going. These sessions *have* been magic. It reminds me a bit of the first Planet Drum sessions we did, which were all first takes. This has been the same—bang, bang, bang—everything has been so smooth."

When I leave the ranch late in the afternoon, the members of Kodo are still in the big room and looking right at home

at their traditional drums—which have names like shime-daiko, Okinawa-daiko and uchiwa-daiko—shaking the rafters of the studio as Hart moves among them, pointing at one player, then another, as if to coax more magic out of each of them. Flye is in the control room looking much calmer now; he's in the groove, too, and his Pro Tools technician, Sean Beresford, is studying his screen to make sure it's all going down smoothly. I can still hear Kodo banging away as I drive past the main house and out toward the trees by the front gate.

It will go on for a few more hours, and this is just one of many similar-but-completely-different days devoted to this project. There would be other percussionists coming through, then various singers, including three fine vocalists from Hart's superb current band, Bembe Orisha: Bobi Cespides, Nengue Hernandez and Azam Ali. Blues harmonica ace Charlie Musselwhite would drop by one day to add his distinctive touch to a track on the *Mondo Head* CD that would eventually be called "Echo Bells." There are African flavors, Native American touches, splashes of Indian and South Asian textures, a track featuring the chanting of the Gyuto Tantric Choir (recorded by Hart and Flye in 1995) and, of course, Kodo's taiko drums pulling it all together. This is world music in the most literal sense.

A few weeks after these sessions, Hart and Flye traveled to Japan for Kodo overdubs at Sony's new studio in Tokyo—"a very nice place," Flye says some months later. "The rooms were all designed by studio bau:ton. It's a massive installation with tracking rooms, mix rooms, mastering rooms, authoring rooms; you name it. The room we were in had a Neve V, quite nice. Right before we left, actually the morning of my flight home, we got up early and did a demonstration surround mix on a Euphonix system there."

Hart and Flye have done 5.1 surround mixes on a number of projects, including tracks from Hart's *Superlingua* CD, a just released *Mickey Hart's Greatest Hits* package, and, earlier in 2001, remixes of the Grateful Dead's *American Beauty* and *Workingman's Dead* albums (see *Mix*, August 2001). But because the Kodo CD is on a CBS subsidiary (it was released in Japan last fall; the American release is this spring), Flye and Hart's surround mix was to the SACD format on a Euphonix console at Glenwood Place (formerly Kendun) in Los Angeles. "Originally, SACD was only in stereo," Flye says, "and then last spring they got it working in multichannel. By the time we actually mixed [in August 2001], they did have a 6-channel system, and it was up to us whether we wanted to make that sixth channel a sub or an overhead or whatever, and we chose it to be a sub channel to make it compatible with everything else that we've been doing with surround mixing. You knew Mickey would go for the sub. [Laughs] And I will say, the system sounded *very* good."

Members of Kodo inside Mickey Hart's studio

"I think we're going to blow some minds with this one," Hart noted casually the afternoon I was at the studio. "It's different than anything I've ever done, but it's still connected. And that's what this is all about, of course—connecting musicians and cultures; connecting the whole world, really. Rhythm can do that. It *is* doing that." ■

Mickey Hart's Website is accessible through www.dead.net.

INDIGO GIRLS

FROM PAGE 147

Ray. With his reputation cemented, Matullo opened Orphan Studio, and has since worked with Mullins on all his albums, as well as with Collective Soul, Josh Joplin, Michelle Malone and numerous Atlanta-based artists. He also engineered *Stag*, Ray's independent project. At that time, she was already talking about making an acoustic Indigo Girls record, and, he says, "We met, I gave them my two cents about how I could help out, and we took it from there."

With Collins producing and Bob Clearmountain mixing the finished product, Matullo says that his role in making the album was "giving [Saliers and Ray] what they wanted and trying to make it easy for them to accomplish what they wanted to do. The creativity is the producer's job; the technical part is up to the engineer. It's making something happen fast so as not to lose the momentum, and putting all the technical pieces together. The setup of the record was pretty huge, and making it logistically happen is the job of the engineer and assistant engineer—Robert Hannon. The way we started recording, we couldn't have gone anywhere but Tree Sound because it's big, open and everyone can see each other. We set up the entire band and that can be overwhelming, so it says a lot for the studio and assistants, in general, that they made everything work for us."

While making an acoustic record offers some ease compared to setting up and capturing a multi-instrument, high-volume rock band, the flip side is that tracking is more precise: Flaws and errors can't be concealed under loud guitar solos. Matullo agrees with the premise, but says, "With the Girls, it definitely didn't make a difference because they're such great players that they make it easy on the engineer. I just had to get the right mic and make sure it sounded like what they were playing. As long as you're in a great studio, the job is simply to capture the pure sound. This is a very stripped-down record, and I haven't done one like this in a long time. It was two acoustic guitars and a band and not a lot of overdubs, but that was the goal going into it. We wanted to make sure that everything we recorded had nothing wrong, because it would all be heard."

Although Matullo makes it sounds easy, Saliers counters that making records "always feels like work. It takes a lot of energy; you want every take to be the best it can be, and sometimes parts take forever. It was getting cold, so throat issues came up that you can't predict. We were working out arrangements. It takes a lot of mental energy, and working quickly made it more stressful for me, but it was good for Amy because she'd done *Stag* that way. I had more of an adjustment. I was used to working on a record for four or five months, so I felt I was rushing my songs [over seven weeks]. Now I'm glad we did it quickly, because after it was done, it was a relief."

Ray found that Peter Collins had "loosened up in some ways as far as letting some things go that he may not think are

perfect. Not the performances—he's always forgiving about that—but in production ideas. He's pretty steadfast and consistent because he's always been a hook man. One thing that was different is that we used Pro Tools, which we'd not done with Peter before. It didn't change his approach, although maybe he's more willing to comp a vocal because it's easier now, whereas before...Emily was always more into that than Peter. So now it's quick, and everyone gets what they want. I did a lot of live vocals on this record. I loosened up and wanted to capture the moment. It was a low-budget album, and it was more important to capture the vibe than the perfect pitch. In the past, I might have been too much of a stickler and sterilized and took the life out of the songs sometimes."

To capture the essence and clarity of the vocals and acoustic guitars, Matullo relied on Neumann and Royer microphones. With Ray, he used two Neumann U67s and a Royer 121. "The ribbon microphone is very old technology dating back to the jazz singers of the 1920s and 1930s," he says, "and it's making a comeback in the digital arena of making records because it's very warm and natural-sounding, and great for acoustic recordings. Amy is a big fan of the Royer for her vocals. With Emily, again I used the U67 or the newer Neumann TLM 170 and vintage U47. My mic pre and compressor of choice on every song was the Avalon 737. That stayed consistent, and I just switched out the microphones.

"I don't always use the same piece of gear for this specific instrument, but for acoustic guitars, I'm a huge fan of the Neumann KM184 or KM84, the vintage version. They're very real-sounding and capture the guitar really well, especially in instances where you're doing live guitar and vocal. They're smaller mics and very tight in the pickup pattern, so you don't get a lot of vocal bleed on guitar music. It's a smaller diaphragm mic. For larger diaphragms, I like the U67 or 149. As far as outgear to go with those mics, I used the Focusrite ISA 215 mic pre. The compressor is very important for acoustic guitar, and I used a Distressor."

Matullo believes that *Become You* could not have been made without Pro Tools. "With today's technology, as long as you use good mics and pre's and warm-sounding instruments and gear, there's no reason not to use [Pro Tools]," he says. "It makes the job easier and faster, and you don't have to throw up that twelfth roll of tape to do overdubs. We set up everybody live—*everybody*—and we kept a lot of those tracks. We'd go through the songs and record everything, literally. We couldn't have done that with tape—we would have run out! Peter is a big fan of happy accidents, and he didn't want to miss a note, so that if there were amazing takes, we'd have them. Of course, we did some fixes, but the basic recording of this album was all done live." ■

Cool Spins FROM PAGE 151

sonic approach on his first album, *Silvertone*, way back in 1985—that beautiful, lonely voice—part-Elvis, part-Orbison, but still original; the twanging guitars and reverb-laden tracks that hearkened back to Sun rockabilly; the melancholy laments of love lost and dreamy visions of that perfect love we all seek. Everything he's done since has been some variation on those themes and approaches, and yet he always manages to make it sound fresh. And on his last three albums, he's really expanded his pallette to great effect. On *Always Got Tonight*, he shows once again that he is a master of capturing singular moments and feelings in rela-

tionships—from desperation, to quiet longing, to resignation, to that moment of realization that "just friends" has blossomed into "true love." He's rarely self-pitying, usually understanding, *always* trying to make sense of the swirl of emotions running through him. Yes, you've heard it all before, but the textural variations from track to track, the parade of memorable hooks, and the pleasing, sincere vocal delivery add up to a wonderful valentine to love itself. This may be his best album yet.

Producer: John Shanks (one track produced by Isaak). Engineers: Lars Fox, Mark Desisto, Mark Needham, Mark Valentine. Mixers: Chris Lord-Alge, Jack Joseph Puig (two tracks). Studios: Studio 880, Henson Recording, Ananda Studios, Mark Needham Audio, Cornerstone, Image Studios, Ocean Way Studios, Mushroom Studios, The Warehouse Studios. Mastering: Doug Sax and Robert Hadley/The Mastering Lab. *—Blair Jackson*

Donna the Buffalo: *Live From the American Ballroom* (Wildlife Music)

Hailing from upstate New York, Donna the Buffalo is a sort of roots groove band, with a strong cajun influence. Five of the six bandmembers are multi-instrumentalists, comfortable on all manner of acoustic and electric stringed instruments and keyboards; it's quite an eclectic stew. The principal songwriters, Jeb Puryear and Tara Nevins, are both adept at penning catchy, driving tunes that build neatly and leave plenty of room for instrumental interplay; no wonder they've been embraced by the jam-band crowd. Their unison vocals remind me a bit of the late, underrated Timbuk 3, and the larger three- and four-part group vocal scheme occasionally resembles the bright, joyous blend of late Talking Heads. Though there are introspective moments and the occasional socially conscious and/or philosophical lyric, the party groove with a great sing-along chorus is never too far away with this band. The release consists of two CDs covering 15 original tunes, recorded live. Definitely a band to watch.

Producers: Donna the Buffalo. Recorded live by Alex Perialas. Mixed by Perialas and the band at Pyramid Sound Studios (Ithaca, N.Y.). Mastered by Perialas at Pyramid. *—Blair Jackson*

***Monster's Ball: Original Motion Picture Soundtrack, composed by Asche & Spencer* (Lions Gate Records)**

To this critic's eye, the best moments in *Monster's Ball* belong to lead actors Halle Berry and Billy Bob Thornton, whose intense performances almost make up for the cynically manipulative (and occasionally nonsensical) plot. But director Marc Forster's first major studio effort is beautifully shot—the opening credits sequence is almost worth the price of admission—and meticulously assembled. Further, it benefits from a starkly sympathetic soundtrack composed by Asche & Spencer, a company best known for scoring TV and radio commercials. Headed by Minneapolis native Thad Spencer, the 14-year old company has won numerous awards for its commercial scores with such clients as Nike, Nintendo, Porsche, Volvo, Sony, Ikea and Mercedes Benz. For *Monster's Ball*, the Asche & Spencer creative team created a dozen cues, mainly reflective pieces for synth and keyboards, augmented here and there with

L.A. GRAPEVINE

by Maureen Droney

Over at Track Record's North Studio, I found energetic producer/engineer Tim Palmer mixing on Track's new SSL 9080 J Series desk. Palmer, known for his work with U2, Pearl Jam, David Bowie and Tears for Fears, among others, was settling in after some major globetrotting, which put him in Dublin, Sydney, London, Toronto, Copenhagen and Rome. It's definitely been a good year for Palmer, who's been called one of the unsung heroes of alt rock. Along with being nominated for a Grammy for mixing several songs on U2's *All That You Can't Leave Behind* and producing Ozzy Osbourne's latest effort, *Down to Earth*, he's also been mixing for Irwin Thomas, Off By One and D.A.D. His workload hasn't lightened any since he touched down at his L.A. home base. At Track Record he'd just finished mixing the debut album for Maverick Records' Stage, which was produced by 2001 Grammy nominee Greg Wattenberg (Five for Fighting's "Superman [It's Not Easy]"). And he's currently working on MXPX mixes for a new 20-song compilation.

"Producing Ozzy's record this year was great fun, and new territory for me because I got to co-write a few tracks with Ozzy," Palmer comments. "But I'd decided a couple of years ago to concentrate a lot more on mixing. Through mixing I get to tackle many genres of music. I've always enjoyed the challenge of mixing a rock record and then, the week after, mixing a pop record. I don't want to get cornered into one area of the market; I think life would get very dull to get up knowing what everybody expected of you every day.

"Coming from a production background," he notes, "rather than just pushing up the faders, I'm prepared to add an overdub idea to the mix or change the arrangement slightly. But of course, in case they hate it, I always put mixes down in the original form. It's amazing how much easier it is to be creative these days because of digital and Pro Tools. If you want to change the

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PHOTO: MAUREEN DRONEY

Tim Palmer pictured in front of the new SSL at Track Record

NASHVILLE SKYLINE

by Dan Daley

Glenn Meadows, one of Nashville's and the industry's leading mastering engineers, was dismissed from his position as vice president of mastering services at Masterfonics. Emerald Entertainment Group, the parent company of Emerald Recording Studios in Nashville, made the announcement in late February in a press release.

Dale Moore, Emerald's CEO, indicated that the parting was not amicable. "I am sorry to see Glenn go, but our differences, in my opinion, had become insurmountable," he said in a prepared release. Moore was reluctant to elaborate further, other than stating that, "There were differences we couldn't overcome. He left me no choice." Moore bought Masterfonics out of bankruptcy in 1999 and retained Meadows as vice president of mastering operations; Emerald Recording filed for Chapter 11 bankruptcy protection last year.

Meadows seemed to confirm the nature of the split when he told Nashville Skyline that he would have no further comment other than to say that he has retained counsel and is "exploring his options."

Masterfonics was founded in 1973; Meadows, a two-time Grammy winner and three-time TEC Award nominee, had co-owned the facility since 1977 before becoming sole proprietor in 1989. The studio's two original mastering suites were designed by Tom Hidley. Michael Cronin designed a third mastering suite added in 1998.

Moore did say that mastering remains a linchpin in the company's overall business strategy. "That division is extremely important to us, providing the ability of our clients to seamlessly move through the [entire] recording process." He also stresses the need to maintain a high-end mastering operation to compete with what he called a changed mastering environment. "There's more competition."

he says. "There's been emphasis put on the ability to master cheaply...on Pro Tools rigs, which can be done, but the quality is not even close to what we can deliver."

Moore says that Meadows' departure will not affect that strategy. He notes that Masterfonics' other mastering engineers—Benny Quinn, Jonathan Russell and Tommy Dorsey—had developed significant client bases of their own.

Alabama checked into Soundshop Recording Studio to cut their latest RCA release. Mike Bradley (seated left) engineered the sessions and Don Cook (seated right) produced.

On the matter of the bankruptcy situation, Moore says that he expects to file a reorganization plan with the court in March, after which creditors have 60 days to review the plan. He is optimistic about the outcome and says he expects the company to emerge from Chapter 11 well before the end of the year.

Not So New Kids In Town—RCA recording artist Martina McBride and her husband, John, president of live sound company MDSystems/Clair Brothers Audio, have purchased and renovated the former Creative Recording Studios in Berry Hill. Already the leading candidate for Nashville's most successful pro audio couple, they expect to open a completely remodeled and vastly upgraded two-studio facility by early spring.

Creative Sound was originally owned by producer Brent Maher, and was where he recorded many of the Judds' albums. More recently, it had been

—CONTINUED ON PAGE 167

NEW YORK METRO

by Paul Verna

Mixing for the stars. Engineers who have moved from stereo to surround mixing have had to grapple with such complexities as bass management, surround panning, phase relationships and deciding how—or whether—to use the LFE and center channels. The absence of a single standard for 5.1 has only complicated the engineer's task. Where should the speakers be placed in the room? Should one mix for a lowest-common-denominator system in which not all five speakers are equal, or should one assume that the end-user's playback gear meets professional specs?

However complicated these questions may seem, imagine a scenario in which one is asked to mix for 26 discrete channels in a three-dimensional space that uses a vertical—as well as a horizontal—plane. That was the challenge put before Benjy Bernhardt, sound designer at the Hayden Planetarium in New York. In late 1999, as the refurbished Planetarium was preparing to celebrate its reopening—and the new millennium—with the Tom Hanks-narrated show *Passport to the Universe*, Bernhardt oversaw an unprecedented multichannel production that included 23 speakers placed throughout the ceiling of the building's Space Theater, plus a sub channel, a channel for seat shakers underneath each chair in the audience, and a separate channel for a floor shaker. That same system, with a few modifications, has since been used to produce the Planetarium's current show, *The Search for Life: Are We Alone?*, which features narration by Harrison Ford.

"This is an all-encompassing experience," says Bernhardt. "It's an immersive, virtual reality theater unlike anything else I know. There are other domes out there, but they have much simpler systems for audio and video. We're on the cutting edge of both."

The audio mix system at the Planetarium consists of two Pro Tools rigs feeding effects (by sound designer Paul Soucek), music (by composer Stephen Endelman) and narration to a Level Control Systems Matrix 3 processor equipped with Space Map three-dimensional panning software. The LCS functions as the venue's mixing console, sending automation and panning data, as well as audio signals, to the 26-channel array. The two Pro Tools MixPlus systems—Soucek's sound effects system and Hylenski's Pro Control-equipped rig—connect to the LCS LX-300 interfaces via 24-channel ADAT Bridge interfaces. This method was chosen because, at the time, the LX-300 units did not have AES/EBU inputs; they have since been upgraded to accommodate AES/EBU.

The Space Theater's speaker system is an all-Meyer rig, consisting of three CQ-1s in the apex of the dome; eight UPA-1Ps circling the dome about midway down; and 12 more UPA-1Ps near the horizon line. Three Bag End S18E-1(s)

—CONTINUED ON PAGE 168

Shown at the mix station within the Hayden Planetarium, back row from left, are senior engineer Jeff Galitzer, supervising sound designer Benjy Bernhardt, composer Stephen Endelman and show control programmer John Sacrenty. In the front row are sound designer Paul Soucek (left) and re-recording mixer Peter Hylenski.

SESSIONS & STUDIO NEWS

SOUTHEAST

New artist and Outkast protegé **Killer Mike** is finishing pre-production for his debut album *Monster* at **LevelHeads Studio** (Atlanta). Scheduled for release on **Aquemini Records**, the project was handled by the production team **The Beat Bullies** and studio owner/engineer/guitarist **Dan Marshall**. Marshall and The Beat Bullies are also continuing work on tracks for **Hot Tub Tony** (the solo project of Outkast's **Big Boi**).

NORTHWEST

Engineer **Ryan Hadlock** has been busy working with **The Geoff Tate Band** at **Bear Creek Studio** (Woodinville,WA)...Mudhoney locked out some time at **Gravelvoice** (Seattle, WA). **Scott Colburn** and **Julian Martlew** engineered the sessions for their latest record for SubPop...Queensryche drummer **Scott Rockenfield** was in at **Reel Music** (Bothell, WA), working on a solo release. The effort is being co-produced and engineered by longtime Queensryche knob twister **Tom Hall**.

NORTHCENTRAL

Out at **Acme Recording** (Chicago), **Ben Weasel** recorded his solo record for Lookout! Records. **Mass Giorgini** produced with **Phillip Hill** engineering.

NORTHEAST

Jamiroquai got the remix treatment from Japanese producer **Shin Osawa** and engineer **Dave Darlington** inside Studio C at **Kampo** (NYC). The two-day remix session was for the band's song "Love Foolosophy"...**Alien Ant Farm** were in at **Indre Studios** (Philadelphia) taping a Y100 Radio broadcast. Currently touring in support of their release *Anthology*, the band laid down an acoustic performance and a Q&A session. **Rufus Wainright**, feeling a bit "Excalibur" as he often does, returned to Indre for a "Live from the World Café" session with host and co-producer **David Dye**. Indre's **Michael Comstock** engineered both sessions.

STUDIO NEWS

Skip Saylor Recording acquired the historic **Devonshire Studios** (North Hollywood, CA). The three-room studio was the site of such recordings as Tom Petty's *Full Moon Fever*, Roger Waters' *Amused to Death*, Ozzy Osbourne's *No More Tears* and Nirvana's *Nevermind*. Devonshire Studio 3 features an 80-input SSL G Plus console and a Neve 1604...**The Headway Music Complex** (Westminster, Calif.), a recording, rehearsal and production facility, is celebrating 20 years at its present location. Originally opened as a small home-recording studio by **Michael Mikulka** and **Steven McClintock**, the complex now boasts five professional-quality recording studios, fully isolated rehearsal studios, mastering facility, a full-service graphic design, CD duplicating service and a sound, lighting and staging company. ■

Please submit your Sessions and Studio News for "Coast to Coast" and "Current" to Robert Hanson. Submissions can be sent via e-mail to RHanson@primedia business.com; fax 510/653-5142 or snail mail: 6400 Hollis St., Suite 12, Emeryville, CA 94608. Photo submissions are always encouraged, and please include the name(s) of the artists, producers and engineers on the project, and the location of the studio.

Some of the key players at the Headway Music Complex, L-R: Britt McQuate, Michael Mikulka, Cris Barber and John Vestman

SESSIONS SPOTLIGHT

BOUNTY OF KORN AND THE GROTESQUE

The year 2002 should prove to be another banner year for hard rock fans everywhere: **Korn** frontman **Jonathan Davis** has kept himself busy both producing and helping to compose the soundtrack to Anne Rice's *Queen of the Damned*, as well as working on Korn's fifth studio album, *Untouchables*, at **The Village** in West Los Angeles. The *Queen of the Damned* project was a collaboration between Davis and **Richard Gibbs** of Oingo Boingo and includes vocal contributions from **Marilyn Manson**, **Wayne Static** (Static-X), **David Draiman** (Disturbed), **Chester Bennington** (Linkin Park) and **Jay Gordon** (Orgy). At the same time, Korn has spent the better part of the year on their new album with producer **Michael Beinhorn**, working with engineer **Frank Filipetti** while at The Village and engineer **Andy Wallace** at **Enterprise Studios** in Burbank. *Untouchables* is slated to be released on June 11.

From left: Korn's Jonathan Davis, producer Michael Beinhorn and engineer Frank Filipetti inside The Village.

L-R: engineer David Bottrill, studio owner/engineer John Ellis and Godsmack's Sully Erna

Also working at Enterprise, Marilyn Manson (the band) have been busy tracking and mixing their next studio album, *The Golden Age of Grotesque*. In to co-produce and engineer is longtime **KMFDM** guitarist/vocalist **Tim Skold**. The effort is set for release on Nothing Records sometime in September.

Taking a break from work on their next album, **Godsmack** contributed the song "I Stand Alone" to *The Scorpion King* soundtrack. The band stepped into **Prism Sound** (Acton, MA) to mix the track with engineer **David Bottrill** and studio owner/engineer **John Ellis**. ■

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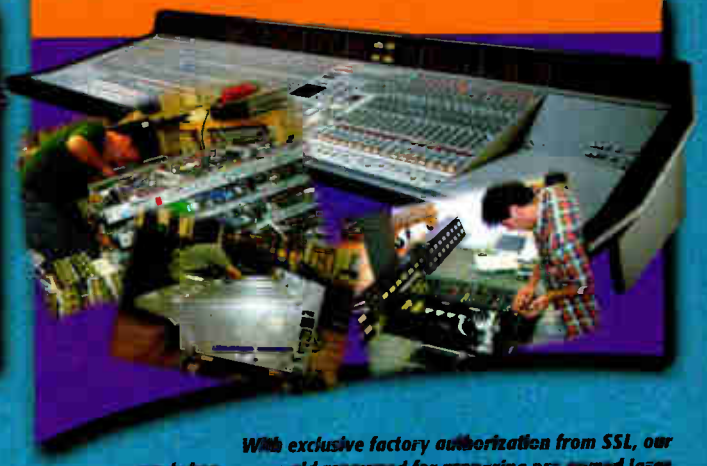

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L.A. GRAPEVINE FROM PAGE 160

sound of a vocal or guitar it can be done in seconds, whereas in the past, it was a bit painstaking: patching in this, splitting channels, etc., etc. The MP3 format, although fairly primitive, has meant that it's now easy to zoom a mix to Australia for a reference check in no time at all."

Traveling the world, Palmer has come to rely on the universal setup of an SSL 9000J console, Genelec 1031A speakers, Pro Tools, and "any good analog ½-inch 2-track. I had the same setup in Copenhagen and in Sydney at 301 Studios," he says. "I can happily sit and mix and it doesn't really matter where in the world I am. I've always loved the SSL 9000; to me it's a very open-sounding console. I return all my Pro Tools outputs straight into the J Series channels to use those lovely EQs and compressors."

Seeing a Fender Telecaster sitting in a corner that was a gift to Palmer from U2 guitarist The Edge, I couldn't resist asking what it's like to work with the world's greatest rock band. "It's a totally different experience mixing for U2," he reflects. "With most projects, you're mixing at the very end of a chain and you've usually got about a day to mix per song. With U2, the mixing process is an ongoing thing. We do a mix and see how the song is sounding, but then they might decide they'd recorded a better verse a few weeks ago, so they'll dig it out and we'll try that! For a

PHOTO: MAUREEN DRONEY

Lon Cohen inside the new Studio Rentals facility in North Hollywood

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band that has been around as long as they have, they're a real example of people who don't rest on their laurels. They work really hard, and they're always looking to better things and take it to the next level."

Other projects that have been done in North Studio (known for its cool drum sound, and whose control room redesign for the 9K was done by Vincent Van Haaff) in the past year are Crash Radio, with Matt Serletic producing and Noel Golden engineering, and producer Raphael Saadiq working on Instant Vintage with engineers Gerry Brown and Danny Romero. Track Record's South Studio, which has undergone renovation with new wood floors and acoustic treatments, has also been busy. On the day I dropped in, producer Jimbo Barton was in overdubbing for Buckcherry on the SSL 6072E console. Other recent projects included TLC with engineer Tommy D, and Courtney Love's *Bastard* with engineers Matt Wallace, Bjorn Thorsrud and Joe Barresi.

Track Record owner Tom Murphy is celebrating his 31st anniversary as a studio owner, so the install of the 9k was kind of a birthday present. "I've always loved the art of recording sound," he says, "and I've endeavored through the years to advance the state of that art. I've been fortunate to work with some of music's greatest talents, and by collaborating with the best acousticians, training a talented staff and installing the SSL 9000J—the ultimate analog desk—I plan to offer the best in recording services so that I can continue to do so."

Just a few blocks away in the same North Hollywood neighborhood, Lon Cohen Studio Rentals celebrated its eighth year in business by opening a new facility. The detail-oriented personality of company owner Lon Cohen is apparent as soon as you enter the building—LCSR definitely doesn't look like any other equipment rental place you've seen: It's got leather furniture, tastefully scattered antiques and a paint job (the designer color "toasty spice," Cohen says) worthy of a high-priced decorator. Then there's that kitchen fitted with stainless steel cabinets, and the space reserved for a Wolf range that's on the way—this is definitely a class operation.

A further tour shows where Cohen's attention to detail really comes into play: the impeccably maintained guitars, amps and effects that are the core of his rental business. The list of what's available is amazing, and Cohen's printed descriptions of the instruments are akin to those of a wine connoisseur. "It's true," he says with a laugh, "my anal-retentive nature has served me in some ways. For one thing, I'm very stringent about how stuff is checked in. Obviously, when your amps and guitars are in the studio with a microphone in front of them, they're under the microscope. It's really important that there are no buzzes or rattles. We check everything thoroughly before it goes out, and when it comes back in. We listen to the controls, switches and jacks to hear if they scratch, and the speakers and cabinets are inspected for noise. It's an inexact science, of course; amps have tubes that go bad as they get old, but we do as much preventive maintenance as possible. And we're pretty good. We rarely have a problem."

There's a padded, dead tech room where amps get turned up to 10 for testing, and next to that are the racks of guitars, which also get set up, tuned, and checked both in and out. The collection is extensive and includes not only classic guitars of all kinds but also other stringed instruments. If requested, a tech also accompanies the equipment, tuning and setting up for clients.

"I've got all the normal stuff like bass guitars, acoustics and electrics," Cohen notes, "including lots of classics and one-of-a-kinds. And then there are all sorts of little treasures and oddball stuff, including one of the largest collections of rental 'lefty' guitars that I know of."

The oddball stuff includes a banjitar banjo-guitar hybrid, an authentic Indian tamboura and sitar, Mexican instruments such as guitarrons and vihuelas, and something called a guitorgan—a '70s invention with the guts of an electronic organ in the body and frets of an electric guitar, allowing organ and guitar to play at the same time through separate outputs.

Cohen's amp collection is also extensive. Stored in a carpeted room in niches labeled with their vintage, it includes some items he refuses to rent. "I'm really proud of this stuff," he comments, "like one of my 100-watt Marshalls. Mike Doyle, who wrote the history of Marshall, thought it was one of the very first ones, which were made for Pete Townshend. He trashed most of them, but it seems to be one of the survivors. There's also one from when Marshall first started, with the metal badges. Rumor is that they're actually casket tags—that the first Marshall shop was next to a mortuary where Jim Marshall got a hundred tags that he used as labels.

"It's kind of a Noah's Ark," he adds, surveying the room. "I started collecting a long time ago. What I've tried to do, when I'm listening to or playing a guitar, is to think of it from the artist's perspective. As a guitar player, you can play ten guitars and one out of the ten is really magical. That's how I've tried to collect. If I find one that's really awesome, I get it. The same with amps; I try to find ones that sound exceptional, that are going to have an impact. I believe that, from a musician's standpoint, when you have an instrument that really sounds great, it inspires a performance. You're comfortable with your own instrument, but if you play another one that feels so much better, you're going to play that much better. The payoff for me, I guess, is the thrill I get watching people get inspired and later thanking me for having such great stuff."

Cohen carries new as well as old equipment. "When it comes to new equipment," he states, "I try to work with manufacturers that I feel are on the cutting edge of tone and performance. There are some people making great stuff out there and I enjoy great relationships with them.

"It's interesting," he concludes. "Lately I find that a lot of the producers I work with are becoming really inventive and creative; they want to try different sounds. In the past, if a producer was doing a rock record, they'd get a Fender Precision bass and an Ampeg SVT; that was it for the rock sound. Now, guys are trying really cool, interesting things—using amps like this Acoustic 370 from the '70s, then overdubbing on it with an Ampeg B15 from the '60s. They're blending and mixing and there are some really interesting textures coming out on records now." ■

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NASHVILLE SKYLINE FROM PAGE 161

owned by a trio of commercial jingle producers. The McBrides acquired it last year and brought in George Augsperger to update his original acoustical and monitoring design of the 1970s-era studio. McBride then bought Donald Fagen's Neve 8078 console, which was upgraded by Geoff Tanner—who had worked as a Neve technician on the console when it was first built—and McBride's chief tech (and former Frank Zappa tech) Arthur "Midget" Slopeman. It is installed in the main control room, adjacent to the studio's large tracking room. The equally vintage Sphere console that came with the

studio will be moved to the facility's second, smaller control room. Both control rooms have extensive Pro Tools systems, which are linked to a central network server. Studio A also has a pair of sequentially numbered Studer A827 multitrack decks.

The studio—which at press time was still unnamed—will be a combination of commercial and private: John McBride says that Martina and her longtime co-producer Paul Worley will do her next record there, but that she will book time like any other client. Despite a difficult studio economic climate, John McBride strongly believes that this facility will be at least marginally profitable, while giving the McBrides a creative locus for Martina's records. "I don't believe this studio is a great business opportunity, but I do believe it can be profitable," McBride states, explaining that much of the equipment is gear the couple has acquired over the past two decades, and that they capitalized the entire estimated $2 million project themselves. "We don't have bank loans and equipment leases, so we're already ahead of the game there," he says. "If it breaks even, I'm a happy guy." He also believes the main room can support a rate structure ranging between $1,200 and $2,000 per day.

It's also worth noting that Martina McBride and Worley previously made her records at The Money Pit, a small facility in which Worley is a part owner. Thus, moving her productions to a self-owned studio doesn't take any work away from other commercial Nashville facilities.

But more than anything else, the studio quenches a passion that predates John McBride's success in the live sound business. "My original proposition to the bank in Wichita 23 years ago when I started out was for a recording studio," he recalls. "That didn't fly, but my proposal for a live sound company did. So I'm finally getting around to doing what I wanted all along." ■

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NEW YORK METRO FROM PAGE 161

subwoofers reproduce the LFE channel, along with seat and floor shakers made by Aura.

Unlike a conventional theatrical production, the Hayden Planetarium shows are not mixed live. Instead, they are recorded onto Akai DR-16 Pro hard disk recorders for synchronized playback with the venue's custom Zeiss Mark IX projection system and the Digital Dome, which consists of seven custom DVS High Resolution video players and a Zeos projection and edge-blending system. However, because of the Planetarium's unique speaker array and physical configuration, the mixes needed to be done on-site. That meant that, in order to work on *The Search for Life*, Bernhardt and his crew—mixer Peter Hylenski and sound designer Soucek—had to set up their respective Pro Tools and LCS rigs in the Planetarium while *Passport* was still running. Basically, the team would roll in their gear after the audiences left and work through the night. The following morning, the equipment would be disassembled and put back in a secret room until that day's show ended.

The setup and breakdown task was managed by Jeff Galitzer, who also oversaw maintenance and repairs on the gear, and assistant Russell Baird. Other key crew members included Gretchen Schwartz, creative director for the *Search for Life* production, and John Sacrenty, who, as show control programmer, ran

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time-lines during the mix, synchronized devices and helped spot timings.

"People always seemed surprised that we were mixing the show in the Dome, but there was no other logical—or faithful—locale to do this kind of mix, especially with all the spatialization we do via LCS," says Soucek. "In essence, the Dome is our studio."

If the logistics of mixing in a dome theater between feature presentations are unprecedented, the creative challenges of such a large-scale multichannel production are also one-of-a-kind. "It's different from what people are used to," says Bernhardt. "It takes a lot to wrap your head around it. You have to create an environment that's dynamic and interactive, the way life is."

Hylenski, who has years of experience with LCS systems, most recently mixing for the Broadway production *Seussical*, says he relied heavily on LCS's Space Map feature. "Space Map allows you to draw visual representations of your speakers onto a clean slate, so you can create a view of the dome showing where the major loudspeaker areas are. You connect sets of three speakers together using what's called a 'triset,' and the system does the math. As you drag a sound through this map, it moves through the soundfield."

From a sound design point of view, the Planetarium projects are complicated by the fact that space, supposedly, is silent. "So I've been told by so many scientists!" says Soucek, who was formerly the co-owner of Planet 10 Post, an audio post house that was acquired last year by Livherty. "But we wanted to define an underbed 'spirit' of each place we travel to, and that was done using organic elements—mainly wind and water—and treating them to within an inch of their lives."

Given the success of the first two shows in the new planetarium, Bernhardt expects to get busy soon working on a third production. That will probably mean setting up and tearing down the Pro Tools/LCS rig every day, while *Search for Life* is still running. It won't be the first time—or the last—that Bernhardt and his talented crew will undertake what many would have regarded as impossible.

ATR-102 gets Lodged in Lower Manhattan. The mastering studio known as The Lodge has become the first such facility in the New York metro area to acquire the ATR-102, an Ampex recorder modified to accommodate two tracks on a 1-inch tape. Lodge president and chief mastering engineer Emily Lazar says, "When I first heard it, I knew the 1-inch ATR would be the perfect addition to the technology we have here already. The incredible sound of the machine was the primary reason for purchasing it, but 1-inch also makes a great archive format. These days, with so many digital formats to choose from, record label executives, producers and artists tend to question not only media stability, but also whether or not the current formats will become obsolete."

Lazar says she became intrigued by the ATR-102 after hearing that three of her favorite-sounding recent albums—Bob Dylan's *Love and Theft*, Mark Knopfler's *Sailing to Philadelphia* and Elton John's *Songs From the West Coast*—were mixed to the 1-inch format. Other users of ATR's 1-inch 2-track include producer/engineers Chuck Ainlay and Ron St. Germain, and mastering great Bob Ludwig, who is also a proponent of ATR's 2-inch, 8-track machine, designed for surround mastering applications.

Compared to the ½-inch ATR-102, the 1-inch version offers a lower noise floor (by a full 3 dB), which allows recording at lower levels for more detail and transient punch, according to ATR founder Michael Spitz. ■

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—FROM PAGE 60, MUSIKMESSE

effects. TERA's multisynthesis engine offers analog synthesis, physical modeling, FM synthesis and VirSyn's "spectral synthesis," which allows users to create dynamic resonant structures containing 128 resonance filters. TERA works as a standalone app or as a VST plug-in.

Emagic's (www.emagic.de) Vintage B3 is a software instrument for Logic 5 that models—you guessed it—the legendary Hammond. The EVB3 is laid out like the original, but offers an extra octave above and one below the five octaves of the original. The detailed simulation of the original electromechanical tone generation includes key click and speaker simulations. Effects include vibrato, tremolo and wah; a Leslie effect plug-in is also available. Emagic also showed the EVD6, a virtual Clavinet that recreates the sound of the original Hohner D6.

Of course, if you wanted a *real* Hammond, you'd have to cram into the packed **Hammond** (www.hammond-suzuki.com) booth, where attendees checked out the "New B3," a re-creation of the classic B3 organ. Identical in dimensions to the original (but mercifully, half the weight!), the New B3 offers the familiar dual manuals, reverse keys, drawbars and pedals, but features digital tonewheel generation, MIDI out, Flash card memory and controls for key click, treble/bass, overdrive and reverb. Deliveries begin late this year.

STUDIO ESSENTIALS

You never have enough mics, and Musikmesse brought in a fresh new crop. Shipping now, the AT-4040 from **Audio-Technica** (www.audiotechnica.com) is an affordable ($495 list), true condenser that puts a large-diaphragm cardioid element into a 4033-sized housing. Switches for low-cut filtering and -10dB pad (155dB max SPL with pad in) complete the package. *Tubemeister* **Dirk Brauner** (www.dirk-brauner.com) unveiled Phantom, his first solid-state mic, built into the same body size as his tube Valvet model. This large-diaphragm cardioid condenser has a squeaky-clean self-noise of 8 dBA. Phantom pricing was not set at press time (probably around $1,100—with flight case and shockmount). Russian mic builders **Oktava** (www.oktava.org) debuted the ML52, a figure-8 ribbon model in an elegant birdcage-style body. Retail is $799.

Danish Pro Audio (www.dpamicrophones.com) kicked off its tenth anniversary with the launch of the 4041-SP, a large-diaphragm/low-noise (typically 8 dBA) omni designed to operate at standard 48 VDC phantom power. The 4041 is now available in three versions, as its removable capsule can attach to other bodies, offering optional 130V tube, or 48 and 130V powered, solid-state preamps. **Neumann** (www.neumann.com) teamed up with **Sennheiser** (www.sennheiser.com) to create a new wireless system using the KK 105S capsule (based on Neumann's KMS 105/140/150 handheld vocal mics) and Sennheiser's SKM 5000 transmitter.

Quested (www.quested.com) unveiled the F5, a powered near-field reference monitor in a hip two-tone cabinet. Designed to provide the characteristic sound of Quested's higher end designs, the sealed F5 cabinets house 80 watts of onboard biamplification driving a magnetically shielded 5-inch woofer and 0.8-inch soft dome tweeter, with front panel power, volume and LF/HF cut and boost controls. Quested also showed two 180-watt powered subs with a 10-inch long-throw woofer. The F19 is intended for adding bass to existing full-range stereo monitors. Designed for surround, the F19.1 provides LCR I/Os, a dedicated LFE input with gain control and several low-pass filter settings, phase adjustment and sub out/direct input for using multiple cabinets in 6.1 or 7.1 applications.

LIVE SOUND

Distributed in the U.S. by ATI (www.audiotoys.com), Audient's Aztec Live Console features a modular architecture and 32, 40 or 48 input channels. Features include 12 VCA sub groups, eight audio subgroups, VCA solo, a 12x8 matrix, eight mono and two stereo aux buses, and LCR outputs. A stereo ambience input facilitates in-ear monitoring, and scene automation is standard. The board's innovative exterior frame design protects the mixer, while providing numerous handgrip positions for loading the console through narrow doorways or into tight installation spaces. Aztec is already in use on the Groove Armada tour in the UK.

Martin Audio's (www.martin-audio.com) Wavefront W8L uses horn-loading techniques in a line array format to produce an extremely powerful system, providing max continuous SPLs in the 134dB range. This three-way, full-range box—also useable without subs in many applications—combines proven driver-loading techniques, vertically coupled waveguides, and true constant directivity horns for high efficiency and coverage consistency. Inside is a horn-loaded/ported 15-inch woofer, and vertically coupled constant directivity horns loaded with two 8-inch cone mid drivers and three 1-inch HF compression drivers.

Martin Wavefront W8L

Debuting at Winter NAMM, JBL's (www.jblpro.com) SoundFactor line brought JBL performance to new levels of affordability. Now JBL rounds out the series with the SoundFactor SF22SP powered sub, featuring dual 12-inch woofers in a bandpass enclosure and an onboard 500-watt peak (300W continuous) power amp. The 32x18x35-inch SF22SP cabinet weighs 126 pounds; removable 3-inch casters simplify load in/out.

MORE TO COME

There were plenty of other interesting debuts at Frankfurt Musikmesse, and we'll include some of these in our regular new product sections in the months to come. Meanwhile, it's not too early to start planning for next year's show, to be held March 5 to 9, 2003. For more information, visit www.musikmesse.com. ■

—FROM PAGE 24, IF YOUR SCREEN'S NOT CLEAN

perature. As expected, the area that required the most re-tweaking was the black level, where an IRE of 7.5 was best for the Da-Lite, zero was correct for the FireHawk. This made dramatically better blacks *and* much better shadow detail and shadow color density.

It was then that I realized that the FireHawk's low- and no-light performance potential was in fact *not* wasted at all. I never really thought much about the fact that there is *always* ambient light in any room with a screen, as there is always back-scatter from the screen itself.

This effect was limiting just how black the Da-Lite could get, but the biker-science trickery in the FireHawk seemed to overcome this problem.

The bottom line? With a properly set up projector, the FireHawk delivers cooler, better, more saturated colors and something else: the elimination of any cartoon-like artificiality. This is something I never even sensed before I saw a FireHawk, but I see it now. I can't think of any more scientific descriptor. There is a depth and solidity to colors on this screen that makes other screens seem a bit "thin."

You also get unbelievable blacks (have I made that clear yet?) but clearly with some loss of maximum brightness. And the FireHawk does make human skin a bit colder, a little more purple or silver. This may bother you, it may not. It's...different. I know people who are bothered by this, and others who like it and do not consider it to be a negative factor at all.

In the end, Stewart claims the FireHawk to be a 1.3 screen, but there is no question that it is darker than my 1.3 Da-Lite.

And when you consider that I didn't feel I had enough light to start with, it may surprise you that I have decided that I am willing to give up that peak brightness for the incredible improvement in blacks and shadows at *all* ambient room light levels, from bright to none.

So? I am having a 120-inch horizontal 16:9 made, and it is going into the studio immediately as the new reference screen.

But as hokey as this is, I would like to see some sort of Super FireHawk: just as black at the bottom end, but with more gain for whiter whites, if that is even possible with its layered technology. I know, purists cringe the world over... ■

SSC lives in a place that has winters. Next year, he may do a winter trilogy on wood-burning fireplaces, but he will return to audio...

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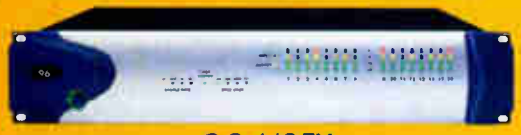

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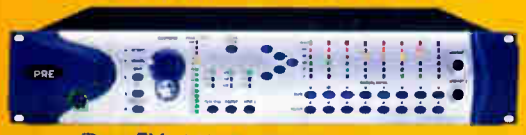

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—FROM PAGE 28, THE WORLD ABOVE 20K

Six of the subjects showed a slight increase, while the remaining four showed a slight decrease in brain activity. There were a couple of other tests in the paper, and those results are equally curious but hardly more compelling. Among the remarkable conclusions that the researchers made from this experiment: Not only do we indeed respond to sounds above 26 kHz, but our standard method of real-time A/B evaluation of audio systems is not valid!

Interesting stuff but a little out there, I think you'd agree. And because the results haven't been confirmed or followed up, as far as I know, in the 11 years since the experiment, it would seem that we'd have a lot of company. So maybe I'm missing something, but I think that it's a bit much for the entire audio industry to reinvent itself based on this one light-years-from-definitive study. It reminds me of that infamous paper that equated a person's ability to resist pressure on his outstretched arm with whether he was hearing digital or analog source material. Whatever happened to that guy? Perhaps he's working up an experiment to prove that subjects listening to 96kHz digital audio on their Walkmans can run a marathon 73 seconds faster than those listening to 44.1kHz audio!

> It might appear, then, that as long as there is something going on in the top octave, it sounds perfectly okay to us.

There are less-formal experiments that purport to show that we can hear above 20 kHz, and perhaps the best known of these is the one that Rupert Neve—whom I have a tremendous amount of admiration for, although I think he's completely wrong on this—does. He plays his audience a 10kHz sine wave and then a 10kHz square wave, and everyone in the place agrees that the two waves sound different. Therefore, he concludes, because the lowest harmonic above the fundamental in a square wave is the third, we are hearing 30 kHz!

Of course this is, as the English say, "tosh," and many before me have pointed this out. There are a lot of reasons why we can hear the difference between those two tones, none of which have anything to do with ultrasonic sensitivity. One is simply that the energy of a square wave is higher than a sine wave at the same nominal amplitude, so the square wave sounds louder. Another is that any transformers in the signal path, unless they are exquisitely designed and constructed for passing such high frequencies, will introduce slewing and intermodulation distortion from the square wave—not only from the third harmonic, but from all the odd harmonics above it—that will have products well inside the audible range. And, if somehow a perfectly amplified 10kHz square wave *were* to make it all the way to the speakers, then the speakers would create their own distortion, which would be quite different from the distortion a sine wave would make.

You can easily prove this for yourself by running a 10kHz sine and a 10kHz square through a guitar amp. You will immediately hear the difference, even though the amp probably doesn't have much response at all above about 6 kHz. My friend Leon Janikian, a longtime audio engineer and a professor at Northeastern University, re-creates Neve's experiment for his classes, but with an additional step: He plays the two signals from oscillators and then records those same signals onto a 44.1kHz DAT machine and plays them back. Then he asks the group if they can discern any difference between the first pair and the second. Regardless of the order in which he plays them, the students can easily differentiate between the sine wave and the square wave, but they can't hear any difference between the pre-DAT and the post-DAT signals. Because the DAT isn't recording anything at all above 21 kHz, it's obviously *not* energy at 30 kHz that the students (whose high-frequency response is probably a lot better than Leon's) are hearing.

So, it seems like the audio world above 20 kHz, unlike the radio world of my youth above 50 MHz, will probably not turn out to be very important. As I said, there may be other reasons why high sampling rates are helpful, and they are very much worth discussing, but not because your old technology, and mine, is missing anything. ■

Paul Lehrman is at long last beginning to get over his technolust. Thanks to Richard Elen and David Moulton for their contributions and suggestions.

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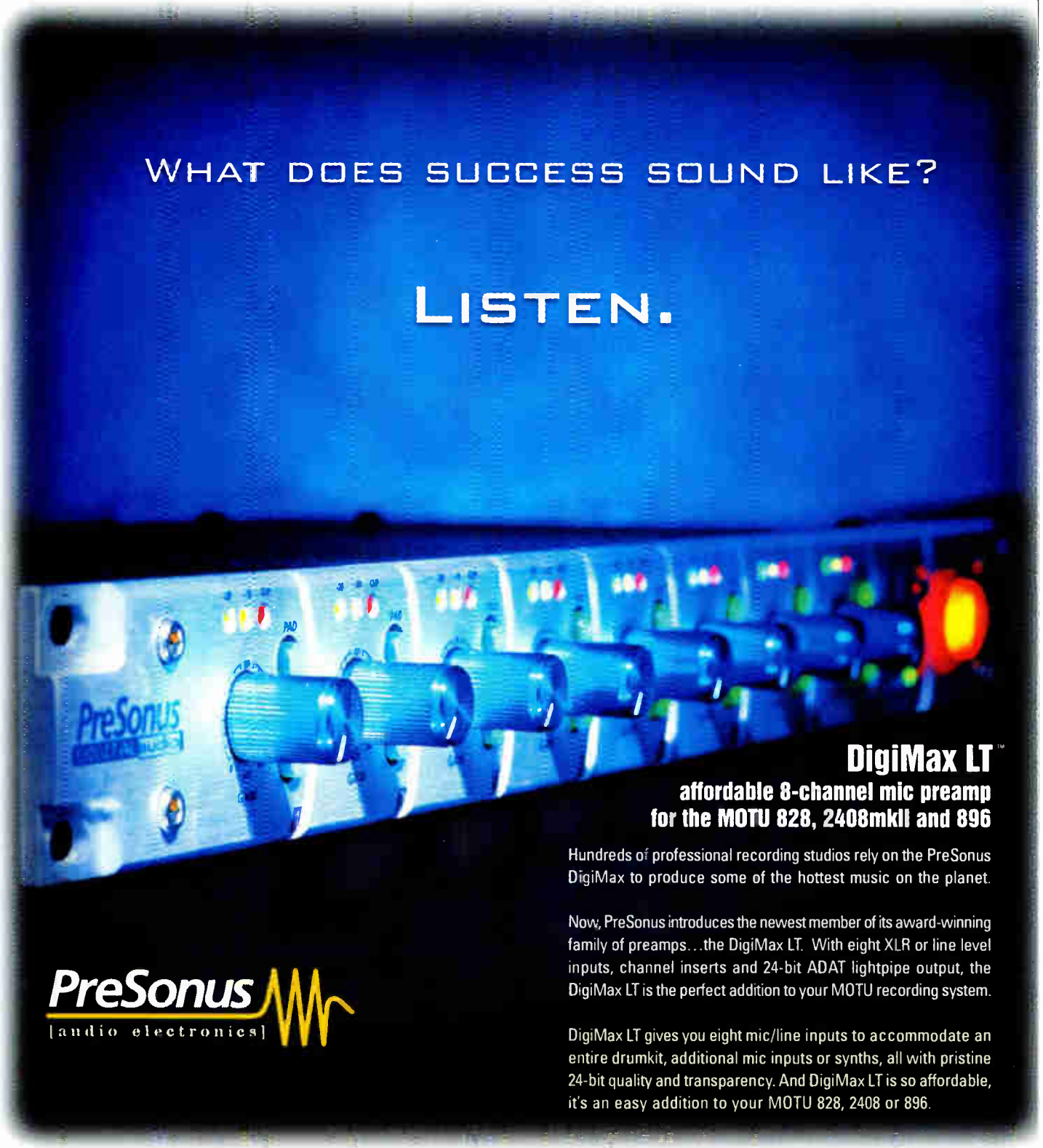

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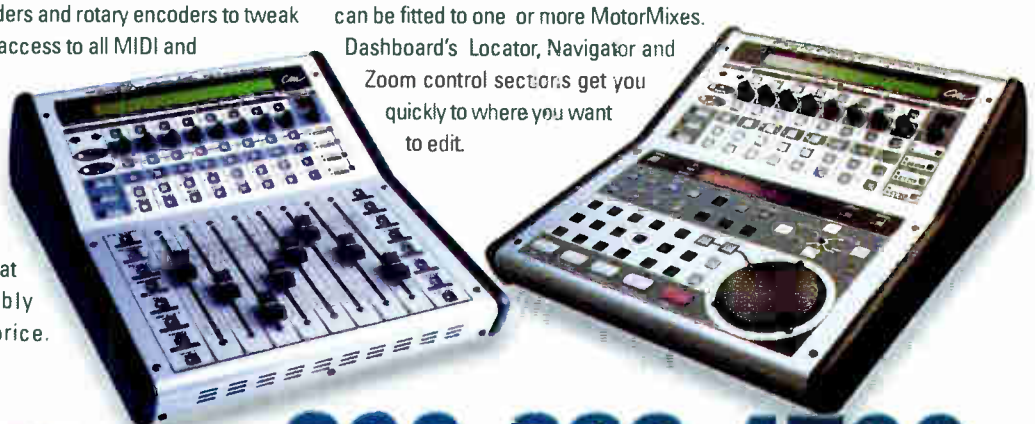

CM Labs

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BIAS Peak 3.0 for Mac OS 9 and X, is the ultimate editing, processing, and mastering companion for Digital Performer! Peak gives you lightning fast, nondestructive waveform editing with support for audio files up to 32 bits and 10 MHz, including 24-bit/96kHz files. Unlimited Undo/Redo gives you the freedom to work creatively. Select an audio region in DP, choose the "Use External Waveform Editor" command, and instantly switch into Peak! Peak's sophisticated options for on-the-fly marker, region and loop creation are simply unparalleled.

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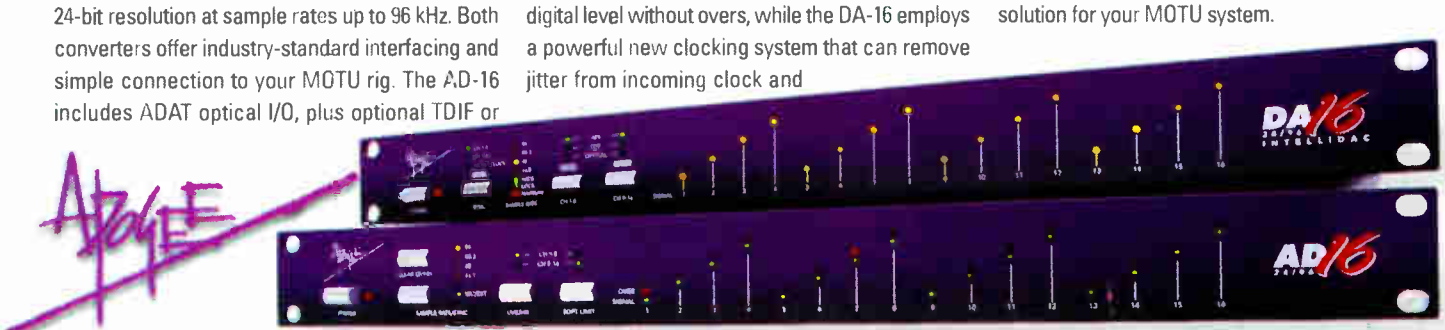

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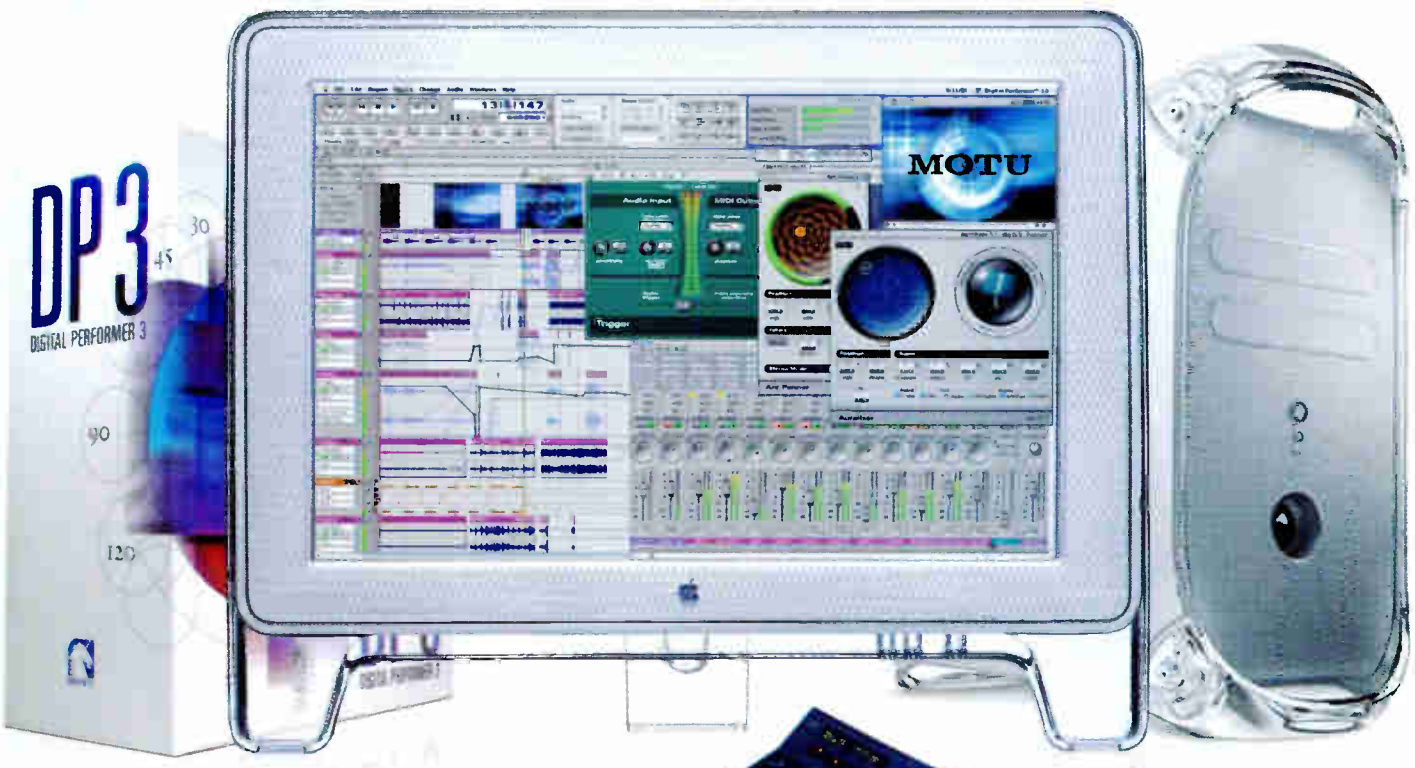

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BY RUDY TRUBITT

Terrasonde Audio Toolbox

Getting the Most From This Little Powerhouse

I bought my first piece of test equipment in 1975—a Micronta volt-ohm meter from the local Radio Shack. I assumed its manual would teach me to fix stuff, but the tiny pamphlet left me none the wiser in the ways of electronics. You might have the same experience today with the Terrasonde Audio Toolbox. It packs a fantastic assortment of acoustic and electronic measurement capability into a handy package, but, alas, it won't transform you into an acoustician any more than my $20 VOM turned me into an electronics whiz.

Analyzers give you data depending on the questions you ask. It's up to you to formulate your questions and then interpret the results. So, when you get your hands on this spiffy little box, think before you measure—especially when loudspeakers and microphones are involved!

REMEMBER TO REMEMBER

The Audio Toolbox has a lot of adjustable parameters tucked within its various screens, but these reset to their default values when the unit is power-cycled. Fortunately, there is a way to save all settings in nonvolatile memory.

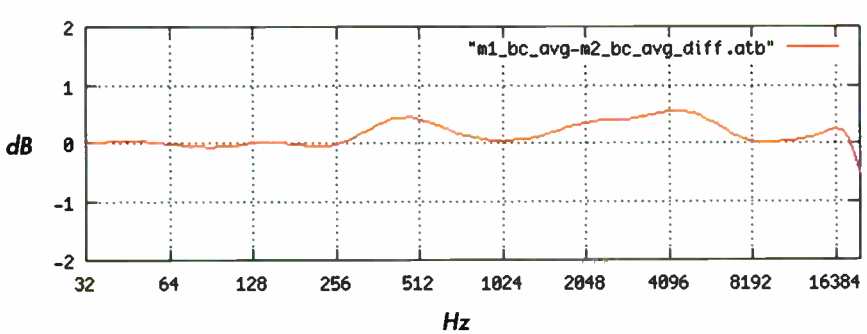
In the Utility Functions page, select "Setup & Calibration." Under "Save Defaults," scroll the knob to "Store Settings Save" and click. Now all your settings—such as sweep-generator output level, start/stop frequencies and sweep duration—will be waiting for you the next time you're ready to work. By the way, Toolbox software Version 3.0 saves a more complete list of parameters than Version 2.5.

PLUG-IN ANALYSIS

Higher-end analyzers (such as the TEF) make swept-frequency measurements through a narrow-band input filter that tracks the sweep-generator frequency. The Toolbox doesn't have this feature; however, I found a case in which the Toolbox's lack of an input filter made it possible to make a DAW measurement that otherwise would have been difficult. I generated a 10-second tone on one of my DAWs and then made several EQ'd variations with different plug-ins. I then played these EQ'd tones into the Toolbox. I wanted to see how closely each plug-in's response matched its GUI curve and how closely they matched each other with ostensibly identical settings. When performing these asynchronous sweeps, make sure that the Toolbox's sweep settings match the DAW's test tone and start them together. Toolbox users with the upgraded contractor's software could use the ½-octave RTA and a pink-noise test tone and avoid the manual sync required by the previous example.

ACOUSTIC MEASUREMENTS ON A BUDGET

Making an *absolute* measurement of a microphone or a loudspeaker traditionally requires a reflection-free, anechoic environment. However, I've had some luck performing *relative* measurements under less controlled conditions. For example, I wanted to compare the frequency response of a pair of budget condenser mics. I placed the first mic and speaker 16 inches apart on an open garage floor to minimize floor reflections. After plugging the mic into the Toolbox, I ran a couple of sweeps and saved the results. I then repeated the same test with the second mic, making sure that the placements were identical in both tests. The resulting curves were anything but flat, but that's okay; it's the *difference* between measurements that's of interest. As you can see from the plot, the mics measured within 1 dB.



The free software GNUPlot can graph Toolbox measurements. Shown here is the smoothed difference in frequency response between two similar-model budget condensers. Mic #2 is a half dB hotter than mic #1 at 500 Hz and 5 kHz.

OLD TRICKS, GNUPLOTS

Speaking of plots, here's another tip: The results of many Toolbox tests can be downloaded to a Mac or PC as ASCII text files. Although many users graph the results in Microsoft Excel, I prefer using GNUPlot, a free software program available for Mac, Windows and many other platforms. Visit www.gnuplot.info for downloads, FAQs and more information.

You can use GNUPlot to generate raw or smoothed frequency-response curves, impulse responses from Energy-Time Graph measurements or bar charts from RTAs. Visit my Website at www.trubitt.com and follow the "Toolbox Tips" link for GNUPlot examples and a template to get you started. ■

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