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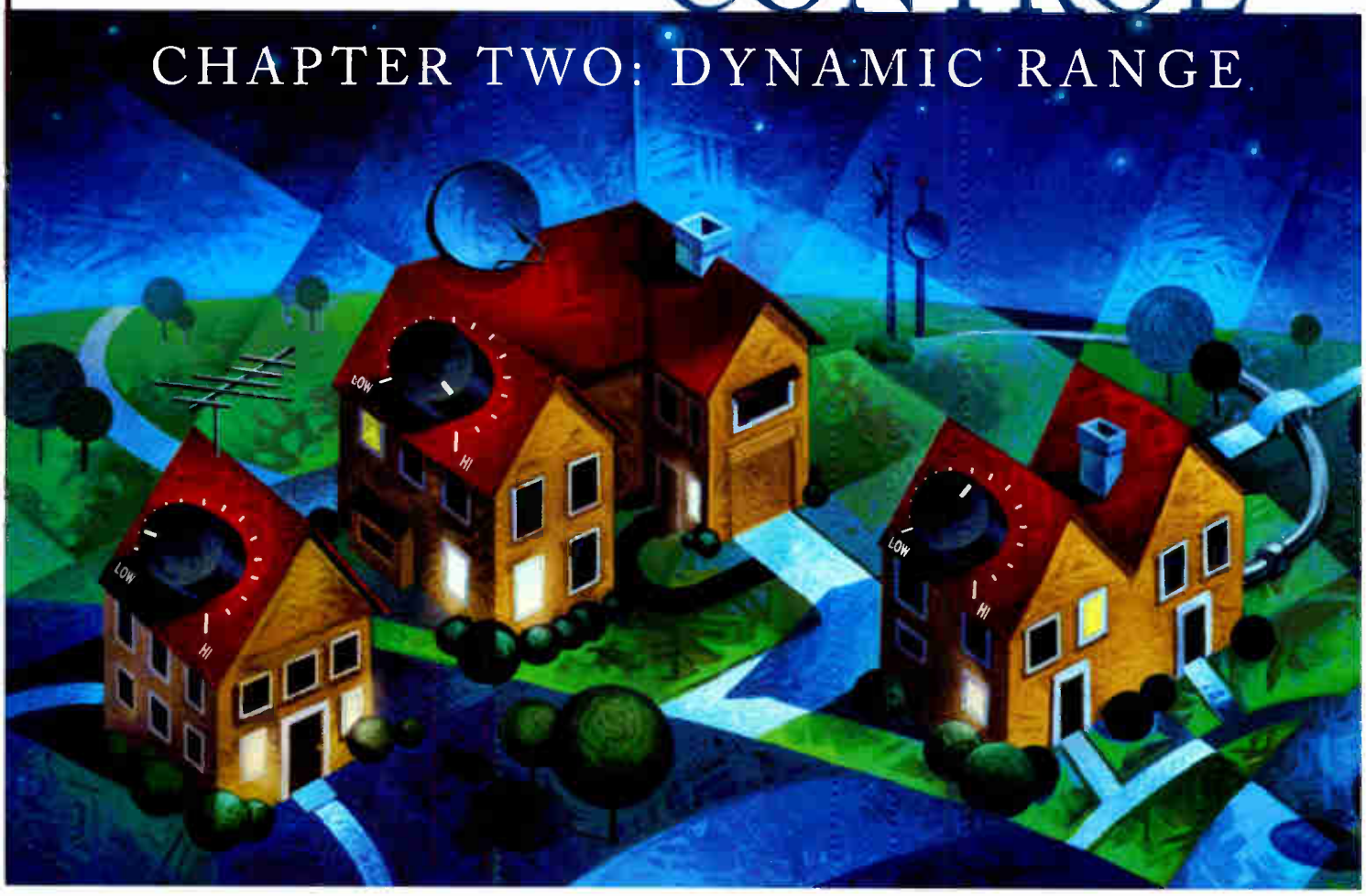

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MIX

PROFESSIONAL AUDIO AND MUSIC PRODUCTION

MAY 2001, VOLUME 25, NUMBER 5

FEATURES

On the Cover: O'Henry Sound Studios, Burbank, has become a favorite among both film and record engineers, and many come for the custom 88-input API console in Studio A. For more, see page 14. **Photo:** Ed Colver. **Inset photo:** Steve Jennings.

Check Out Mix Online! http://www.mixonline.com

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COAST TO COAST

TECHNOLOGY

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DEPARTMENTS

Get the MX-2424 Advantage!

"The 'Golden Ears' all found the TASCAM performed extremely well, nearly beating out a unit priced four times higher. The listening tests confirmed what I already knew: the MX-2424 is a solid performer at a great price."

- Glen O'Hara,
Pro Audio Review Magazine

"...the MX-2424 puts high-resolution sound quality and professional recording features at your fingertips."

- Electronic Musician Magazine,
2001 Editor's Choice Award

"...the TASCAM MX-2424 is a rock-solid, excellent studio recorder that performs well, sounds great and is priced right."

- George Petersen,
Mix Magazine

"The machine alone is impressive enough to warrant close attention, but the implications inherent in the control and networking capabilities make it potentially astounding."

- Rob James,
Studio Sound Magazine

You probably machines in is the What you advantages multitracks, transition just getting understand

* based on an average 3 1/2 minute song of 24 tracks at 24-bit/48kHz. Your mileage may vary.

† Offline CD-R backup is possible with an Ethernet-equipped computer. The $749 (USD) reference is based on TASCAM's CDR-Pro Bundle.

MX-2424 24-TRACK 24-BIT HARD DISK RECORDER/EDITOR

know that with thousands and thousands of use around the world, the **TASCAM MX-2424** most popular 24-track recorder ever made. might not know is that the MX-2424 offers huge that aren't available on other standalone hard disk regardless of price. Whether you're making the from analog and tape-based digital recorders or into recording, here's some info to help you truly the MX-2424 advantage.

Ph.D. in Nuclear Physics Not Required

If you've ever recorded before, you'll find the MX-2424 as easy to use as any multitrack recorder. Flip the Power switch, arm a track and hit the Record and Play buttons. Voila…you're tracking to its internal hard disk. Since TASCAM has been the world leader in multitrack recording for over 25 years, we know how to create gear that's powerful and sophisticated without making the learning curve too steep.

Edit How *You* Like: MX-View™ Waveform Graphic Interface and Extensive Front Panel Editing

One of the main reasons to get into hard disk recording is the incredible editing power versus tape. Running in native Mac and PC versions and connected via a fast 100Mb Ethernet interface to your computer, the upcoming MX-View is a powerful graphic editing interface that offers sophisticated, sample-level editing on par with full-featured digital audio workstations. You can drag and drop on the fly, get onscreen metering for up to six MX-2424s, set up custom configurable keyboard shortcuts, manage virtual tracks and much more. If you want to use the MX-2424 in the field, its extensive built-in front panel editing tools let you edit without lugging around a keyboard, monitor and mouse.

True Recording Power: Take the Punch-In Challenge

24-track, 24-bit digital audio requires a powerful hard disk recording engine. The MX-2424 is so strong that it allows for seamless, gapless punches across 24 tracks, with up to 72 tracks of throughput to accomplish this considerable task. If you're brave, try arming 24 tracks on any other standalone 24-track hard disk recorder and quickly punching in and out. It's just one example of the MX-2424's awesome dual-processor recording power and extremely fast SCSI bus. You can choose between TapeMode and Non Destructive recording, and access up to 999 virtual tracks per project with 100 locate points, 100 levels of Undo and much more.

Sound Designer II, Broadcast Wave Files and SCSI Drives for Ultra Flexible Compatibility

TASCAM understands the reality that you may need to interface your audio with other pieces of equipment. Since the MX-2424 writes Sound Designer II™ audio files to Mac-formatted disks and Broadcast Wave audio files to PC disks, it's easy to move sound back and forth between your computer and the MX-2424. With these standard time-stamped file types and professional SCSI drives, you're ensured sample-accurate compatibility with Pro Tools™, Nuendo™, Digital Performer™ and more. With compatibility being so important to MX-2424 owners, it's no surprise that its 24-channel interfaces are ready to connect to just about any console, digital or analog. Or that its analog, TDIF and AES/EBU interface modules are 96kHz ready.

Back Up Your Tracks: As Low As A Buck Per Song

Media	Cost of Drive	Media/10 Projects	Total Cost
90 Minute IDE Drive	$299	10 Drives	$2990
Orb Drive	$299	1 Drive + 86 Disks	$2879
TASCAM DVD-RAM	$599	1 Drive + 20 Disks	$1739
Offline CD-R Backup	$749	1 Drive + 90 Disks	$959

If you're forced to use cheap disk drives to backup, you'll pay in the long run. DVD-RAM drives may be connected to the MX-2424's front panel or rear SCSI port, and offline CD-R backup via Ethernet transfer to your computer is the most cost-effective backup method available on any HD recorder by far.

Hard disks are great for recording…but not so great for archiving and transferring audio. That's why the MX-2424 gives you choices like 9.4GB DVD-RAM discs for your backup solution. Or simply transfer your audio to your computer and backup to CD-ROM for as low as one dollar for an average pop tune*.

Get the Advantage of the Most Powerful and Most Affordable 24-Track Hard Disk Recorder Available Today

There's much more to the MX-2424 than what fits on this page, like its award-winning sound quality, professional built-in synchronization tools and TASCAM's amazing online support forums. So if you're getting into the hard disk revolution, you might as well take advantage of the recorder with all the advantages. Just go to **www.mx2424.com** for the complete MX-2424 story, or check out the MX-2424 for yourself at any TASCAM dealer.

Available soon, the new MX-View graphic editing software offers DAW-style waveform editing power, drag-and-drop editing on the fly, control of up to six MX-2424s with metering and much more.

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FROM THE EDITOR

SURROUND: THE NEXT STEP

5.1: It's here. It's now. And with an increasing number of consumers climbing aboard the home theater bandwagon, there's actually a (potential) audience for audio-only DVD releases. There are some hurdles to overcome, but overall, the industry is making significant progress.

One problem is the limited number of DVD-A capable players in the market. Right now, they're expensive, although this situation has been improving. Given the small percentage of DVD-A players, savvy producers have been including DTS and/or Dolby Digital mixes on most discs, so the consumer can buy product now and enjoy the surround experience—even if they aren't listening to DVD-A. Of course, a couple years down the road, when most DVD decks are DVD-A-compliant, this will become a moot point.

Unfortunately, creating several mixes of each product complicates the production process, but here again, there are some good signs. Both Dolby and DTS have been selling encoder/decoder hardware for some time, and more recently, companies such as Kind of Loud and Minnetonka have offered software for DTS and Dolby Digital encoding. Checking reference surround mixes outside the confines of a control room's optimized listening space is little more complicated than burning some DTS or Dolby Digital tracks on a 50-cent CD-R and tossing it into the DVD player in a home system. One caveat here is the unfortunate fact that some home DVD players don't recognize CD-Rs, so a pre-purchase checkout with a home-brew disc is important when selecting a DVD player for home reference use.

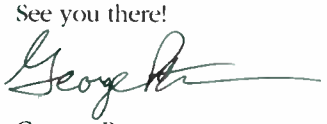
One production snag is the plethora of mixdown formats used for storing surround mixes. At least with stereo, the choices were relatively few (i.e., DAT, ½-inch analog, ¼-inch analog, etc.), but with 5.1 mixes, just about anything goes, such as Genex, ADAT or DA-88 (with or without bit-splitting) and just about any imaginable variation of data storage media; the list is seemingly endless. In this issue, Paul Verna talks to top engineers, producers and mastering pros about how they're handling the situation.

On the studio hardware side of surround production, things are definitely on the upswing. Michael Cooper takes a look at 28 consoles designed specifically for surround mixing, focusing on models that include full multichannel panning, busing and monitoring functions. Not everybody is ready to take the plunge into a full-on multiformat mixer, so there is also a healthy market of third-party accessories—such as surround monitor controllers, panners and routers—that expand the functionality of existing consoles and may buy a couple more years of life for that board you currently have.

We've had a few changes at *Mix* this month. Our art director, Tim Gleason, who was a major force behind the look of *Mix* for more than 20 years, is no longer with our company, and we wish him all the best in his future endeavors.

Also, you might notice a new icon on some of our new-product pages this month. We are debuting Demo Rooms, offering streaming video information about products and technologies. Check them out at www.mixonline.com. And the AES convention returns to Amsterdam—everybody's favorite city—May 12-15. If you're in town, stop by the *Mix* booth and say hello.

See you there!



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FEEDBACK

THE BEST THINGS IN LIFE COST MONEY

March letters by Jim Stagnitto and Roger Hughes typify what I believe are false assumptions by those championing the brave new world of "free" digital music.

First is the assumption that the quality of new music will be unaffected by the minor detail that composers will be unable to earn a living. All creating in this not-for-profit realm will be done as a hobby in whatever spare time one has after work—the work that pays the bills. I ask you to imagine the quality of, say, the NBA, if all players participated in their spare time and for no pay. There is, in nearly all endeavors, a profound difference between the amateur and the professional.

Second, Mr. Hughes writes that, "Future artists will not be the 'creators' of 'original' tunes and other works of 'art,' but the assemblers and dissemblers of the signs and symbols of the times...We will all be 'repro' people." Well, we already have a pretty good preview of this future in much of modern art, where paying dues is considered anachronistic. So-called artists cut and paste what genuine artists have created into hodge-podges of unedifying junk. If this is followed to its logical conclusion, each generation of music "collagists" will be re-reassembling and re-dissembling the works that its predecessor assembled and dissembled. And the ever-diminishing gold they will be mining will be the real music that was originally created by real composers. The other possible future will be one much like today's Broadway theater, where the public, having lost interest in new musicals, is served up endless recycled versions of *Annie Get Your Gun*, etc.

The "music" we can look forward to, if intellectual property cannot be protected, "the digital flotsam of interesting sounds and symbols," is going to make the term "Golden oldies" ring more and more true.

Hugh Prestwood
Greenport, N.Y.

STOP AND SMELL THE MUSIC

When I was just a teenager, I remember trying to save all the money I could to buy some record of, let's say, Dire Straits, and my limited budget made me choose from among other records. This fact, which perhaps looks negative, was possibly great for me because of the added value it gave a record: It was an "object of desire."

Nowadays, you can almost instantly have any record, with no effort to get it. There is no wait, no cover booklet, even no smell. Do you remember the smell of a new vinyl record?

I know all of this sounds a bit stupid, but I don't like free things. How will people understand the value of something that costs nothing? How will they guess the hours of working—sometimes a whole life—when an MP3 file is so easy to get in seconds and for no money? And, finally, even with a watermarking system to ensure (legal) downloading, I will always prefer my old vinyl and CDs, as much as I'll like the feel of a real book and hate its screen alias. Yes, I know times change, and I will always try to adapt to them, but I'll miss the smell of records.

Pablo Vega
Ruido Studios, Spain

MIDI BOOSTER

I enjoyed Paul Lehrman's article about FireWire and MIDI and your disappointment with Gibson's CEO ("Insider Audio," February 2001). To address the lack of reliable information about Vision 4.5.1, I put together a Website documenting its quirks and hardware setup strategies, as well as general FAQs and other info based on posts to the Topica Opcode User's Group.

We're just keeping the torch alive for an awesome MIDI/audio production environment: www.fm-music.com.

Fred Meggs
Via e-mail

THE REAL PROJECT STUDIO

Can you please give me the definition of a "project studio"? In your February "The Project Studio" column, you state that Peter Moshay has a barn to work with, with a control room the size of a large raquetball court and two more rooms for live tracking! Not to mention Hall & Oates' money. I hardly think that this fits the definition of a project studio.

I agree that many people now have the advantage of setting up a studio in their house or in a connected space for a reasonable price, but this isn't one of those. I have worked since last summer on a small space in my garage (8x17 feet). My budget has been close to nothing, and I have done all the work myself, except for a helping hand from a friend in putting up drywall.

Within this "project studio" are my hopes and dreams and everything else that I have stuffed into this small space. There, I will record, mix and master. I have no other rooms to go to, no control booth or isolation booth. I have yet to make a dime, yet I hope to. That, to me, is what defines a project studio. I have nothing against the studio that you mentioned. It is obviously well-established and making decent money. But, I think you should highlight the struggling project studio owners. Get the guy who's running MOTU gear out of his closet, or the girl who has her setup in the dining room next to the kitchen. These people are truly running a studio with a tight belt and are trying to make a musical difference and a living.

Brook Dillon
Via e-mail

EDITOR'S REPLY

You are correct. The definition of a project studio is pretty loose, and *Mix* does not define it by space available or budget. Most often, we rely on the fact that it is noncommercial: Hall & Oates do not rent their studio out for money. The overriding definition we use is that a project studio is primarily run by an owner/operator who works on his or her projects and is not looking for commercial time. That said, however, we have in the past featured commercial project studios, and we've often struggled with the distinction between project studios and home studios. The lines are murky. Thank you for your insights.

Tom Kenny
Editor, Mix

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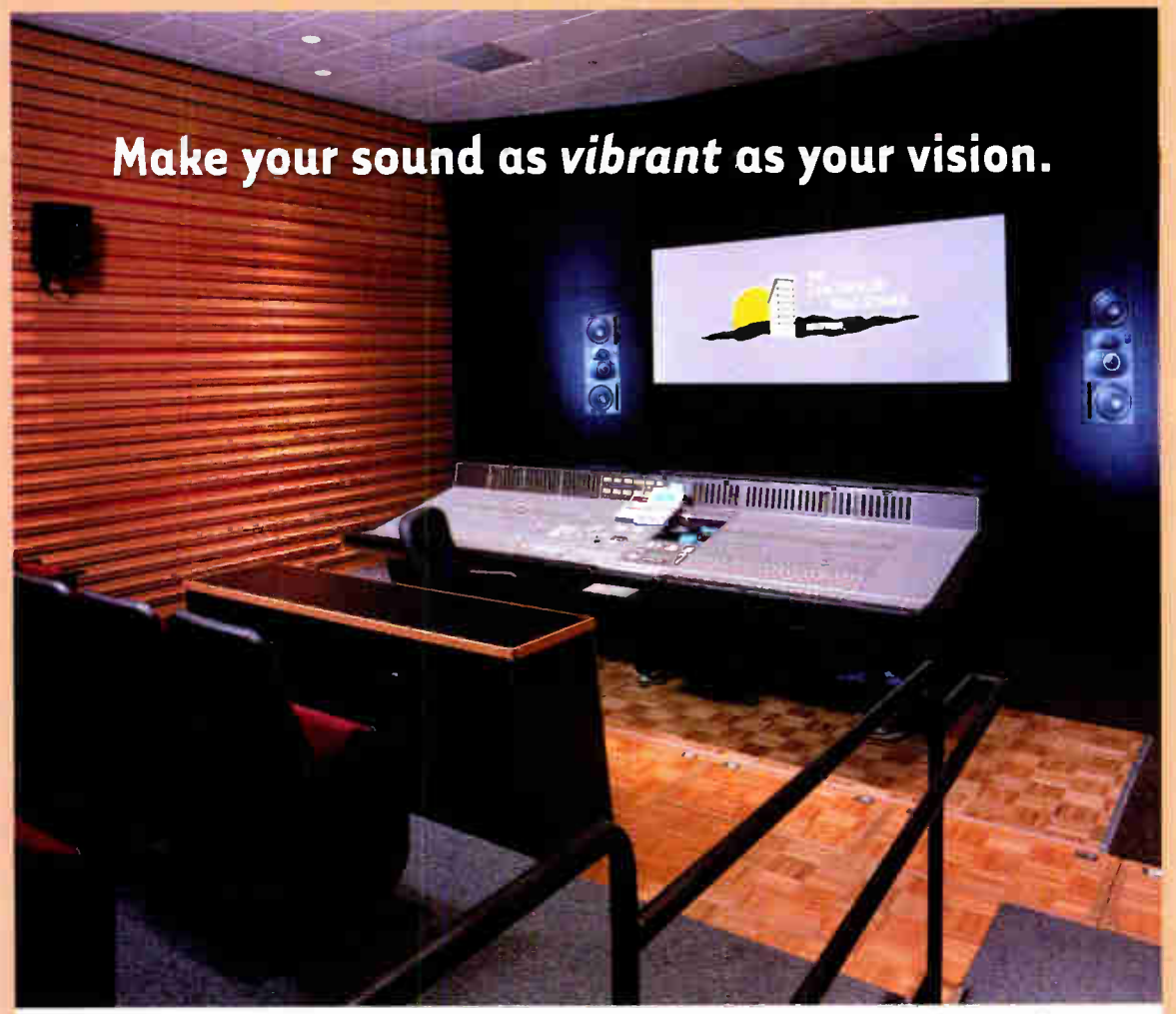

Los Angeles Film School, Hollywood, CA

***Finland** – where all Genelec's are made*

Did you realize that Genelec offers more monitoring solutions for your multi-channel surround needs than any other professional loudspeaker company in the world? It's good to have a lot of choices: four different main soffit-mounted systems, three tri-amp systems, four bi-amps, and three subwoofers. All fourteen feature line level crossovers, room response controls, direct-coupled amplifiers and protection circuitry. All come with more than 20 years of active monitoring expertise and the intrinsic quality that will make you feel confident about your work again. Perhaps even passionate.

When L.A.'s busy *Los Angeles School of Film* recently renovated their main dubbing stage, they selected Genelec monitors to satisfy the diverse needs of a teaching institution's audio post-production instructors and students. For main L-C-R monitoring, they chose an array of our **1038AC**'s – industry renowned for their high-output, dynamic headroom, sonic accuracy, and precise, stable imaging. For additional surround monitors, **Model 1031A**'s were selected. Each active system is a superlative audio solution designed and manufactured by a professional monitor company with more real-world, multi-channel surround expertise than anyone else.

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CURRENT

PROFESSIONAL AUDIO NEWS AND EVENTS

DOLBY OPENS NEW L.A. OFFICE

Dolby Laboratories celebrated the opening of its brand-new Burbank office building with a huge party on March 21, demonstrating the company's service commitment to the Hollywood entertainment community. David W. Gray, VP of the Hollywood film division, says, "Our new location in the heart of the entertainment industry's working center means that we will be more accessible than ever to our enormous Los Angeles client base."

Located at 3601 West Alameda at Hollywood Way, and adjacent to many film and TV production centers, the 21,000-square-foot facility is three times as big as the previous office and houses the 49-seat Larry Umlang Presentation Theatre II, equipped with the latest technology for projecting all formats of film and video with 5.1 surround sound playback. The beautiful and sonically insulated theater, named after Dolby's original Hollywood theatrical engineer who died in 1988, "floats" on neoprene blocks built into the building's foundation. In addition to offices for Dolby's L.A. staff, there are project and home demonstration theaters for DVD and HDTV, rooms equipped for audio testing and experimentation, in-house production suites, conference rooms and event spaces.

In attendance at this royally catered affair were hundreds from the L.A./Hollywood film/TV/music industries, as well as executives from corporate headquarters in San Francisco, Dolby founder and chairman Ray Dolby, and president Bill Jasper.

—Barry Rudolph

NOTES FROM THE NET

NEW LIFE FOR SCOUR

BETA TESTING: PHASE ONE

CenterSpan Communications Corporation has begun Beta testing for the new Scour Exchange system, powered by agreements with EMusic, Moonshine Music, Crush Media and Management, FILMSPEED and Tvparty.com. Volunteer registered users, numbering more than 200,000, will be able to download and share over 100,000 music and video files during the testing period, previewing a new Scour Website that will include the addition of a paid service. The new service is expected to be up and running by third quarter 2001.

According to Howard Weitzman, president of CenterSpan's Digital Media and Entertainment Group, "The labels and studios want a legal and commercial platform that meets their needs, as well as those of consumers, and that's exactly what we are bringing to market."

Artists in the CenterSpan library range from modern performers, such as Green Day and Arrested Development, to classic artists like Creedence Clearwater Revival and Bob Marley. Users will also be able to access the video library, which includes full-length films, film shorts, trailers and classic TV clips.

Scour was sued for copyright infringement last October and ultimately filed for Chapter 11. CenterSpan bought the failing company for $9 million last December.

MUSIC LICENSING MADE EASIER

MP3.COM OPENS ONLINE SERVICE

Instead of searching through stacks and stacks of CDs to find that one "perfect" song for a movie or TV show, music supervisors and producers can now find it online—and license it, too.

MP3.com announced the creation of its Music Licensing Program that provides multimedia creators with a comprehensive online resource to search for, listen to and license digitized music. MP3.com is joined by its exclusive music licensing partner, enableyourmusic Inc. (EYM), which offers representation services for the majority of artists on MP3.com, including song price, contract negotiation, collection of licensing fees and royalty income. Currently, the program hosts over 850,000 songs that can be accessed for an annual fee of $25.

Searching for content is offered through three steps: The Licensing Search Tool allows users to locate music by its exact attributes, such as tempo, mood and lyrical keywords (clicking on the License button next to the chosen song initiates the licensing transaction); users can post a request on the Licensing Opportunities on either the MP3.com or EYM sites; or users can contact EYM directly and will be e-mailed a personalized compilation of music with info on why each song is relevant to the request.

MP3.COM'S MICHAEL BAYER

According to Michael Bayer, director of music licensing at MP3.com, "We have created a resource to easily find great music for every commercial licensing application."

Visit www.mp3.com/musicsupervisor or www.enableyourmusic.com for more information.

Industry News

Producer, engineer and recording artist **Alan Parsons** joined **Artistpro.com**'s (Vallejo, CA) adviser forums staff...**AMS Neve** (Burnley, England) announced a restructuring in its board of directors: co-founder of AMS, **Stuart Nevison**, joins the board as marketing adviser; **John Lawrence** is the new chairman; and **Douglas Graham** brings his business experience to the board...Former VP of **Apogee** (Santa Monica, CA) **David Kunn** returned to the company as its new president... **RealNetworks** (Seattle) looked to the former president of Fox Network and Ticketmaster, **Larry Jacobson**, to fill the positions of president and COO. In other company news, **Gary Drucker** was hired as the new VP of the consumer division and **Scott Ehrlich** as the new VP of programming...**Neutrik** (Liechtenstein, Germany) announced the retirement of its founder, **Bernhard Weingartner**, as chairman of the board...**Dolby Laboratories** (San Francisco) has restructured its consumer division: **Richard Hockenbrock** was promoted to VP of licensing operations and heads the operations group; **Steve Vernon** joins the consumer division as VP of licensing technology and also heads the technology group; and senior VP and general manager **Ed Schummer** continues to oversee the intellectual property group...**Line 6** (Thousand Oaks, CA) had many new appointments to its executive team: **Watt Webb**, VP of marketing; **Teresa Covington**, VP of finance and CFO; **Ken Bauer**, VP of human resources; **Keith Carnall**, managing director of Line 6 Europe; **Dan Garrett**, director of international sales for the Pacific Rim and Central and South Americas; **Paul Wright**, director of European sales; and **Dan Cohen**, presentation material designer...Technology and entertainment industry vet **Scott Smith** joins **Sonicbox** (Mountain View, CA) as the new CEO, while **Jon Holtzman** is the new CMO, and co-founder **Niko Bolas** assumes the role of chairman of the board...**Klipsch** (Indianapolis) promotions: **David P. Kelly**, senior VP of worldwide sales, and **Cris Pyle**, director of marketing. Klipsch also welcomed **Dave Rutz** to the company as the new senior VP of marketing and product development...Get out those address books! **TC Electronic** (Westlake Village, CA) opened a new office in China, at Apt. 702 bld. 8, Julong Garden, No. 68 Xinzhongjie, Dong Cheng District, 100 027 Beijing, China; 86/106/552-3490; fax 86/106/553-2634. **Bitheadz** (East Greenwich, RI) also opened a new office at 2850 South County Trail, East Greenwich, RI 02818; 401/886-7045; fax 401/886-7049. **Gallery Software UK** (London) has moved to Gallery 8 Somerset Gardens, Highgate, London N6 5EQ; 44/208/340-5677; fax 44/870/130-5336...The new general manger over as **Mass Audio Visual** (Burlington, MA) is **Jeff Robinson**. ■

ON THE MOVE

Who: Ted Keffalo

What: President/COO Event Electronics

Main Responsibilities: Oversee day-to-day operations: sales, marketing and financials

Previous Lives:

- VP sales and marketing, Event Electronics
- Director of marketing, Alesis
- Sales manager, Alesis
- Manager, Hogan's Music, Torrance, Calif.
- Owner/engineer, WE Studios, Redondo Beach, Calif.
- House mixer, Concerts by the Sea

What do you have in your CD changer right now? "I have a demo of 'I Love This Time in My Life,' a country song I wrote for Jennifer Starr & Silver Spur. I'm a huge guitar fan, so I've got Robben Ford, Stevie Ray Vaughan and Eric Johnson. I also always have to have at least one Beatles album close by."

What book is on your bedside table? "You never know who you'll meet on a plane. I once sat next to animator Howie Hoffman and gave him a copy of a Beatles bootleg CD; he returned the favor by sending me *Lennon in America*. It's a fascinating book."

Favorite films and why? I can watch *Indiana Jones* or *Star Wars* anytime, anywhere. They're total escapism and still have an effect on me. *Almost Famous* is another favorite—it takes me back to my rock 'n' roll days."

When I'm not at work, I'm usually off doing... "I write songs in my studio, mostly for therapy. I have way too many guitars, but I have a 1970 Martin D35 I bought in 1971 that has all the songs in it. It's magic."

SIXTH ANNUAL MIX L.A. OPEN

The Mix L.A. Open charity golf tournament, presented by the Mix Foundation for Excellence in Audio, will take place Monday, June 11, 2001, at the Malibu Country Club.

This popular industry event is a "best ball" tournament. Registration and a continental breakfast start at 8 a.m., with the shotgun start signaling the opening of the tournament at 10 a.m. An awards ceremony, silent auction and dinner are scheduled for 3:30 p.m. For more information about sponsorship opportunities and entry fees for individuals or companies, check the Website at www.tecawards.org; for an order form, contact Karen Dunn at 925/939-6149 or KarenTEC@aol.com.

POST-PRODUCTION CONSOLIDATION

TELEVISION CORPORATION ACQUIRES PACIFIC MEDIA AFFILIATES

Pacifica Media Affiliates, an entertainment post-production sound company, announced that it has been acquired by Television Corporation plc, a London-based TV facilities and production company.

Under the agreement, Television Corporation's equity share in PMA raises to 75% from 50%; PMA's former president, Galen Walker, is now CEO; PMA's former executive VP, Ricky DeLena, becomes executive director; and PMA's former controller, Chuck Valdez, is now CFO. Additionally, Dana Arnold, former CEO of PMA, and former chairman Hal Katersky have resigned.

Terry Bate steps up as chairman of the board at PMA and will work alongside directors Walker, DeLena and Chris Rowlands. A final director will be named at a later date.

For more information, visit: www.pacificamedia.com.

CORRECTIONS

The Universal shockmount profiled in December's "Preview" is offered by Gary Young, not Gary Plant. Visit www.shockmount.com to learn more.

The "Mega-Synths" article (February 2001) inadvertently named Arboretum Systems as the company responsible for Metasynth. The product is sold directly through its creator company, U&I Software.

Also in the February issue, Snuffy Walden's album came out in March, not "early next year."

The "Field Test" on Empirical Labs FATSO (April) ran the incorrect phone number. The correct number is 973/728-2425.

Mix regrets these errors.

ON THE COVER

O'Henry Sound Studios

BURBANK

by Maureen Droney

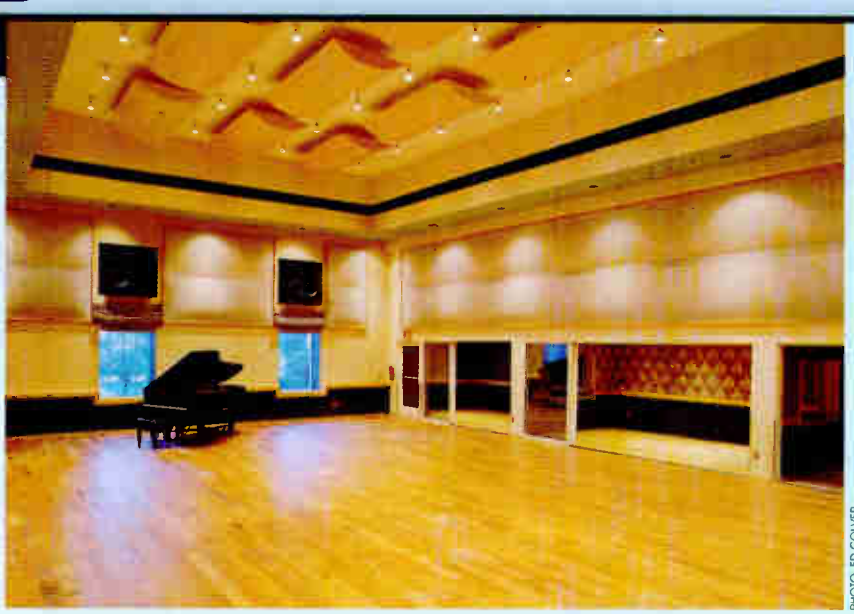

PHOTO: ED COLVER

O'Henry's Studio A

Even in a mixed market like Los Angeles, only a handful of recording studios successfully combine work for pop music with jingles and scoring for film and television. Burbank's O'Henry Sound Studios is one of those. The 14,000-square-foot, two-room facility opened in 1993, after engineer Hank Sanicola and his wife, Jackie, decided to close their home studio and build a from-the-ground-up commercial complex. In the ensuing eight years, O'Henry has become a favorite orchestral recording place for such top scoring mixers as Shawn Murphy, Armin Steiner and John Richards. Film credits include *Austin Powers*, *Chicken Run* and *Dinosaur*. The studio has also played host to album projects for artists from REM and k.d. lang to Mariah Carey, Ray Charles and Sugar Ray. Commercial soundtracks have included work for Southwest Airlines, McDonalds and National Geographic, among many others.

"People told me you couldn't build rooms that you'd be able to rent to both record and film people," recalls Hank Sanicola. "But with the help of people like Shawn, Armin and John, we have. From the beginning, they liked our location and our staff, and they helped us learn how to provide what the scoring business needs.

"We spent a lot of time at it. For the first string date we did, I ran out to Costco and bought, I think, 40 chairs. It was a 30-piece date, and, all of a sudden, we needed headphones, music stands, chairs...Then we did a 40-piece and then a 50-piece. It just took off. We didn't really go after the business, we just got some sessions and learned how to make them happy."

The O'Henry complex, originally designed with the help of architect Jack Edwards and studio consultant Rick Ruggieri, has always had a stylish and comfortable vibe, featuring a garden patio, a large common lounge and kitchen, and private lounge/offices for each studio.

In 1998, Studio B was renovated with a new design by studio bau:ton and the installation of an 80-input SSL 9000 J Series console fitted with an SL 956 J multiformat monitoring system. In 2000, it was time to upgrade Studio A, which had housed a custom API console since the facility opened. The Sanicolas and chief engineer Harold Kilianski decided to stick with the custom direction, embarking upon building one of the largest fully discrete consoles in the world. Studio A's desk now features 88 inputs fitted with enhanced API modules, Flying Faders, and 5.1 mixing and monitoring capability.

"Our objective was to have the capacity to satisfy the demand of high-profile record projects and/or scoring and mixing in a 5.1 mode on something that sounded really good and was easy to use," Hank Sanicola explains. "Also, we knew that our clients liked Flying Faders. I had specific applications that I needed to address, and I wanted something simple. There was nothing out there that quite fit the bill."

"The whole mission of this project was to keep the original sound and to improve what we could," adds Kilianski. "We wanted more buses; we wanted to balance everything to minimize connection issues, we needed more inputs and a 5.1 center section. But, in obtaining those things, our emphasis was on a short signal path. We wanted to go through as few electronics as possible in order to maintain the sonic character."

Sixty-four of the original modules were reconditioned, and Andrew Isett newly built 24 more, an endeavor requiring painstaking detail (making metal plates, painting and silk screening). All of the modules are now housed in a frame specially constructed by Dale Manquen, because the original API frame wouldn't carry the weight and size of the new 16 1/2-foot console.

The modules house traditional API-style 2520 amps. The center section, also all discrete, was designed by Kilianski with board design by Steve Firlotte of Inward Connections, using SPA 690 amp blocks designed by John Hall. The Flying Faders automation system now supplies 95 automated faders.

To complete the project, Studio A was shut down for two months. In addition to the console rebuild, the control room was stripped down to cement and redone, complete with new floor and wall treatments designed by studio bau:ton. Since reopening, projects in Studio A have included Dianne Reeves, Placido Domingo, *Star Trek Voyager* and mixing for the soundtrack of Stephen Spielberg's upcoming film *AI*.

"The only way to do this well is to really stay on top of it," Sanicola concludes. "It's about taking care of all the little things, consistently. The main thing is, you try to make people feel welcome when they walk in the door." ■

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How Do I Write Thee?

WHEN I CAN'T EXPLAIN MY WAYS

ILLUSTRATION: JAMES YANG

Music. Painting. Internal combustion engine design. All the same. As far back as I can remember, the act of creation has been the same for me, no matter what I am creating.

A blank sheet of paper, an endless yet constricting expanse of clean white—an invitation to create; an opportunity to fail.

Maybe that paper has a light blue grid on it, and you are supposed to create the next-generation, 1,700-horsepower, titanium V8 for a top fuel dragster, or maybe it has groups of horizontal lines to help you create the next "Stairway To Heaven." Or maybe it's just...blank. Or canvas or a giant computer display on the wall—bristling with 24-bit digital potential, while you stand there bristling with 24 thousand bucks worth of cool 3-D, radio-linked paint brushes in your hand...

You take a deep breath, chant your tried and true cosmic mantra—"It don't matter, it's all good"—and hit the sheet with the tool. And so it begins.

Sometimes, there's no schedule at all; you can take three years for one piece. Other times, you are commissioned and have only three weeks. And then there are those reality benders when you are just late—way, way late and you only have three lawyers, but they have *nine*. No difference. Remember—it don't matter, it's all good.

As far back as I can remember, there have only been three ways to create, three *types* or conditions of the creative process. Please allow me to introduce myself and my three conditions to you—Flash, Crunch and Stall. I will detail these in reverse order, just so you will wonder why the hell I listed them in that order as if I was planning all along to discuss them in the opposite order.

1. Stall. A creator's biggest fear—drawing a blank.

The pen, the brush, the guitar—the instrument of choice is in your hand, but your brain is on strike. No matter what you do, absolutely *nothing* happens, you are *blocked*. In fact, the more you try, the further away any faint glimmer of a concept that you may have vaguely sensed retreats.

Solution? There is only one. I have spent decades pretending to ignore this simple fact, but once I gave in and accepted it for the truth that it is, my total annual down-

—CONTINUED ON PAGE 231

BY STEPHEN ST.CROIX

Ed Cherney has engineered for some of the biggest music artists of the last two decades – and is still going at it. Cherney's engineering credits are literally a Who's Who of the music industry: Jackson Browne, Eric Clapton, Bob Dylan, The Judds, Bette Midler, Iggy Pop, Bonnie Raitt and The Rolling Stones – to name only a few.

World-renowned producer Don Was has worked with Ed on numerous projects over their long and prolific partnership. Was has produced an impressive number of major recording artists including The B-52's, Barenaked Ladies, Bob Dylan, Elton John, B.B. King, Willie Nelson, Randy Newman, Bonnie Raitt and The Rolling Stones.

When it comes to choosing the right mic for their Grammy winning work, the Audio-Technica 40 Series tops the list. "My AT4060's have great body and warmth and still give me the clarity and presence I want," says Ed. "I put up a 4060 and everyone is happy – the artist, me, everyone."

Take an "insider's" tip from one of the music industry's most successful A-teams, and try a 40 Series mic on your next session. Who knows? You might just be making musical history – like they have.

Special thanks to The Record Plant, Hollywood, CA

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NAMM Bits

COOL ALTERNATIVES FROM ANAHEIM

ILLUSTRATION JACK DESROCHER

This past January, the Winter NAMM show returned to Anaheim, Calif., the home of Mickey Mouse, Knott's Berry Farm and countless other institutions dedicated to the proposition that, dammit, you *are* going to have fun! And I returned, too. The last three years, this gigantic music industry trade show, second only in enormity to Frankfurt's MusikMesse (which I've never been to and have no great desire to go to) has been held in downtown Los Angeles. During that time, the Anaheim Convention Center was undergoing a giant facelift, and, although it was still open for business, the NAMM powers-that-be decided that it would be—believe it or not—*safer* to hold the show in downtown L.A., a place where even the taxi drivers won't wander at night without a bodyguard. So I have stayed away. But this year, I came back. And, yes, I did have fun.

A lot of other people came back, too, apparently. The number of registrants at the show, which celebrated the 100th anniversary of the organization (whose full name is the International Music Products Association), was 65,372, which represents a 10% increase from last year.

Anaheim hasn't changed much in the interim, and the "new" convention center isn't much different from the old one, except there's now an impressive, but not particularly useful, three-story glass lobby occupying the space that used to be outside, between the convention center and the adjacent Hilton Hotel. The remaining sliver of open space, although they've tried to soften it with plants, is something of a claustrophobic concrete wind tunnel.

Inside, the center is much the same as it's always been—a cavernous bunker—only they've removed most of the walls separating the various "halls" so that it feels even larger. And it definitely seemed noisier: Even in the acoustic guitar and saxophone sections of the building, the ambient SPL was well up into the New York-subway-at-rush-hour range.

Anaheim, itself, was unusually cold, even for January. When I left Boston in the morning, it was 37°,

BY PAUL D. LEHRMAN

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and when I arrived that night at my hotel, it was 38°. Southern Californians, who don't understand winter, think that the way to warm up a room is to blow electrically heated air into it. So the relative humidity inside the hotels and convention center, already low to begin with (remember, if it wasn't for all that water coming from north of Sacramento, Orange County would still be a desert), felt like it had dropped to zero. Bottles of water were selling briskly from machines on the show floor at $2.25 a pop. It's no wonder it took me just one day to come down with a nasty case of "convention throat," or "NAMMyngitis."

During the week of the NAMM show, there always seems to be some disaster going on in the outside world. One year, the show began two days after the Northridge earthquake. Another year, we went to war with Iraq, and every monitor in the place was tuned to CNN, watching the bombers as if they were a video game. This year, there was the installation of George II in Washington, but everyone ignored that. The threat of rolling electrical blackouts throughout California, however, was harder to ignore, but, thankfully, Orange County was spared that week. I was a little sorry about this—it would have been interesting to see how conventioneers (not to mention Disneyland) would have coped without electricity.

There are two reasons I go to NAMM: I get to see old friends and new technology. I wasn't disappointed on either count this time. I won't bore you with the details of my social calendar, but it was great to see fellow *Mix* columnist Stephen St.Croix, who, although we are separated by but a few sheets of paper every month, I actually get to see in meatspace infrequently. Stephen was sporting his cool new 21st-century short 'do, and, for a change, you could actually see his face, which is really quite pleasant.

As for new technology, there were, of course, lots. This year, I happened to be on a particular mission to find "alternative" electronic musical controllers for a course I hope to teach in the fall, and the show gave me a terrific opportunity to scope out what folks all over the world, in companies large and small, have been doing in their workshops and laboratories. My sympathies at any trade show tend to be with the smallest and most struggling companies, and there were plenty of those in attendance. Some of them were showing some pretty cool stuff.

Alternative music controllers have a habit of appearing and disappearing quickly. It's tough to get people to agree to learn a new instrument, and making a successful product that requires players to learn a new technique and, God forbid, *practice*, takes time. That's something that cash-strapped startups don't often have, and so sales of new controllers by small companies, no matter how well-received they might be by the press, rarely reach the critical mass necessary to make their manufacturers viable. For me, every NAMM show brings back fond memories of glorious oddities like Palmtree's Air-Drums (also known as the "MIDI maracas"); the SynthAxxe, which looked like a guitar that had been run over by a truck; and the MIDI "tap shoes," "dog collar" and stringless harp from companies whose names I can't remember.

Even in the acoustic guitar and saxophone sections of the building, the ambient SPL was well up into the New York-subway-at-rush-hour range.

Larger companies, too, have felt the pressures of the market when it comes to making innovative and unusual instruments, and many of them have pulled out of that side of the business. But a few have hung in.

Yamaha (www.yamaha.com) has been flying the flag of MIDI wind controllers for many years, and the company's latest is the WX5, which, like its predecessors, uses fingerings similar to a flute or saxophone, with additional knobs and keys to change octaves and operate pitch bend and other continuous parameters. The WX5 incorporates most of the features of earlier WX Series controllers, but the price is considerably lower: $699. Of course, to get the most out of it, Yamaha recommends a pairing with its physical-modeling synth module, the VL70M, which is $799.

Roland (www.rolandus.com) has always pursued MIDI drums and guitars, and many of its products have straddled the pro and consumer music worlds successfully. The latest result is the HPD-15 Hand Percussion Pad—let's call it a "MIDI Conga"—and, in fact, they were showing a few of them attached to conga drum shells, but they're hardly required. The HPD-15 is a rubber pad with 15 different sections, each of which can be programmed to play a different sound. All of the pads have pressure sensing, and the larger pads also have positional sensing, so you can change a sound by pushing on the pad or by moving around on it. It also has two ribbon controllers and a "D-Beam" infrared distance sensor, so you can wave your hands in the air and do weird things to the sound. It comes with 600 (!) percussion sounds in ROM and a built-in sequencer, all for $1,300.

Speaking of waving your hands around, Alesis (www.alesis.com) has come up with two nifty little devices, the airSynth and the airFX. Both units look a little like trackballs for an iMac, but the glass ball in the middle doesn't move. Instead, it houses an infrared sensor that detects hand positions in 3-D, using technology that the company has applied for a patent for. They have no other controls except a program-select dial. The airSynth contains 50 sounds, while the airFX has 50 filters, time-based effects, reverbs and a few synth sounds. At $249 each, these are slated for the DJ market: Both devices have RCA outputs and pass-through inputs, so you can put them in the same signal path as, say, a CD player without tying up mixer inputs or aux sends. There are no MIDI jacks, so there's no way to interface the units with anything else, but a company representative told me that Alesis is considering using the technology in MIDI devices in the future. I hope they do—it's way cool, and it would be great to open it up to other types of performers.

Any discussion of musical hand waving would be incomplete without mention of Bob Moog's Theremins. Before there were any Moog synthesizers, there were Moog-built Theremins. Moog has gone back to his roots, and his company, Big Briar (www.bigbriar.com), was showing two of the beasts. The Etherwave Theremin is a classic two-antennae job, housed in a small box with a vertical pole for pitch and a horizontal loop for volume. It goes for $369, but there's also a "Bob Moog Signature" Version for an extra $30, or you can save $70 and buy it as a kit, which comes with an assembled and pre-tested circuit board, in case your soldering chops aren't what they used to be. At the high end is the Ethervox MIDI Theremin ($3,500), which is in a large wood case that's modeled after Leon

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Theremin's original instrument. It's a very clever design: As you move toward or away from the pitch antenna, it sends MIDI data in the form of either individual note commands or pitch bend commands or some combination of the two that you can program. It also receives MIDI, so you can record (and edit) your swoopings and play them back.

Besides Moog, one of the pre-eminent names in the early days of synthesis was Don Buchla, builder of wonderful nonkeyboard-oriented (which is one reason why it never caught on like Moog's) modular systems, named after their creator. I learned all about voltage control and sequencing on one of those beasts in college. Although the old machines are now collector's items, Buchla, himself, is still very active and has designed some really interesting electronic musical interfaces with names like "Thunder" and "Lightning." His latest creation, the Marimba Lumina, is being marketed by a company called Nearfield Systems (www.multimedia.nearfield.com), which primarily makes radio antenna measurement products but has formed a new multimedia division just to sell this instrument. Much more than a MIDI xylophone, the Marimba Lumina (and its new $1,000-cheaper little brother, the two-and-a-half-octave ML2500) has a ribbon controller, 10 control pads, storage for 50 setups, a built-in Yamaha XG synthesizer, and inputs for seven trigger or controller pedals. It has all kinds of expression and duration control, arpeggiation, alternative scales and much more. The instrument comes with four color-coded, foam-covered mallets, each of which can be programmed separately; so, for example, hitting a note with the red mallet will play one kind of sound, while hitting the same note with the green mallet will play a different sound. You don't have to be a killer xylophone player to get the most out of this baby, but if the guy demoing it was any indication, it does help.

And speaking of built-in synths, I've been writing about software synthesis for a number of years, but so far I've yet to see anything that I can put on my computer that I would consider to be a reasonable replacement for a good general-purpose hardware synth module. But the latest version of Native Instruments' (www.native-instruments.de) Reaktor is getting awfully close. The $500 software, which works on Mac and Windows platforms, puts a completely configurable polyphonic/polytimbral synth, a sampler, a drum machine and a groove generator onto your computer in one fell swoop. Version 3.0, due out this quarter, has a more intuitive user interface with modules that make the architecture of the system much clearer. To get more than a handful of voices out of it, you need at least a 400MHz computer, but we all know those aren't hard to find anymore. The German company has also released a "Junior" Version of the software, called Dynamo, at $200.

A new company from Victoria, B.C., Tactex Controls, is making "digital skin": fabrics that can detect position and pressure when they are touched. The technology grew out of the Canadian Space Agency (you didn't even know there was one, did you?) and is now being applied to touch pads, game controllers, cell phones, "wearable" computers and—you guessed it—musical instruments. The company's first music-oriented product, the MTC Express, is a hand-sized touch pad that hooks up to a computer through the serial port (or a serial-to-USB converter). At NAMM, Tactex was demonstrating it on a Mac using custom objects created in the musical programming language, Max, to do interesting things with sound and spatialization. By itself, the MTC Express sells for $495, but the technology was also

—CONTINUED ON PAGE 252

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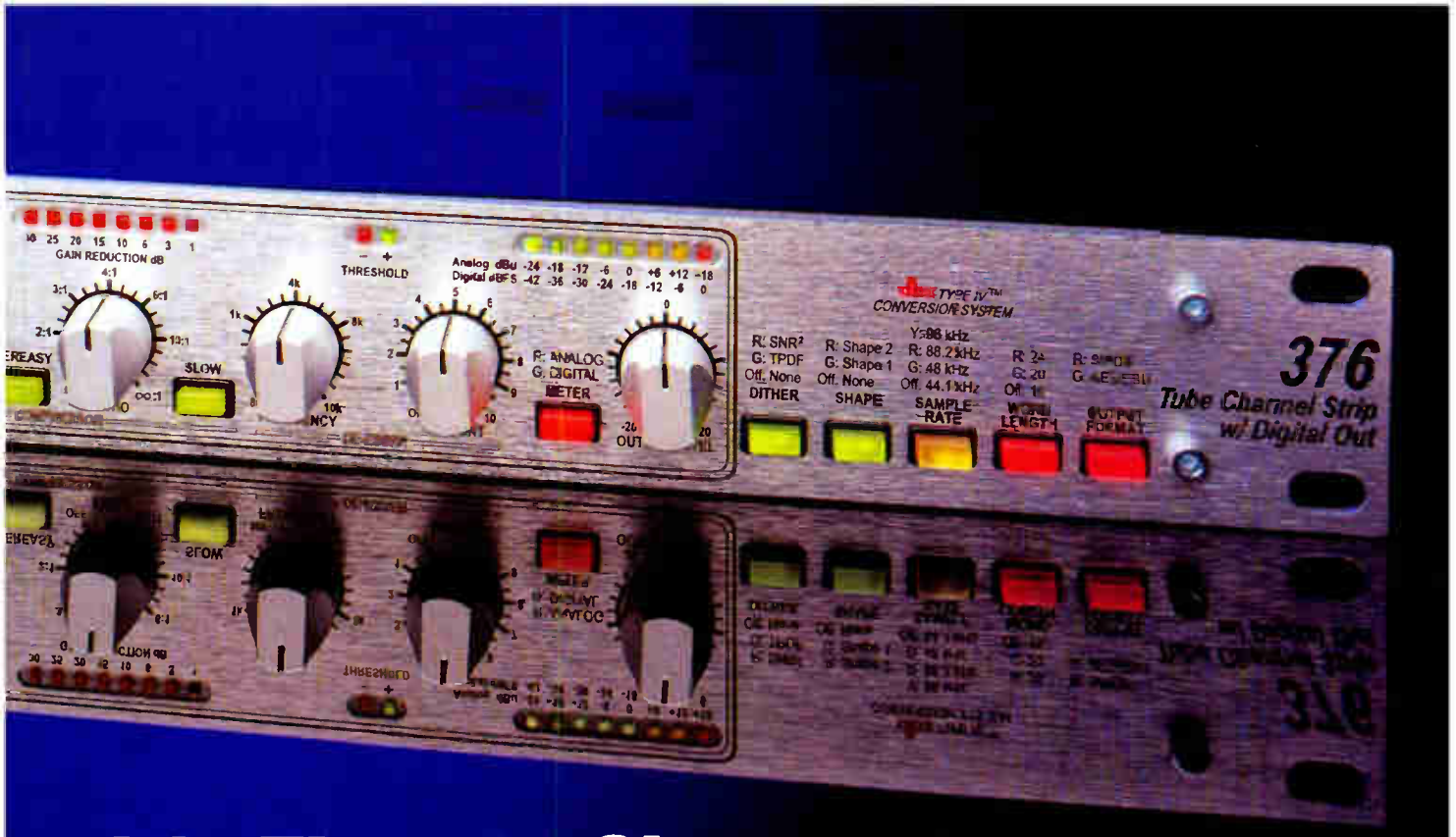

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So Many Choices, So Little Time

NCE UPON A TIME, AN ALBUM WAS AN ALBUM, a single was a single, and the number of formats available to recording professionals and consumers could be counted on one hand.

How times have changed. Today, in order to create recordings and release them commercially, mixing and mastering engineers have to contend with a dizzying array of formats. For stereo projects, the choices go beyond analog and digital. Nowadays, any engineer worth his or her salt must be able to handle DASH, ADAT, DA-88 and analog tape, which exists in various track configurations, record-

MIXING AND MASTERING ENGINEERS FACE THE FORMAT QUAGMIRE

ing speeds and noise-reduction types. In addition to those tape-based formats, mix engineers can expect to receive multitrack masters in any number of hard disk systems, especially Pro Tools, which has no standard storage medium. That means that a Pro Tools session might come in on a SCSI drive, a FireWire drive, a CD-R or DVD-R or any number of digital tape cartridges, including Exabyte, DDS, Data DAT and AIT.

BY PAUL VERNA

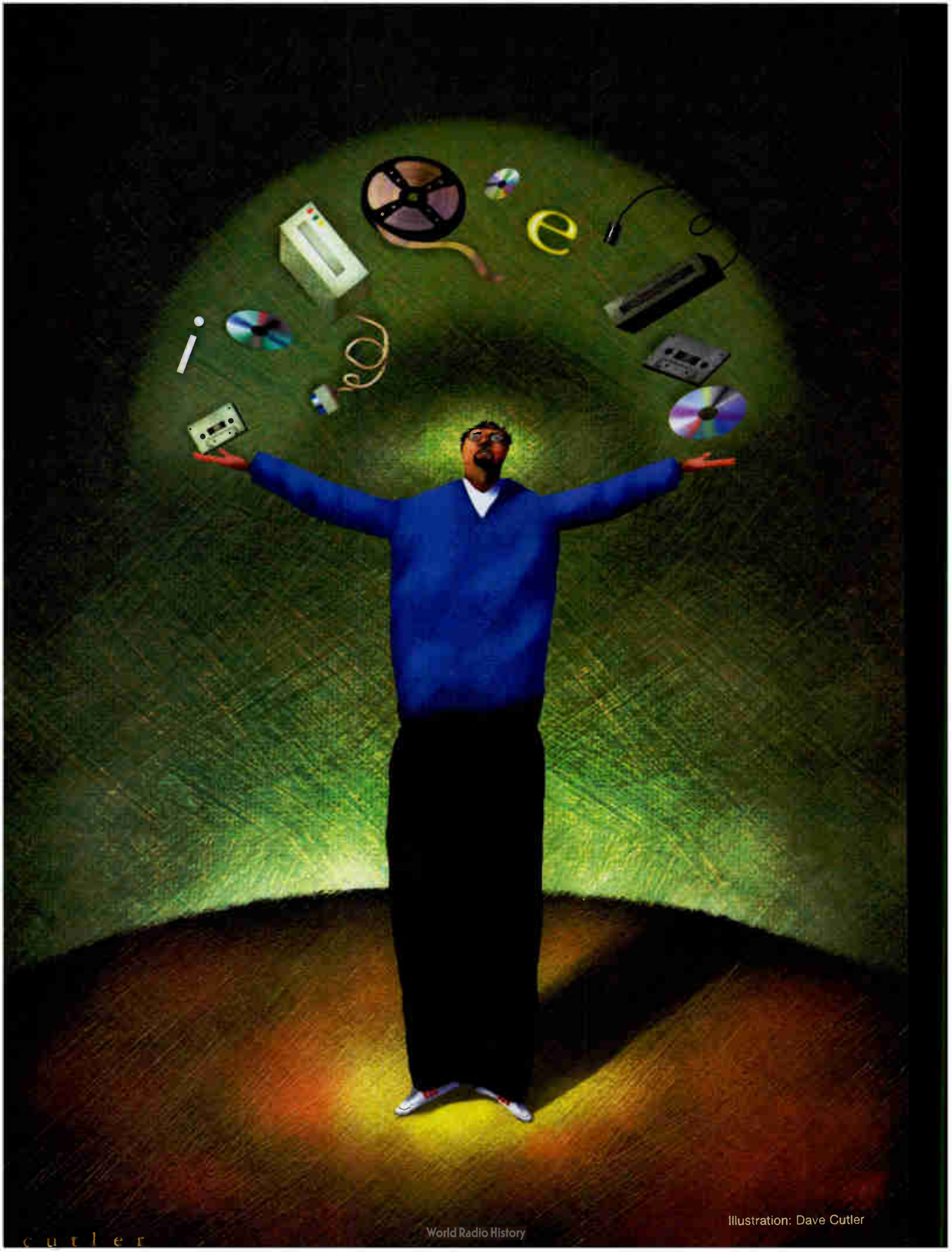

Illustration: Dave Cutler

cutler

Once the mixer has possession of the master (or sets of masters) and has procured all of the necessary hardware to handle the formats in question, a new set of choices opens up with regard to the mixdown medium. Here, the options include DAT (either in the new 24-bit version or the more common 16-bit variety), CD-R, DVD-R, magneto-optical disc, ADAT or DA-88 (sometimes using bit-splitting techniques, which are not standardized), Alesis MasterLink (which uses optical discs), and any of the aforementioned hard drive systems and their associated backup devices. Then, of course, there's analog tape, which most mastering engineers say they still prefer. Not to be outdone by digital, analog 2-track tape exists in various guises, including half-inch, 1-inch and 2-inch reels; speeds of 30, 15 and 7.5 ips; and noise-reduction systems, like Dolby SR.

In the multichannel domain, the spectrum is even more complex, with mixdown options ranging from hard disk recorders, like Pro Tools and Genex, to tape-based MDMs, such as DA-88 and ADAT. Beyond the decision of which format to use for the multichannel master, engineers must figure out—to the best of their abilities—what the final release medium for the project will be. For instance, will it appear on DVD-Audio, DVD-Video, Super Audio CD, Dolby AC3 or DTS, each of which offers varying degrees of choice with regard to bit budgets, compression algorithms, disc types and allocation of non-music items, like videos, liner notes, bios and Web access.

Tom Jung, owner of DMP Records

At the consumer level, the bombardment of format options is no less intense than it is for the people who create the music. Even a "simple" stereo release may encompass such disparate mediums as CD, cassette, vinyl, DVD-Video, DVD-Audio, MiniDisc and any number of download formats like MP3. In the multichannel world, DVD-Audio, DVD-Video, Super Audio CD and DTS are vying for consumers' attention and threatening to confuse them with format overload.

Posing a rhetorical question that many engineers are asking themselves these days, Skywalker Sound director of music recording and scoring Leslie Ann Jones says, "How many formats does it take? Too many, as far as I'm concerned."

Jones should know. Not only does she serve in a managerial capacity at one of the largest and busiest commercial facilities in the world—where part of her job is to make equipment purchases—but she is also an award-winning engineer who faces format dilemmas every time she starts a project. "In my experience, the format decision affects the creative process right from the beginning," she says. "I'm about to record a live album with Michael Feinstein in Israel, and the first thing I had to think about was what format I was going to use, and then I had to fit my format and mic selection into a [pre-existing] budget."

Mixers and mastering engineers who own their own facilities—like Bob Clearmountain, Mick Guzauski and Bob Ludwig—face the same combination of creative choices and financial burdens that Jones describes. They complain that the pressure to invest in multiple systems—ranging from DASH recorders to tape-storage systems for digital audio workstations—is so intense, it sometimes gets in the way of creativity.

Commenting on the data storage demands of a large-scale multichannel project like the live DVD *Bruce Springsteen and the E Street Band: Live in New York City*, which he recently mixed in stereo and surround, Clearmountain says, "The data shuffling gets to be mind-boggling. Even the manufacturers don't realize it. You go to AES, and they all talk about 5-channel this, 7-channel that, and I wonder how many of them have ever had to deal with an entire project in 5.1? It's insane, the amount of data involved, especially for a home studio like mine."

The data shuffling gets to be mind-boggling. Even the manufacturers don't realize it.

—Bob Clearmountain

One of the factors that complicates the format quagmire is the sheer number of people involved in a typical recording project, particularly pop, hip hop and R&B albums that use multiple producers, engineers and studios. Mastering engineer Tony Dawsey, who has been working at New York powerhouse Masterdisk since 1980, says, "There was a time when you would get a ¼-inch or ½-inch master from one studio, one engineer and one producer, and it was all put together on a reel. Now it's a lot more complex, because there are a lot more people involved. I often get into situations where an album gets held up, because one producer didn't turn in his track. Sometimes we're waiting for days with everything in place except for the one track, and it ends up getting down to a crunch when the track comes in. When you have different producers, different engineers and different studios, everything becomes an emergency."

The rapid proliferation of formats may have complicated the lives of engi-

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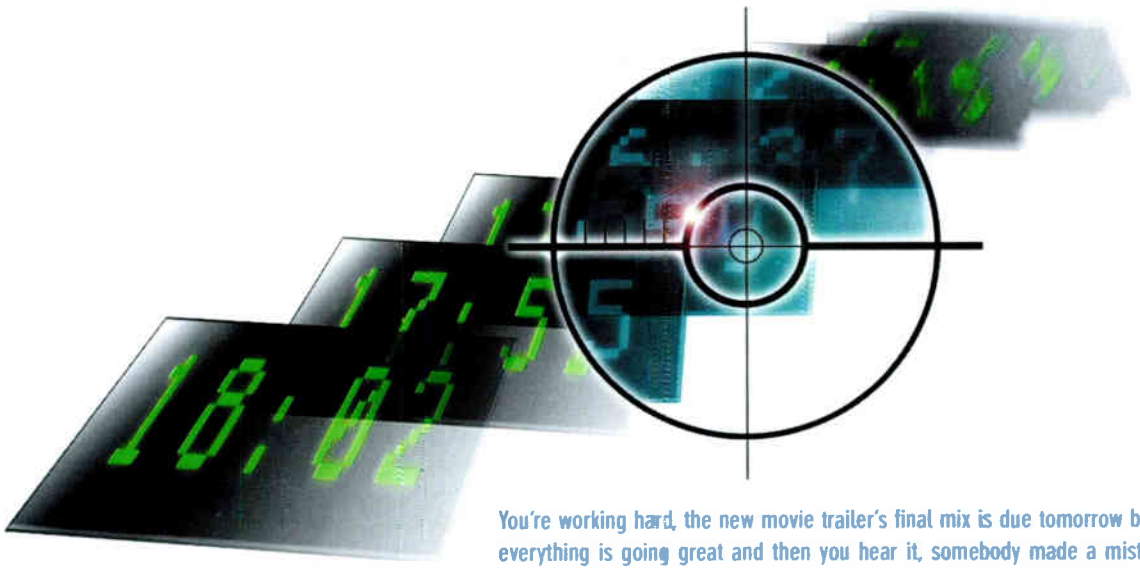

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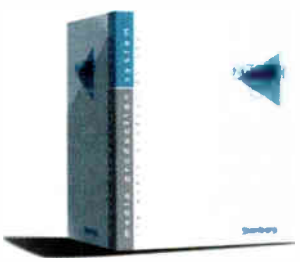

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neers and studio owners, but it has also generated more business for them, which they appreciate. "These days, it can take twice as long to EQ an album as it used to," says Dawsey. "If it took four hours before, it takes eight hours now, with all the different formats we're dealing with, and because people are putting 15 or 20 tracks on an album instead of eight or 10 tracks.

The format decision affects the creative process right from the beginning.

—Leslie Ann Jones

Studio time has gotten longer per project than what it used to be. All told, it takes me about a day to do a 'normal' project, that being one version of an album. But any time there's more than one version, like clean, 'street' and instrumental versions, it's another day."

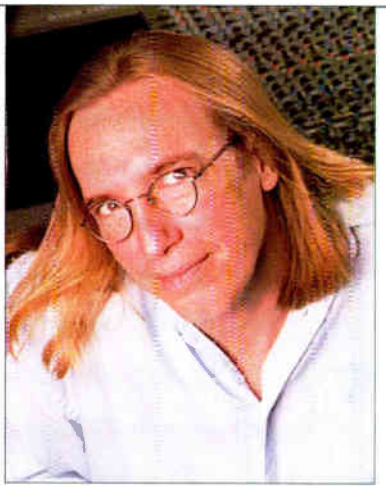
Ludwig, who mastered the Springsteen DVD and CD at his Gateway Mastering studio in Portland, Maine, adds, "If this had just been a CD, Bruce might have booked only one day here. But because of all this complexity, it was two days with Bruce and lots of post-production afterward."

On the mixing side, engineers like Clearmountain, Guzauski and Chuck Ainlay are seeing a steady stream of work mixing albums in 5.1, and the material ranges from current titles such as Mark Knopfler's *Sailing To Philadelphia*, Springsteen's *Live in New York City* and Eric Clapton's *Reptile* to classics like Peter Frampton's *Frampton Comes Alive* and Michael Jackson's *Thriller*. In these early days of surround sound production, there are as many opinions on how to execute 5.1 channel mixes as there are engineers doing them, but there is virtual unanimity among mixing and mastering engineers that creating separate stereo and surround mixes is preferable to using the automatic "fold-down" features built into such multichannel compression systems as Dolby AC3 and Meridian Lossless Packing (MLP).

Clearmountain says, "If you pan something in five channels and then fold it back to stereo, very often it's not going to work. You might have something spread between the left front and left rear, and when that folds down to mono, it's just going to be on the left channel. That might be fine, but maybe you want it to be a stereo sound. If you're going to commit to doing that for an entire project, it's like working with your hand tied behind your back."

For projects with budgets that do not allow for separate mixes, engineers are willing to accept a fold-down, albeit reluctantly. Ainlay notes, "As far as making a DVD-Audio disc compatible with a portable DVD system, using the fold-down gives you the option for somebody to take that DVD-Audio disc and play it on the beach. Say somebody, for economic reasons, didn't do separate mixes, the fold-down is applicable there. But I still think there should be a separate mix."

In most cases, engineers working in the 5.1 domain are not concerned with the final release format of their mixes. After all, whether a title will appear on DVD-Audio, DVD-Video, Super Audio CD or DTS does not affect the creative decisions that go into a mix. However, some engineers, like DMP Records owner Tom Jung, have honed in on favorite formats and are tailoring their work accordingly. In Jung's case, all of his projects—which consist mainly of acoustic recordings done live to six channels—are now being done in Direct Stream Digital and released on Super Audio CD.



The biggest thing with 5.1 remixes is finding all the elements: the masters, the technical notes, the bits of gear used in the mix initially, etc.

—Chuck Ainlay

"I love the way DSD sounds," says Jung. "It's a simpler system than PCM. Even at high [PCM] bit rates, you have decimation and interpolation, and those are things that don't exist in the 1-bit DSD world. At 24/96, the damage is minimal, but it's still there. To me, DSD is a much purer interpretation of the analog signal."

For Jung, the purity of the audio signal takes precedence over all other aspects of his projects. Pop engineers, on the other hand, must add a battery of logistical considerations to their concerns over sound quality.

"The biggest thing with 5.1 remixes," says Ainlay, "is finding all the elements: the masters, the technical notes, the bits of gear used in the mix initially, etc. There may be loops that weren't recorded back to the multitrack, and other material that's hard to find."

In an effort to simplify and standardize the multitrack archiving process, some facilities are consolidating entire

works of art

artists at work

Walter Afanasieff | Mark "Spike" Stent | MJ Cole | Sir George Martin | Robbie Williams & Guy Chambers | Jay Kay

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projects on FireWire drives—which have become increasingly affordable—and keeping them there for posterity. Skywalker's Jones says, "We're trying to get to the point here where we treat hard drives like analog tape reels. It used to be you shipped the masters to the record company when you were done with your project. Now, you're usually shipping Exabyte tapes, which can be very cumbersome. By transferring all our digital data now to FireWire drives, where the entire project exists on one drive, if you end up remixing something, it's easy to access. You don't have to take the Exabyte and restore an entire project to remix one tune."

While the FireWire system may work for Skywalker, the industry at large has no standard—or even a prevailing pattern—when it comes to archiving its recordings. Observers say that such past nightmares as sticky tape syndrome and lost masters will pale in comparison to what future generations of engineers can expect to encounter when they try to remix projects that are being archived under present-day conditions.

"With recordings, nowadays, on people's Pro Tools systems, a lot of times all the stuff doesn't get turned into the record companies," says Ainlay, adding, "It's going to get *really* strange."

If the archiving choices themselves seem overwhelming, then the questions regarding the stability and longevity of current data formats are downright frightening. Despite certain manufacturers' claims, no one really knows how long a CD-R, Exabyte, DAT or hard drive may last. And, while they anxiously back up their data to their format of choice and hope that the medium holds up in the long term, engineers are grappling with an entirely new set of format and sound quality issues with regard to audio on the Web.

"The whole MP3 thing is interesting," observes Ludwig. "It's very difficult to figure out in advance how the MP3 encoder is going to react to the material you send into it. I've done classical projects with extremely wide dynamic range with high MP3 encoding rates, and you can't hear the difference in the noise floor. On the other hand, we were encoding this Paula Cole track, and the encoder was really affecting her vocal in a nasty way. That's not the kind of thing you can EQ for."

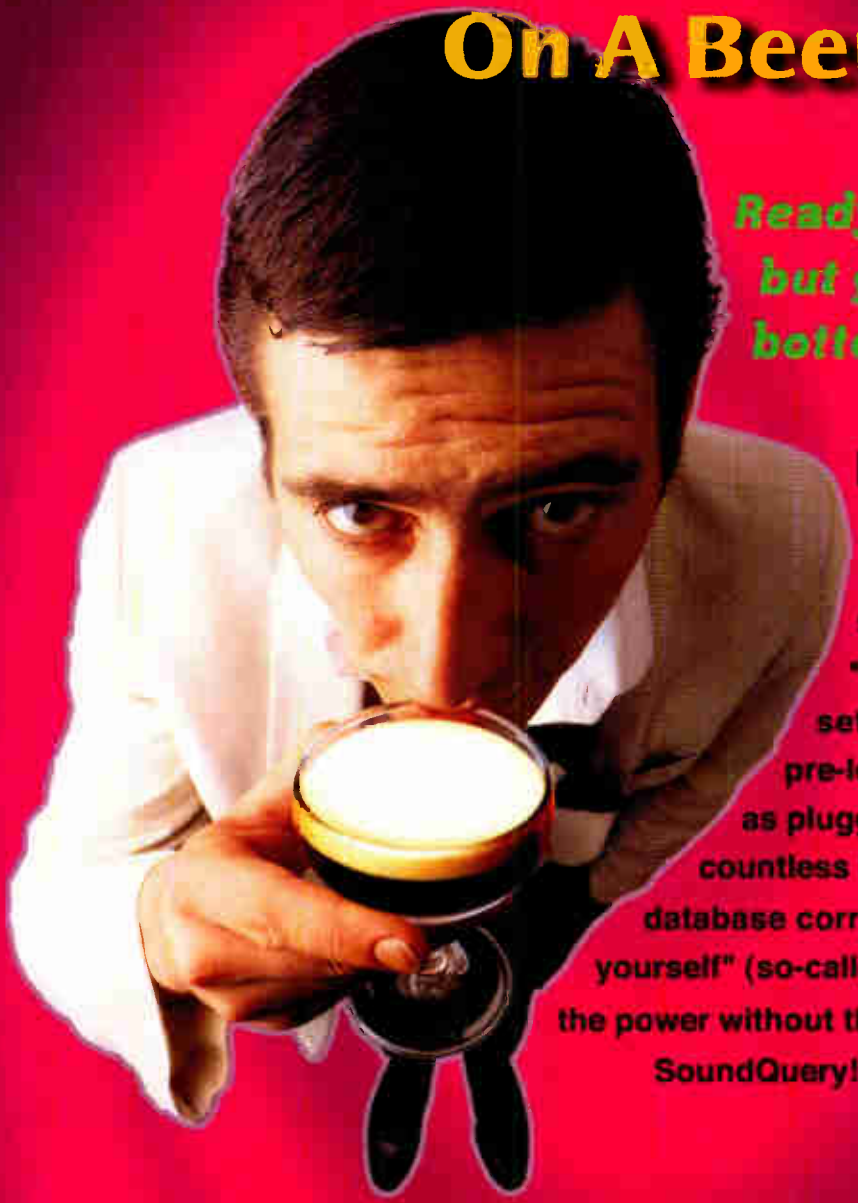
Clearmountain says he avoids sending MP3 files of his mixes because of quality concerns. Instead, he encourages his clients to find an ISDN-equipped studio in their area or directs them to his FTP site, where he posts uncompressed Sound Designer II files of mixes in progress.

As Internet audio matures, it will probably further complicate the lives of recording professionals by presenting them with new technological challenges. In the meantime, mixing and mastering engineers are working furiously to keep pace with a rapidly evolving format landscape. "It keeps life exciting," says Dawsey, letting out a hearty laugh. "I'm a very blessed and lucky man to be as busy as I am, but it adds to the stress level. After all, I'm just one individual!" ■

Paul Verna is Mix's New York editor.

Champagne Tastes...

On A Beer Budget?



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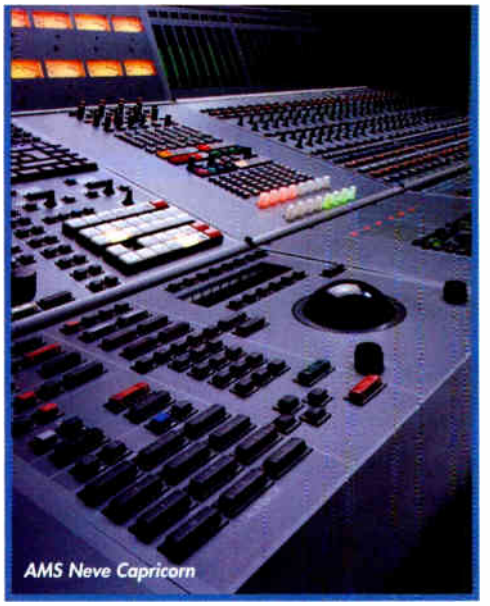

AMS Neve Capricorn

Surround Sound Consoles

Examining the Options for Multichannel Studio Production and Film Post Mixing

BY MICHAEL COOPER

With this issue's focus on mixing, we thought we'd look into some recent products and time-proven consoles designed for surround sound production in both music and sound for picture applications.

With dozens of mixing consoles claiming surround sound bragging rights, we thought it would be helpful to distinguish those desks with purpose-built surround functionality from the wannabes. To be sure, many of the new breeds of 8-bus digital consoles can be adapted for surround operation, but not without serious handicaps or adding third-party add-ons. For 5.1 monitoring during mixdown, for instance, six of the eight buses in these boards are typically delegated to serving the 5.1 monitor feeds, leaving only two buses with which to mix! Also, a MIDI joystick or some other third-party add-on is often required to effect continuous surround panning. And, usually, the only way you can raise or lower all six monitor levels simultaneously is by first subgrouping the buses.

Although it's great that cost-effective consoles designed for stereo operation can be adapted—sometimes rather marginally—for surround sound work, engineers who must work efficiently to meet unforgiving deadlines require a console that was expressly built for the job at hand. Accordingly, all of the consoles featured in this article can continuously pan tracks in real time in surround format using a single pan control (e.g., mouse, touchscreen or joystick). These boards also allow you to listen back to a surround mix and still retain at least eight buses for mixing. And they all provide a dedicated master monitor level control, so you can raise or lower the output of all of your speakers with the twist of one knob or by moving one fader. We note where a company provides an in-house, surround-specific option in order for its console to achieve this level of functionality. But consoles requiring third-party add-ons are not included in this roundup. Also, surround consoles that are tied to workstations and/or integrated recording systems (e.g., the Digidesign Pro Control) are also not covered here.

Soundtracs DS3

Inevitably, whatever criteria we choose to weed with, the patch will leave out some eminent products. One such example is the Amek Media 51 audio recording and production console. The Media 51 supports 5.1, 7.1, LCRS and stereo formats and can be ordered with up to 64 inputs. The console features SMPTE-based Supertrue™ automation, Virtual Dynamics™ on every channel, Cue List event triggering, two groups of six buses (configurable as two multiformat stems), an optional joystick, and mic preamp and EQ sections designed by Mr. Rupert Neve. See the accompanying chart for contact info for Amek.

Of course, the chart on the following pages should only be used as a starting point in your research. Most of the consoles listed are highly configurable, making it difficult to quantify some features (such as number of inputs and channels) in absolute terms. That said, we've narrowed the surround consoles field down to a manageable list of standout candidates. Sit down with your hands up—we've got you surrounded! ■

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

Surround Sound Consoles

Studer D950

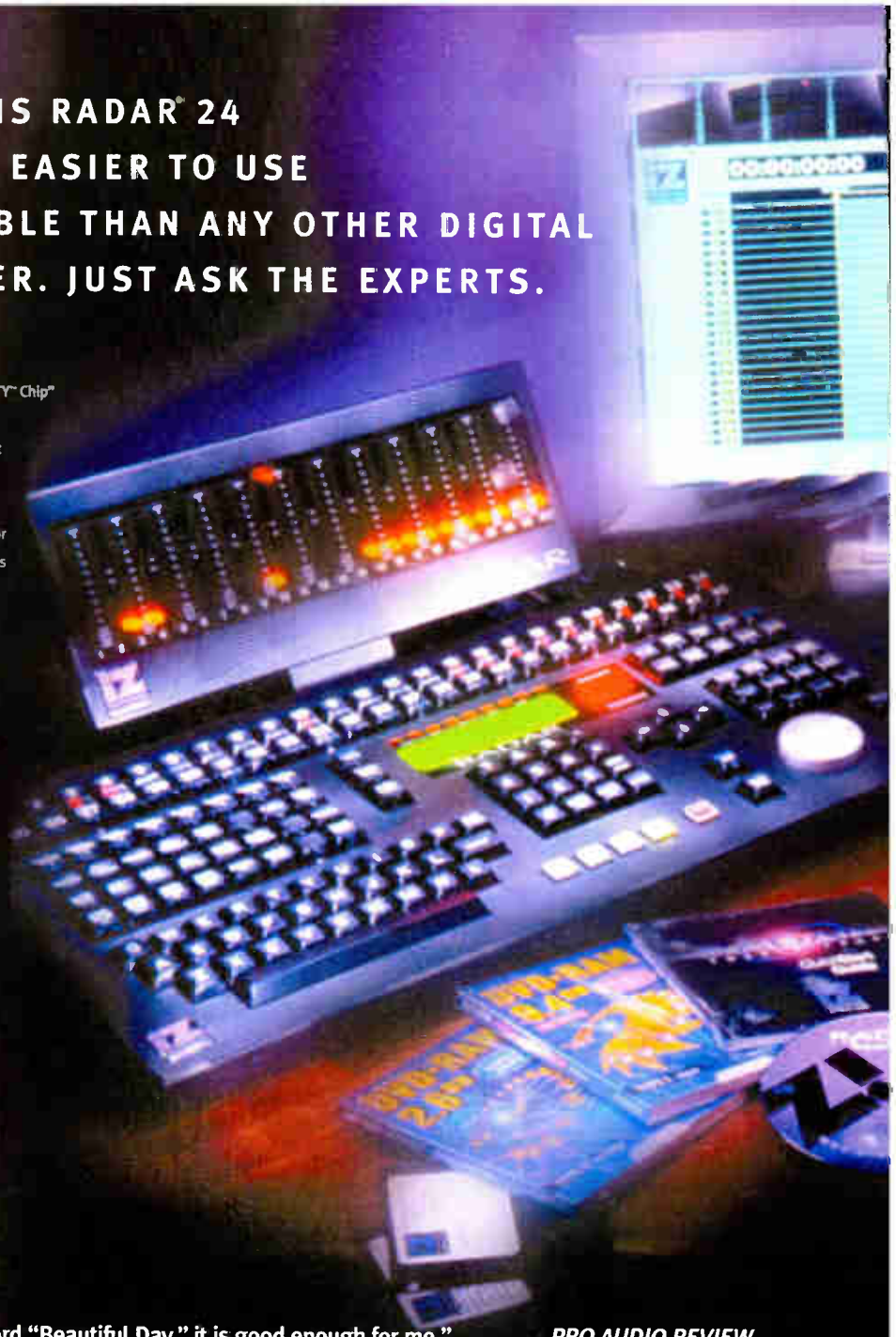
Sony DMX-R100

Model	Telephone	Website	Analog/Digital	Max Mic/Line Ins	Max Total Inputs	Max Input Faders/ Channels	Assignable Feder Banks	Output Buses	Automation	Metering	Individually Calibrated Monitor Outs
Amek 9098i	888/286-9358	www.amek.com	Analog	128 (120 mono + 4 stereo	248	248	N/A		Recall w/ manual reset faders; dynamic switch on/off	VU/PPM/LED (configurable)	Yes
Amek DMS	888/286-9358	www.amek.com	24-bit/48 kHz digital	64	64	64/64	16	32	Complete	Any type (configurable)	Yes
Amek Galileo Post	888/286-9358	www.amek.com	Analog	56	112	112/112	N/A	24	Recall w/manual reset; faders; dynamic switch on/off	LEDs, RTW 5.1, VU	Yes
AMS-Neve Capricorn	212/965-1400	www.ams-neve.com	24-bit/48 kHz digital	192, in any combination	256	64/256	12	64	Complete	Peak Full-Scale (FS) LCD	Yes
AMS-Neve Libra	212/965-1400	www.ams-neve.com	24-bit/48 kHz digital	96, in any combination	256	48/256	4	64	Complete	Peak FS LED	Yes
AMS-Neve Libra Post	212/965-1400	www.ams-neve.com	24-bit/48 kHz digital	192, in any combination	256	48/256	4	64	Complete	Peak FS LED	Yes
AMS-Neve Logic DFC	212/965-1400	www.ams-neve.com	24-bit/48 kHz digital	512, in any combination	512	120/512	4	86	Complete	LCD with selectable ballistics	Yes
AMS-Neve Logic 3SC	212/965-1400	www.ams-neve.com	24-bit/48 kHz digital	64, in any combination	96	16/96	N/A	32	Complete	Peak FS LED	Yes
Euphonix CS3000	650/855-0400	www.euphonix.com	Digitally controlled analog	104 mic, 208 line	312	104/52	2	up to 48	Complete	VU/PPM (configurable)	Optional
Euphonix System 5	650/855-0400	www.euphonix.com	24-bit/96 kHz digital	Modular blocks of 24 mic, 28 line	672	24/200	2	up to 128	Complete	PPM, average (configurable)	Yes
Harrison MPC2	615/641-7200	www.harrisonconsoles.com	24-bit/48 kHz digital	2,240	2,240	144/288	4	120	Complete	VU/Peak FS	Yes
Harrison Series Twelve	615/641-7200	www.harrisonconsoles.com	24-bit/48 kHz digital	2,240	2,240	144/288	4	120	Complete	VU/Peak FS	Yes
Harrison MPC	615/641-7200	www.harrisonconsoles.com	Analog	832	832	144/288	2	120	Complete	VU/PPM	Yes
Otari Elite+	800/877-0577	www.otari.com	Digitally controlled analog	48 mic + 48 line	144	96/48	N/A	46	Fader; mute; routing; EQ in/out; snapshots	PPM	Optional
Publison Digital Film Console (France)	33/143/608-464	perso.wanadoo.fr/..publison	24-bit digital	128	128	128	yes	112	Faders and rotary controls	TFT PPM	Yes
Roland VM-7000 Series	323/890-3700	www.rolandus.com	24-bit/48 kHz digital	40 (84 with optional AD/DA)	94	24/94	48	32	Complete	LED bridge option	Yes
Sony DMX-R100	800/686-SONY	www.sony.com/proaudio	24-bit/96 kHz digital	24 mic/line	56	56/56	3	8	Complete	LED	No
Sony OXF-R3	800/686-SONY	www.sony.com/proaudio	24-bit/48 kHz digital	120 mic/line	120	65/120	5	48	Complete	LED bar graph	Yes
Soundtracs DPC-II	800/4-FAIRLIGHT	www.soundtracs.co.uk	24-bit/48 kHz digital (96k option)	224 (modular)	224	96/160	N/A	40	Complete	LED (VU master option)	Yes
Soundtracs DS3	800/4-FAIRLIGHT	www.soundtracs.co.uk	24-bit/48 kHz digital (96k option)	112	112	24/96	6	32	Complete	LED w/VU ballistics	Yes
SSL SL 9000 J Series	212/315-1111	www.solid-state-logic.com	Analog	120	500+	240/240	0	>60	Faders and switches with Total Recall	VU/PPM	Yes
SSL SL 9000 Scoring System	212/315-1111	www.solid-state-logic.com	Analog	120	500+	240/240	0	>60	Faders and switches with Total Recall	VU/PPM	Yes
SSL Avant	212/315-1111	www.solid-state-logic.com	24-bit/48 kHz digital	2,000*	2,000*	96/384	up to 3	>120	Complete	VU/PPM	Yes
SSL Axiom-MT	212/315-1111	www.solid-state-logic.com	24-bit/48 kHz digital	2,000*	2,000*	48/96	1	>60	Complete	VU/PPM	Yes
SSL SL 4000/8000 G+ Series	212/315-1111	www.solid-state-logic.com	Analog	112	>300	224/224	0	>40	Faders and mutes	VU/PPM with Total Recall	Yes
Stagetec Cantus	818/701-6201	www.stagetec.com	24-bit/52-bit (28-bit digital A/Ds)	128	128	96/120+	10	64	Complete	LED (PPM or VU ballistics)	Yes
Stagetec Cinetra	818/701-6201	www.stagetec.com	24-bit/52-bit digital	128	128	96/120+	10	64	Complete	LED (PPM or VU ballistics)	Yes
Studer D950 M2	416/510-1347	www.studer.ca	24-bit/48 kHz digital	250+	500+	96/96	10	112	Complete	VU/PPM	Yes

Notes: 1 Bus bit depth and maximum sampling frequency noted for digital consoles; 48 kHz also implies 44.1kHz operation; 96 kHz may or may not indicate 88kHz operation.
2 Complete denotes scene recall, mute, fader, EQ, pan and dynamics automation. 3. All types denotes compressor, limiter, gate, and expander. 4. All consoles offer moving faders. * Via digital routing matrix.

I/O Types	Channel Input EQ (# of bands and type)	Pan Control Type	Aux Sends	Dynamics Processors	Other Features
Balanced analog	2 parametric bands, 2 bell-curve/shelf, 2 HPF/LPF	2 joysticks plus dual pots	16	All types	Rupert Neve-designed audio path, 6-channel monitoring, two automated sends per channel, 24 automated switches per channel; Supertrue™ 4.0 automation
Balanced analog, AES/EBU, S/PDIF	Parametric, bell, shelving, HPF and LPF (6 bands total)	Multiple joysticks, touchscreen	12	64 of any type	Analog and digital inserts; 8-channel monitoring; sample rate conversion (SRC) available for all channels; one hardware control for each function
Balanced analog	4-band parametric, HPF, LPF	2 joysticks plus dual pots	16	All types	Rupert Neve-designed mic pre's; 8-channel monitoring; two automated inserts per channel; eight automated switches per channel, Supertrue™ 4.0 automation
Analog; up to hundreds of AES/EBU, TDIF, MADI, SDIF	4-band parametric/shelving + HPF and LPF	Up to 6 joysticks plus 4 rotary controls	16	All types	CSX monitoring panel provides confidence monitoring in multiformats up to 7.1; touch-sensitive rotary panning; 3-operator layout maintains sweet spot
Balanced analog; up to hundreds of AES/EBU, TDIF, MADI, SDIF	8-band parametric, shelf, HPF, LPF	Up to 2 joysticks plus 4 rotary controls	16	All types	Multiformat mixing/monitoring up to 7.1; single-operator layout; centralized channel strip maintains sweet spot; touch-sensitive rotary pan controls
Balanced analog; up to hundreds of AES/EBU, TDIF, MADI, SDIF	8-band parametric, shelf, HPF, LPF	Up to 2 joysticks plus 4 rotary controls	16	All types	Multiformat mixing/monitoring up to 7.1; single-operator layout; centralized channel strip maintains sweet spot; touch-sensitive rotary pan controls
Balanced analog, up to hundreds of AES/EBU, TDIF, MADI, SDIF	8-band parametric, shelf, HPF, LPF	Up to 6 joysticks plus 4 rotary controls	36 (12 per operator)	All types	Multiformat mixing/monitoring up to 7.1; 3-operator layout; touch-sensitive rotary panning; predub input groups several inputs on one fader; explodes parts throughout desk
Balanced analog; up to hundreds of AES/EBU, TDIF, MADI, SDIF	4-band parametric/shelving + HPF and LPF	Up to 2 joysticks plus 4 rotary controls	8	All types	New for NAB 2001; up to 64 channels within a very compact working area; single-operator, multiformat console brings film-style features to TV post work and budgets
Balanced analog	4-band parametric plus 2 dedicated	Trackball	6 (48 with optional system)	All types	8-channel monitoring; snapshot recall; assignable metering; 8-character fader display; three insert sends per channel; stereo faders; GPI relays option
Balanced analog; AES/EBU, SDIF-2, TDIF, Pro Tools, MADI, ADAT	4-band parametric/shelves plus 2 dedicated HPF/LPF	Trackball/ motorized joystick	up to 24	All types	Up to 16 7.1 bus stems; snapshot recall; multiformat faders; full machine control; simultaneous multiformat mix/monitoring; redundant DSP
Balanced analog	4-band parametric w/HPF	Knobs, motorized joystick, touchscreen	16	Gate & compressor	64x8 matrix; 56 assignable PEC/DIR; multi-operator automation; Toys effects plug-in control panel; sweet spot control; 48 grouping faders; sectional aux buses
Balanced analog	4-band parametric w/HPF and LPF, touchscreen	Knobs, motorized joystick, touchscreen	16	Gate & compressor	64x8 matrix; 56 assignable PEC/DIR; multi-operator automation; Toys effects plug-in control panel; sweet spot control; 48 grouping faders; sectional aux buses
Balanced analog	4-band parametric w/ HPF and LPF shelving; graphic EQ optional	Knobs, motorized joystick touchscreen	16	Gate & compressor	32x8 matrix, 32 assignable PEC/DIR, multi-operator automation; sweet spot control; 48 grouping faders; sectional aux buses/solo, sectional PEC/DIR solo
Balanced analog	(2) 4-band parametric EQs, HPF, LPF	2 assignable, automated joysticks	10	96 gates & compressors	8-channel multiformat monitoring; Direct Assign/five-way Pan Option provides two sets of LCRLsRs pan buses and can hard assign inputs to buses
Balanced analog, AES/EBU, MADI	10-band parametric	4 motorized joysticks	16	All types	Supports all major surround formats up to 7.1; each channel can use three dynamics processors and equalizers simultaneously
Balanced analog; up to 48 channels of AES/EBU,S/PDIF, ADAT, TDIF	5-band parametric, bell, HPF, LPF	Joystick or fader/knob shelf, combination	24 (12 per I/O processor)	All types	16 stereo effects onboard, including COSM Speaker, mic and guitar modeling and 3-D processing; storage/recall of input trim settings; remote I/O processors; RTA
Balanced analog; up to 38 channels of AES/EBU, S/PDIF, ADAT, TDIF	4-band parametric, bell, shelf + dedicated HPF and LPF	Touchscreen, mouse	8	All types	Up to 5.1 monitoring; work surface features one knob per function; high-resolution color touchscreen; 10-bit fader resolution, touch-sensitive faders; machine control
Balanced analog; AES/EBU, SDIF, MADI	5-band parametric, bell, shelf + HPF and LPF	2 motorized joysticks plus rotary pots	24	All types	Up to 7.1 surround monitoring; five different equalizer types; up to 1.2 seconds of channel delay; four different compressor types including GML; machine control
Balanced analog, AES/EBU, TDIF, ADAT optical, MADI	4-band parametric, bell, shelf, filter + dedicated HPF and LPF	Joystick and/or rotary pots	up to 20	Gate & compressor	Offline automation editor; simultaneous stereo, LCRS, 5.1 and 7.1 monitoring; interactive color touchscreens; 40x8 monitor matrix; virtual stems
Balanced analog; AES/EBU, TDIF, ADAT optical, MADI	4-band parametric, bell, shelf, filter + dedicated HPF and LPF	Joystick and/or rotary pots	up to 20	Gate & compressor	Offline automation editor; simultaneous stereo, LCRS and 5.1 monitoring; interactive color touchscreens; 32x6 monitor matrix; machine control
Balanced analog + HPF and LPF	4-band parametric/shelving automated fader	Rotary control and 2 stereo	6 mono,	All types	Selectable monitoring modes and inserts for downmix and matrix decode selection
Balanced analog + HPF and LPF	4-band parametric/shelving	Rotary control and automated fader	6 mono, 2 stereo	All types	Full Scoring Surround Monitor section with integral bus/tape switching; programmable monitor matrix with 96x8 crosspoints
Balanced analog; SDIF-2, MADI, AES/EBU	4-band parametric,shelving + HPF and LPF	Rotary control, joystick, panpoint	8, plus 2 on pre-cub channels	All types	Selectable monitoring modes and inserts for downmix and matrix decode selection; multiple operator options for larger film applications
Balanced analog; SDIF-2, MADI, AES/EBU	4-band parametric/shelving + HPF and LPF	Rotary control, panpoint	12	All types	Selectable monitoring modes and inserts for downmix and matrix decode selection
Balanced analog	4-band parametric/shelving + HPF and LPF	Rotary control, joystick option	4 mono, 2 stereo	All types	Programmable monitor matrix (SL 8000) allows easy selection of different monitoring modes
Balanced analog; AES/EBU, S/PDIF, SDIF, ADAT, Y2, MADI, ATM	8-band parametric, shelf, HPF, LPF	2 motorized, touch-sensitive joysticks	up to 32	All types	Eight configurable knobs per strip; shared NEXUS router allows facility-wide I/O; up to four slave consoles possible; 10 Project Recall buttons restore favorite setups
Balanced analog, AES/EBU, S/PDIF, SDIF, ADAT, Y2, MADI, ATM	8-band parametric, shelf, HPF, LPF	2 motorized, touch-sensitive joysticks	up to 32	All types	Eight configurable knobs per strip; shared NEXUS router allows facility wide I/O; up to four slave consoles possible; 10 Project Recall buttons restore favorite setups
AES/EBU, MADI, ADAT, TDIF	4-band parametric, bell, shelving	Rotary knob, joystick	32 mono	All types	Multiformat monitoring up to 7.1; Virtual Surround Panning provides proprietary room + 16 stereo modeling per channel; multiple reverbs; central assign section with history buffer

THE SIMPLE TRUTH IS RADAR® 24 SOUNDS BETTER, IS EASIER TO USE AND IS MORE RELIABLE THAN ANY OTHER DIGITAL HARD DISK RECORDER. JUST ASK THE EXPERTS.



RADAR®24 FEATURES

- Export files to Pro Tools® and other DAW's
- "ADRENALINE™ Board" 192kHz recording engine with "TRINITY™ Chip"
- "NYQUIST™ 24-Bit world class high resolution converters
- Toll-free, 24 hr. 7 day a week, person-to-person tech support
- Fully compatible with RADAR® I and RADAR®II
- Optional professional remote with aluminium jog wheel
- No external computer required- just plug in any SVGA monitor
- Dedicated function keys - No endless scrolling through menus
- 24-channel digital I/O (you choose AES, TDIF or Lightpipe)
- All drives factory installed - Fully tested
- Real-time waveform rendering in record!
- Real-time, ultra reliable BeOS® operating system
- 2X DVD-RAM and high speed/capacity tape back-up options
- Integrated S/PDIF and AES 2 ch digital I/O
- Integrated 100-BaseT Ethernet for networking
- Control RADAR® 24 from your MAC® or PC via MMC
- Integrated SONY® 9-pin machine control
- Full timecode sync (SMPTE/EBU and MTC)
- RADAR® 24 is Soundmaster® ION compatible
- Outputs 24 analog and digital signals simultaneously.
- Assign any track input to be digital or analog.
- Accesses up to 36,000 Gigabytes of Hard Disk Storage
- Link up to eight RADAR® 24's with RADARLINK®
- Many more features listed at www.recordingtheworld.com

"Hey, if it was good enough for U2 to record "Beautiful Day," it is good enough for me." *- PRO AUDIO REVIEW*

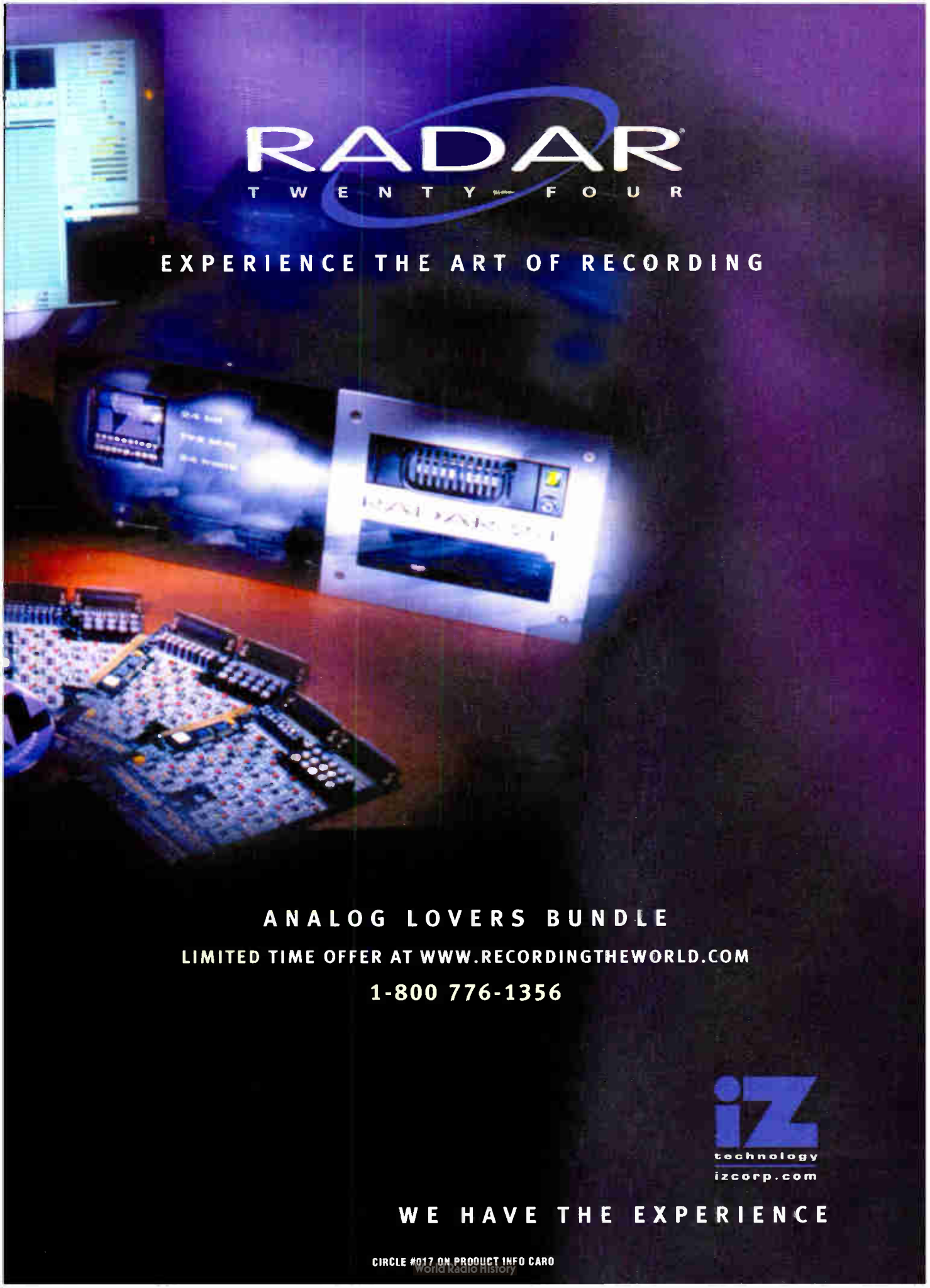
"The iZ Technology Radar 24 sounded absolutely incredible at 96 KHz!" *- AUDIO MEDIA MAGAZINE*

"RADAR is the most analogue sounding digital recorder. It is stable as a rock and brilliantly designed by an expert team that know their audio" *- JOHN ORAM "FATHER OF BRITISH EQ"*

"The sonics are superior to everything else I've ever used." *- TONY SHEPPERD (BOYZ IIMEN, BARBARA STREISAND, BACKSTREET BOYS . . .)*

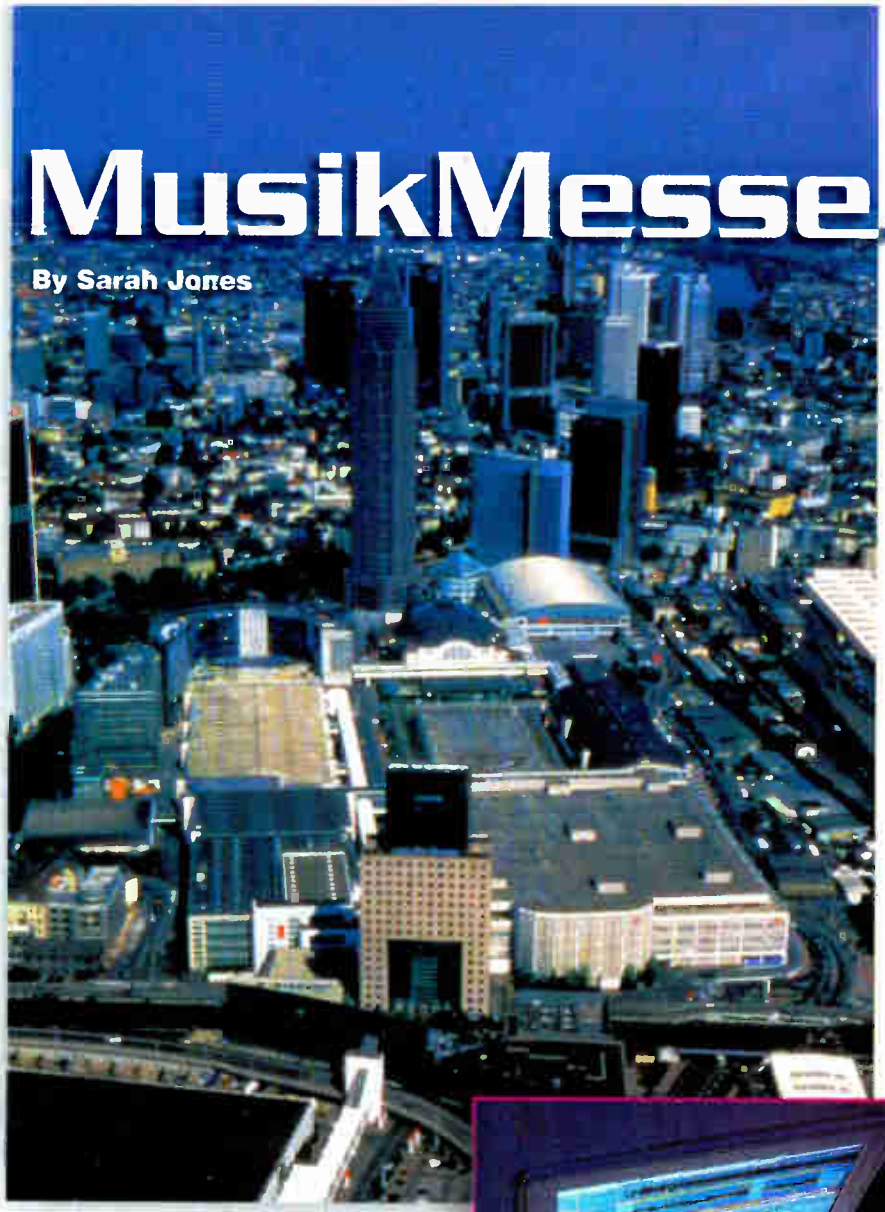
"If you want to catch a glimpse as to where our industry is headed look no further than the iZ Technology RADAR 24 . . . they also offer a service hotline staffed by devoted users. Hopefully other manufacturers will follow their lead." *- SURROUND PROFESSIONAL MAGAZINE*

"RADAR 24 sounds excellent . . . Bottom line, RADAR 24 does what it has always set out to do; bring the high quality sound and simplicity of a tape recorder to the world of digital recording." *- RECORDING "MAGAZINE FOR THE RECORDING MUSICIAN"*



MusikMesse REPORT 2001

By Sarah Jones



Mackie Logic Control

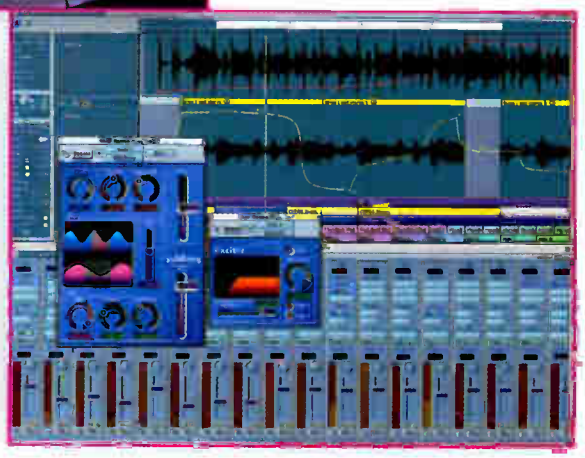
PRODUCT HITS FROM FRANKFURT

March brought dueling trade shows: While the NSCA Convention went on in sunny Orlando (see report on page 44), those wishing to maintain studio tans checked out the hottest new software, hardware, instruments and audio gear at Frankfurt MusikMesse 2001, the granddaddy of music trade shows, from March 7 to 11. With more than 2,100 international exhibitors in nine exhibit halls, there was something for everyone. Here are some of our favorites...

One of the biggest introductions at the show had to be **Mackie's** (www.mackie.com) hardware controller for **Emagic's** Logic Audio. The first product of the strategic partnership between Emagic and Mackie, Logic Control has eight 100mm motorized, touch-sensitive P&G faders, Mackie's rotary V-Pots, and transport and jog/shuttle wheel controls. The controller provides for hands-on adjustment of hundreds of MIDI and audio functions, with simultaneous control over multiple parameters of software instruments and plug-ins. Up to 128 channels can be addressed via bank-switching, and two Logic Control XT extender fader packs can be added for 24 simultaneous motorized fader controls. The Logic Control base unit lists for $799, and is expected to ship next quarter.

Meanwhile, Emagic (www.emagic.de) debuted Logic Audio 5. The redesigned automation is now tied to individual tracks, with 32-bit fader values, and automation data can be copied or moved with objects. Logic plug-ins keep on coming: Logic Platinum 5 now has more than 50! In addition, 24 Audio Instruments are supported in Platinum 5, and hardware-independent scrubbing and high-end dithering have been implemented.

iZ Technology released Version 3.1 software for RADAR, which makes it compatible with other DAWs, with a new Export to Broadcast Wave and .WAV2 function; exported projects can be loaded onto computers equipped with a DVD-RAM or standard DVD-ROM drive, and then dragged and dropped directly into workstation applications for mastering or mixing. The 3.1 release adds the ability to transfer files between multiple RADAR 24 machines via Ethernet, and iZ also announced Version 2.50 upgrade to RADAR II, free to all Otari RADAR users. Version 2.50 features enhanced graphics, accommodation of multiple SCSI backup devices and Macro import and export, and many improvements made during RADAR 24 development. Either upgrade is available at iZ's Website, www.recordingtheworld.com.



Emagic Logic Audio 5

Shipping this quarter, **Steinberg**'s (www.steinberg.de) Nuendo 1.5 offers editing enhancements developed for both music and post-production. These include Open TL import/export for Tascam MMR-8 dubbers, Premiere EDL import, and support for additional audio file formats like MP3 and video options such as DirectShow. Full VST 2.0 support is also provided, and V.1.5 is fully compatible with Steinberg's new HALion software sampler. The Nuendo Surround Edition is a set of six plug-in tools designed exclusively for Nuendo, offering multichannel compression, EQ, reverb and more. Finally, the new Nuendo 8 I/O 96k offers sampling frequencies up to 96 kHz, dithering and storage of all settings.

Celemony (www.celemony.com) says its Melodyne software will extract notes from mono audio tracks and let you then edit melody, pitch, duration, formant and transitions. Melodies can be recorded directly into Melodyne or imported. Once in the Melody Editor, notes can be grabbed and moved to any pitch or time position. Phrasing is preserved, but vibrato and transitions can be edited (getting that Cher sound, for example). Up to 20 tracks can be processed in real time. Melodies can be saved as MIDI files, or pitch and amplitude information can be exported. Melodyne supports ASIO2 and hosts VST1 plug-ins.

The **Behringer** (www.behringer.com) V-Amp marks its entry into the funky-looking-amp-modeler market. This guitar body-shaped box has 16 amp models emulating classic guitar amps, with settings like Brit Class A and Tweed Combo, with 15 cabinet simulations and stereo effects including delay, chorus, flange, tremolo, compression, rotary speaker emulation and more. Retailing at $269, the V-Amp comes with dual footswitch and gig bag. Now all it needs is a fretboard.

Pulsar XTC is **CreamWare**'s (www.creamware.de) new VST-compatible DSP hardware/software system. The PCI card adds six 32-bit SHARC processors and four I/O options, each providing up to 28 I/Os and 24-bit/96kHz resolution. (The processing power is scalable with additional DSP cards.) Software includes more than 30 effects plug-ins from the SCOPE/SP system and an assortment of virtual instruments, including Vectron Player, based on vector synthesis. Pulsar XTC includes CreamWare's new Volkzämpler, which allows sampling at up to 96 kHz with 32-bit resolution, an extensive graphical editor and compatibility with a variety of standard formats. List is $999.

Behringer V-Amp

Audient (www.audient.co.uk) showed the ASP 510 console surround controller. The remote unit offers comprehensive control of monitoring and record functions for surround formats, including 5.1, LCRS, Dolby Surround, DVD-Video, DVD-Audio, SACD and DTS. The ASP 510 integrates with any console and supports three 6-channel and three 2-channel sources, a 6-channel speaker output, and 2-channel and 6-channel recorder outs.

Creamware Volkzämpler

Waves (www.waves.com) demoed its new Renaissance Bass plug-in for TDM and Mac native (Windows on the way) platforms. The Renaissance Bass technology is the second-generation MaxxBass algorithm for pychoacoustic bass enhancement, with a simplified user interface.

Native Instruments FM7

Berkley Integrated Audio Software (www.bias-inc.com) introduced Version 3.0 of its Deck multitrack audio workstation. This upgrade enhances Deck's real-time effects capabilities and updates the user interface. Following the recent release of Deck 2.7, which added ASIO support, Deck 3.0 offers support for VST and a completely redesigned graphical interface. Deck 3.0 will be available this quarter, for a suggested retail price of $399.

VIRTUAL SYNTHS KEEP COMING!

Of course, no visit to MusikMesse would be complete without checking out some cool software synths: **Native Instruments** (www.native-instruments.de) showed the FM7, which re-creates good old FM synthesis and adds distortion, filter operators, modulation, effects and more. The FM7 can read and reproduce sound libraries from the original DX7, DX7-II, DX11, TX81Z, DX21, DX27, DX100 and TX802. It runs either as a stand-alone or as a plug-in, supporting VST 2.0, Dxi, DirectConnect, MAS and ASIO. Absynth, another new software synth from NI, offers graphical breakpoint envelopes, multiple synthesis techniques, MIDI and modulation. Our coolest-swag-of-the-show award goes to Native Instruments for handing out free absinthe (the green liquid kind) at the booth.

Emagic announced lots of new software products, but our favorite was the ES2 synth, with up to 16-note polyphony, three oscillators per voice (oscillators 2 and 3 can sync to oscillator 1), and analog and digital source waveforms, including FM, Ring Mod, Noise and more. A time-based effects processor offers chorus, flanging and phasing. Emagic also introduced the EVO20 multiband vocoder/formant filter for Logic Audio and EVP88, a vintage electric piano synth. **Steinberg** announced **Waldorf** Attack, a VST percussion synth (featured on page 110).

The **VirSyn** software synth combines analog and digital synthesis with physical models, with a user interface that navigates through an 8-dimensional sound space. Up to 12 modular synthesizers can be used simultaneously; effects are included. Check out www.virsyn.com for more information.

Look for more cool stuff from MusikMesse in our regular product columns in future issues. Next month: hits from NAB! ■

REPLItech 2001

Audio, Video and the Next New Format?

By Dan Daley

REPLItech, the media manufacturing show, celebrated its 10th anniversary at the Los Angeles Convention Center in February. Ironically, the Grammys were presented right next door, at the Staples Center, on the second day of the show, so the people who make the music were a stone's throw away from the people who make their CDs, DVDs and MDs, audio cassettes and videos. And soon, their DVD-As and SACDs.

This stew of three-letter acronyms rubbing shoulders with the glitterati of the music business is more than coincidental. For the past few years, REPLItech has given the recording industry a peek under the hood of format developments.

This year's North American show (REPLItech also has a European and an Asian edition) had one panel dedicated to audio: The topic was mastering and authoring for high-resolution audio formats, specifically the still-nebulous DVD-A and the Sony/Philips-backed Super Audio CD. Panelists included mastering veterans Bernie Grundman and Steve Hall, VP and chief engineer of Future Disc Mastering, respectively, and Paul West, senior VP of studio operations at Universal Music in Los Angeles.

Grundman, Hall and West all bemoaned the shortage of authoring tools for DVD-Audio and were particularly critical of Sonic Solutions' software packages, which Hall described as "bare-bones and very inadequate." He also described the DVD-A authoring and mastering process as laborious, noting that several projects he has done have taken as long as three weeks of studio time. "You're literally writing code as you go along, because the tools aren't there yet," he says.

Perhaps it's just as well that there are few DVD-A titles and a virtually nonexistent market. West, whose operations are part of the Universal Music Group holdings, declined to address that label's plans for DVD-A titles, but was in agreement with other panelists that DVD-A is a victim of corporate politics and intramural confusion as much as anything else.

Grundman, who opened a satellite mastering facility in Tokyo four years ago, pointed out that in Japan, a trend seems to be emerging to use the basic DVD-V format as a music product. "In Japan, where the prices of CDs are still high, they seem to like discs with three or four songs and some video on them," he explained. "The regular DVD format is fine for that. Also, there's no market [in the U.S.] for CD singles anymore. But in Japan, it's a big product." Likewise, Sony's MiniDisc format never really caught on here, but it's a resounding success in Japan and certain other parts of Asia. The Video CD (VCD), a highly compressed video format on a Red Book-type disc, is virtually unknown in the States but is the format of choice for the 1 billion-plus Chinese market and has been for over a decade.

If there was an overarching mood at this REPLItech show, then it was concern about the dramatic slowdown in the media manufacturing industry over the last year. Despite record numbers of replicated discs, of all types, the unit price has plummeted, with packaged CDs now routinely selling for under 20 cents on large-volume orders—often not enough to even cover the patent royalties on discs.

DVD disc prices have also dropped sharply, and the entry late last year of two major Taiwanese DVD replicators into the U.S. market (Ritek and Infodisc, the latter being the world's largest DVD maker) has increased pressure on U.S. disc makers. Another depressing factor is the recent lackluster sales figures for music and film titles. The ripple effect of these events has been felt throughout REPLItech's constituency, including heavy equipment manufacturers who make CD production lines—the prices of which have dropped significantly—and the used equipment market, which has seen a flood of CD-R and, to a lesser extent, CD manufacturing equipment. "You want CD-R equipment? I can have 20 lines on your doorstep tomorrow," cracked Larry McGowan, sales manager for Canadian equipment reseller Targray.

And the tide of new formats continues. One of the more interesting ones is DataPlay, a micro-optical disc and drive combination about the size of a matchbox. DataPlay's storage is impressive, at up to 500 MB per disc, which translates to about five hours of "CD-quality" music or 11 hours of MP3 data. The format allows for both prerecorded and recordable portions on the disc and includes Internet links for downloading. The company intends to position the DataPlay disc and its drive in a number of markets, including cell phones, e-books and video games, but the company clearly signaled that music is the first frontier it must conquer.

Remember the drive for a single universal and reliable format for everything? Maybe next year. ■

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SO YOU WOULDN'T HAVE TO.

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NSCA Expo 2001

New Ideas, New Directions, New Products

By Mark Frink

Appropriately located between the "Travel & Leather" and the "Electronic House" trade shows in the cavernous Orlando Convention Center, the 21st Annual National Systems Contractors Association show had a few surprises and the fruits of several emerging trends in live sound. From March 8 to 10, 2001, a record-breaking crowd of nearly 11,000 people attended the show, which also marked the first year that NSCA allowed larger booths, giving the show a more polished, professional appearance. For those who didn't attend, here are a few highlights...

Turbosound co-founder Tony Andrews' decades of designing speakers have culminated in the new company Funktion-One (www.funktion-one.com) and its Resolution line. Though the first impression is the familiar heritage of previous products, these speakers are infused with a subtle color and a host of refinements: light-weight, high-efficiency, startlingly clear vocal reproduction and simple, yet elegant flying hardware characterize the Resolution speakers. Distributed in America by Carl Taylor's Zag Inc. (so named as a humorous allusion to the direction the rest of the industry has taken).

Front and rear views of Meyer's M3D line array show the front- and rear-firing woofers.

Radia Pro Systems' (www.radiapro.com) new Z-190 is a six-feet-tall, 5-inch wide ribbon driver with a fidelity similar to Stage Accompany's successful Compact Driver and the dispersion of a line source: a stunning combination. The use of Neodymium magnets and Kaladex™ diaphragms offer a line source rated at 750 watts with a maximum SPL of 118 dB. Though it reproduces frequencies down to 100 Hz and was demonstrated with full-range jazz playback, its polar characteristics and the mechanics of cylindrical wavefront propagation suggest crossovers above 500 Hz in combination with LF cone line arrays. Three shorter models are 50, 40 and 28 inches tall.

L-Acoustics (www.l-acoustics.com) unveiled the dV-SUB, a 27-inch cube with triple 15s in a dual-vented, 2.7-ohm bandpass configuration weighing 200 pounds. Designed with the same width as the company's compact dV-DOSC, they can fly above in a separate column or provide a convenient base for ground-stacked applications. Equal in height to three dV-DOSCs, a 3:1 ratio is recommended.

Peak Audio (www.peakaudio.com) released CobraCAD software and saw several new products join its growing family of CobraNet digital audio products that use low-cost 100BASE-T Ethernet components for system integration. Up to 64 channels of 48kHz, 20-bit audio can be sent in each direction over a CAT-5 or fiber link.

JBL MPro Series

Crown (www.crownaudio.com) introduced the IQ-PIP-USP2/CN module, which, when installed in Crown's Com-Tech 10 Series and Macro-Tech 02 Series amps, creates the industry's first CobraNet-compatible amplifier. Onboard processing includes alignment delay and eight filters per channel. It also connects the amp to an IQ System for control and monitoring.

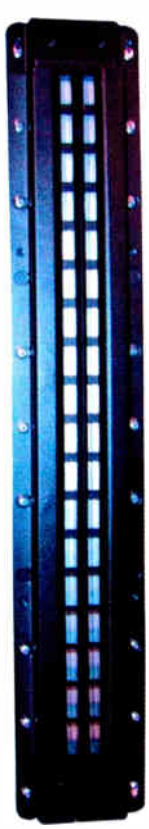
Whirlwind (www.whirlwindusa.com) debuted its DCS88 (DigitalContracting Series), a small, brick-shaped digital audio transceiver with eight mic or line analog inputs and eight analog line outputs on Phoenix connectors. A small power supply injects low voltage from up to 100 meters away on the same CAT-5 network cable. Whirlwind plans a larger DTS Cobra Snake later this year.

SIA Software's Smaart Live Version 4.5 adds cool new features. Available as a downloadable upgrade from www.siasoft.com or a fully operational, 30-day demo CD-ROM, it now includes magnitude thresholding, coherence blanking, vector averaging and phase smoothing. Recently added remote-control devices include the Symetrix 9022, Biamp's MSP Advantage and

Mackie's DX8 mixer, with the Sony SRP-F300, BSS MiniDrive and dbx DriveRack coming soon. AcousticTools V.4 now features a new interface and interconnectivity with SmaartLive.

Sabine's (www.sabine.com) new True Mobility 2.4GHz spread spectrum wireless systems operate in a trouble-free RF band that is internationally accepted, and up to 50 systems can operate at once. Onboard SHARC-based processing offers mic capsule SuperModeling, automatic de-essing, compression, 10 FBX feedback filters, 10 user presets and an optional network interface with AES digital output. Available with single- and dual-channel receivers, and a companion-active, antenna-distribution amp supports 12 channels.

This was perhaps the last good chance to get into the line array business, and four exhibitors made it under the wire, with products just in time for this year's touring season. **Meyer** (www.meyersound.com) unveiled its M3D two-way line array with a performance by Delbert McClinton. The 400-pound, self-powered enclosure has a pair of 15s on the front, a CQ horn in the center and another pair of rear-firing 15s. **EAW** (www.eaw.com) demonstrated its three-way, 200-pound KF 760 line array enclosures with a concert by the fabulous Monhegan Sun All Stars. At each end, an LF 12 is housed in a tuned, vented enclosure with a tall, wide aperture, and between these are a pair of horn-loaded 10s and a pair of 2-inch compression drivers. **McCauley** (www.mccauley.com) announced a three-way line array system with a few details, and **E-V**'s X-Line has been re-engineered since its outing last year with Diana Ross.



Radia Pro Systems Z-190 6-foot ribbon driver

JBL (www.jblpro.com) launched its MPro lines of two-way speakers with optional passive and active subwoofers—the latter has internal amps and signal processing built by Crown Audio. The full-range models feature molded front baffles that integrate horn, ports and woofer mounting. The MPro Series 200 includes the MP215 (with 70°x70° horn, 1-inch HF driver and 15-inch woofer) and the MPro MP255S dual-15 sub in an innovative bandpass box. The first MPro Series 400 models are the MPro MP410 10-inch, two-system, and the MPro MP418, a powered, single-18, bass-reflex sub—all with a Duralex finish.

In other speaker news, **Klipsch** (www.klipsch.com) announced an alliance with the Hard Rock Cafe to place Klipsch systems in HRC hotels, venues and restaurants worldwide. The agreement may include future co-branded retail products bearing the names of both companies.

Checkpoint (www.checkpoint3d.com) showed its Sound Alignment Systems line of precision laser tools. The LG-120 laser line generator has a calibrated quartz beam-spreader that adjusts from 15° to 120°, aiding in coverage prediction. A magnetic base allows it to stick it right onto a speaker grille. Another model that speaker manufacturers should inquire about is permanently installed inside a speaker cabinet and activated with a contact closure.

Next year's NSCA Expo comes to Denver April 25 to 27, 2002. More information will be available at www.nscaexpo.org later this spring. ■

Mark Frink is Mix's sound reinforcement editor.

Hits You Might Have Missed

With 500 booths to see over three days, NSCA had plenty to check out. Here are some items you may have overlooked.

Rockustics' OmniPlanter

• **Rockustics'** (www.rockusticsinc.com) OmniPlanter is a 2-foot high by 2-foot diameter, floor-standing imitation terra-cotta planter housing a down-firing 8-inch co-ax that provides 360° sound.

• **Marshall Electronics'** mic division (www.mxlmics.com) showed a built-in, 5-inch LCD video display panel, Mic Mute switch and an optional gooseneck mic.

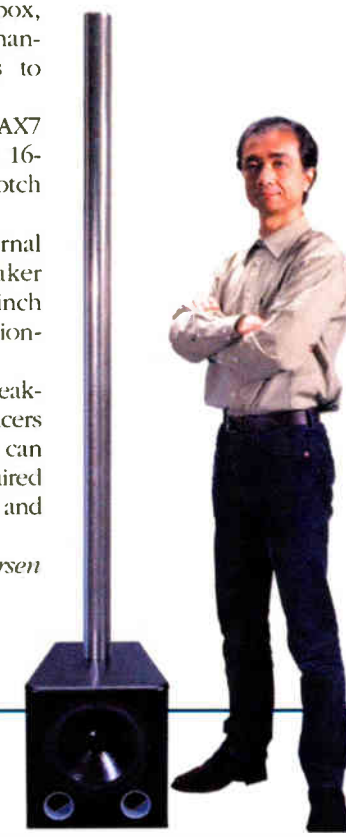
• **Radial Engineering's** (www.radialeng.com) Spider is a 48-channel house snake with a central stage box, with eight 12-channel sub-snakes to mics and thrus to the monitor board.

• **Rapco's** Sweet-T tube DI employs a 12AX7 tube for a warm sound. Features include 16- and 40dB pads and sweepable cut-only notch filters for lows and highs.

• **Technomad's** (www.technomad.com) Vernal compact 9x6x6-inch, weatherproof speaker comes in 12 colors and is loaded with a 5-inch woofer, a horn-loaded HF driver and an optional 70V transformer.

• **i-TEK's** (www.fps-inc.co.jp/itd) Pipeline speaker uses a vertical array of flat-panel transducers within a 3-inch diameter tube. The speakers can be used alone for unobtrusive installs or paired with an optional sub that doubles as a base and extends response to 34 Hz.

–George Petersen



i-TEK's Pipeline speaker

ANI DIFRANCO

Stretching Beyond the Periphery

PHOTO: RHEA ANNA

I'm no heroine
Least not last time I checked
I'm too easy to roll over
I'm too easy to wreck
I just write about what I
Should have done
I sing what I wish I could say
And I hope somewhere
Some woman hears my music
And it helps her through her day.
—"I'm No Heroine"

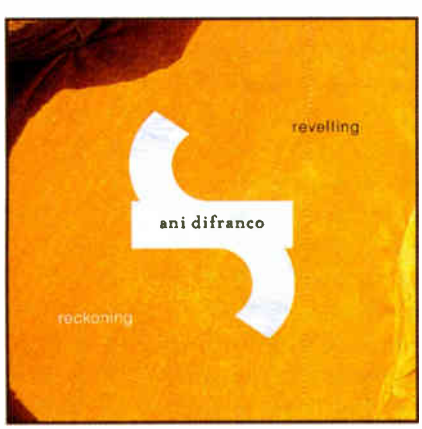
by Sarah Benzuly

While the rest of the world was listening to the likes of Janet Jackson's "Escapade," New Kids On the Block's "Step by Step" and Wilson Phillips' "Hold On," indulging themselves in everything pop in 1990, a folksinger was making her way around small clubs and coffee houses, constantly touring and exposing a new generation of music fans to a different side of the tracks—her vision of reality. Preaching her own gospel, Ani DiFranco's first albums brimmed with an awareness of the sociopolitical/economic situations in her hometown of Buffalo, N.Y., and across the nation. Crowds flocked to see this energetic, charismatic singer/songwriter expose a social consciousness that seeped through poetic melodies and the seemingly casual strumming of an acoustic guitar.

DiFranco is a woman determined to be heard. Since 1990, she has released 13 self-produced albums, including two collaborations with storyteller Utah Phillips. With each release, she delivers compelling rhythms and harmonies that extend into the areas of rock, punk and spoken word, but always find a home in the folksinger way of life—keeping it simple and honest and doing it all on her own. Despite her tremendous accomplishments, many critics have found DiFranco's lyrical style too aggressive, too far removed from the mainstream. And they've found their ammo within her lyrics—in their sometimes stark realism.

Certainly, much of DiFranco's success has come from the appeal of those lyrics. "I don't know how people take [the lyrics], it's a bit of a mystery to me," DiFranco says. "I suppose each person hears things differently. In terms of being a poster child [for feminism], there are probably ideas about self-empowerment or about becoming one's self that are attractive or exhilarating to young women who maybe are just becoming acquainted with those feelings for the first time. Like, 'Maybe I don't have to put up with this,' or 'Maybe I don't agree with this,' or 'Maybe I want to wear this.' So I guess there is room for a pretty visceral emotional response there. Themes of self-empowerment or even just self-questioning or exploration come up a lot in my songs."

Recording since she was 20, this prolific singer/songwriter/musician/producer infiltrated the music scene from the fringe. She never signed with a major label, opting instead to create



her own record company, Righteous Babe Records, which allows DiFranco to have full control over her artistic ventures. Now, too, the label also hosts other artists DiFranco believes in, including the DiFranco-produced Drums 'n' Tuba. The label has grown to become a touring company, a management company, a music publishing company and the Righteous Babe Foundation, a nonprofit organization that seeks grassroots solutions to real-world problems.

Working against the mainstream, DiFranco has nonetheless managed to make her presence known in the music industry. Besides touring successfully year after year, her last four albums have made *Billboard*'s Top 200, and her double live album, *Living in Clip*, went Gold. She has received six Grammy nominations and was included in VH-1's "100 Greatest Women of Rock," which called her "one of the most influential musicians of the 1990s."

Her latest effort, *Revelling/Reckoning*, another double-disc CD, finds DiFranco expanding in yet another direction. The addition of a full band creates a problematic hurdle for critics wishing to simplify her and keep her on the fringe. And, at the same time, the release creates yet another reason why fans love her—DiFranco steadfastly fails to compromise her artistic vision.

"I've got a new, improved and expanded band. I've got a horn section now, so that's pretty new for me," DiFranco says. "I've always had a huge hard-on for brass, and two summers ago, I did a tour with Maceo Parker [who has worked with DiFranco on the past couple of CDs, including the new release], and after a month of hanging with him, playing, sharing music together to the point of no return, it was like, 'Oh, now I have to have my own horn section.' So this is the first record with all six of us; my band."

The new and improved band on the record consists of multi-instrumentalist DiFranco on her usual acoustic and electric guitars, as well as some drums, bass, tamboritza, tongue drum, shakers and keys; Shane Endsley on trumpet and vocals; Daren Hahn on drums and vocals; Jason Mercer on bass, kazoo and vocals; Hans Teuber on reeds (flute, saxophone, clarinet) and vocals; and Julie Wolf, a longtime fixture in DiFrancoland, on keyboards and vocals.

But even with the addition of new instruments and talents, DiFranco

Ani DiFranco and sound engineer/tour guru Andrew Gilchrist

She just blows my mind. How fluid, so natural, it just comes out of her, and my job is just to keep up, speed-wise. And the hours we spent in the studios—there were times when I would say, "Hmm, it's light again. I think we should stop."

–Andrew Gilchrist

ANI DIFRANCO
Stretching Beyond the Periphery

sticks to what she knows best: maintaining her edgy folk sensibilities on *Revelling* and clinging to her acoustic guitar on the mostly solo acoustic second CD, *Reckoning*. And, as on previous releases, DiFranco continues to take control of her musical destiny by planting herself behind the console.

"Initially, and certainly for the first 10 years, [I produced my records] out of necessity," DiFranco recalls. "I was making recordings without a record company and with no big record company to hire a big producer man. It's not like I had some guy around saying, 'Oh, I know how to do this.' So, I was like a lot of young, independent musicians making their own recordings—I just made it up. And certainly, for the first five or eight albums, I had absolutely no facility with machines at all. I walked into a recording studio and I was your typical artist—'I sing and play guitar. Tell me where to sit.' And then, even as I started to become familiar with, 'Okay, what's a preamp and what's a compressor and how does this work?' it took me many years to develop an aesthetic. Like, how do I want my guitar to sound? So the first seven records, all the sounds and the sensibilities of the recording had to do with the engineer who was there. He would choose the mic. So, basically, my involvement in mixing at that time was level setting. Over the years, I started to find my way around patchbays, and I started to understand being able to use gear and also develop a sense of involvement in the recordings.

"At this point, I'm just beginning to have a facility of my own in the studio, and it's a journey. That's another outlet of creativity—the recording studio—and for learning. Now it's not so much out of necessity, but it's because it's another thing that I can do," she says with a laugh. "And enjoy doing."

Since the mid-'90s, Andrew Gilchrist has been DiFranco's primary technical foil, working as an engineer for her both on the road and in the studio. That studio work, he explains, is usually ongoing rather than tied to a specific project. "When people ask me how the album started...it never really did," he says. "There is no pre-production. It's continuing. There are things that I've recorded [during this album] that will be on the next record, and I don't even know it yet."

Whatever time frame (or lack thereof), recording the album took place at DiFranco's home studio, the Dust Bowl in Buffalo, N.Y., and, to a lesser degree, at an Austin, Texas, studio called the Congress House, where she'd worked on her previous album, *To the Teeth*. "This new record is the first one where most of it was recorded at home," DiFranco says. "Certainly, the second record, which is almost all just me—that was a 'middle of the night at home, wake up, turn on a tape machine' kind of situation. It's such a luxury to be able to work any time. The Congress House is a studio that I've been going to for so many years now; it's been at least five. And it's just a really small, unassuming, little studio in a tiny little house. It's just really comfortable."

PHOTO: RHEA ANNA

> That's another outlet of creativity—the recording studio—and for learning. Now it's not so much out of necessity, but it's because it's another thing that I can do, and enjoy doing.
>
> –Ani DiFranco

While the record was still a work in progress, coming together throughout the last tour, DiFranco was rarin' to go when she walked into the studios. "As soon as I write songs, I start teaching them to the band because we are always touring," DiFranco says. "By the time we hit the studio, the songs are fully formed in their arrangements. Some songs start with a guitar riff, and even some on the new record started with a rhythm—a drumbeat or kind of a bass line—and then some of them start with words. It's different all the time. It really depends on where the song lives, what its focus is. Certainly the second album, *Reckoning*, which is a very folk album—it's very quiet, acoustic, mostly solo songs, so, of course, those really focus around the meaning and the words a lot more."

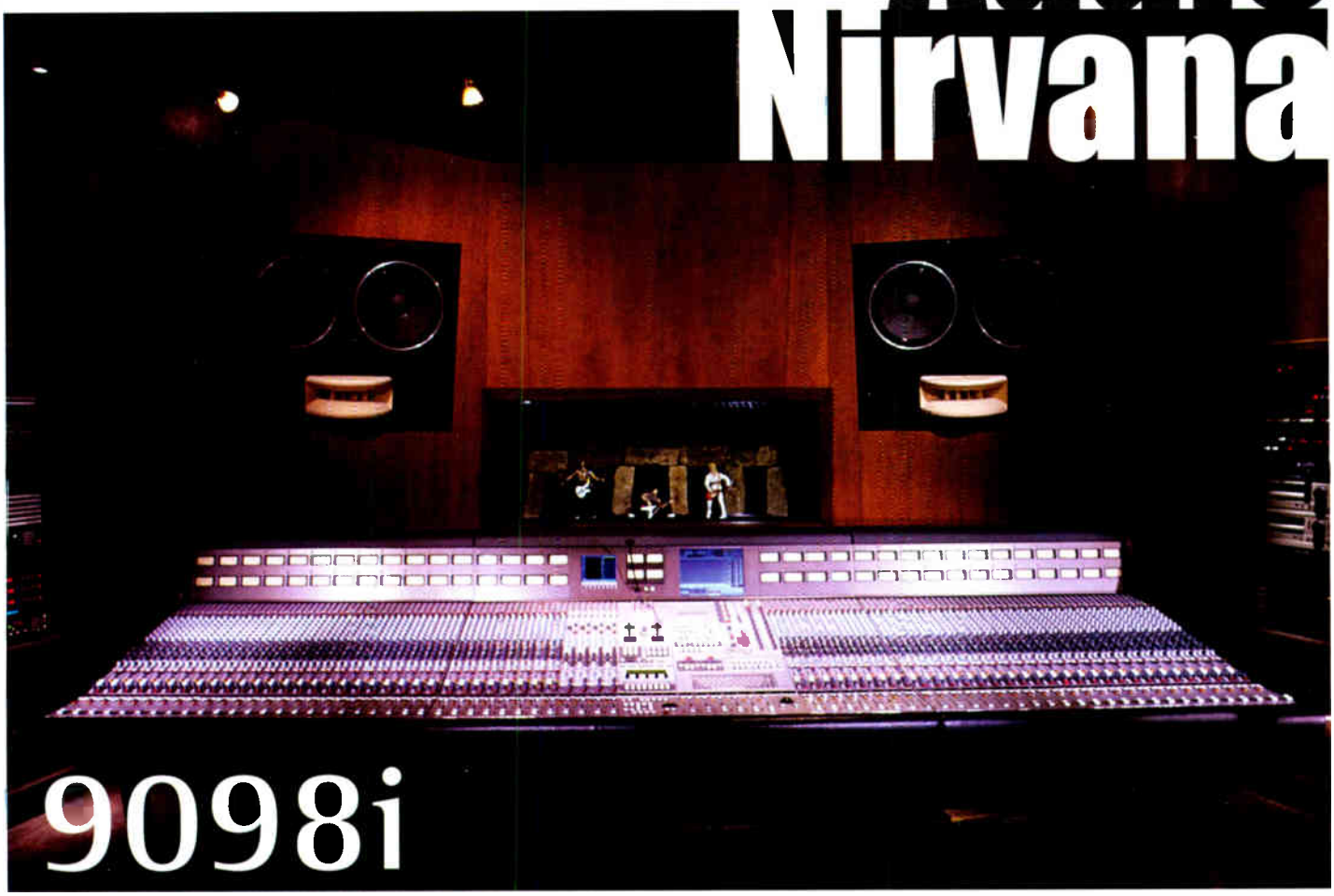
The CD was recorded over the course of a year and, again, working within that "keeping it real" sensibility, DiFranco opted to record direct live to tape, except for most of the second disc, "which, of course, is just a lot of overdubbing, because it's just me," she says. But the band disc was cut live in the studio: "That's my great luxury of having my band and all these musicians: We have the ability to go live to tape and capture performances, rather than this business of overdubbing.

"I think that when I first started making records," DiFranco continues, "there was a lot of overdubbing involved, 'cause that's how I was told to make records. It took me a bunch of years to figure out a lot of stuff for myself, like, 'That's dumb' and 'That doesn't make for good recordings.' I have a problem with the perfectionism side of the studio. I have all of these albums [I've done] and dubious versions of otherwise decent songs. My solution the past few albums has been to record direct live to tape, because I can only play a song a few takes before I'm bored."

Like all of her previous albums, *Revelling/Reckoning* comes complete with in-studio banter, casual moments where DiFranco is caught on tape not knowing if tape was rolling, screwing up lyrics and just having a ball in the studio.

According to Gilchrist, "Traditionally, we make recordings really quickly—just put the stuff down and do it. We'll do the songs a bunch of times. We'll start in Buffalo [at the Dust Bowl], record the

Audio Nirvana



"My choice for the AMEK 9098i was inspired by opportunity and the desire to run ahead of the pack. I was absolutely stunned by the sound of the desk. The power and fullness reminded me of the older Neve modules I've collected over the years. Beyond the sound, in one afternoon, I was able to mix like I was used to mixing and more! The automation package is as engineer-friendly as it is comprehensive, plus I've got dynamic options on every fader!!! It was a dream come true, finally a console with the sonics akin to my old Neve modules, combined with the automation power of an SSL!! Audio nirvana is here! I was receiving calls to book the console before it was even installed!!"

Jim Zumpano, Owner
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songs, have a band session, track the tunes, tour, book studio time in Texas [at the Congress House], do the same songs as if we never did them before." In the end, many of these songs on the new album were tracked three different times in different studios, and then DiFranco chose the version of each that she liked best. There were, not surprisingly, some variations in equipment and even recording format from studio to studio. For instance, some of the songs were recorded to 2-inch analog, but most of the album was tracked to ADAT and edited in Pro Tools.

"As soon as Ani is playing, I'm recording," Gilchrist says. "Even imperfections, personality or weird takes. We'll create dozens upon dozens of tapes just in one week. We're not gonna tweak until it's 'perfect,' and I guess that goes back to folk music—the feeling of real people making music. We try to come out of the studio as unbutchered as possible. She smokes me in the studio, which is my world, which gives credit to her hands-on experience in the studio.

"I just got into Pro Tools editing," he continues, "but I want to stay fairly basic. The idea of tracking to Pro Tools...I just don't want to go there—I'm scared enough of tracking on ADATs. We didn't do a lot of editing; just a few pieces. You know, the old-school style editing of just chopping sections if a song is too long. But we didn't do a lot of tweaking. With Pro Tools, the possibilities are scary. It's frightening how fast I can do it!"

The songs were recorded direct live to tape through either the Amek desk at the Congress House or the Soundcraft console at the Dust Bowl. Monitor pairs included Genelec 1031, Westlake BBSM 6, Yamaha NS-10M and Auratones. The equipment list also included an impressive array of outboard gear, including Avalon mic pre's, a Joe Meek compressor and much more. "A Tube-Tech [CL1B] compressor pretty much sat on the vocals," DiFranco says. "There are a couple of tube compressors always at work somewhere. TC Electronic has a new multi-effects [processor] called FireWorx that has come in real handy the past year of my life. We just got one, and it has *so* many different sounds; we've utilized it in all kinds of different ways. The Eventide H3000 SE is also a fave, which I use for all kinds of things—reverbs and delays and also the little Sampling function. Because I don't really have any sampling gear, if I want to make a loop, [I'll use] the H3000 or Jam Man."


PHOTO: SUSAN ALZNER

Ani DiFranco working her magic on the acoustic guitar

Gilchrist and DiFranco strive to keep the sound as natural as possible, but the engineer also notes, "We like to experiment a lot, try to get something that sounds like the studio that we're in. I like to use a lot of mics and experiment with different ones. I'm a self-proclaimed gear freak, but I like to set up with mics I already know. I like to use the Sony C800 tube mic, because it sounds like she sounds. I also use a Manley Gold Reference mic and an Audix 111 large-diaphragm condenser mic, because it sounds right for her voice. We'll use anything, depending on the song."

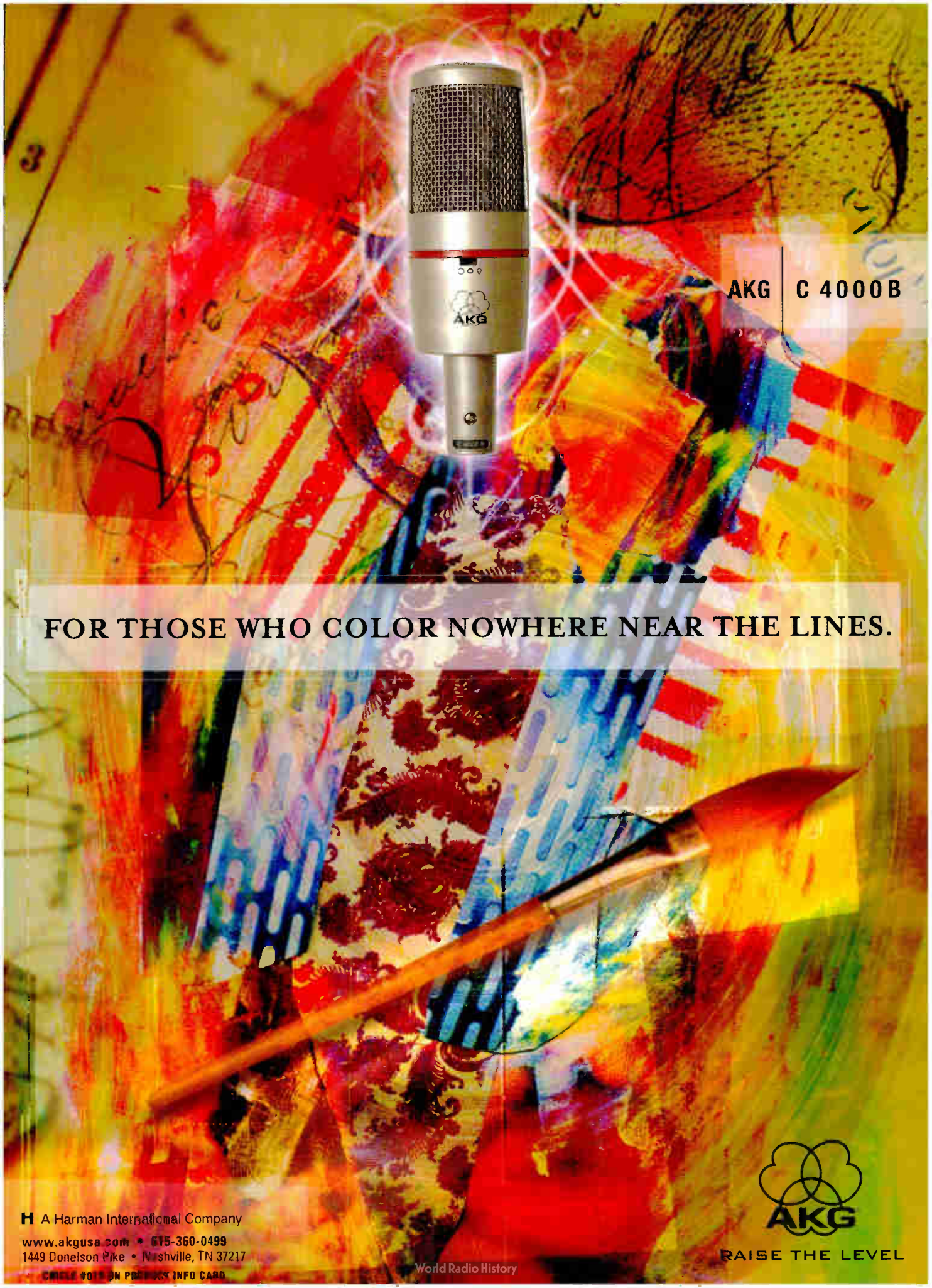
> We try to come out of the studio as unbutchered as possible. She smokes me in the studio, which is my world, which gives credit to her hands-on experience in the studio.
>
> –Andrew Gilchrist

"My vocal mic has been shifting depending on where we're recording," DiFranco adds. "Actually, all the mics are shifting. I'm constantly experimenting with guitar mics and overheads. There weren't really any same ones for the whole record. It changes based on the guitar and the song. But I've kind of fallen into this new thing this last year or two of two mics on the guitar to get a stereo picture of the guitar in the room. Generally, one of them is sort of underneath my chin and pointing down, and the other one I have kind of underneath the bridge pointing up. Not pointing at the guitar [with either]—I find all kinds of problems when I actually face a microphone at a guitar anywhere. It sounds boxy or boomy or dull. But I so love the sound of my guitar just as my head floats above it. Then I also take a DI, usually for a punchy bass. On a fourth channel, I usually send my guitar to an amp. Acoustic guitar through an electric guitar amp has kind of been my thing for a bunch of years. You can kind of shift it between a more amp-y and a more acoustic sound in the mix."

Gilchrist used a combination of room mics and close mics to record the new brass section. He found a Coles ribbon mic to be particularly good on brass. Other mics used throughout the recording sessions included Neumann TLM170 and -103, Royer R121 ribbon mics, and a plethora of AKG, Sennheiser and Beyer models. Gilchrist also tried working in different room settings to get more variation out of DiFranco's amps and vocal mics, including recording in the bathroom "for a great room sound."

DiFranco's friend Maceo Parker joined up with the clan at the Congress House, adding some vocals and saxophone to the new release. (Parker also appeared on *To the Teeth*.) "I've been a huge fan of his for years," DiFranco recounts, "and a couple of summers ago, I was going on an outdoor/shed tour, and we were looking for someone to open the show. And I was like, 'Well, why don't you try calling my musical hero?' We just called him up to see if he wanted to do some shows. He's been kind of family since then."

And, according to Gilchrist, recording Parker's sax couldn't have been any easier. "Just put a mic near him and you get his sound. We used condenser mics—I think a Neumann TLM170 and U87s. He always sounds



great; he's that good. I put up the track, let him listen to it in the control room, he goes into the room and just *does* it. He only does three takes and he's done. He tells me he's done and I'm like, 'Okay, that sounded great!'"

With all the recording finished, Gilchrist and DiFranco set out to pull the CD together and master the tracks, a process that turned out to be a revelation of its own.

"Mastering was scary," Gilchrist admits. "There were so many DATs. I had so many spreadsheets open that I had a hard time trying to keep track of things. [Ani] would add songs when we were listening to things in playback, because she felt that something was missing. So, she would just do it and I would run tape. I would walk into the studio each day and not have any idea of what we were doing that day—if it's an idea she has, screwing around or actually recording."

"Initially, I thought I was just making one record," DiFranco explains, "and then there were certain songs that didn't really want to be put into one box with other songs. And then I started to conceive of it as two records. At first, it was just gonna be *Reckoning*, and then the idea for the second record came to me. And the flipside of 'reckoning' was the idea of 'reveling.' I guess, basically, the songs ended up kind of divided thematically along those lines. The *Revelling* record has a lot more complexly produced stuff and a lot more band material. And then the *Reckoning* record is much quieter and simpler."

As with many projects, final playback exposed a few hidden surprises that, for the benefit of a natural sound, were kept in. "On one of the recordings," Gilchrist reveals, "if you listen way under the tremolo and electric guitar, you can hear a TV. We were locking ADATs up to rough cuts of this movie, and we didn't realize that we were going to get interference. But it sinked its way into the recording. We left it, but I can hear it now and say, 'Oh well.' But when we were dubbing for a sample CD for radio, I thought, 'Wow, this sounds really good.' Because in the past few months, I'm just hearing all those things that made me cringe.

"But this is a beautiful record," he continues. "She just blows my mind. How fluid, so natural, it just comes out of her, and my job is just to keep up, speedwise. And the hours we spent in the studios—there were times when I would say, 'Hmm, it's light again. I think we should stop.' I'm just glad that the record is done. It was getting to be so long.

"We'll just keep going, though. She's like no one I've ever worked with or ever encountered. Her level of concentration and speed of activity are unreal. I mean, the quality is really good and her writing is incredible. Also, her guitar work is strangely overlooked."

PHOTOS THIS PAGE: SCOT FISHER

Andrew Gilchrist and Ani DiFranco at DiFranco's home studio, the Dust Bowl, in Buffalo, N.Y.

As for Ms. DiFranco, she'll just keep doing what she loves and what her fans love her for: her powerful lyrics and melodies, the nearly hypnotic rhythms that seem to emanate from her without much effort. "I guess I'm most interested in writing what reflects someone's reality, because I think that there are so many stories all around us that don't necessarily find their way onto the TV," she comments. "I think the act of telling one's own story and broadening the palette of colors in a culture is a good place to start. I'm just doing what I do—touring and making records and otherwise living for music." ■

Sarah Benzuly is Mix*'s copy editor.*

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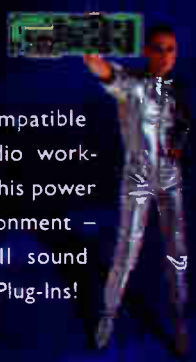

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ELLIOT MAZER

RENAISSANCE MAN IN A DIGITAL WORLD

Elliot Mazer has had a long, varied and distinguished career as a record producer, studio owner/engineer, entertainment technology company executive and audio consultant. Primarily known for his 30-year association with Neil Young, Mazer has also produced hit albums by Linda Ronstadt and Janis Joplin, worked on The Band's *The Last Waltz* film and album, and developed the AirCheck monitoring system, which automates the recovery of publishers' royalties from radio stations.

Most recently, Mazer has been working with Neil Young on a DVD-Audio reissue of *Harvest*, Young's chart-topping album from 1971. For Mazer's description of the recording of "Heart of Gold," the Number One single from *Harvest*, see Classic Tracks on page 198.

Elliot Mazer in Neil Young's Redwood Digital studio while mixing the DVD-A for Harvest.

I understand that you are mixing the* Harvest *DVD-A at Neil Young's Redwood Digital studio. Can you describe the technical setup?

I thought that it would be important for Neil to have a dedicated 5.1 monitoring system in his control

room that is reflective of what a consumer would have at home. He has a 5.1 soffit-mounted TAD system that works well for tracking and film mixing, but that's not really representative of current consumer 5.1 systems. Craig Street, a wonderful producer and longtime friend, talked to me about the stereo monitoring system that he carries between studios. He came over to my house and played a few of his projects on my new Parasound/Energy system. Craig concluded that my system properly reflected the subtle decisions he had made on his bigger system. Neil purchased a six-speaker system with Studio 100 speakers and associated power amps. This worked well, and the mixes we made sound good on other systems.

DVD-A has amazing potential. It enables the public to enjoy high-resolution recordings on relatively inexpensive consumer products. I am convinced that we will be able to buy complete DVD-A systems—with six speakers—for under $500 by Christmas 2001. Right now, the price point is around $650 for the complete system I use, which is a Technics A-10 and a Creative Labs Desk Top Theater 5.1 speaker system that cost me $139.95. I used it in my hotel room to review new mixes every night. It was very helpful.

Setting up Neil's studio for a 5.1 mix was interesting. We set up both digital and analog recording systems, using Genex MOD recorders for digital storage and an analog Studer 827 2-inch 8-track. We transferred the original masters to digital through PMI HDCD Model 2 boxes at 192kHz, 24-bit; the sound of 192/24 is amazing and very different from 96/24.

How is Neil's attitude toward digital these days? He made an impassioned speech on fidelity and "bad" digital at the TEC Awards event a few years ago.

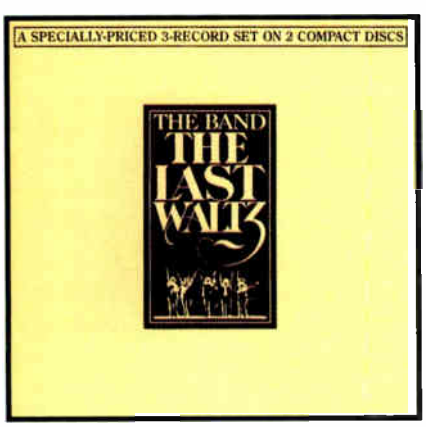
John Nowland, Neil's studio manager—and a wonderful Bay Area engineer who did projects at His Master Wheels [Mazer's San Francisco studio] and ran Merle Haggard's studio—did a 192kHz, 24-bit transfer of the *Harvest* stereo master through PMI converters. I played a DVD-A of that for Neil in his control room, and he, like all of us, was amazed at how real it sounded. It sounded like analog. Neil has spent a considerable amount of time and money on digital gear. He wants it to work, and I think he is happy now. Neil is transferring his analog library of music through the PMI Model 2 HDCD boxes at either 176.4/24 or 192/24. He is spending his own money on this project, and that is a serious level of commitment to digital. I believe Neil makes his new recordings on 16-track 2-inch 30 ips. He uses SMPTE to lock

BY CHRIS MICHIE

together the necessary machines.

For the DVD-A remix, we had to overcome some technical and practical issues. Recording six channels of 96/24 uses lots of disk space. Neil has been using Genex MOD recorders at his studio, Redwood Digital, for years. The current Model 8500 is in Beta release, so far as I know, and has its share of problems. We were getting a huge number of errors during takes while writing to the MOD disks. Denny Purcell of Georgetown Masters gave us a bunch of workarounds for these problems. One was to never put more than 13 minutes of music on a disk per side, and the other was to only use certified disks. We tried both and still had problems. We came up with a system that worked, but we incurred unnecessary costs and spent a lot of extra time.

Here's how it worked: During the DVD-A mix sessions, we only wrote to the internal hard disk, and when we had 13 minutes on the hard disk, we made a SCSI backup to a MOD. After



we listened to the SCSI backup, we made a second MOD SCSI backup. The SCSI backups have to be done in real time, as does the listening. So 13 minutes of security cost us 3x 13 minutes for listening and 2x 13 minutes for SCSI copying, so 13 minutes of music took us 75 minutes to check. We did get perfect copies, but we wasted 20 percent of the disks and a lot of time. I know that you can argue that we would have to make the copies anyway and listen to them, but you cannot selectively backup files from the Genex hard disk to MOD. I needed the hard disk for my next mix, and I wanted both MODs to be made from the original hard disk master. This made it necessary to do this during the mixing sessions, which was disruptive and costly.

A second problem we came across is that to get these bits into a DAW, you have to make a real-time AES transfer. Some of the DAWs don't sound great at high bit rates, and one has to be careful about degradation. It would be much better if Genex, Sonic Solutions, Pro Tools and other manufacturers all complied with AES 31 and enabled us to move files around.

How practical was it to use Young's Neve 8078 for mixing for 5.1?

The audio quality of the 8078 is amazing and therefore worth the effort to make it work for DVD-A. It's obviously a vintage console, but Neil has spent a lot of money getting it in shape, getting it back to original specifications, and it is so versatile that it is not much of a chore to make it work for 5.1. The monitoring section was obviously not 5.1-ready, so Neil had some third-party gear installed to handle 5.1 switching, level matching, etc., but this gear deteriorates the audio quality in the monitoring chain. I hope that a manufacturer comes along with a high-fidelity 5.1 monitoring system that can be used on consoles built for stereo or quad.

Our signal chain was simple. The front two channels and surround channels we sent through two pairs of buses, and used Rev Send 3 for the center channel and Rev Send 4 for the subwoofer (LFE) send. Deciding what goes to the subwoofer is one of the trickiest aspects of mixing 5.1. If you rely on the subwoofer for most of your low-frequency information, your final mix will be bass-light on systems that do not have subwoofers, so I turn the subwoofer off when I am doing my basic mix. When this mix starts to sound like music, I turn on the subwoofer and blend in an appropriate amount from various instruments.

The buses fed three Model Two HDCD converters and the 2-inch 8-track Studer. On some songs, I preprocessed the mix through the Studer before it reached the HDCD box, so some of the songs on the *Harvest* DVD-A have been run through the Studer Record/Play chain, and some were sent right into the HDCD boxes. Plus, Neil has an analog backup of all the 5.1 mixes on the 2-inch 8-track. The audio quality of the analog backup is amazing.

You mentioned that you had a portable 5.1 system, but surely you used something a bit more sophisticated for checking your mixes at home?

I have a bunch of playback systems at home. The main system consists of two Ed Long speaker systems, each one larger than me! They are fed by a pair of McIntosh tube amps and a Parasound P/LD 1100 preamp designed by Bay Area audio legend John Curl. The CD player is a Rotel RCD 971 HDCD player. I also have a wonderful turntable and assorted DAT machines.

When we started to talk about the *Harvest* DVD-A project, I decided that I needed a 5.1 system. I went to Parasound and found an HCA 2205 5-channel power amp designed by Curl and a multichannel preamp/processor that did Dolby Digital, DTS, TMX and high-resolution analog (AVC 2500). The Energy xl16B speakers are a little bigger than NS-10s, and I have an 8-inch powered subwoofer. The DVD-A machine is the Technics A-10, which has analog outputs for 5.1. I set up the speakers at home and at Neil's studio using a formula designed by Georgetown Masters, the mastering studio we are using for *Harvest*. This was tricky, but in the end I could hear well from most places within the speakers. I can't presume that most people will set up six speakers perfectly and always sit in the middle—most people cannot set up two speakers correctly. Engineers, headphone users and people that listen on their PCs are among the only people that sit in the "correct" place to listen. If the music

PHOTO MARSHALL FALLWELL JR

Elliot Mozer in session at Quadrafonic Sound, early 1970s.

changes substantially when you move around or when the six speakers are not set up properly, there is something wrong with the mix.

You grew up in New York City and suburban New Jersey and went to college there. How did you get into the industry?

I loved music as a kid. Jazz and folk were my passions growing up until Elvis landed. I loved looking at and listening to records and got a job in the Sam Goody record store while I was going to college. One of my jobs was singles buyer for the store, and one day the Decca salesman came in and played me "My Generation" by The Who. I loved it and ordered five copies for the store, even though it was not on radio and nobody had heard of them in 1965. I played the record in the store, and people bought it. That really got me excited. Eventually, I got to know Bob Weinstock, the founder of Prestige Records. He asked me what I wanted to do, and I told him that I wanted to make records. He hired me, and I went to work for him doing all kinds of stuff like delivering DJ copies to stations, sorting the tape library, listening to new releases, checking label copy. He let me visit the studio and watch the recording process.

Esmond Edwards was the A&R guy, and they used Rudy Van Gelder's studio in Englewood Cliffs, N.J. Esmond was making records with Red Garland, Oliver Nelson, and the studio was, and still is, fantastic. Rudy had a tube board with rotary pots, similar to what Columbia had at their studios, and he had mono and stereo Ampex 300s and perhaps a 3-track ½-inch 300. Rudy got the sounds, the A&R guys worked with the musicians and the stuff sounded great. The room is beautiful and very lively. Rudy recorded big bands as well as small groups. This *was* live recording—you put down exactly what the consumer would hear. My first production was a bossa nova album with Dave Pike. Clark Terry played trumpet, and I produced two of Clark's albums a few years later for Cameo.

Skipping ahead to the '70s, you produced albums for American artists such as Neil Young, Janis Joplin and Linda Ronstadt, but you also went to England to record Frankie Miller, Rab Noakes, Mike D'Abo and Andy Fairweather-Lowe. How was life as a continent-hopping freelance producer back then, and how have things changed?

The '60s and '70s were wonderful times for recording. You could really hear where a recording was made. Memphis sounded like Memphis, L.A. like L.A. and London sounded like nothing we had ever heard. The British studios, musicians and producers had a completely different rulebook and completely different kinds of equipment and tastes in music. American engineers, for the most part, used rooms and miking technique in an attempt to translate a literal copy of an instrument onto tape. British engineers used EQ and whatever gear they could find to create a sound, which did not necessarily have to be a literal copy. U.S.-made consoles had EQ with ±12 dB, while British desks had ±20 dB. A British studio setup would have a zillion U67s, while an American setup would have a bunch of different mics. The British producers, engineers and musicians loved the music coming out of Memphis and Florence, Alabama and Detroit. Americans wanted to sound like The Beatles, who really started out wanting to sound like the Everly Brothers or Chuck Berry, etc.

It is now possible to make complex-sounding records anyplace, and for a fraction of the cost of years ago. But the essential thing about a great record is the quality of the song and what emotion is transferred to the listener.

Early UK studios, pre-Neve and pre-Trident, had very simple equipment. Most desks had little or no EQ, and most control rooms had one or two compressors, if any. Reverb came from live chambers. Glyn Johns told a story recently about the desk at Olympic, which had one EQ knob and only two settings—pop or classical. Glyn, like most engineers and producers who started in the '60s, learned to get his sounds from the musicians. People ask him which compressor he used on the bass drum on "Honky Tonk Women." I get asked which one I used on "Heart of Gold." The answer to both those questions is none. We worked with great drummers who knew how to make their kits sound great, and we know how to capture those sounds and put them in perspective. Those were literal sounds. George Martin used whatever voodoo was appropriate to get sounds on Beatles records. They were not necessarily literal sounds.

During the '70s, things started to even out between the U.S. and England. Neve desks were coming to the U.S., and many of us were working on both continents. Brits made records here, we made records there, and, by the end of the '70s, records started to sound the same—too bad. Then MTV came along and really clinched it. Everybody could see and hear everybody else's music. The labels wanted the artists and producers to make hits that sounded like the current hits, and individuality started to overtake creativity. It was no longer the case that a record made in a specific city sounded like that city.

Today, Pro Tools and other technologies level this playing field even more. It is now possible to make complex-sounding records anyplace, and for a fraction of the cost of years ago. But the essential thing about a great record is the quality of the song and what emotion is transferred to the listener.

The two records you made with Area Code 615 were recently re-released on CD by Koch. They were very influential at the time, and I was surprised that it took so long for them to be re-released.

We had to go through a huge amount of red tape to get the CD out. The reissue happened in 2000, 30 years after we cut the records, and Universal could not find the contracts. It turned out that Mac Gayden had them, and we sent a copy to Andy McKaie at UMG. He got us back into the system, and Koch made a deal with them. UMG had the original ½-inch master for the first album, but Polygram had lost the master for the second LP—we had to use a Dolby A tape dupe master and a Dolby A 8-track copy.

The Area Code 615 records were cut at Cinderella Sound, which is a two-car garage behind Wayne Moss' house in Madison, Tenn. Wayne, a top session player in Nashville, had converted his garage by building a control room and adding acoustical treatment to isolate and shape the sounds. It had a drum booth built by Wayne and Kenny Buttrey, legendary drummer for the Everly Brothers, Neil Young, Bob Dylan, Elvis,

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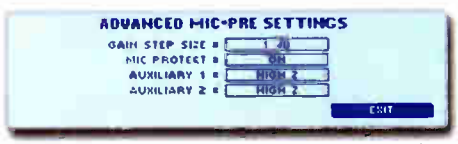

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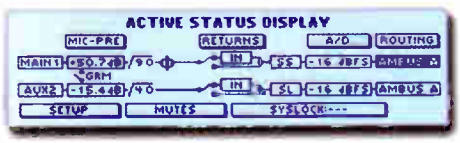

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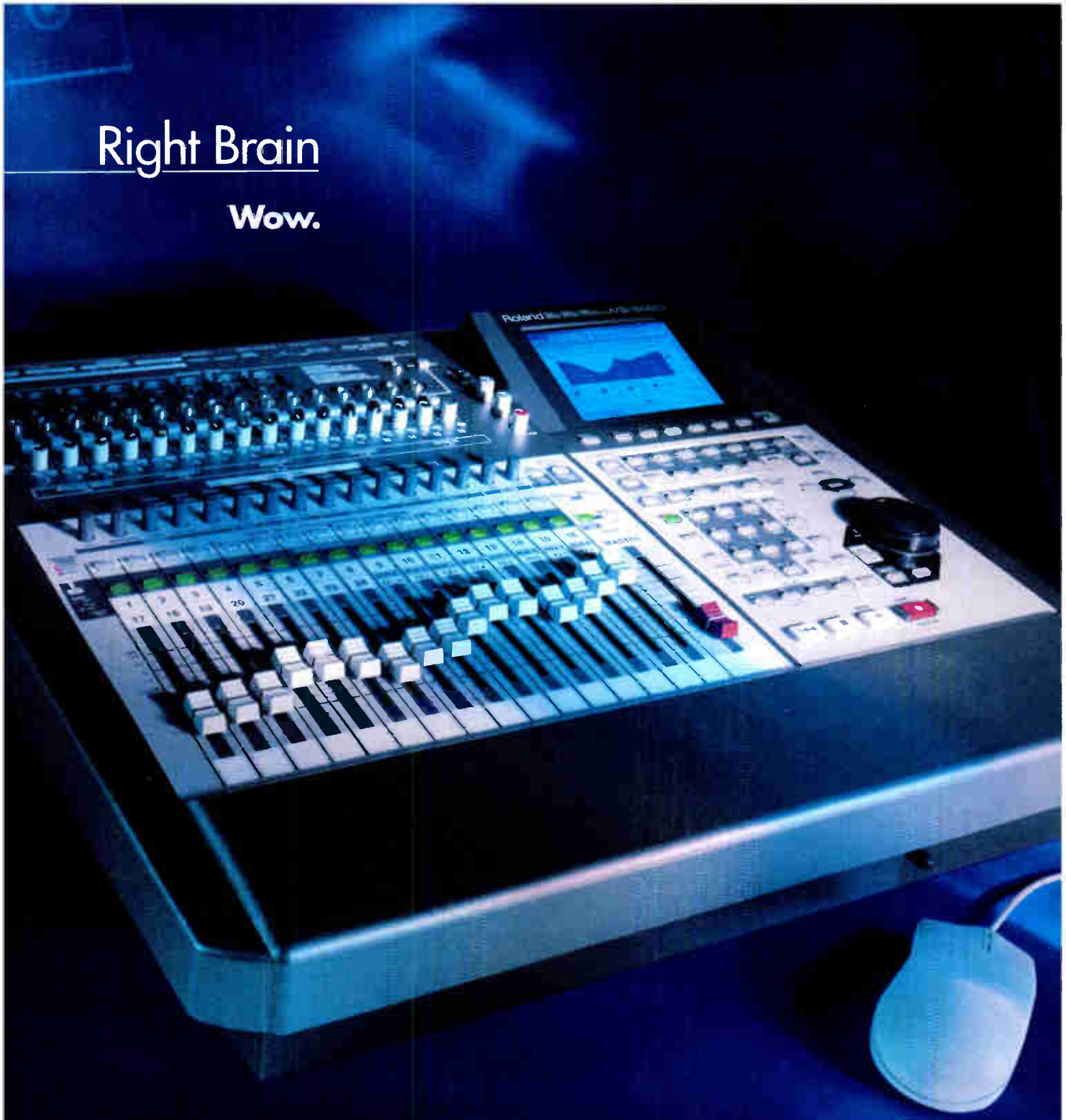

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George Harrison, Simon & Garfunkel, etc.. Wayne, Kenny, guitarist/songwriter Mac Gayden (who wrote "Everlasting Love" and played with J.J. Cale and Bob Dylan) and harmonica virtuoso Charlie McCoy (George Jones, Bob Dylan, Simon & Garfunkel) had a band called Charlie McCoy & The Escorts. They were mostly an R&B band, and the 615 project was conceived to have R&B rhythms under country sounds.

You also worked with The Band on **The Last Waltz.**

From the start of *TLW*, it was obvious that none of us would settle for anything except perfection. We would have one show, one night to document the music of The Band and their friends. We spent months preparing for this gig. Robbie Robertson, Marty Scorsese, The Band, Bill Graham and his people met many times to plan this massive event. Marty wrote a shooting script that was from The Band's lyrics. The seven cameras and my truck got their cues from these pages. We rented Wally Heider's truck, which had a large API console, two 3M 24-tracks and racks of Dolby A units. We recorded at 15 ips, Dolby A, with sync on track 24. I used my Neve Melbourne 12x2 desk for additional inputs. The truck split many of the P.A. mics, and we added extra mics for piano and drums. I did not use any compression, and I had to hand-ride everything. I had to anticipate every move onstage.

The computer allows us to do things that we could not do in the analog world. The song and the performance are the essence of a record. What is recorded is much more important than how it is recorded.

We rehearsed for two days. Every song was rehearsed, and most of the guest artists did onstage rehearsals. Muddy Waters and Bob Dylan did private rehearsals at the Miyako Hotel. Ray Thompson, one of the great remote recording engineers, came up to help me mike the show during the rehearsals. Ray knew how to make live sound *live—Frampton Comes Alive* and *Aretha Franklin Live at the Fillmore West* are part of his repertoire. Ray worked mostly on the house mics and the piano.

The gig was amazing. There was one place in the show where all of us had a problem. When Paul Butterfield came onstage, Robbie broke a string, Paul went to the wrong vocal mic, a lighting panel went down and half the cameras ran out of film during the delay. It took all of us a few minutes to recover, and then everything was fine throughout the show. There was a problem with the AC power feed to the truck, and some hum got on tape as a result.

The post-production for the film and record were done at The Band's studio in Malibu, Shangri-La. I was not involved in this process, as I was too busy in the studio. I like the way the movie sounds and hope I get to hear a great-sounding DVD-A out of the music.

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Tell us more about the Jack Nitzsche album.

That project was recorded in St. Giles Cripplegate, a first-century Church of England gothic church in the Barbican area of East London. The timpani were literally placed over the grave of poet John Milton. Bob Auger set up his Neve rig in the rectory office, which is next to the pulpit. The pews were removed, and the London Symphony Orchestra was set up in the traditional way. (David Meacham, the conductor, had previously conducted the LSO on the two songs they recorded with Neil Young on *Harvest*.) Bob Auger knew the hall and the orchestra.

We recorded to 8- and 4-track machines at 30 ips. The speakers were Tannoys. Jack sat mostly on the lounge chair between the speakers listening. David Meacham would ring the intercom and ask me if in measures 134 to 140 the first violins were to play F, F-sharp, G, G-sharp, etc. I would look at the score and see if that was what Jack had written and then ask Jack if this was okay. It was correct, and, for the most part, we just had them make one or two takes. The sessions took two days, and all went exceedingly well. I did the stereo mix at Quadrafonic. I wound up using just the monitor section of the console, since the mix was really a rebalance and no processing of any type was needed. We hope to do a DVD-A version of this album soon.

How did you get involved with the Jazz Masterpiece reissue program for Columbia Records?

A friend at Columbia Records (Jack Rovner, now president of RCA) asked me about my association with Windham Hill—I had produced a few projects for them, including a Michael Hedges album—because Columbia felt that they did not know how to market to the "new age" consumer. I told them that I thought that this market would love many of the albums that Columbia had in their catalog. They asked me to make up a list of potential releases, and I did. This was the start of their Jazz Masterpiece Series. I suggested that Erroll Garner's *Concert By the Sea* was the prototype new age album, as were many Dave Brubeck, Billie Holiday and Miles Davis records. They were jazz records that spoke to a mass audience. Along with *Concert By the Sea*, I targeted albums such as *Kind Of Blue* and *Take Five*. Larry Keyes, a Columbia engineer who I had worked with on Janis Joplin projects, did the transfers.

Can you explain your association with CCRMA and "the world's first all-digital recording studio"?

One of the engineers at His Master's Wheels kept telling me about the musicians at Stanford who were using computers to create and modify music. Eventually I visited CCRMA [Center for Computer Research in Music and Acoustics] and was truly amazed. They were in the DC Power Lab at Stanford, which they shared with the Artificial Intelligence group. They were using PDP 11 computers to do synthesis and digital processing. The machines were the size of large New York apartments, and they had 64 MB of RAM and huge external hard disk packs that stored something like 300 MB. This was in 1977. Andy Moorer, the inventor of Sonic Solutions, John Grey, a musician with a Ph.D. in psychoacoustics, and Loren Rush, a well-known composer, were the core of CCRMA under the leadership of John Chowning, the inventor of FM synthesis. They had primitive AD/DA boxes.

CCRMA amazed me. I saw music being composed, arranged, processed, morphed, created and stored in boxes. I heard the box do things to analog sounds that could never be done in the analog world. Check out our CD on Elektra, *The Digital Domain*. This project

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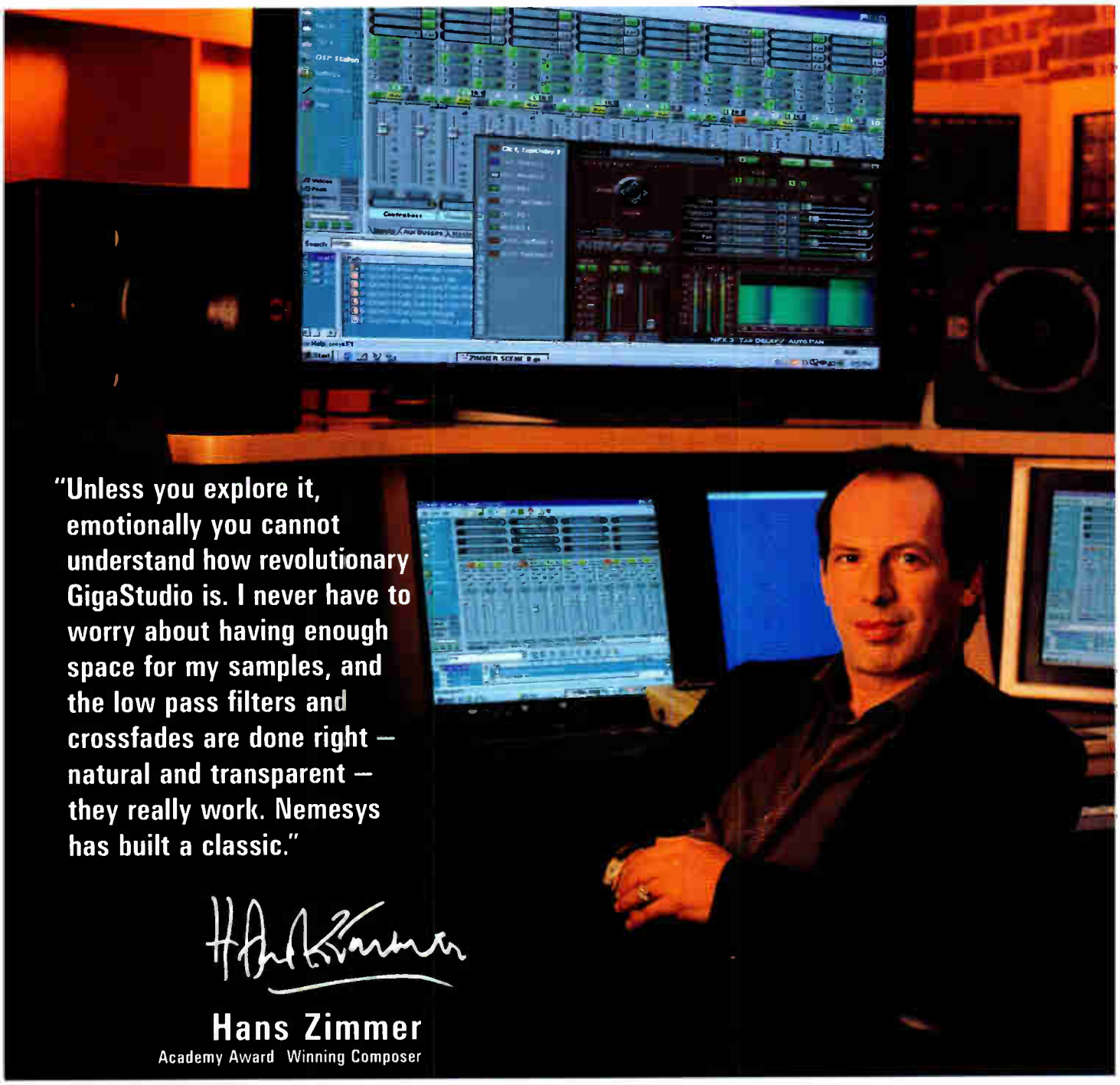

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was created mostly in the box. It consists of analog sounds, fully digital sounds, synthesized sounds, and it was recorded in the early 1980s. Andy Moorer created a piece called "The Lions Are Growing"—the first time I had heard morphing. A human voice becomes various instruments.

I was their analog person, and I showed them how we made records in the analog world. I got to play with their stuff and very much enjoyed being around some really smart people. Julius Smith, another CCRMA guy and a fine musician with a band, later did the audio stuff for nEXt. I think Julius is still at the lab. Mickey Hart and John Meyer spent time there. We showed CCRMA stuff to Ampex, the leader of the analog world, Wally Heider, Glen Glenn, Neil Young and many others. Those that saw the system were amazed, although it took a few years for the software and hardware to become universal and accessible to the masses. CCRMA bred the Yamaha DX7 synth, Sonic Solutions, nEXt and Apple audio, Liquid Audio and many other companies and many recordings.

As an early proponent/developer of digital recording technology, are you surprised or disappointed by the current state of the recording industry? Has Pro Tools been a positive force in the industry?

I think that Pro Tools and MIDI and samplers are wonderful enabling tools. These tools have created a new way of making music. The song and the performance are the essence of a record. What is recorded is much more important than how it is recorded. It is music. I am sure we will see great products such as Pro Tools, SampleCell and Vision working at 192 kHz/24-bit. When this happens, these tools will let us create recordings that sound analog, and, to me, that is a good thing.

What is the AirCheck monitoring system and how did that evolve?

AirCheck is passive broadcast monitoring technology that I started in San Francisco in the early '80s. This system listens to the radio, the Internet and watches TV. It identifies what it hears—it is very intelligent software. The idea for this technology came from meetings I had with a friend who was a marketing guru at Columbia Records, Jon Birge, who told me that nobody really knew what was on the radio. I spoke to my friends at CCRMA, and we started to come up with an idea of how a computer could do this.

Neil and I were working on *Everybody's Rockin'*. We heard a story about a DJ who suddenly made a lot of money at the tables in Lake Tahoe. This guy had convinced a label that he was playing their record. The joke was, he wasn't and he was getting paid anyway—listen to "Payola Blues" on *Everybody's Rockin'*. Cut to a few years later, and we find that the labels know what is on the radio, because AirCheck and BDS tell them. I sold my company to Radio Computing Services in 1989. AirCheck is being used to monitor radio in the U.S., France, Holland and Brazil, and monitors TV in Germany and Brazil. RCS is the leading supplier of technology to the radio industry, and I am happy to be a part of it.

Is it too early to say whether the launch of DVD-A is a success or a failure? What might have been done differently?

The DVD-A machines that I have played with sound great and are fun to use. The system has great potential. It is too soon to know much about all this, but I am very optimistic. Warners have put a huge amount of effort into this project, and I am happy about that. Wait 'til people hear 192/24 on a consumer player that they can buy for $500! ■

Chris Michie is a Mix *technical editor.*

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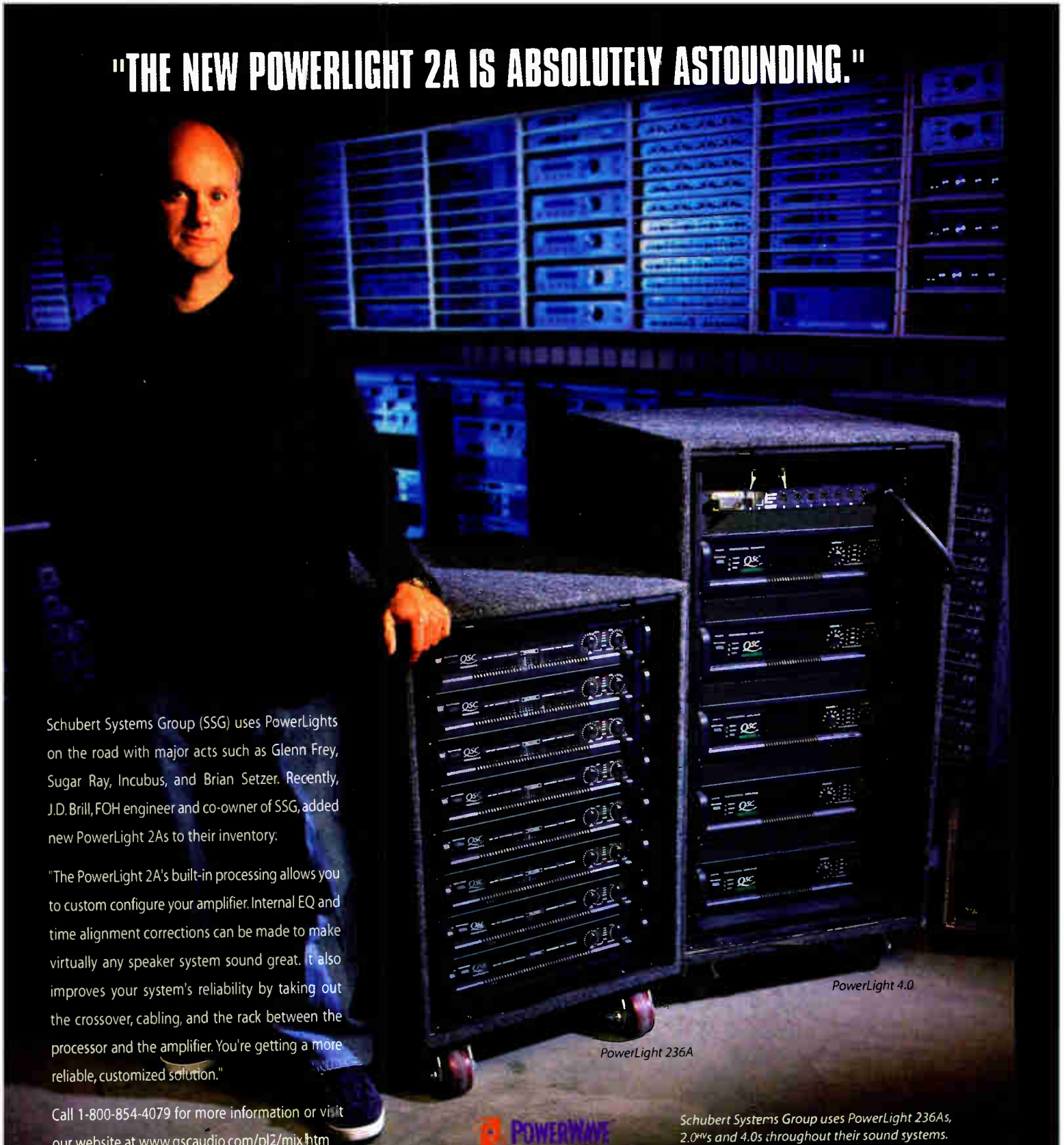

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The orchestral setup at the Skywalker Scoring Stage

ONE FOR THE CHILDREN

Robert Rodriguez on Music for "Spy Kids"

BY TOM KENNY

When we first checked in with director Robert Rodriguez, it was 1993, and young fellow Austinite Eric Guthrie was putting together a synth score for the breakthrough, low-budget film *El Mariachi*. The score was recorded wild to DAT; Rodriguez, Guthrie said, did not know what timecode was. In 1996, we found Rodriguez at the SSL Axiom, mixing the music on his film *From Dusk Till Dawn*. Last month, we tracked him down at Skywalker Sound's Mix G, where he was mixing music alongside Michael Semanick, this time on a Neve DFC for *Spy Kids*.

Rodriguez writes, directs and serves as camera operator, edits, cuts sound effects, produces and supervises visual effects on his films. For *Spy Kids*, he also wrote a few music cues, did some orchestration and supervised the music. He's hands-on, to say the least. When he needs a break from editing on the Avid in his garage, he either swivels to his SGI computer to look at visual effects coming in from Canada, or to his fully blown Pro Tools/Digital Performer/Kurzweil rig to play with music. He now, needless to say, knows about timecode.

Counting Rodriguez, there are no fewer than six composers on *Spy Kids*, with roughly 70 minutes of music in the 84-minute film. Originally, Harry Gregson Williams of Media Ventures was hired to score the film, but he took sick in the fall (he's better now) and couldn't finish. Then facing a tight Christmas release deadline, Rodriguez turned immediately to Los Lobos, who had written songs for *Desperado*.

"I had this idea of Latin orchestral cues that had action, instead of the European orchestra that we're so used to hearing," Rodriguez says. "I wanted sort of a Latin James Bond sound, Latin music that sounds spy-like, because it's all in minor keys. A lot of my favorite music is A minor, B minor, D minor. I immediately thought of Los Lobos, which has that off-rhythm. What's great about them is that they're very parts-oriented. Steve Berlin will play a sax part, and you think, 'I'll just take that sax part and make it horns.' It's almost orchestral already, and that's what inspired me. Their normal playing is so much more orchestrated and arranged than straight rock."

Los Lobos ended up providing the driving rhythm for two climactic cues: the wedding scene, which Rodriguez wanted to be as dynamic as John Williams' "Duel of the Fates," and the final conflict. Rodriguez then wrote the orchestral parts in his home studio, which were later re-recorded by a 90-piece orchestra. "I wasn't really sure what a Latin orchestra would sound like," Rodriguez laughs. "Then I found this composer from the 1930s, Reivueltas, doing this amazing off-tempo stuff, like in 7-time, where you never knew when the I was coming in. I thought,

—CONTINUED ON PAGE 72

DANNY ELFMAN

Self-Taught, Self-Styled

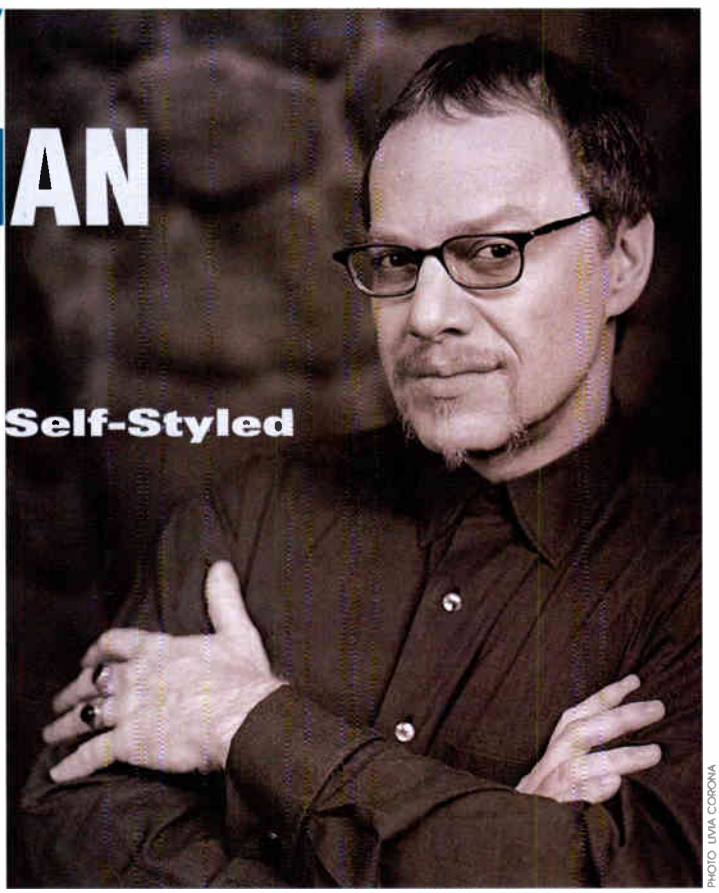

PHOTO: LIVIA CORONA

BY RICK CLARK

When Danny Elfman's name first appeared on major film scoring credits, those who recognized him most likely thought of him as the frontman for the new wave band Oingo Boingo, who scored modern rock hits in the '80s with "Only a Lad," "Dead Man's Party" and "Weird Science," among others. However, Oingo Boingo was not your run-of-the-mill pop band, and their eclectic arrangements and irreverant songs earned them a devoted following over the course of almost 15 years and 10 albums. Today, anyone aware of Elfman's history realizes that his step from pop music to a successful film-scoring career was a perfectly natural move.

Before Oingo Boingo, Elfman spent a number of years working as a "music director" for his brother Richard's theatrical troupe, The Mystic Knights of the Oingo Boingo. It was during that period that Elfman immersed himself in the music of Harry Partch and Terry Riley, as well as pioneering jazz artists like Cab Calloway and Duke Ellington. He also taught himself to transcribe music and create arrangements. This musical development, coupled with Elfman's love of old monster movies, '50s and '60s sci-fi and fantastical films (like Ray Harryhausen's *Jason and the Argonauts*) helped pave the way to his recording work, and then to projects with Burton, Sam Raimi and Gus Van Zandt, among others.

Elfman's first foray into film scoring was in 1980 for his brother's film *Forbidden Zone*. His first major studio film, however, was Tim Burton's *Pee-Wee's Big Adventure*. That marked the beginning of a long, productive relationship; Elfman has worked on every one of Burton's films since, with the exception of *Ed Wood*.

In all, Elfman has scored music for 45 films, including *Men In Black, A Simple Plan, Good Will Hunting, The Family Man, Proof of Life, Beetlejuice, Edward Scissorhands, Batman, Batman Returns, The Nightmare Before Christmas, Midnight Run, Scrooged, A Civil Action* and *The Legend of Sleepy Hollow*. It would be tough to label Elfman's style—words like quirky, playful and whimsical come to mind, but they don't do him justice. Quirky or not, Elfman is not afraid to experiment, and he creates empathetic nuances and surprises that are unique to each score.

I understand that you are getting ready to work on Tim Burton's version of **Planet of the Apes.**

I haven't started yet, but I took my daughter today to the set and had her pose with a few of the apes. [Laughs.] My daughter had a great time. She is 16 and has known Tim Burton her whole life. She was born the same year I did *Pee Wee's Big Adventure*. She tortures him still by constantly calling him Uncle Tim. He goes [makes an exasperated sound]. She does that because she knows it annoys him. [Laughs.] The only anecdote I have so far is seeing the trailer in a packed theater full of rowdy half- and fully clothed apes all hollering and clapping. They screened it for the cast. It was a moment.

Let's talk about scoring music for film.

Why talk to me, for God's sake? [Laughs.] I'm thinking about getting into it some day.

—CONTINUED ON PAGE 74

SOUND FOR PICTURE

For Once, A Warm and Fuzzy Column

BY LARRY BLAKE

A funny thing happened as I was riding in a van last year with fellow crew members coming back from location. I had been working my cell phone, arranging a weekend get-together with some film sound buddies and buddettes, and a department head (let's call him "William") figured out what was going on.

"This would never happen in my field," he said. I didn't understand him: "You mean, you don't get together with colleagues/competitors to break bread and share war stories?" "No way," he said. Too many top people in his profession regarded themselves as *artistes*, and with that comes a lot of sniping and bitching. As a result, they just don't hang together. This was shocking to me.

He asked me the nature of my relationship with these folks. It had not really occurred to me, but I had never worked with most of them—we just knew each other by reputation and visits to each other's facilities. But we keep in touch and are friends, despite the fact that the business side of our relationships are mostly competitive.

All of this got me thinking not only about the nature of our respective jobs, but also of work in the film industry. And pretty much all of the answers I came up with were overwhelmingly positive. Thus, the title of this column.

The merest mention of sample rates or timecode is *verboten* this month, as I'm putting myself in my sitting-around-the-campfire-at-high-school-retreat mode: Kumbaya, "I love you man," etc., ad nauseum. There are many relationships in this equation: with others in post sound, as noted above, with production mixer friends, with the other departments during production and with the industry as a whole. The latter is perhaps a good place to start, because most of *Mix*'s readers are more Grammy than Oscar, more Nashville than Nicasio (home of Skywalker Sound), more ADAT than DTRS. (Okay, okay, nothing technical!)

We all grow up with certain stereotypical images of Hollywood: directors with megaphones and bull whips, temperamental movie stars who won't come out of their trailers, fawning sycophants, etc. While I've yet to see a director so equipped, indeed all of the above and more can be found in the movie industry. But I think these examples are much more the exception than the rule.

In fact, I think that in many ways, the tone of a film set is a much more democratic environment than many workplaces. A good "non-pro" (*Variety*-speak for people with jobs outside the entertainment industry) friend of mine works at a top hotel in New Orleans, and I hear

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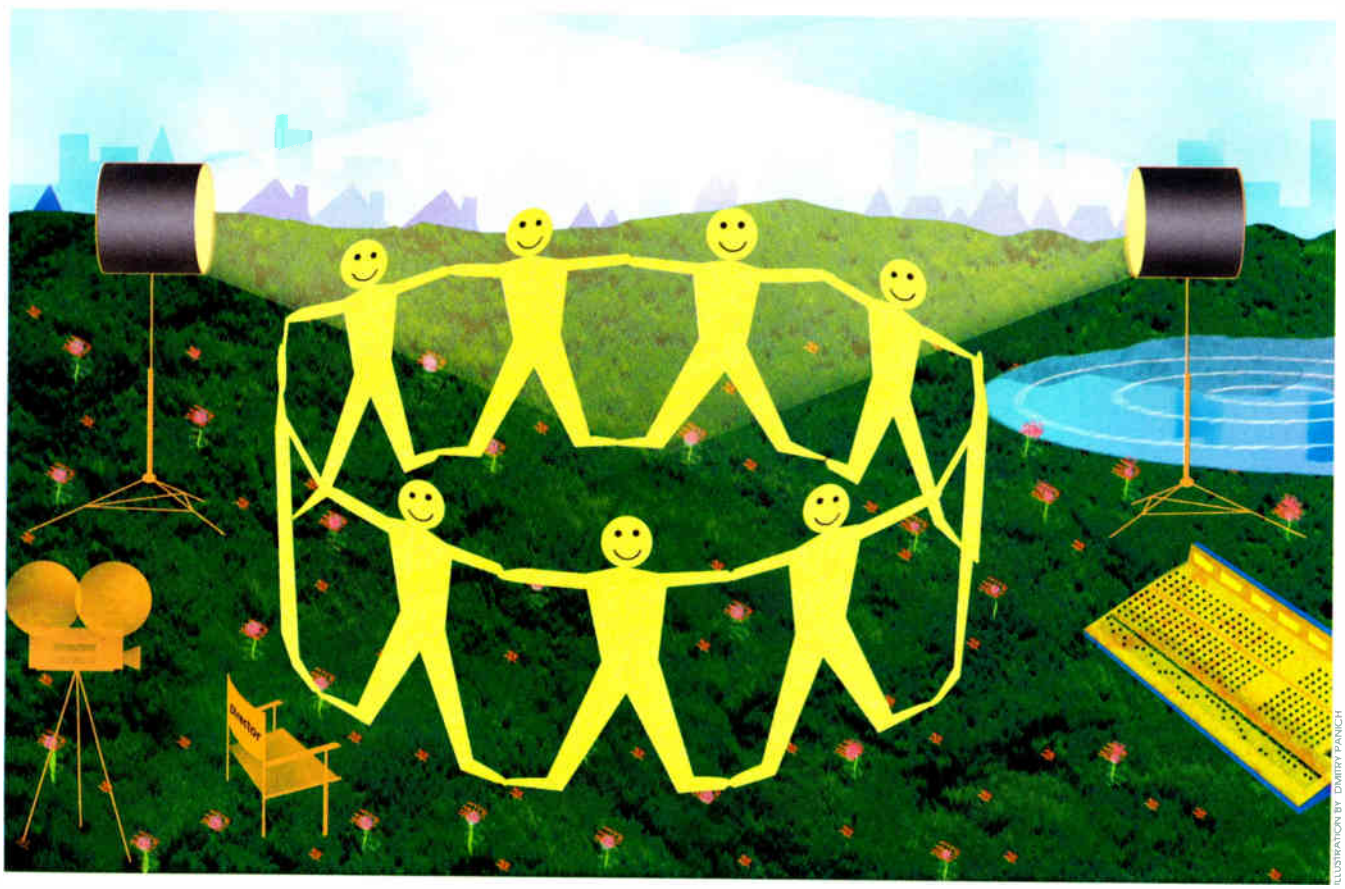

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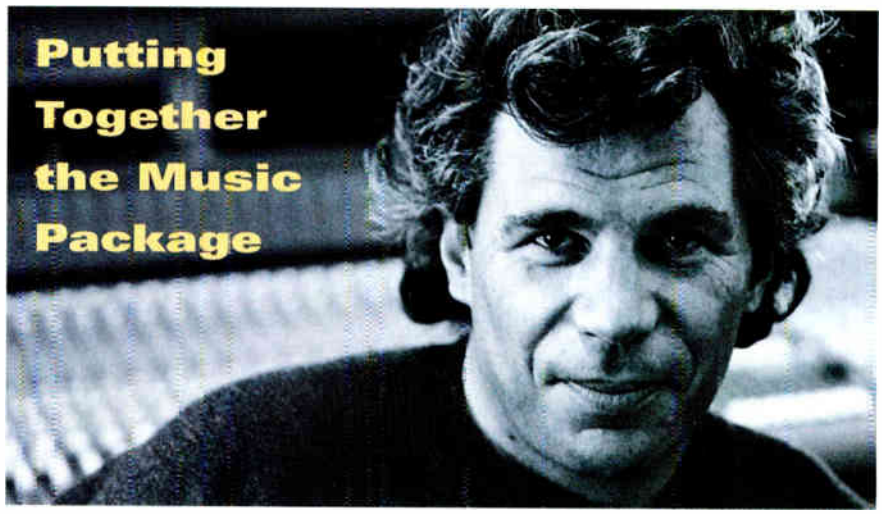
Gohl/McLaughlin Productions

BY DAVID JOHN FARINELLA

Whether they're creating simple pop songs or grand, sweeping orchestral scores, musicians across the globe are looking to express emotion and evoke emotion in their listeners. Composing music for a film, though, is a bit different than straight songwriting. Rather than pour out their own emotions, film composers are called on to heighten the emotions being evoked by the images. It's a challenge for many musicians, and that's why the film music production team of Teese Gohl and Steve McLaughlin, collectively known as Gohl/McLaughlin Productions, gets the call from a handful of A-list film directors and producers.

To date, Gohl/McLaughlin has worked on such films as *The Red Violin*, which earned them an Oscar for Best Score, *Titus*, *The Iron Giant*, *Cookie's Fortune* and *Flawless*. Most recently, McLaughlin produced Michael Kamen's score for *X-Men*, Guy Pratt's score for *County Kilburn* and was working on *The Count of Monte Cristo* with Ed Shearmur. Gohl produced Michael Small's score for *South Pacific*, and Elliot Goldenthal's tracks for *Final Fantasy* and the upcoming Julie Taymor film *Frida Kahlo*. Gohl is a keyboard player/producer, and McLaughlin is a Grammy Award-winning engineer. What makes their pairing a bit odd is the fact that Gohl works in New York and New Hampshire and McLaughlin in London. "We'd like to be in the same place," says Gohl. "We always hook up at some point, but it's not always possible to spend a month or two months locked away in some studio, and it's also not necessary anymore. We both have studios in our homes that can facilitate everything from rough demos to final mixes."

Steve McLoughlin, in London.



Teese Gohl, the New York connection

Though they have worked with well-known composers like Michael Kamen and Elliot Goldenthal, Gohl and McLaughlin have recently started to work with such musicians as Dave Stewart of Eurythmics, Rich Robinson from the Black Crowes and songwriter Bruce Roberts. The goal, so far, has been to combine the twin desires of pop artists getting songs onto film soundtracks and directors getting functional music for their film.

"Pick any rock icon or pop artist who basically has no experience doing film scores but would love to do it and has talent for it," Gohl explains. "We provide the vehicle to make sure that the music gets done on time and on budget. The film producers are usually very afraid of hiring someone who is used to being in the studio for a month to a year doing an album. Most commonly, you'll have a few weeks to a couple months to complete a score, and the money is much tighter than in record projects. What we do, through our experience, is provide facilities where that can happen."

Gohl points to the recent *Trip* soundtrack, which he produced with Rich Robinson of the Black Crowes, as an example of his studio's flexibility. "We did a lot of great stuff in my loft in New York," he says. "In fact, we had trouble when we moved to a studio, because we tried to get some of the vibe."

Of Gohl's two studios, the New Hampshire joint is the most ambitious. Not only does it boast the typical Pro Tools and Digital Performer setup, it's stocked with some impressive studio gear, including an old analog Topaz console. "I could record a small chamber orchestra or a rock 'n' roll band up there," he says. "Instead of a small control room and a larger live room, I made it a big open room, put all the hard drives and the noisy gear behind glass, sealed-off doors, and have one sizable iso booth. A lot of the work I do by myself, and I don't want to be cooped up looking out into this beautiful space." His New York facility is simply a Macintosh G4, a Roland VM-7200 mixer and a couple of Tascam DA-88s.

Though McLaughlin's London studio includes some random bits of vintage gear such as Korg Chaos pads, Electro-Harmonix pedals and Decca Tree mic setups, he also relies on the relatively simple Macintosh/Pro Tools/Performer system.

Throughout their production careers, Gohl reports, technology has provided opportunities to experiment as well as save precious time. He points to the score he recorded with Robinson as an example: "Where something was loud and raucous, like a full-distortion guitar, it becomes a much smaller sound sweetened by a string arrangement that I might have done. That can be done fairly quickly outside of the recording schedule while the film is being dubbed."

If he gets a call during the mix that

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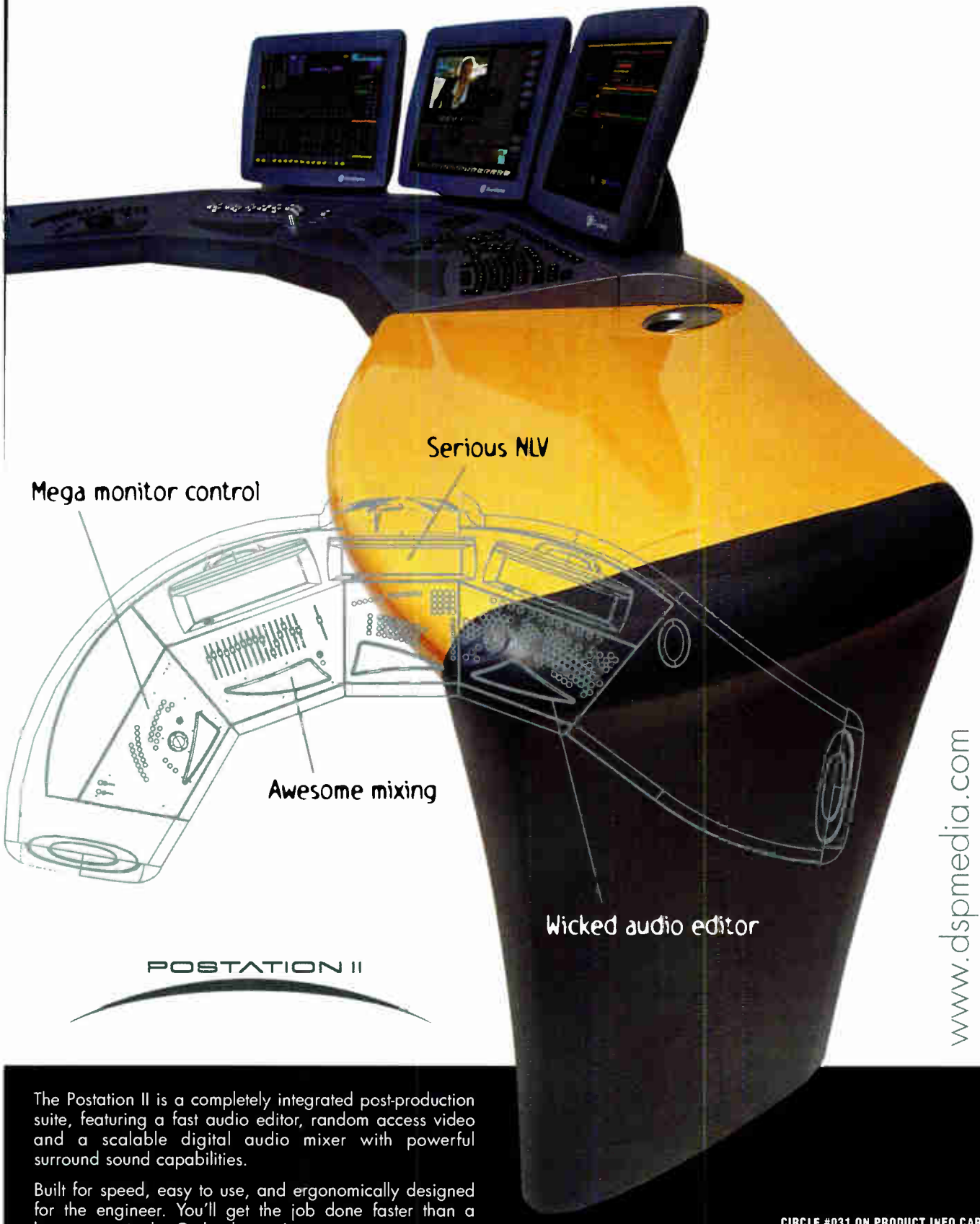
It's "Australian" for faster post production.



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—FROM PAGE 66, "SPY KIDS"

'This is what a Latin orchestra sounds like,' where the rhythm is a little different, a little off-kilter." [Editor's note: You can hear Rodriguez playing power chords on guitar during some of the changes. And there's a playful take on Santana's "Oye Como Va," which Rodriguez calls "Oye Como Spy."]

PHOTO: RICO TORRES

Robert Rodriguez behind the camera, with his son Rocket

At the same time, Danny Elfman had written the main spy theme, but he was unavailable to write any more. When the film got pushed back to a late March release, he contributed more cues based on the same theme. "Danny showed me how one theme played differently throughout the movie can come out kind of neat," Rodriguez says. Meanwhile, Heitor Pereira and Gavin Greenaway of Media Ventures filled in for Gregson Williams. The orchestra was recorded at the Skywalker Scoring Stage, then mixed down by Alan Meyerson at Media Ventures.

Rodriguez came up with the idea for *Spy Kids* in 1994, before he had the first of his three boys. He began writing it in 1997. For a director associated with the likes of *Desperado* and *The Faculty*, this was to be his homage to the innocence of *Willy Wonka* and *Chitty Chitty Bang Bang*.

"The concept that I wanted from the beginning was to feel like a child wrote, directed, edited and composed this," Rodriguez says. "The themes would be almost childlike in their simplicity. Melodies you could hang on to after the movie was over. A simplicity to the notes. There are so many composers, and they all had their own flavor, and it's seamless. I think they all got excited, because it's a whimsical movie. It's fun, it has spies and it's about kids. There are some very cool cues that you're just not used to hearing in a kids' movie. It's very musical, and I think kids are going to love the soundtrack."

Tom Kenny is the editor of Mix.

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—FROM PAGE 67, DANNY ELFMAN

You ought to give it a try.

I should give it a try. It seems like these days, just about anyone can do it, so why not? Huh?

Just get your sampler and some Pro Tools and slam it together.

Yeah. Slam it together.

To your credit, your music doesn't sound that way in the films you've scored. You do a great job of blending rich-sounding symphonic and choral elements with more interesting percussive and synthesized components. Give me an idea of how your process evolves.

Oh, boy. Organized chaos. I'm not a naturally methodical person, but I have to force myself to create a bit of a methodical way of thinking at the beginning of the process, and then it becomes chaos. It's really both. There is a methodical approach that I take at first. I can't start writing the score until I have all of my themes completely laid out. I have to know what they are and how they are going work and how they interrelate. I always think about it like doing a painting, and I can't start the painting until all of my colors are completely worked out.

A painter friend of mine in New York once brought me to his studio, and he was setting up all of these jars of pigments and colors. I asked him what he was doing, and he said, "I've been doing this for about a month, and I'm about to start some paintings, and I don't start until I've settled on exactly what tones and pigment and colors are compared and laid out in a certain fashion. When it is completely done, I'll start my first picture." I thought to myself, "That is exactly what I'm doing when I start a film." I'm laying out all the melodic pieces, knowing in my head how it is all going to work together.

Once I have all of those elements together, there is no method anymore. I just dive into the first cue. I go as close to chronologically as I possibly can. I don't plan or think about where the music is going to go. It really is extremely unmethodical. I tend to let the music carry itself, and I become very often surprised by it. I never question it. The beauty of working with Tim is neither does he.

For example, on *Sleepy Hollow*, I wrote this dark theme for the Horseman and I wrote a kind of a child's theme for Ichabod Crane, which in fact would play when he was a child, on flashbacks. For reasons that I don't understand and never questioned, that

PHOTO: LIVIA CORONA

theme kept coming in the middle of the Horseman's theme. This bit of innocence would just happen, and I remember thinking, "What is this doing here?" What I've learned over the years is to never ask that question. You just enjoy it, use it and move on. Everything musically...if it appears in a cue in a certain way, it is there for a reason. The less I try to analyze it, the better I am. So, that innocent theme juxtaposed against that monster just worked for me.

See, a lot of directors wouldn't let you do that. They would think very methodically and intellectually about music and say, "Oh my God! How can you play this theme over that character?" Well, what Bernard Hermann taught me is that basically it was all bullshit. You can do any goddamn thing you want. [Laughs.] The only rule is that there are no rules. Whatever works! Period!

So you basically trust the mystical process of the art.

Absolutely. My trick is really simple. I prepare as much as possible in the beginning, and then I let it take over. If I don't do the preparation in the beginning, it is likely to not be cohesive in the end, and that isn't acceptable. Ultimately, it has to fit together like a puzzle. It is like, "Do the homework in the beginning and then don't ever think about it again."

I love the fact that Tim never questions that stuff and goes, "What in the hell are you doing playing Ichabod's theme over the Horseman?" He reacts to it the same way I do. He'll chuckle. He thinks only about the music on a totally visceral level. He doesn't intellectualize it, and that is how I write it.

Speaking of visceral, I really enjoyed the classic horror movie vibe of **Sleepy Hollow.**

It was fun. There is this one scene in that movie that I thought was so great for Tim, and it was the first thing that he showed me. It was the scene where the family is putting the little boy to bed and the Horseman breaks in. First, the Horseman decapitates the father, and then the mother gets it. The little boy is hiding under the floor when his mother gets it, and he sees his mother's head rolling on the floor and [the Horseman] ends up looking down through the cracks at the boy. Up to that point, Tim never had gotten like that. His violence has never been that intense. The level of violence in Tim's movies is like that of a Western; he is so not into graphic violence. But this was such a visceral scene, and the Horseman does, in fact, catch the kid and get him, too.

We grew up on a lot of the same kinds of fantasy and monster movies, and that is why I think we share similar sensibilities. *Sleepy Hollow* was very much like a good version of those kinds of films. I grew up a block from a movie theater, and that was like the center of my existence. I went there every weekend, with the exception of weekends when they would have what I would've called "kids' movies," which I hated as a kid. When I say that, I mean films with no monsters or mutants or fantasy.

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I lived a block from a movie theater, but they ran The Sound of Music *for five years.*

Oh my God! That would've been the death of me! As a kid, I wouldn't see musicals if you paid me. I hated musicals, and I hated comedies, for the most part. I feel so fortunate to have lived so near a theater that catered to the tastes of kids at that time, which were monster movies and science fiction.

I loved the Ray Harryhausen stuff, which had Bernard Hermann's music—movies like *Jason and the Argonauts* and *The Seven Voyages of Sinbad* and *Mysterious Island*. I also loved Roger Corman's Edgar Allen Poe stuff, like *The Raven* and *Tales of Terror* and *House of Usher*. These were my ideas of a comedy. It wasn't *Flubber* or *Chitty Chitty Bang Bang* or that kind of stuff, which I really detested. My idols were Peter Lorre, Boris Karloff and Vincent Price.

One of my very favorite movies growing up was a movie called *The Haunting*, which would definitely stay up there on my permanent Top 10 list. It was so great. I didn't realize at the time that this was the same Robert Weiss that did *The Day the Earth Stood Still* and *West Side Story*. [Laughs.] Talk about a bit of versatility?

The Day the Earth Stood Still is my favorite of those fantasy films. It is also where I discovered Bernard Hermann's name, and it suddenly had meaning to me. I was so taken and moved by that film. It was the first time it dawned on me that the music was composed by an individual. As a kid, you just assume that everything is just "there." That was the first time I realized that it wasn't just "there," and it isn't all the same. This was great music, and it was moving me.

When did you start getting into music?

Most of my high school friends were musicians, and I wasn't. I figured it was way too late for me, because everyone I knew had been playing since they were seven. At the time, it seemed like, "Forget it. It's never going to happen." I mean, I had a guitar and doodled on organ and piano. I tried to take some lessons, and I was really bad at lessons. I would memorize my lessons really quickly, but I couldn't play stuff back to the teacher. I'm really bad at one-on-one. I'm much better in front of a thousand people, instead of one person.

Anyway, I never went to college, and I never even quite finished high school, actually. I went off to France

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before my last year in high school in 1971. My brother was in a crazy music theatrical troupe there called Le Grande Magic Circus. I was just 18, and I joined him in France. I had just picked up the violin that year and was planning on traveling around the world. I wanted a small instrument to try to learn while I was traveling. Guitar was just too big. I ended up getting hired and touring with them, and I spent close to a year traveling throughout Africa, primarily through West Africa. I remember I spent my 19th birthday in Africa, because the Nigerian border guards sang me "Happy Birthday." I lived for a brief while in the Canary Islands.

My brother returned to Los Angeles and started a theater troupe inspired by Le Grande Magic Circus called the Mystic Knights of the Oingo Boingo. He recruited me to become the "music director" of the Mystic Knights the day after I arrived home with hepatitis. It was like, "You don't have to work hard. Just soak it in and watch while you are getting your health back." [Laughs.]

There were eight years of really intensive work with the Mystic Knights. In that period, it went from being like a ragtag street group to being a really full-blown theatrical troupe, where everyone had to play three instruments. I picked up trombone. I taught myself to write and transcribe. I started really getting into percussion.

A lot of the driving force of the Mystic Knights were these two percussion ensembles and early jazz. I refused to listen to contemporary music for almost 10 years. I wouldn't listen to anything after 1935.

Leon Schneiderman, who was the saxophone player and a high school friend, went with me to Africa, and we brought back these balafons, but they were too delicate, so we built our own. We built bass balafons. Then we started building a pot-and-pan orchestra, with big racks of tuned mining pans and beer cans and measuring cups.

There was a large portion of my life where I really wanted to become a modern-age Harry Partch, who was kind of my idol. Harry Partch was a very eccentric American composer from the '40s and '50s who built his own instruments. He developed some scales and used microtonal tuning and devised ways to write for these microtonal marimbas and instruments that he built. I loved that and was fascinated by

—CONTINUED ON PAGE 82

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—FROM PAGE 70, GOHL/MCLAUGHLIN

a cue doesn't quite work, then Gohl will spend an hour working something up, often from the tracks they've recorded and not used, and then send it over via bike messenger. "Or, chances are, we'll have a music editor on the dubbing stage, and I'll just work with him in Pro Tools until we get something that works. You use your resources. You might have recorded anywhere from a half-hour to an hour-and-a-half worth of music; there's a lot of stuff there. If a cue doesn't work, that doesn't mean you have to go back and rewrite it overnight and get another orchestra.

When Gohl gets a chance to write scores of his own, he often begins on an acoustic piano. Once he's ready to get the music down to demo form, he turns to a number of samples housed within a Kurzweil 2500, or he sits at a Roland JV-1080 or the vintage Korg M1, Moog and Prophet DX. As far as modules, he goes back to the Proteus Orchestra for woodwind sounds and analog modules by Oberheim. There are even the rare times when he'll use a Yamaha VL-1 to perform some physical modeling. "It is a difficult instrument to master, but it is a fantastic instrument for monophonic sounds," he says of the VL-1. "It was too complicated and too expensive to catch on with the mass market."

Much like a pop music producer, Gohl is charged with helping the composer down the path while spotting a film. "Depending on how much a composer knows what to do, he'll just come up with something, or we further coax him along, maybe playing some ideas until we have some themes that we can apply to various scenes. Then we build it up from there," he says. "During something like *The Red Violin*, you're talking about a very experienced, polished composer in his own right. So, during that project, I did not write a single note. My job was to produce everything from the recording sessions to the technical aspects of music editing, how it's cut in and how it appears in the final dub of the film."

The team's main responsibility, it seems, is to make sure that all involved are happy with the final score, including directors, producers and composers. Gohl points to the recent work his partner performed on *The X-Men* soundtrack, written by Michael Kamen. "The director wanted that type of John Williams soaring orchestral score, the producers wanted more of a drum-oriented, Hans Zimmer rock 'n' roll thing," he recalls. "What happened in the end was a combination of the two, all of which landed on Steve's shoulders, because the composer had no interest in doing something that's not him. So, he started to generate some of those loops, some of those rhythms, and integrating with the music that Michael had written. In the end, you have a working compromise. It's always a compromise; it's not always satisfying, but you have something that everybody's happy with."

Obviously, that's not always possible, and that fine line of making everyone happy is a challenge. Gohl takes the long view to survive the internal battles. "You walk [the line] by knowing that this is just another movie," he says. "Even if it's the biggest hit of all time, you know what the best music was for the film and why it's there." And having a sense of humor helps, he adds. "When Steve and I work together, we have a lot of fun. You've got to have fun. The sense of humor and the lightness, especially in the tough parts, is really important."

David John Farinella is a freelance writer based in the San Francisco Bay Area.

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—FROM PAGE 78, DANNY ELFMAN

the music of Terry Riley. I really loved percussion.

The Mystic Knights was this odd theatrical union of crazy percussion ensembles and the music that I loved most during the '70s, which was a lot of vintage Cab Calloway, Duke Ellington and Django Reinhardt. It was through that early jazz that I taught myself to write and notate, because I used to have to transcribe the solos and the arrangements.

So you are utterly self-taught?

Yes. I owe a great debt to Duke Ellington, really. Those were the first transcriptions I did. His arrangements were not that simple, and the harmonies were really interesting. I learned that, if I took the time, I could get it exactly right. That is where I learned my confidence in my ear.

Cab Calloway's arrangements were also really a big deal to me. Some of those arrangements had some really dense, crazy shit, and they were not that easy to write. They could be very fast and complicated. I would listen to videocassettes of Betty Boop cartoons and old records, but I learned that if I listened hard, I could freeze it in my head and hold it there and write it down. It ended up being critical training for me, even though I didn't know it at the time.

This was also where I began to compose. The last big and most ambitious composition for the Knights ended up being what really gave me the confidence many years later when I was asked to compose for film. It was the "Oingo Boingo Piano Concerto 1 and a Half."

What caused you to move from the Mystic Knights into starting up a band?

It was really hearing the ska that came out of England around 1978. That is what turned me around. I loved listening to the High Life music of West Africa. It was a little more Latin than ska, but really up-tempo. It was the same exact-size band as Oingo Boingo became—an eight-piece band with a horn section. It was hearing The Specials, Selecter and Madness and then XTC, who really clicked for me. I wasn't a fan of '70s rock at all, but when I heard all this energetic stuff coming out of England, that is what totally did it for me. Bang!

So it wasn't until the very end of the '70s that you heard any popular music that you could relate to?

Yeah. Somewhere, early on in that decade, a trumpet player friend of mine turned me onto Miles Davis' *Bitches Brew* and Sravinsky's *Rites of Spring*, and it was probably six short months after that that I threw away almost my entire record collection. [Laughs.] I've always been prone to extremes. I don't know what exactly clicked me into old jazz, but I felt that I was displaced in the '70s. I felt I really belonged in the '20s. I felt like I was a character out of late-1920s Paris that somehow got stuck in 1970s Los Angeles.

Was your family musical?

No. My parents listened to folk music like Pete Seeger. I know my Dad listened to Beethoven, I seem to recall. Classics. They were schoolteachers.

So how did they feel about you leaving high school?

They weren't happy. I did get a diploma sent to me. I just didn't want to stick around to get it. I managed to squeak enough credits and take off. It wasn't like I wasn't interested in college. I just wanted to get the f*** out of high school as fast as I could. I really disliked people my age, for the most part. I just had as much as I could take of teenage boys in general. It was that weird out-of-place thing. Being surrounded by teenage boys was, for me, like being in some kind of zoo full of orangutans. For the most part, they were so f***ing stupid and proud of it that it was mind-boggling. [Laughs.] It probably hasn't changed that much. I just wanted to be around girls. I couldn't stand boys. I had some friends who were boys, but they were misfits like myself. They were eccentrics.

When I go into the studio, I send an entire duplication of my setup in a mobile rig.

I was very much in a similar situation in junior high and high school. I was the tall skinny guy who was given a hard time by all the jocks.

And I was the little weird-looking albino kid that couldn't see anything in the sun. When they did team sports, I was blind as a mole in the light. Of course, in those days, you couldn't wear sunglasses to school. I didn't un-

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derstand that I simply wasn't designed to be out in daylight under any circumstances, much less catch a ball under a sunlit sky. I was a pretty bitter kid, a nerd, at that age.

Is there anything that I haven't touched upon that you would like to address?

You didn't ask me about a lot of equipment, which I really appreciate. I'm always grateful when it is not a super-technical talk of "what's my gear."

I will say that I'm constantly changing my rig, but the most common, long-lasting staples from the beginning that I have been using are the E-mu samplers, which I've been using since their very first E-I, the Macintosh, which I've used since the Jurassic version, and Mark of the Unicorn Performer, which I've used since its earliest incarnation. My extensive personal sample library of percussion is all laid out for the Emulators, but recently I began converting some of that library to use on the Gigastudio as well.

Concerning Mark of the Unicorn, that is one of those things that, once you are really good at a certain software, it would take a really compelling reason to change. The speakers I listen to are Questeds. I love listening to those. I have a pair of the small Genelecs, which are nice. If I have to set up in another space, I'll use the Genelecs.

I have a bunch of stuff spread out in different places, but I never use more than two in one place. Actually, I have two G4s, eight Emulators and two Pro Tools systems, because everything is duplicated. When I go into the studio, I send an entire duplication of my setup in a mobile rig. That is because it was getting more ridiculous having to drag all of my shit down into the studio.

See, a lot of the samples and things that I use stay in the score. A lot, like the orchestra sounds, get replaced by the real thing. But very often, there are anywhere from a dozen to 48 tracks or more of my own stuff. My engineers are always moaning and groaning about this, because I lay down stuff that isn't orchestral. It is stuff I'm playing, and I want to bring it in. Almost all of the percussion and synthesizers in my scores are mine. So, finally, I realized that the only way I could do this was to have a rig that I could roll in and plug in and set up and be up and running in a couple of hours—instead of dragging half of my studio down and taking an entire day setting it up and then dragging it back. It just didn't make sense.

That said, the whole art is non-technical. It has become technical, in terms of laying it out. I have to say that working out stuff with a director, in one's home studio, before you get in front of an orchestra, is usually a very positive thing. Because whatever differences you have, you try to get through as many of them as possible without a big orchestra there, so you can duke it out on your own time, so to speak. I think that is good. It is good to know that the technical stuff doesn't make the score. It helps with the presentation, and directors really want that nowadays, but I started out with just a piano and a couple of little sequencers and then grew into other things. It still hasn't changed the fact that the art is still the art, and it is still about capturing the tone.

Your scoring for the film Edward Scissorhands ***was truly magical at capturing a tone. It is probably the most mimicked film piece that you have done to date.***

That is clearly true. Closer to Christmas time each year, the Edward stuff just starts popping out all over the place. It is really funny. The phone really starts ringing as it gets close to that season. People will call up and say, "Did you hear so and so? You've got to check it out?" It also rings at some odd times, for different commercials.

It certainly is one of my favorite Tim Burton movies, and even though there was plenty of humor, I found it to be a wonderfully touching movie.

So did I, but then anything that is emotional in movies is because you "buy" it. I know a lot of people who thought *Titanic* was extremely emotional and that it moved them to tears. This was from people who had relatively good taste. [Laughs.] For me, I didn't feel a single stir inside of me. Why we find anything moving or not is a pretty subjective thing.

It has been said that Burton's movies always have this compassionate thread for the misfit underdog. Obviously, you relate to that, the kid who needed sunglasses and had a hell of a time trying to catch a football in school. It makes perfect sense that the two of you would enjoy such a positive collaboration.

That is definitely true. [Laughs.] Tim and I both were probably the underdogs in our past. Weird kids who struggled hard to find the niche.

Rick Clark is a Mix *contributing editor.*

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—FROM PAGE 68, A WARM AND FUZZY COLUMN

stories of how the executives have name tags with their last name ("Mr. Blake"), while the blue-collar workers are identified by their first names. At the same time, these staffers would *never* address the hotel manager by *their* first name. This idiocy makes perfect sense to me, as ritzy hotels have always left a weird taste in my mouth due to the frequency in which the staff simultaneously fawn obsequiously while looking down at you.

A film set, on the other hand, is a notably democratic place to work. More often than not, the leading lady will be addressed by her first name. Sure, she will be staying in a suite and will have her own driver, but everyone is brought together by the camaraderie of long hours in sometimes difficult and dangerous locations. Even though my solitary nature has me spending most of my time either alone or with a few other people in dark rooms, I cherish the time that I have spent the past nine years on sets, most of them on Steven Soderbergh's films. His production team is nothing short of aces in every department and is almost completely void of stereotypical movie-set histrionics.

In general, I have been lucky enough to work primarily on films whose production track is the foundation for the overall mix, and I relish the opportunity to collaborate closely with the first part of the film sound chain. I have had a chance to work with some of the best in the business, who are also, not coincidentally, some of the nicest. This has been further proven to me because when I have had run-ins, it was with some mixers whose work is not at the top of the game.

There has been plenty of fur flying back and forth between production and post-production sound over the years, in the form of finger pointing and accusations. Much of this can be found on

GLOSSARY

OSCAR: The name of the awards handed out by the Beverly Hills-based Academy of Motion Picture Arts and Sciences. Oscar statuettes for Best Achievement in Sound are given to the production mixer and up to three re-recording mixers, while the Best Achievement in Sound Editing is the domain of the supervising sound editor and/or sound designer, for a total of no more than two.

VARIETY: The daily and weekly entertainment industry trade paper that is famous for its distinctive industry "slanguage": films are "pix," writers are "scribes," you don't quit or get fired from a job, you "ankle" it. Thus, one of the most famous *Variety* headlines: "Sticks Nix Hick Pix."

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Internet news groups, where flaming is all too often the rule. Sometimes I want to compare the relationships between the two camps to the war of the sexes: "You just don't understand me!"

No, I don't understand completely the issues that production crews face, but it has been an immense help, both to me and I suspect to them, my witnessing first-hand the problems that they face. Because, ultimately, they all become *my* problem, and any time one can put forth a unified front in the heat of battle in production, the better chance the production track has of shining in the final mix.

The other internecine battle in film sound sometimes occurs between sound editors and re-recording mixers. The complaints here are less related to the work performed by the other side as it is to how the line is drawn between them. This skirmish also doesn't cross my radar, because I feel very comfortable in both worlds, and am indeed friends with a good percentage of the dozen or so people in the industry who also go "both ways." This collegial feeling perhaps peaks every year at the sound effects bake off, where 800 members and fans of good sound editing gather at the Academy.

While there has been criticism of this night from various folks, I—being the nerd that I am—think that it's nothing less than wonderful to have good work celebrated in such a manner. When I was having the discussion at the beginning of this column, it gave me pause to think if there were any other departments that have this level of closeness. I gather that the world of visual effects would be a good candidate, because not only is that field so large, but it's commonplace for them to work on the same films together.

My hands-across-the-water experiences in my career in film sound has also literally been just that, as I have been fortunate enough to meet colleagues from around the world. Sometimes this has been through visits to Europe for foreign language mixes, and sometimes this has been through my writings and seminars. I find it very humbling to go to other countries and find out that we indeed have more in common than we don't. (Please pardon the cliché, but I warned you of the tone of this column.)

What's the dark side of working in film sound? Certainly it takes its toll in your private life because of the demands that it makes on your time. Yes, you get paid good money—stupidly good sometimes—but you have to give up any hope of living a 9-to-5 existence. There is very little glamour and celebrity to be found in making a line of ADR integrate seamlessly into a film, other than the knowledge that you were able to keep audiences focused on the film.

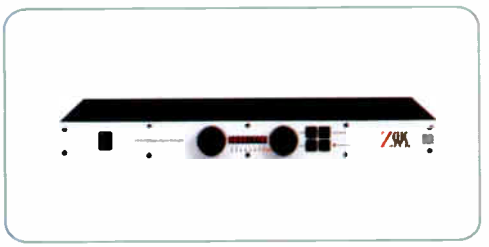
But I, for one, cannot even consider what I would be doing if I weren't able to work in film sound. Maybe I'd be a camera man...

Send your warm, fuzzy comments to PO 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 film community there is so small that not only do you know everyone, you probably went to school with their spouses.

Digital Audio Essentials

from the digital audio interface experts



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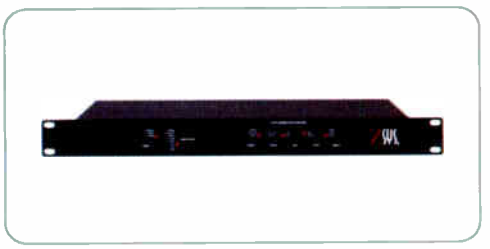

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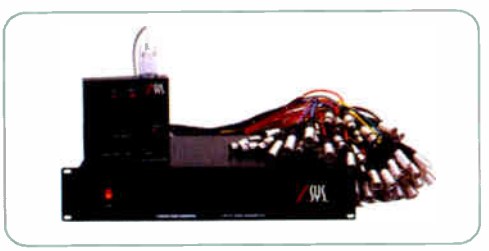

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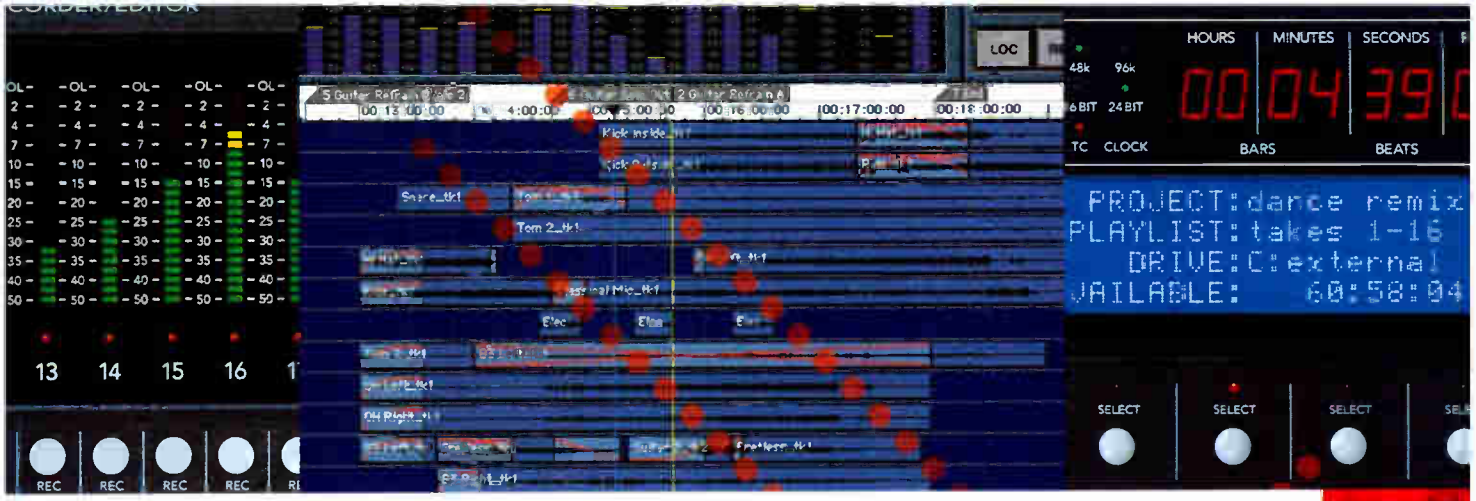
George Petersen
Mix Magazine March 2001



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gone…which makes doing "punch-ins" a dicey gamble. This is called *linear* (destructive) recording. Even some current hard disk recorders use this old-fashioned technology!

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"The recorder's faceplate holds few mysteries and most users can be up and recording just minutes after unpacking the HDR24/96."

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CIRCLE #049 ON PRODUCT INFO CARD

ARMIN STEINER

TIPS AND TALES FROM AN L.A. STUDIO PIONEER AND SCORING ENGINEER

PHOTO: MAUREEN DRONEY

Armin Steiner is a self-described survivor, having achieved the kind of career longevity that, in the music business, eludes all but a select few. A gracious man with a polite, almost courtly style, he's also highly opinionated, offering an educated and well-articulated point of view that stems from both his past experiences in the recording industry and his current commercial recording work.

Steiner's pop engineering credits include more than 100 Gold and Platinum albums with major artists starting in the mid-'60s and including hits for Glen Campbell, Neil Diamond, the Fifth Dimension, Bread, Heart, Dolly Parton, Johnny Rivers, Hall & Oates, Helen Reddy, Barbra Streisand and many more. In recent years, he's returned to his youthful roots as a classical violinist and has become an in-demand scoring engineer, recording orchestral soundtracks for

such films as *Silverado, Home Alone, Born on the Fourth of July, JFK, A League of Their Own, Witches of Eastwick* and *Cocoon*, and for television shows from *Dynasty* and *Star Trek: The Next Generation* to *Beauty and the Beast* and *King of the Hill*.

We met for this interview at the Newman Stage on the Fox Studios lot, where Steiner was recording a series of orchestral cues for upcoming episodes of *King of the Hill*. Afterward, we adjourned to the Fox dining room, where, seated beneath historic wall murals harkening back to the 1930s, we settled in for lunch and a long chat.

You're one of the very few engineers who started out to be a classical violinist.

Yes, Phil Ramone is the only other one I know of. And I hear he was pretty good! It's true that I went quite far with my music, to the point where I played with symphony orchestras and was a Columbia artist, all while I was very young.

Then I got serious about this end of the business. I decided I wanted more of a normal life, that I didn't want to live out of a suitcase as I thought I'd have to do if I stayed in the classical scene as a soloist or a concertmaster.

Somehow, with all those hours you'd spent practicing your instrument, you still found time to develop some technical skills.

I always had this technical thing going. I was 11 when my father bought me a tape recorder. He was an international chess master, and he traveled all over the world. But his hobby was disc recording. We're Hungarian, and my father used to record gypsy music directly to disc in our living room.

I used to record myself and my mother, who was a concert pianist and who played accompaniment for me. And it used to drive me crazy that I couldn't record my violin properly, because that old recorder had so much wow and flutter—there was always wavering in the background.

What formal training did you have to be an engineer?

My first job was at Electrovox Recording Studios, when I was 15 or 16 years old. I was actually told after two weeks that I didn't have any talent for the business and should really give up.

After that, I went to City College here in L.A. for two years studying music, and also engineering and physics and chemistry. There I became friendly with the man who was head of the intercampus radio station. He took me under his wing, and pretty soon I was recording big bands and opera—all of that at 17 years old.

I went from there to UCLA, where I was in the music depart-

BY MAUREEN DRONEY

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ment. I played a lot, and I also took engineering classes. And I did the same thing there but for a different reason. Even back then, UCLA was an impossible place to park. So in order to get a parking pass, I offered to do recording for them—at Royce Hall, all over campus. I had a big heavy Magnacord machine, and I was carrying this stuff everywhere, but I had my parking pass! Meanwhile, I had also gotten a job at Radio Recorders, which was one of the first independent studios.

It wasn't long before you opened your own studio. Actually, you were way ahead of your time, because your first commercial studio, which you built in about 1960, was in your house.

Yes. A bedroom over the garage, which was 10 by 14, became the control room. The studio, in the garage, was 25 by 15, with 14-foot ceilings. I soundproofed and air-conditioned it with a flow-through system. I took the air from the basement, which was cold, and built it so it went through the pipes at a very low velocity and therefore was quiet. My uncle helped me, and although my mother thought I was nuts, she supported me in every way.

I also put an iso booth in. Studios didn't really have iso rooms then, just portable ones that they moved around. But I actually made a little room that was very bright. It was lined with masonite, which was very shiny and reflective—an acoustical equalizer. It was wonderful for all the R&B vocals that we did in there. I also built the recording console.

From scratch?

Yes, of course. You couldn't go out and buy a lot of things back then; you had to build them. The console was stereo and had six faders, three on each side. Later, I added three more faders on each side without preamps to use with high-output microphones like the U47. Especially with close-miking, there was sufficient gain structure with those mics so that it worked pretty well, and I got cleaner sound that way. We also added a center-channel mixer, made up of Langevin modules that had three mic inputs, one line input and reverb sends. It was designed by Sherwood "Bert" Sax, the brother of Doug Sax of The Mastering Lab. He's a brilliant engineer who designed most of the electronics and put it all together.

One thing that was really significant to that studio, and part of the reason our sound was so good, was that we developed a phase-correcting network that we used on every channel of our tape machines.

Using tape, as opposed to recording direct to disc, made phase shift properties more apparent. When the fundamental and its overtones don't arrive at the same place at the same time, and the sound is a little bit spread, you don't hear it coming back exactly like you do in the room. What Bert did was design a device we called a "scrambler." So if we had a 3-track recorder, we would have a scrambling device for each of the three channels, and they would be tuned to the characteristic of the tape track. We'd come out of the bus, into the scrambler, out of the scrambler, into the tape machine. And it would decode itself better. It was a compromise between shifting the high end and the low end at the same time, and it created better transients. We were the only ones who had that.

I used to have The Supremes up there, Marvin Gaye—my mother used to cook for them. Stevie Wonder was in when he was 9 years old. People think I'm making this stuff up, but it's true.

What other equipment did you have?

When 3-track came out, I had two 3-track machines, Ampex 350-3s, two Ampex 350 2-track machines and one that was mono, an Ampex 200—a great big machine. It was a well-equipped place. I even had reverb. One was a combination of three spring devices that I'd made and hung on the wall, and one was a wonderful-sounding live chamber that I'd built underneath the house.

Your mother let you build an echo chamber in the basement? And run cables through the walls?

Yes. She even let me use her Thunderbird to haul the trailer full of tile that I needed for it. My mother was quite amazing. She also let me use her piano, on which we ended up cutting several hit records.

You had no background in pop music before you built the studio. How did you learn about it?

Two people who were very influential in the commercial rock 'n' roll business helped me and actually went into business with me: Lincoln Mayorga, who is a great pianist and the arranger for the Four Preps, among many artists, and Eddie Cobb, who was the bass voice in the Four Preps. They were producing records for other people, and they taught me. I had never really paid attention to commercial music before, only classical.

How did you get clients to come to you?

After the studio was all built, I did a couple of demo sessions, and we thought it sounded pretty good. Then one afternoon I got a call from the Wilder Brothers, two very nice and crazy men who had heard I had a studio. They came over with a little group called Dick and Dee Dee. We cut a demo, and three or four weeks later it was a Number One record called "The Mountain's High."

From that moment on, word started traveling. Motown got interested, and I was busy all the time. I had Glen Campbell, Billy Strange, Tommy Tedesco, Dennis Budamir, all these guitar players sitting there at my house. There was Ray Pohlman, one of the truly great Fender bass players and the first man to actually build a distortion device. Hal Blaine, Earl Palmer, Joe Osborne, Larry Knechtal, Bill Pittman, Mike Deasy and, of course, Carol Kaye. I'd get a call at three in the morning from Herb Alpert saying, "I've got to overdub a tambourine on this piece." I'd be in my pajamas and I'd walk up there and we'd do it—that was that. I used to have The Supremes up there, Marvin Gaye—my mother used to cook for them. Stevie Wonder was in when he was 9 years old. People think I'm making this stuff up, but it's true. As a matter of fact, I did a film session with Stevie awhile back, and he remembered both me and my studio.

It was a different time, a different place. You couldn't do that kind of thing now, the city wouldn't allow it. I mean, it was all illegal. And there was a lot of activity.

Why did you finally move your studio out of the house?

Really, I would have to blame it on the

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CIRCLE #051 ON PRODUCT INFO CARD

Watts riots—that very tragic happening in Los Angeles that made many people really paranoid. I was recording a lot of black acts there—mostly for Motown. And we would have lots of cars and people outside the house. Most of my neighbors didn't mind, but one who lived across the street called the city.

I was off working at Radio Recorders one day, and my brother called to say that a city inspector was there, telling him that I had to have the business out within 24 hours. So I did. I'd operated it for a good seven years, and probably had 10 or 11 Top 10 records, but I disassembled the whole thing, took all the equipment over to Radio Recorders and never looked back.

You built two more studios after that.

Yes, I had Sound Recorders from '65 to '71, then I moved across the street where I built Sound Labs, which I operated until 1980. Then I was at Evergreen in Burbank for a year-and-a-half, then Lionel Newman hired me here at Fox.

You've said that out of all the pop music that you've recorded, the Richard Harris epic, "MacArthur Park," is probably your favorite.

That's a subject all in itself. It was 7 minutes and 20 seconds long, and we recorded the music at my studio, Sound Recorders. I think that [songwriter] Jimmy Webb was inspired to do an epic by The Beatles' "Hey Jude." The way Jimmy conceives a song is that he sees the whole thing, then goes back and does it. He's one of the few people who can see the whole picture at one time. And that was an extraordinary piece of music, because it had chord progressions and melodies that were far more reaching than your average pop record, to say nothing of a great lyric.

So it was conceived as a whole and he wanted to record it as a whole, with absolutely no edits and no stopping, not even within the movement structure. If you remember, it was a three-movement piece. He wanted to do the whole thing as a complete piece of music, because he wanted to capture the whole inspiration.

What was the session like?

It was our usual rhythm setup. Hal Blaine on drums, Joe Osborne on bass, Mike Deasy on guitar, Larry Knechtal and Jimmy himself on piano and harpsichord—I can't remember which one did what, they were playing in unison.

We started rehearsing at 10 in the morning. We rehearsed and rehearsed, changed and rehearsed, because it was very complicated, especially the rhythms. The slow section had to be a certain mood...it was like a mini movie.

They rehearsed the same piece for six hours, then put the music down and played the entire piece of music from memory in one take. And that was the magic. Anybody else would have taken it and edited—chopped it up in little sections—and it wouldn't have worked.

What did you record to?

Eight-track. Sound Recorders was one of the first commercial studios to have

SELECTED CREDITS

E: Engineering; M: Mixing; R: Remixing

Bread: *Best of Bread* (1972, E)

Glen Campbell: *Southern Nights* (1977, E)

Judy Collins: *Hard Times for Lovers* (1979, E/R)

Neil Diamond: *Hot August Night* (1972, E)

Danny Elfman: *Music for a Darkened Theatre, Vol. 1: Film & Television Music* (1990, E)

Hall & Oates: *Daryl Hall & John Oates* (1976, E)

Heart: *Dog & Butterfly* (1978, E)

The Nitty Gritty Band: *Nitty Gritty Dirt Band [Liberty]* (1967, E)

Helen Reddy: *I am Woman* (1972, E)

The Simpsons: *Songs in the Key of Springfield* (1997, E)

The Turtles: *Happy Together* (1967, E)

Empire of the Sun original soundtrack (1987, R)

Die Hard 2: Die Harder original soundtrack (1990, E/M)

A League of Their Own original soundtrack (1992, E)

Robin Hood: Men in Tights original soundtrack (1994, M)

Cocoon original soundtrack (1997, E)

Way of the Gun original soundtrack (2000, M)

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an 8-track. Columbia had done it, as I recall, by running two 4-track machines together, not even with a synchronizer—it was kind of all makeshift. But we actually built one. We took an Ampex 200 deck, that huge thing with big motors, built as a monaural machine, and, as I recall, we used Ampex PR10 electronics. The PR10 was two channels in one box, so we didn't have to have so many amplifiers hanging around. So, we added together four packages of Ampex 2-track electronics.

Then we needed heads. We had the idea to take the specs from a 4-track head and use the same geometry to make one that was 8-track. We found a company called IEM, in Chicago, whose chief engineer, John Pretto, was building 7-channel data heads for telemetry for satellites, and we had them build it for us.

A lot of composers will discuss with me beforehand the kind of texture they're looking for. To me, that's absolutely the most valuable information.

We didn't even have automatic tape lifters on this thing, so we had to pull the head gate back by hand when we did the rewind, which was difficult to do with 1-inch tape. There was a lot of resistance there, but we made it work.

Of course [laughs], after the rhythm section was done, they took the tape to London to record Richard Harris, and they had to go through a similar process. At Landsdowne Studios, they built an 8-track machine out of Scully parts in order to put his voice on.

Do you recall how you miked the band?

I'm a creature of tremendous habit, so I know that, probably, I used two Sony C-37 microphones over the drums. There may not have been a snare mic, but if there was, it was a Sony C-500.

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On the bass drum, probably an Electro-Voice 666—you could hammer nails with it. Piano: always a single mic, a U47. The harpsichord would have been an AKG 451E, taped to the stick of the harpsichord. We always took the bass direct. On the guitar, just a single mic—an AKG 451E—I had a series of those, and I liked them because I could put a pad in them to take down the level so that we wouldn't have any distortion.

And, always, of course, I'd set it up to have everyone sitting close together. That's very important. If the rhythm section can hear well and feel well together and have eye contact, it's going to be much better for the ensemble and for whatever magic you're going to get from that ensemble.

Would you have compressed the bass?

No, I very seldom use compressors, except for the bass on rhythm and blues records. I rarely even use them on vocals. I always feel like I can ride the level myself better. Once I hear the melody, I've memorized it, and I'd rather deal with it that way.

The only limiters that I ever used were LA-2As, LA-3As, 1176s and, later, the Inovonics. I still like the Inovonics if I have to use one—I think it's the most "unlimiter" limiter that I know. And, of course, in the early days we had the old Fairchild tube job, that brute-force, heat-producing monster that adds so much distortion along with its limiting that it creates a "sound."

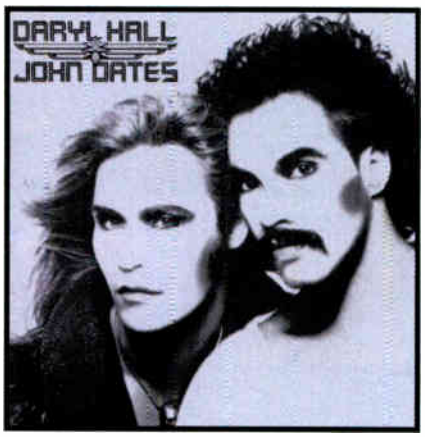
Mastering a 45 rpm record of that length, which you also did at Sound Recorders, must have been another story unto itself.

We had to get 7:20 on a 45 rpm record. The only other record that had been done that way was "Hey Jude." Cal Frisk, who worked for me and was a super-great engineer, did the mastering. It was done manually; we didn't use variable pitch—we opened and closed the grooves manually.

I knew the music so well, you see, that we could maximize cutting it by doing it by hand. When the music gets very quiet, you can close the grooves, because it doesn't take up much space.

When you have louder sound and deeper bass, you need more land between the grooves in order to reproduce it. Knowing the music, you pretty much know your limits.

In those days, don't forget, it was a



real battle of levels with 45 rpm records. It was always about trying to make the loudest disc and defeat all the stuff in the transmitters and the radio stations so that you could produce the loudest single over the air.

There were two factors to consider: the amount of space that is technically allowed—up to so many centimeters from the center—and the distortion factor. As you get toward the inside of the record, you have greater distortion. It was art and science at the same time; that was the romance of the business in those days. And, since the masters were all cut by hand, maybe there was a

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CIRCLE #107 ON PRODUCT INFO CARD

slight difference between each of them. Maybe I made a better one the second time!

These days, the bulk of your work is orchestral recording. How do you prepare for a large scoring date?

The most important thing is to know what it's going to sound like beforehand. You must get a mental picture of that by knowing your composers and their style.

I also try very hard to go over the details before we ever get into the studio. A lot of composers will discuss with me beforehand the kind of texture they're looking for. To me, that's absolutely the most valuable information.

Normally, our actual setups are going to be pretty much the same, unless you want something special. Like on the *Witches of Eastwick* score, John Williams wanted me to put the tubas next to the French horns, because they all played together. Now that isn't something that you would normally do, but it worked marvelously well. He was 100 percent right, as usual. Those are the kinds of things that create a sound. When I did *Silverado* with Bruce Broughton, another magnificent composer, there were times when it was so loud in the room that it was impossible. We had a very small string section, so I decided to put the strings over to one side of the room and then let the brass and the winds have all the space. Then we put up three microphones for them and came in a little closer with the microphones on the strings. And it worked. Really, it's about letting the music be your guide.

On the Newman Stage, where you often work, the console is an SSL 9000. You also like working on the large API console at O'Henry Studios. (See this month's "On the Cover" on page 14.)

Yes. O'Henry's is an all-custom board, with API equalizers, a marvelous-sounding console that was a great product of love and very precise engineering. I do like the SSL 9000, and I work also on the Neve V Series.

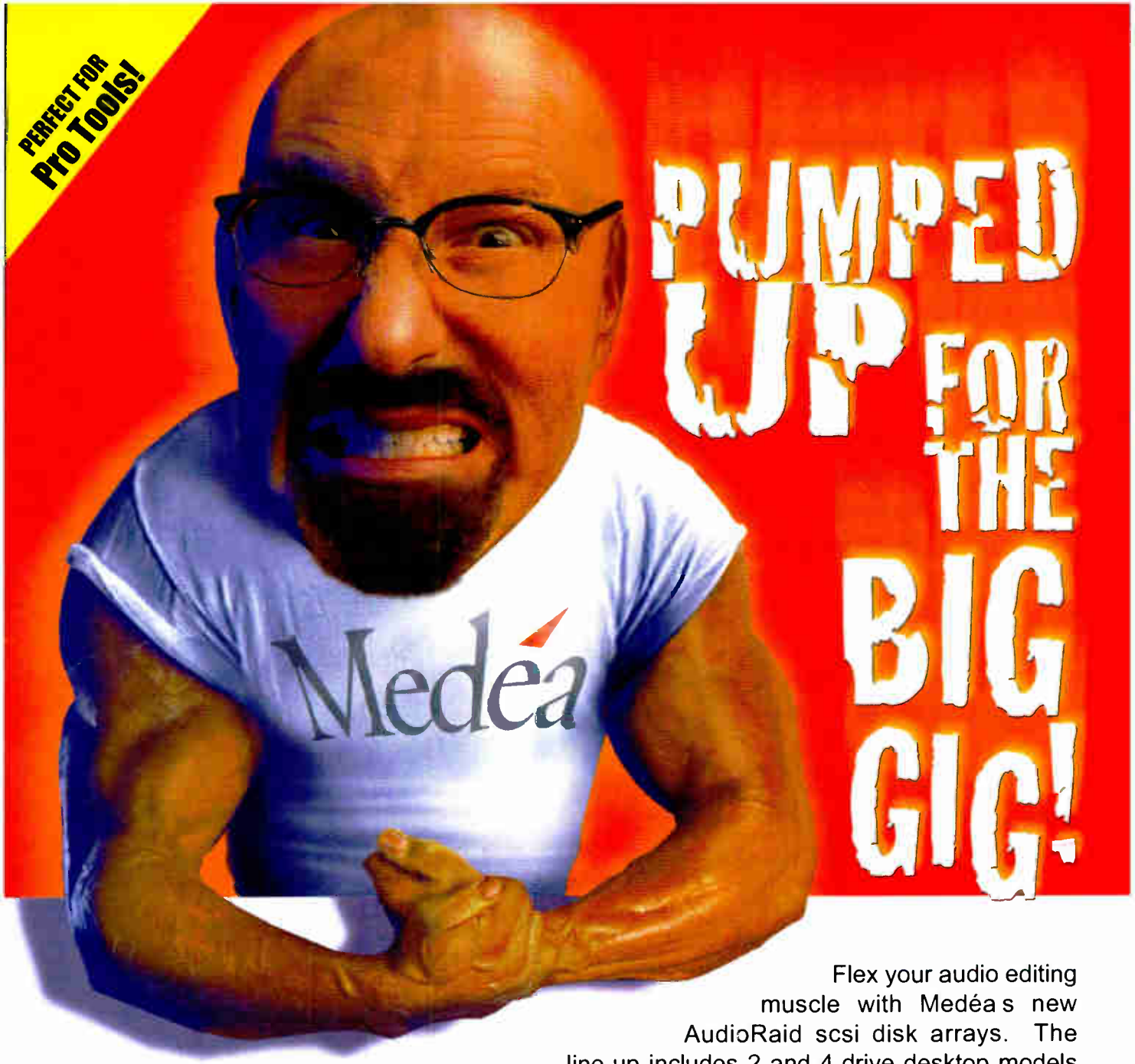
You're not a fan of tube mics for scoring dates.

It depends on the maintenance of the microphone. You don't want a breakdown, because it will always come at the wrong time. It will always happen when you're ready to make a take, or you're in the middle of something that is beginning to come together in a most unique manner, and there you fall on your face. Plus, the fact that none of these [tube] mics are even. They don't sound similar, and if you're going to use them across the front of an orchestra, with peculiarities and artifacts different for each microphone, you've got problems.

What mics do you prefer then?

There are great mics by Sennheiser, which I think are the best modern microphones made, and that's the MKH Series. Their characteristics are extraordinarily musical, and that's what's important to me—how musical they sound, how real they sound. The reason they sound so good is because their off-axis response is totally linear. In a Neumann microphone, for example an M50, the off-axis response is very jagged, very unlinear. Remember, any leakage you get in the room must combine. That's why it's very important many times to use the same type of microphone, so that the characteristics of the leakage will be the same. It's just logical. Practical physics.

I rarely do any close-miking. For TV, we do go in a little closer, but for scoring motion pictures, you want the sound of an orchestra, and you cannot



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get it by sticking a microphone in front of somebody's face. It will just sound small.

Therefore, almost everything is coming from the overheads, which would be MKH 80s or 800s. I use five across the front. I also use either MKH 20s or the solid-state M50s for the two surrounds, which are placed overhead back from the orchestra. Then, I'll maybe put a couple of MKH 40s over the woodwinds, just in case I need to accentuate a solo or change the balances. For the most part, for a brass section I'll stick up a couple of TLM170s at a great distance, and I might open them up just a bit and use just five percent of those mics.

What about the percussion?

Perhaps a TLM170 over the timpani for some accentuation, and perhaps some high over the overall percussion. I would always rather pick things up in a natural balance. I want to get what you would really hear if you were in a fine concert hall.

You use very little processing when you record.

The only thing I use is a little reverb.

You monitor with reverb.

No, I record with it. Absolutely. I have a favorite that I've used for the last 12 years or better, the Roland R-880. I have a very special program that we developed the algorithm for, on a card that I burned at the factory about 10 years ago.

What new equipment have you been impressed with lately?

Nothing, really. At the risk of sounding dated, I'll state that nothing much has really changed in 40 or so years. You still have to get from microphone to line-level, and what we've done in the intervening years is merely to put a lot of garbage in between them, which serves to degrade the sound.

Okay, then, is there any old equipment that you can't live without?

No. I use what I have. I don't want to make a big deal out of it. I just need to get the signal properly, and then the proper balance, the sonority. I like to preserve dynamics. If something is quiet, it should be extremely quiet. If something is loud, it should be earthshaking. If the music is exciting, it should come off as excitement, not as something the engineer tries to interpret.

We are not interpreters. We are servants of the music, and all we're doing is taking what the composer did and, hopefully, putting it down in the perspective that they heard.

What advice do you have for someone who wants to become a scoring engineer?

I think he or she should come and listen. Listen to what the orchestra is doing, and after they have that in their heads, they should go in and listen with somebody who has some years of experience.

That's how I learned. When I was 14 or 15 years old, I sat with Thorn Nogar at Radio Recorders, who would be doing an Elvis Presley session in the morning and then Henry Mancini in the evening. I saw what he did and learned why he did it. I learned from all of the wonderful staff engineers at Radio Recorders. You can learn so much from observation, if you have a keen ear.

Your job is to try to create the excitement that the artist intended to have in the music. When it gets exciting, your fundamental obligation is to be able to capture that dynamic. It's not only loud or soft, it's all that intensity that happens. It doesn't matter if it's rock 'n' roll, big band, operatic or symphonic, the most important thing is to let the music be your guide. No matter what you're recording, if you let the music be your guide, you will never go wrong. ■

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

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CIRCLE #062 ON PRODUCT INFO CARD

SON OF TOSH

MORE TRADE SHOW MAC NEWS

If you use a Mac at home or work, then by now you've probably already seen the ads, purchased the cocktail napkins and generally gotten caught up in the spin of Apple's PR machine. But hang in there, Genteel Reader (who am I kidding), as here lurks a few choice morsels for you...This month, I'm veering away from CES (which I covered last month) to discuss a follow-on show at San Francisco's Moscone Center: Macworld. It was annoyingly busy, making it difficult for me to get my work done. I shouldn't complain, though, as recent metrics indicate that 17% of new Macintosh purchases are by users switching from a Windows world. The new operating system, along with Gigabit Ethernet-equipped, five-slot CPUs and the new TiBook, fueled the big buzz and will pull in yet more converts and lapsed pilgrims. Though Apple hasn't sent out my Solutions Provider copy of X, I can safely say that it will beat the pants off Win ME as a desktop OS.

If you didn't make it to my Pueblo by the Bay for the show, then you missed more networking, storage, productivity and rich media tools than you can shake a CD-R at. Let's start with the obvious stuff.

FireWire has come into its own, and Macworld's home court advantage allowed storage vendors to show their hard drives, bridges, repeaters, way fast networking, DVD and CD-RW drives. More, cheaper, better. Now that Plextor does ATAPI, its mechanisms showed up at several booths, disguised as external FireWire drives. Ecrix debuted its long-awaited, 1394-attached VXA tape drive, which is all I'll say about that for now, as a future column will get into backup options and the new tape formats. Other storage stalwarts like Atto and Adaptec proclaimed their support for OS X, and 3ware showed its new midrange 1000BaseT SAN product, a first for the Mac OS space. Think SCSI over IP (block-level transfers rather than file), and you'll begin to see why this trendy product category is heating up. More on that in the months ahead.

BY OLIVER MASCIAROTTE

In other storage news, Arco Computer was one of several vendors testing the Mac waters with a simple IDE RAID controller line—great for you tinkerers too cheap to buy a ready-made. Archos Technology was demo'ing its USB combo 6GB storage/MP3 player gadget, a fun item for you other tinkerers with disposable income. Those of you with a music or effects library in a jukebox will appreciate studioZee's ZephIP, a widget that easily lets you control your consumer TV, CD or DVD transport via infrared commands from your Mac.

There were no fewer than four pure-play Digital Asset Management vendors. This is another product/service class showing signs of long-term growth.

On to the big excitement for me: Unix on PPC. Linux is the current darling of the server set and is making significant inroads into the enterprise as well. But, despite the work of Eazel and others, I don't see Linux making a huge impact on the desktop. Enter another processor-independent, open-source project: Darwin, the basis for Appie's

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CIRCLE #048 ON PRODUCT INFO CARD

OS X. During development, Apple's goals were a simple and elegant UI, a modern, reliable kernel, killer graphics, the best Internet experience of any desktop OS, and, finally, gentle migration from the current, classic Mac environment. Sounds like a plan.

OS X is scheduled for general availability before this issue hits the street, so I won't bore you with stale stuff. But I did find the double hit of new hardware and the new OS generally buoyed my spirits. The four usable slot towers would make admirable studio processors and the new svelte portables are great for on-the-go production. But what really got me going was the small signs that Apple is now a Unix platform, with the accompanying up and downside. The upside: unprecedented speed and stability, rapid migration of existing hardware and software from other Unix flavors and a wee peerage in the court of Enterprise Computing. The downside: weaker security without significant bolstering.

So, what about audio at the show? Oh yeah, audio. Other than to say that Tascam had a small booth showing their nifty control surface, I'll defer the discussion until OS X ships. Fear not, we'll keep you informed as the plot thickens. Meanwhile, happy mousing!

OMas works on content creation infrastructure issues and lives just up the hill from the site of the first Yerba Buena rancho. This column was created while under the influence of Radiohead's Kid A *and Grant Hart's* Good News For Modern Man. *Links and occasional commentary for "Bitstream" at http://seneschal.net.*

CONDENSED CREAM OF OS X

Mac OS X, a layer cake of software modules, is not really new. Its lineage extends back to over 30 years ago, to a time when Big Iron dominated computing and AT&T needed software to run their public switched network, the phone system. Since that time, Unix has grown into the dominant enterprise operating system. It also became the brains that made, and continues to make, the Internet possible.

The foundation of OS X is Unix or, more precisely, Darwin. Darwin is somewhat akin to the current Mac's System suitcase, the fundamental bit on which everything else is built. Because it's based on a Mach 3 microkernel developed at Carnegie-Mellon and UC Berkeley's Standard Distribution Unix 4.4, Darwin provides all of the stuff one would expect from today's Unix: full pre-emptive multitasking, advanced virtual memory and complete memory protection with modern networking services. Because Darwin is open-source, improvements and fixes are rapidly accomplished by a collective of international zealots, not anesthetized worker bees. That work is examined by Apple, and the juicy bits are incorporated back into the next version of their commercial product. Also, savvy end-users can tweeze the code to their liking, something you can't do with proprietary operating systems.

Sitting on Darwin are three presentation engines: Quartz, OpenGL and QuickTime, handling 2-D, 3-D and motion/rich media, respectively. Quartz, the 2-D graphics engine, is based on Adobe's PDF, the Portable Document Format. It provides anti-aliased, on-the-fly rendering with transparency and masking. This means that the OS itself can read, generate and write PDFs. Three-dimensional chores are dealt with by OpenGL, the industry standard developed by Silicon Graphics.

The third presentation service is QuickTime, playing on its superior quality and rich media support for audio, video, sprites and text tracks. QuickTime holds the number two spot in end-user adoption, with Real ahead and Windows Media Framework behind. After many, many months of requests, Apple still hasn't gotten back to me about OS X developments for MIDI, synchronization and multichannel I/O, so I'll have to defer discussion until Apple PR opens the corporate kimono a bit. But QuickTime 5, now in beta, adds support for Flash 4, DLS-2, SHOUTcast and the Sorenson Video 3 codec.

The next-to-the-top layer in the OS X torte provides three APIs (Application Programming Interfaces) for high-level development, Classic, Carbon and Cocoa. Classic allows old-school MacOS applications to stretch their legs. Carbon is a collection of modernized OS 9 APIs, the mechanism by which propeller heads create applications. Carbon-compliant apps will run under OS 9 or X. Cocoa is the most advanced and powerful development environment. In Apple's words, Cocoa is a "next-generation, object-oriented application framework, accessible from Objective-C or Java." That translates into developer productivity, consistency and maintainability, all important if you're building the next generation of audio applications. Also tucked in there somewhere are the networking bits and welcome additions like Java 2.

The icing on the cake is Aqua, a user interface hybrid drawn from many influences and a thing of beauty. Because most desktop users are unlikely to open a shell or command line interface and interact with the kernel directly, Aqua is where most of us will spend our time. —*Oliver Masciarotte*

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CIRCLE #064 ON PRODUCT INFO CARD

New Software/Hardware for Audio Production

WALDORF ATTACK

Steinberg (www.steinberg.de) announced Attack, a VST percussion synth by Waldorf. Attack generates sounds in real time, with direct control over all parameters. Each percussion set allows 24 sounds, spread across two octaves. Two oscillators, each with nine waveforms, represent the sources. Other features include ring modulation, frequency modulation and a Crack module that reproduces analog handclaps. The filter section features six filter types, resonance of up to self-oscillation and an overdrive of up to +52 dB. Attack is integrated into the VST 2.0 interface, so all parameters can be addressed via MIDI controller. Retail: $149.

Circle 339 on Product Info Card

AUDIOCUBE 5

Spectral (distributed by Sascom Marketing, www.sascom.com) introduces Version 5 of its AudioCube multichannel mastering and audio restoration solution. The base system includes a 24-channel audio card and eight channels of AES/EBU I/O, expandable to 16 or 24 channels with optional rackmount I/O modules. AudioCube 5 provides Native, Pentium-optimized software, running on dual 1GHz Pentium III processors, with 256 MB of RAM. The system, based on Windows 2000, includes Wavelab and Nuendo, both of which are fully integrated into the AudioCube 5 architecture. The system also features 29 24-bit/96kHz, 64/32-bit floating-point mastering, restoration and analytical tools. Surround software, such as Dolby AC3, can be added for DVD-A or other multichannel work.

Circle 340 on Product Info Card

KORG D1600 DIGITAL RECORDING STUDIO

Building on its previous 24-bit, 16-track workstations, the D1600 from Korg (www.korg.com) adds numerous updates for a portable, pro recording package. Features include 128 tracks (16 tracks with eight virtual tracks for each), a removeable media using standard IDE hard drives, a 20GB internal drive (31 hours at 24-bit/44.1 kHz), control of standard Copy/Paste/Erase edit functions via a TouchView waveform display, optional CD-R drive, 24-bit S/PDIF optical I/O, audio scrubbing, and built-in autochromatic tuner and PCM drum machine. Its 24-channel/8-bus mixer includes XLR balanced preamps (with phantom power), 3-band EQ with sweep mids, 192 onboard DSP effects and 100 scene memories for storing fader/panning and effects settings.

Circle 341 on Product Info Card

KOL SMARTCODE PRO ENCODERS

Kind of Loud (www.kindofloud.com) is now shipping its SmartCode Pro Dolby and DTS encoders. Both versions of SmartCode Pro are AudioSuite plug-ins that allow Pro Tools users to preview their 5.1 surround mixes in real-time 5.1, then encode and decode the mix to create a 6-channel surround master. DTS-CD ($495) allows you to encode and burn a Red Book CD (using most desktop CD drives) for playback on most DTS-equipped home theater systems. The full version of SmartCode Pro DTS-DVD ($1,495) is intended for DVD authoring, which requires additional bit rates and includes SmartCode Pro/DTS-CD. SmartCode Pro Dolby is $795.

Circle 342 on Product Info Card

T-RACKS 24 VERSION 2.0

IK Multimedia announces

Version 2.0 of T-RackS 24 (www.t-racks.com), a stand-alone software mastering suite for Mac and Windows that is physically modeled after analog gear. With Version 2.0, T-RackS is now 24-bit, reading and writing 24-bit .AIFF, .WAV and SD2 files. An enhanced multiband peak limiter algorithm and an output stage with soft-clipping shaper with pre and post levels allows for more loudness without using compression or limiting. The saturation shape is continuously variable from hard digital clipping to ultra-smooth, tape-like saturation. A new compressor ratio control makes the unit more flexible and musical, and T-RackS 24 now lets you adjust such "internal" settings such as the multiband limiter's single-band levels, thresholds or attack times; compressor sidechain low-frequency cutoff; and global internal patch routing and more. T-RackS 24 users will also be able to share these settings online through a new T-RackS pro-mastering Web forum. Other new features include eight new "vintage" skins, more than 50 presets and dongle-free operation. List $299: registered users can upgrade for free.

Circle 343 on Product Info Card

DIGIDESIGN CONTROL|24

Now shipping, Control|24 from Digidesign (www.digidesign.com) is an analog front-end and control surface for controlling Pro Tools. The system features 24 touch-sensitive moving faders, 16 Class-A Focusrite mic preamps, full 5.1 control room monitoring control and dedicated controls for accessing transport/editing and DSP functions. Retail: $7,995.

Circle 344 on Product Info Card

UPGRADES AND UPDATES

SADiE announced the immediate release of the **AES31 standard for network and file transfer of digital audio.** AES31 defines the source material alongside edited audio (including crossfades) that is text-based in the manner of a traditional EDL. The format is sample-accurate and supports multichannel files in excess of 99 channels, as well as interchange between PAL and NTSC formats. The format is also open and non-proprietary. Visit www.sadie.com...**Access Music** (www.access-music.de) released a new **version of its Virus A soft-ware,** supporting owners of this discontinued product. The release has bug fixes and new features such as analog boost, an enhanced arpeggiator, random pitch generator and Sound Categories, which scan Virus' memory for like sounds...**Midiman** is the new U.S. and UK distributor for **Propellerheads.** For more information, visit www.midiman.com...**Spin-Audio** introduces **3D Panner Studio,** a plug-in for VST and DirectX that allows you to place your audio tracks in a 3-D space around your head and arrange them in a single window. Go to www.spin audio.com for details...**Emagic** has **licensed the POW-R algorithm** for digital wordlength reduction.

POW-R, short for Psychoacoustically Optimized Wordlength Reduction, converts longer wordlengths (up to 32 bits) to 16-bit format, while maintaining perceived dynamic efficiency and low noise...**CD Cyclone Duplication** (www.cdcyclone.com) announced its newest CD-RW product, the **CDRevo FireWire drive** with 16x burn capability. Retail price: $399...**Cakewalk** is now the distributor of **Image-Line's FruityLoops 3.0.** New features include a photo-realistic interface, support for DXI soft synths, DirectX audio effects and support for Windows 2000...**Digigram** (www.digigram.com) signed an agreement with AT&T to **license AT&T's implementation of MPEG-2 AAC,** for use in its multichannel audio codecs...**PSP** (www.pspaudioware.com) introduced the **MixTreble,** the fourth plug-in in the PSP MixPack: MixTreble offers four processing algorithms for removing hiss, processing transients, enhancing stereo and harmonics and switchable soft clipping. ■

MY PIECE DE RESISTANCE!

UNDERSTANDING AC/DC, SERIES/PARALLEL, RESISTANCE AND IMPEDANCE

We interface equipment every day, assuming and hoping that the relationship between source and destination will be a happy one. In any electrical circuit, impedance is a major part of that relationship, a rather deep subject that had me pouring through old textbooks and wishing I could still do the math. Here is my "Piece de Resistance," an overview of basic electronic information that will prepare you for next month's further adventures.

AC/DC: THE JUICE

Electricity can be described as an Electromotive Force (EMF). You know AC—alternating current—as sound and power (the giant hum that comes from wall outlets). Batteries deliver direct current (DC). Both are expressed in volts. AC can be transformed, rectified and filtered into DC—power supplies do this most of the time.

AC implies time by way of repetition. The frequency of AC is stated in Hertz—Hz—formerly known as "Cycles Per Second," or CPS. It is easiest to imagine one complete cycle of a sine wave starting at zero volts—going positive, then crossing zero, going negative and returning to zero. Before vacuum tubes, transistors or IC op amps can amplify AC, they must first be "turned on," biased with DC using resistors!

STORAGE

AC cannot be contained like DC, which can be "stored" in an electrochemical form as a battery or in an electrostatic form as a capacitor. Imagine filling a bathtub with water or parking a car at the top of a very steep hill. With gravity as "the force," throwing the switch is equivalent to pulling the drain plug or releasing the brake.

Unlike the popular water analogy, DC does not leak from the battery terminals, although, sometimes, the chemicals do. When AC and DC are put to work, however, magnetic energy is radiated into the air from the cabling, the principle behind inductors and transformers. Radiated AC, in the form of hum and buzz, finds its way into vulnerable "appliances" such as electric guitar and bass—another topic!

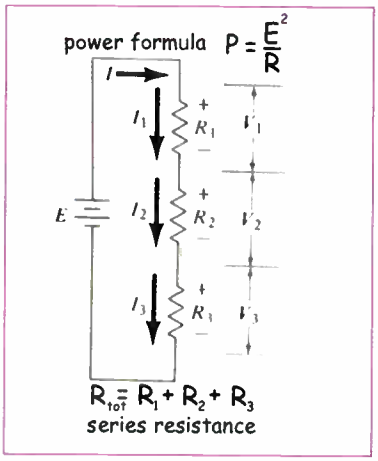

Figure 1a: Series circuit configuration and formula plus the power formula

DC might imply a constant polarity and voltage, but time cannot be frozen. Even a battery—disposable or rechargeable—holds a charge over a defined period of time that is primarily determined by use. Within time as we know it, a rechargeable battery has a charge and recharge "cycle," still technically DC, yet one could argue it being of subsonic frequency.

SERIES AND PARALLEL

Two circuit configurations are shown in Fig. 1a and Fig. 1b using resistors for each example, along with the respective formulae for calculating total resistance. Figure 1a shows resistors in series configuration, and Fig. 1b demonstrates parallel. In series, resistor values are simply added together. The total resistance decreases in the parallel configuration; the formula as shown matches the example but can be continued ad infinitum. Add more resistors, and the end result will eventually approach zero ohms; in essence, a piece of wire.

Note: Both "E" and "V" may be used to denote voltage.

Test No. 1: It is common knowledge that two 8-ohm speakers connected in parallel becomes 4 ohms. What if the two speakers were 8 ohms and 4 ohms? (Answer No. 1: 2.6 ohms.)

Tip: Most Windows PCs have a calculator with both Standard and Scientific modes.

Test No. 2a: Ohm's Law and the power formula are included in Fig. 1. These essential electronic tools are used to determine current flow and power consumption. Most cars have a 12-volt battery. Assuming that the sound system's amplifier can swing 10 volts peak-to-peak, what is the peak power output of one channel into an 8-ohm load? (Answer No. 2a: 12.5-watts peak power.)

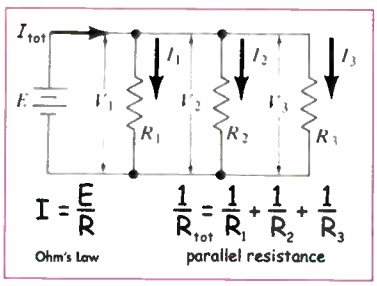

Figure 1b: Parallel circuit configuration and formula plus Ohm's Law.

Test No. 2b: (Bonus Question) What is the RMS power for the same sound system? Hint: See the February issue of this column. (Answer No. 2b: 1.56-watts RMS.)

LYNN EAR

Like the water analogy, a variable

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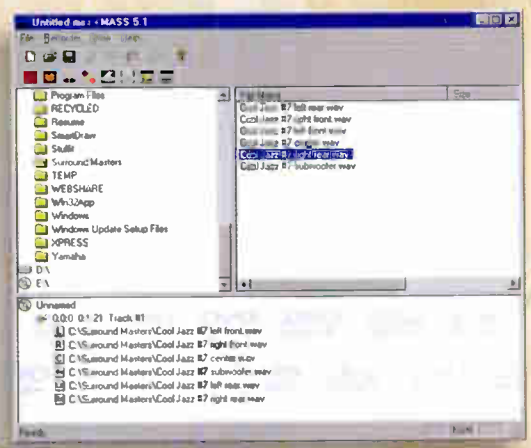

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resistor can be viewed as a valve, although vacuum tubes and transistors are much more efficient when "heavy lifting" is required. In a recording console, for example, the effect and aux sends are examples of variable resistors in the form of rotary potentiometers (pots).

Most pots are three-terminal devices. Typical connections to a linear fader are detailed in Fig. 2. The input is at the top, output via the middle terminal (called the "wiper") and the bottom terminal is the signal common, typically connected to ground. The wiper divides the resistor into two parts: The ratio of the bottom resistor to the total resistance determines the amount of input signal that is output. The very first example in the table on p.116 is the easiest to visualize.

The table defines 16-bits of dynamic range in 6dB increments as represented by the change in voltage and the equivalent resistance for a 10-kilohm fader.

A mechanically linear fader may also be electronically linear when a DC control voltage is used for VCA-type automation. The table on p. 116 shows how an audio taper pot differs. Starting with 10 volts at the top of a 10-kilohm fader, each 6dB drop represents a 50% voltage reduction from the previous value. While the first drop from 10 volts to 5 volts is half the electrical value, you know that the wiper knob will not be halfway down.

Test No. 3: Imagine a fader that is both mechanically and electrically linear. Put in 10 volts at the top, set it halfway and get 5 volts out. The fader comes in three resistance options—1,200 ohms, 4,800 ohms and 10 kilohms. The equivalent circuit is a series resistor pair consisting of...(Answer No. 3: 600, 2,400 and 5 kilohms, respectively.)

Test No. 4: The resistive element in an audio taper pot is "logarithmic," matching the ear's nonlinear sensitivity to level changes. It's hard to avoid the math, but I encourage those with access to a scientific calculator to engage the dB formula at the lower right corner of Fig. 2. Divide any two voltages from the table, take the log and multiply by 20. Compare your answers with those in the table. It feels good, doesn't it? I used to do this on a slide rule!

MIX MASTER

In a mixer, an IC op amp may have to feed several effect sends as well as the primary fader. If four pots will be connected to an op amp, then it is important, for the sake of efficiency, to choose an optimal resistance value that, when combined in parallel, isn't so low as to overload the op amp or so high as to be vulnerable to stray capacitance (next month's topic).

For ease of head calculation, I chose four 2,400-ohm resistors. Combine the first two pairs into a single pair of 1,200-ohm resistors and then combine those into one 600-ohm load. This, too, is a magic number, vintage gear having input and output impedances of 600 ohms and being referenced to 0 dBm. The Power formula (in Fig. 1a) states that P equals E-squared divided by R. In this case, E is 0.775 volts.

Test No. 5: Apply .775 volts to the load and determine the power. (Answer No. 5: 1 milliwatt.)

Note: One mW is the reference for 0 dBm, 4 dB below "nominal" level for professional equipment.

Many op amps can comfortably drive a 600-ohm load. But within a mixer module, only the output amps need to be prepared to work this hard and only when driving vintage-style equipment. Typical pot values are between 5k and 10 kilohms. Four 10-kilohm pots represent a 2,500-ohm load to the op amp.

Test No. 6: Can you calculate the power if 0.775 volts appear across a 2,500-ohm load? (Answer No. 6: 0.24 milliwatts.)

THE SCIENTIFIC METHOD

In all of the sciences, it is common to minimize the variables to facilitate understanding and simplify calculation, if only for the moment. With that in mind, consider impedance as the full-color version of resistance. The series parallel circuit examples in this article consisted mostly of a battery

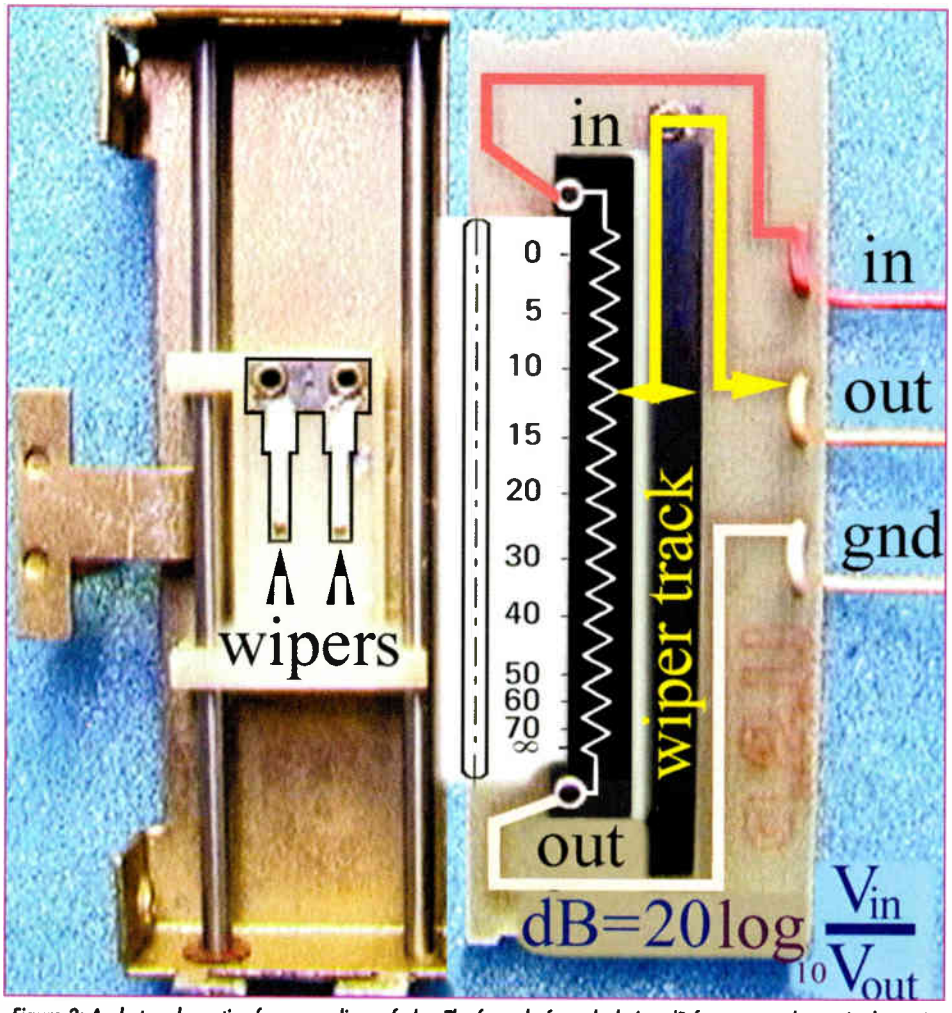

Figure 2: A photo-schematic of an open linear fader. The formula for calculating dB from two voltages is shown in the lower right corner.

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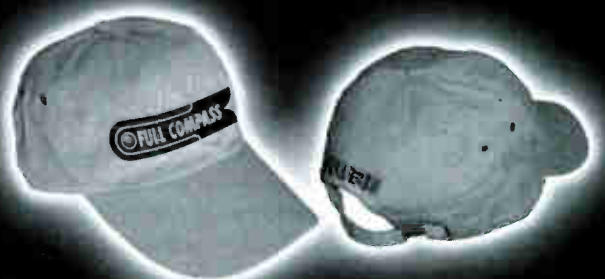

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and resistors—certainly not the real world, so black and white that there wasn't even a power switch! AC voltages were treated like DC, except when calculating peak and RMS power.

Oversimplified, impedance is to AC as resistance is to DC. While both quantities are expressed in "ohms," the former requires higher math (trigonometry and calculus); the latter can pretty much be ciphered in your head. With the exception of the "dB" formula, the math presented in this article is quite basic. You calculated current using Ohm's Law—10 volts divided by 10 ohms is 1 ampere—but if a capacitor or inductor were in the circuit, the voltage and current would change over time, requiring several calculations. Even the switch would play a key role!

Next month's math takes time into consideration, but don't get nervous about it. A demo version of "Micro-Cap 6" is available at www.spectrumsoft.com as a free download. Just draw a schematic and *it* does the ciphering. Meanwhile, let's look at the basic concepts comparing resistance to impedance.

SPECIFIC HEIGHTS

Resistance is a scalar quantity measured in ohms, just as the term "height" is defined by its magnitude (inches, feet, centimeters, meters) and no more. By contrast, temperature is defined by its magnitude—degrees—which alone does not tell the whole story. Wind can make a 20° day feel like 10° (wind chill), while humidity can make 70° feel like 80° (the yuck factor). Like the temperature example, impedance is a vector quantity defined by its magnitude in ohms, but instead of wind chill, there is a phase angle, a manipulation of time.

I-C-E IS N-I-C-E

Remember that DC can be stored over long periods of time in batteries and to a lesser extent in capacitors. Add a

Fader Top	Volts	Resistance (10-kilohms total) Top-to-Wiper / Wiper-to-Bottom
0 dB	10	0 / 10k
-6	5	5k / 5k
-12	2.5	7.5k / 2.5k
-18	1.25	8.75k / 1.25k
-24	0.625	9,375k / 625
-30	0.3125	9,687.5 / 312.5
-36	0.15625	9,843.75 / 156.25
-42	0.078125	9,921.875 / 78.125
-48	0.0390625	9,960.9375 / 39.0625
-54	0.01953125	9,980.46875 / 19.53125
dB	millivolts	
-60	9.765625	9,990.234375 / 9.765625
-66	4.8828125	9,995.1171875 / 4.8828125
-72	2.44140625	9,997.55859375 / 2.44140625
-78	1.220703125	9,998.779296875 / 1.220703125
-84	0.6103515625	9,999.3896484375 / .6103515625
-90	0.30517578125	9,999.69482421875 / .30517578125
-96	0.152587890625	9,999.84741209375 / .15287890625
Fader Bottom	millivolts	All resistor pairs add up to 10 kilohms

Table: Based on a typical 10-kilohm console fader, the table shows the relationship between fader position (in dB), output voltage and resistance.

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switch to the series or parallel resistor examples. At the moment, the voltage E is applied to the resistance R no matter whether the source is AC or DC, the current will be instantaneous.

Reactive components—capacitors and inductors—manipulate the time relationship between voltage and current. A fully discharged capacitor appears as a dead short at the moment it is connected to a DC voltage source, the current leading the voltage by 90°. In engineering school, simple expressions such as "E-L-I the I-C-E man" helped students remember that voltage-leads-current by 90° in an inductor L (a coil of wire).

SPARK!

Have you ever plugged or unplugged a device when its switch was in the On position? At the exact moment the plug and socket made or broke the connection, a sizeable spark most likely occurred. Connecting AC power to a reactive device such as a transformer is one of the reasons lights dim but don't stay dim when a device is turned on.

ABSOLUTE ZERO

Getting back to the temperature analogy for a moment, the materials used for making or plating wire—copper, silver, gold or aluminum—all have a defined resistance at room temperature. Absolute zero on the Kelvin scale (0 K) is the lowest temperature theoretically possible—at approximately -273.16° C (-459.69° F). Wire that cold becomes a more perfect conductor. That's why audiophiles love winter here in Minnesota!

In reality, the slight amount of resistance per foot becomes cumulative with extremes of distance or of thinness. For example, speaker cable consists of a pair of conductors separated by insulation, a capacitor by definition that becomes a contributing factor as the series resistance increases. At high frequencies, the wire also has some inductance. Hold that thought...

Next month, the circuit examples will include capacitors and inductors in real-world examples of signal corruption and failing components. In the meantime, drop by www.tangible-technology.com for a visit. ■

This past winter, Eddie shoveled 65 inches of snow. By the time you read this, he'll be planting a vegetable garden. Got any seeds?

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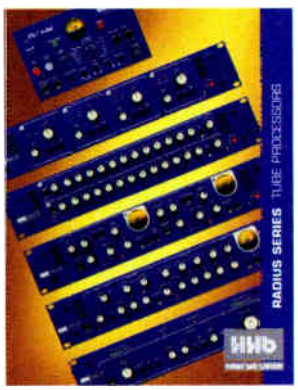

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FIRST WE LISTEN

CIRCLE #070 ON PRODUCT INFO CARD

PREVIEW

SCHOEPS POLARFLEX MIC SYSTEM

Schoeps (now distributed by Redding Audio, 203/270-1808) is shipping its Polarflex Microphone System, which combines a DSP processor paired with two omni and two figure-8 (or four cardioid) capsules to emulate the sound of nearly any microphone. Polarflex can be used conventionally—like any stereo mic—or the signals from the four capsules can be recorded separately and combined after the recording, with processing handled in the analog or digital domain, giving the user full control over reverberant ambience, directional characteristics and tonal shaping.

Circle 327 on Product Info Card

APOGEE ELECTRONICS INTELLIDAC 9616

The IntelliDAC 9616 from Apogee Electronics (www.apogeedigital.com) is a 16-channel, 24-bit, D/A converter capable of operating at sample rates of up to 96 kHz. The converters can source their digital input from AES/EBU, ADAT optical or TDIF signals, and the unit can sync to wordclock or a specified input. ADAT and TDIF inputs are organized into two groups of eight, and channels 1-8 and 9-16 can accept different sources. Individual channel gain is digitally adjustable, and balanced analog outputs are supplied in groups of eight on 25 pin D connectors. (Pinout is the same as for other Apogee D/A converters and the Tascam standard.) An "intelligent" two-stage reclocking system de-jitters both incoming clock and data, and the system is capable of correcting phase errors between synchronous digital sources of up to 150°.

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BEHRINGER TRUTH B2031

The Truth B2031 bi-amplified studio reference monitor from Behringer (www.behringer.com) are sold in hand-matched pairs for $799/pair. Featuring a 150-watt, 8.75-inch, long-throw woofer with a polycarbonate diaphragm and a rugged cast-aluminum chassis, plus a 75-watt, 1-inch, Ferrofluid-cooled tweeter, the Truth B2031 offers a frequency response from 50-20k Hz and is fully shielded. Features include adjustable low-frequency roll-off, room compensation adjustment, peak limiter protection circuitry, Mute functions and automatic stand-by switching. Inputs are servo-balanced, ¼-inch TRS and XLR connectors.

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ALESIS POWER AMPS

Alesis (www.alesis.com) adds three amps to its RA range: the RA150 ($259), the RA300 ($359) and the RA500 ($459). Housed in a heavy-duty steel chassis, each model features detented front panel level controls, overload/protect indicators, bridged mono operation and relay-controlled turn on/off. The DC-coupled, fully complementary discrete amp topology features dual-differential input stages and uses noiseless convection cooling. Inputs are balanced ¼-inch and RCA-type; outputs are dual-binding posts. RA300 and RA500 models offer XLR-input connectors and bar graph metering.

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AUDIX SCX-25 CONDENSER

The SCX-25 from Audix (www.audixusa.com) is a studio condenser mic with a new suspension-mounting system that effectively isolates the capsule from the housing and electronics. This both minimizes reflective surfaces and maximizes phase coherence, while eliminating the need for an external shock-mount. Featuring a 25mm, gold-sputtered diaphragm, 135dB SPL handling, a 20-20k Hz response and a low-noise preamp design, the SCX-25 provides a wide cardioid pattern and an "open" sound usually only found in much larger (and more expensive) classic microphones. The mic requires standard 48-52V phantom power, measures 5.5 inches in length and weighs 8 ounces. Price: $799.

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PREVIEW

TL AUDIO TUBE PROCESSOR

The VP-1 Tube Processor from TL Audio (distributed by HHB, www.hhbusa.com) combines a pentode preamp, 4-band parametric EQ, compressor, expander/gate, de-esser and peak limiter. The VP-1 features a Siemens EF86/6267 pentode in the front end of the preamp, followed by six Sovtek ECC83/12AX7A stages in the secondary stage of the preamp, compressor and four in the EQ section. The preamp stage accepts mic, instrument and line inputs and has a 30dB pad, phase reverse and a variable highpass filter. The transformer-balanced mic input offers a choice of tube or Class-A signal paths. The compressor offers both hard and soft knee characteristics and a choice of tube or optical compression stages. Additional features include stereo link facility, optional wordclock input and AES/EBU and S/PDIF digital outs. Price: $2,699.

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DPA MICROPHONES STEREO KIT

DPA Microphones (www.dpamicrophones.com) offers its large-diaphragm condenser mics as a stereo kit, including a stereo boom, stereo mic preamp, all necessary cables and accessories—packaged in a Samsonite briefcase. The complete A-B Stereo Kit has two matched omni Type 4041 mics with 130V preamps and self-noise matched to within 1 dB. Frequency response is 10-20k Hz with a 4-6dB soft boost around 8 kHz; peak SPL handling is 144 dB. The modular mics can be used with either the 3532-S solid-state preamp or the 3532-T, with a pentode vacuum tube preamp driven as a cathode follower in a unity gain, Class-A design. Both systems offer low noise: 7 dBA for the 4041-S and 10 dBA for the 4041-T.

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CAD TUBE MIC

CAD Professional Microphones (www.cadmics.com) offers the M9 large-diaphragm tube condenser model. This cardioid studio mic features a 1.1-inch (inside diameter), gold-sputtered capsule and a wide dynamic range, low-noise head amp circuit based on a 12AX7 tube. The output stage is a high-speed dual op amp in a balanced differential configuration. Frequency response is 10-20k Hz, with a slight rising response characteristic at 15 kHz. Switches on the mic body engage a highpass filter and a -20dB pad. The M9 is supplied with a swivel mount, dedicated power supply (no phantom power needed), a 30-foot, 7-conductor mic cable and rugged carrying case. Price: $499.

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TRIDENT-MTA SERIES 80 EQ

The new Series 80 dual-classic channel module from Trident-MTA, distributed by Fletcher Electro-acoustics (www.joemeek.com), is based on the famed Trident Series 80 console, introduced over 20 years ago. Designed by Trident founder Malcolm Toft, the new Series 80 is a dual-channel, fully discrete mic/line preamp and two bands of EQ per channel with sweepable center frequencies, plus 2-position high- and low-shelving filters and a 50Hz highpass filter. Additional features include 48V phantom power, polarity reverse, an EQ in/out switch and independent output level controls. Price: $2,499.

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KS STUDIO MONITORS

A supplier of high-quality speakers in Europe for more than 20 years, KS products are now available in the USA (distributed by CAP Audio, www.cap-audio.com). Its line of powered monitors range from the 6.5-inch/two-way ADM 4 near-fields to the massive, tri-amped ADM 1, which are capable of 125dB SPLs and feature analog and AES/EBU digital inputs. The ADM 2s shown here offer analog and digital interfacing, 300 watts of internal bi-amplification and a frequency response of 38-20k Hz.

Circle 336 on Product Info Card

PREVIEW

MBHO CONDENSER CAPSULE EXTENSION

The MBC-603A from MBHO (distributed by MTC-MBHO U.S. at 718/963-2777) is similar to its MBP-603 miniature condenser mic, but includes a 9-foot extension cable, useful in recording and broadcast applications where traditional mic placement techniques are unsuitable. The MBC-603A features transformerless circuitry and smooth on-/off-axis frequency response. Price of the preamp and extension cable is $382. Small-diaphragm capsules—sold separately—list between $237 and $281.

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Z-SYSTEMS 96kHz SRC

Z-Systems Audio Engineering (www.z-sys.com) announces the z-link96 and z-link96+ miniature sample rate converters. Both units support up to 24-bit digital audio at sample rates up to 96 kHz, and both allow output word length to be set at 16- or 24-bits. Dynamic range is greater than 120 dB, and THD+N is better than -115 dB. Both the z-link96 and z-link96+ feature internal clock references that allow the units to generate 44.1/48/88.2/96kHz output sample rates internally, and the z-link96+ can be synchronized to an external AES11 reference.

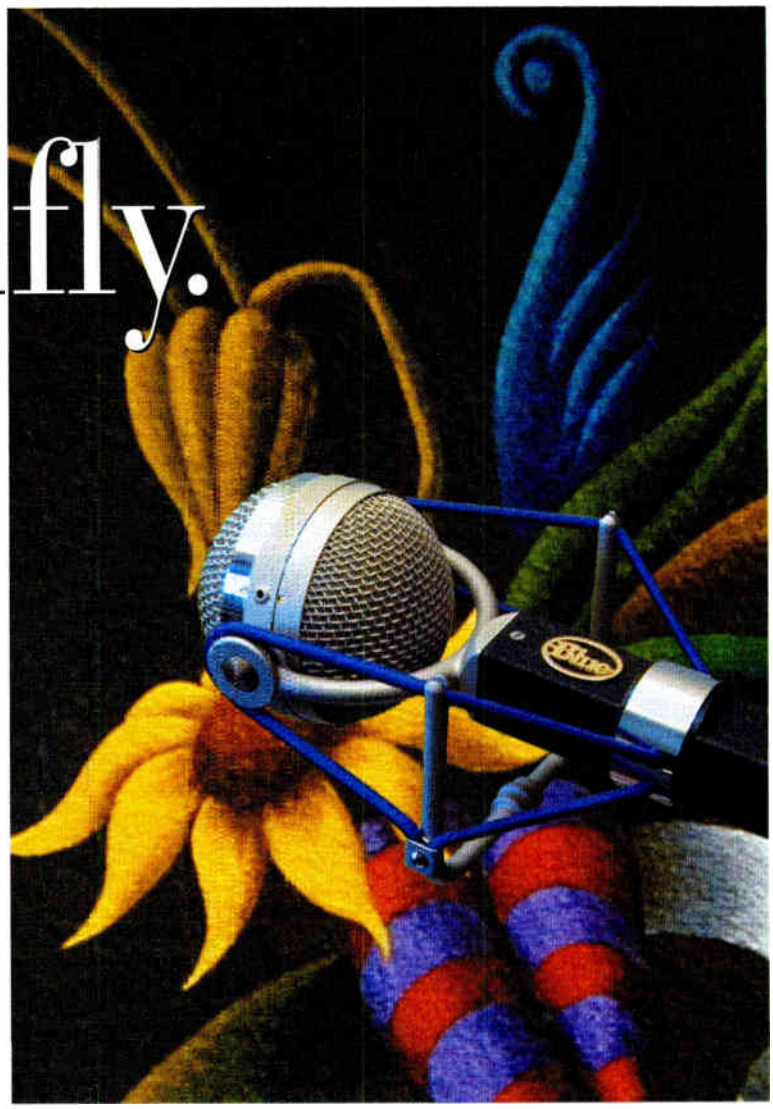
Circle 338 on Product Info Card

HOT OFF THE SHELF

Lexicon has announced a major software upgrade for the 960L Digital Effects System. Available free to 960L system owners, Version 2 (V.2) software adds support for a second reverb card, doubling the system's DSP horsepower, support for 16 channels of I/O and several new Lexicon presets. Additional features of V.2 software include both global mix control and global I/O control (allowing users to override individual mix settings), enhanced input metering, dual-LARC2 support and several new cascaded configurations, including mono in/stereo out configurations for 96kHz operation. Call 781/280-0300 or surf to www.lexicon.com...**Zero International's 44-page 2001 catalog of door and window sealing solutions** provides specification guidance and full-size schematics for hundreds of components and integrated systems for blocking flames, smoke, air, light and sound. Call 800/635-5335 or click on www.zerointernational.com...**Independent Audio has announced the FREQue II effects processor**, featuring fully floating, balanced inputs and outputs, adjustable input gain and output wet/dry mixing. The unit offers an output frequency range from 1-55k Hz. For more information, call 207/773-2424 or visit www.independentaudio.com...**GEPCO's 5596GFC Series 100-ohm AES/EBU digital multipair cables** feature a 12.3MHz bandwidth, ultra-low attenuation and jitter, mechanical stability and precision 110-ohm impedance. Available in 4/8/12-pair configurations, the 5596GFC is optimized for 96kHz bandwidth requirements but is suitable for long runs in 44.1-/48kHz applications. Cables feature color-coded and alphanumerically printed pair jackets, bonded foil shield and a flexible outer jacket. Visit www.gepco.com...**KK Audio studio furniture** is designed to house workstations, compact mixers and rack equipment. The MAX D 8 ($1,195) is designed for the Mackie D8B, but can house other compact consoles, such as the Yamaha 02R and Ramsa DA7. The unit includes a monitor bridge, adjustable keyboard shelf and 10-space rack. The MAX D 7 ($1,145) is designed specifically for the Panasonic DA7. KK also offers video monitor and speaker stands. Call 818/765-2921...**Neutrik PatchLink SPL ¼-inch patch panels** require no soldering and feature individually replaceable PC cards. The modular 19-inch rackmount patch panel is fully PCB-wired without nut fastening and features 48-balanced channels in one rackspace. The front and rear panels have two rows of 24 sockets for mating with stereo phone plugs. Configurations can be half-normaled or isolated. Accessories include individual send/return split print modules and a Patch-Box with eight send/return modules, a solution for console insert jacks that eliminates the need for specially wired Y-cables. Drop by www.neutrikusa.com...**Yamaha has discontinued its NS10M studio monitor**, in part because the wood pulp used in the woofer cone is no longer available. Long used as a reference standard in recording facilities worldwide, the NS10M was introduced in 1978. Yamaha says replacement drivers will be available for the foreseeable future, and remaining NS10M production for 2001 will be allocated according to dealer purchase levels of last year. Visit www.yamaha.com/proaudio.com. ■

Dragonfly

Year of the Dragonfly.



Fast, maneuverable and beautifully engineered, the BLUE Dragonfly employs an innovative design that offers fine tuning and precise placement to please the most discerning recordist, combined with an ease of use that is without equal among contemporary microphones—and at a price that's considerably less than anything in its class. The Dragonfly is a unique pressure-gradient cardioid condenser microphone, employing the BLUE hand-built single-membrane large diaphragm capsule coated with a 6-micron mylar film of pure gold and aluminum. Enclosed within a rotating spherical grille, the capsule can be positioned and adjusted in the smallest spaces. Complete with an integrated elastic shockmount, the microphone's electronics are based on a class A discrete circuit, with a transformerless output. Its neutral sonic character gives flight to everything from vocal to percussion, electric guitar and bass, as well as more "difficult" sources such as saxophones and stringed instruments. Oh, and did we mention that among its rave reviews, the Dragonfly is one of *Electronic Musician's* 2001 Editor's Choice award-winners?

Matched sets of Dragonflies can be purchased exclusively from BLUE. This limited edition set is uniquely colored in deep green lacquer with gold accent trim and housed in handmade cherrywood boxes. Contact BLUE for more information.

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MARK OF THE UNICORN 1296

MULTICHANNEL 96KHZ AUDIO I/O

I've worked with Mark of the Unicorn devices for quite a while now. Back in 1999, I reviewed MOTU's original and wildly successful 2408 audio interface for *Mix*'s sister magazine, *Electronic Musician*. Working extensively with MOTU's subsequent audio interfaces, I've recorded and mixed everything from commercial CD tracks to live theater music to soundtracks for film and TV, and I've found that the quality of MOTU's interfaces have always served me and my associates well.

However, I've been in some critical recording situations where either an interface with multiple balanced XLRs were required or we wanted to record at sampling rates higher than 48 kHz. Until recently, other hardware solutions were the only choice. MOTU's 1296 now provides these features, plus a lot more.

The 1296 provides 12 analog channels of inputs and outputs via XLR connectors operating at +4 dBu. AD/DA converters are 24-bit, "enhanced multibit," 128-times oversampling, a third-generation step up from the converters used in previous MOTU interfaces. Two channels of AES/EBU are also available. Both wordclock I/O and an extra "AES Word In" allow the AES/EBU output to resolve independently to an external wordclock source (more on this later). Inputs and outputs for all 12 channels have 19-segment LED metering on the front panel for easy viewing.

The 1296 connects to the host computer via the PCI-324 card, which is included in the 1296 core system ($2,095). The 1296 interface is compatible with MOTU's other PCI-324 interfaces—including the 2408, 2408mkII, 1224, 308 and 24i—and can be purchased separately as an expansion I/O ($1,795) for those who already own a MOTU core system. Up to three interfaces in any combination can be connected to a single PCI card via Audio Wire connectors, which are a high-bandwidth, low-latency, 72-channel, bidirectional digital format developed by MOTU that employs the same socket components and cables as the 1394 (FireWire) protocol. Each PCI-324 card also provides an ADAT Sync In and an RS422 din-8 "Control Track" connector for interfacing with MOTU's Digital Timepiece for sample-accurate synchronization between ADATs, DA-88s and other digital devices. Multiple MOTU interfaces automatically resolve with each other via the PCI-324 card. Three 1296 interfaces provide 36 simultaneous channels of 24-bit, 96kHz audio I/O on a single PCI card.

The PCI-324 Console software controls routing of signal flow, sample rate, synchronization, buffering and monitor settings. In addition to being a perfect hardware fit for MOTU's Digital Performer, the 1296 ships with standard ASIO and Wave drivers for compatibility with third-party Mac and Windows audio software. Subject to the capability of the host software, the 1296 supports both 16- and 24-bit depths and can operate at 44.1, 48, 88.2 and 96kHz sampling rates.

The 1296 core system also ships with AudioDesk, a full-featured audio workstation for Mac OS. AudioDesk is basically Digital Performer without the MIDI features, and it is fully capable of professional recording and mixing.

BY ROB SHROCK

SETUP

As with the original 2408, the initial setup of the 1296 could not be easier. The trickiest part of the whole process is installing the PCI-324 card. If you know how to install a PCI card in your computer, you're home free. A setup wizard on the installation CD helps you figure out the best way to set up connections by asking specific questions about your gear and making recommendations based on your answers. For those who already have a PCI-324 core system, it is still necessary to install the latest version of the software to allow proper configuration of the 1296.

The manual is well-written and provides both Mac and Windows versions in the same binding. The manual also provides explicit instructions for interfacing the 1296 with Digital Performer, AudioDesk, Cubase VST and Sound Manager.

Once the software is properly installed, you'll notice that you now have the options of 88.2- and 96kHz sampling rates in your host software. Choosing one of these higher sampling rates in the PCI-324 Console will automatically dis-

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able any other MOTU interfaces connected to the PCI-324 that operate only at 44.1 and 48 kHz, so be sure to also reassign the main monitor outputs to one of the 1296 pairs if you want to hear the stereo bus output of any previous sessions.

The Audio Wire cable provided is 15 feet long, which is the maximum length recommended by MOTU. This will likely be long enough for most users, but if you keep your CPUs in a remote location from your working position, you may have to assess your setup to ensure that you still have good visual contact with the front panel meters of the 1296.

I found the meters to be excellent and easily viewable from across an average-sized control room, so it's not necessary to have the 1296 located right next to you for normal operation. The meter scale ranges from -42 to -1 dB, with LEDs below -6 dB showing 3dB increments, while those above -6 show 1dB increments from -4 to -1 dB, allowing for fairly precise metering. There are two indicators for "overs": The first LED lights up only momentarily, whereas if even a single sample reaches full scale, the second-level LED remains illuminated until cleared in the software. I would have liked a Front Panel button for manually clearing the "over" LEDs.

Both the clip timeout and peak/hold timeout of the meters can be set by the user to any duration from a few seconds to a few minutes to infinity. A separate display to the left of the meters indicates system clock rates, AES/EBU clock rates and whether any sample rate conversion is taking place.

FIRST USE

Both AudioDesk and Digital Performer automatically sense when the 1296 is active on the PCI card, allowing recording at the higher sampling rates. Because I have already been recording 24-bit at 48 kHz into Digital Performer via my 1224 interface for a while now, I was immediately interested in creating some new 24-bit recordings at 96 kHz.

For a lot of electronic-based recording (synths and samples), I can get by just fine with a single audio interface, needing only a few inputs and one or two pairs of outputs for monitoring; a single 1296 will work fine for many users who want to make the jump to recording and mixing at higher sampling rates. I have a tracking rack that contains a pair of Neve 1272 preamps and a few other goodies, which I usually run everything through on the way to the computer, so I connected the rack's XLR outputs to the 1296's first pair of inputs and wired four buses of my mixer to inputs 3 through 6 and monitored playback of Digital Performer through outputs 1 and 2.

A quick comparison between the 1296 and 1224 interfaces of recordings made at 48 kHz revealed no significant differences in quality, even though the 24-bit converters in each are a generation apart. However, I have always thought both the AD/DA converters in MOTU's audio interfaces have sounded great, including even the 20-bit converters in the original 2408.

After recording a basic track at both 48 kHz and 96 kHz with the 1296, comparisons between the two versions did reveal a qualitative difference. The 96kHz recording sounded a little more open overall—I wouldn't say that I heard more top end (which it actually contains), but I would say that I could "feel" a difference between the two, with the 96 kHz sounding a shade more "realistic." The effect is cumulative, and the more tracks you add at 96 kHz, the more you notice the difference.

Of course, your hard disk management becomes much more of an issue. Upping the bit depth from 16- to 24-bits adds 50% more to each sound file's size; doubling sampling rates from 48 to 96 kHz adds even more bulk. A three-minute song containing 18 front-to-back, 24-bit, 96kHz tracks takes roughly 1 GB of data to store. But the higher resolution sounds great, and three 1296 interfaces and a screamin' computer would allow for some incredibly affordable 36-track audiophile recording.

A HANDSHAKE CAN REVEAL A LOT

As I mentioned earlier, the 1296 contains some versatile synchronization and interfacing right out of the box. It can operate internally at double the wordclock input rate, while the AES/EBU output can be synched to an independent word rate. This allows the 1296 to sync to incoming wordclock at 48 kHz (such as from a digital mixer) while operating internally at 96 kHz, and at the same time providing an AES/EBU output synchronized to a DAT player at 44.1 kHz.

The 1296 also has built-in, real-time sample rate conversion, allowing the sample rate of an incoming AES/EBU signal to be converted to the sample rate at which the 1296 is currently running at. This means an incoming 44.1kHz signal can be converted to 96 kHz on-the-fly. How does the sample rate conversion sound? In a phrase—really, really good. As much as we all hate sample rate conversion, sometimes we have to do it; at least the 1296 does it well. Consider it a bonus.

The AES/EBU output can be set to mirror any pair of analog outputs, which remain simultaneously available. The AES/EBU output can also directly mirror any pair of 1296 inputs (and at a different sample rate, don't forget). Very cool features.

BIG BAND AUDITION

I was recently involved in arranging and recording two days of big band sessions in Los Angeles with some of

MOTU 1296 SPECIFICATIONS

CONVERTERS (AD/DA)	24-BIT, 128-TIMES OVERSAMPLING
ANALOG I/O	12 INPUTS, 12 OUTPUTS; XLR +4 BALANCED
DIGITAL I/O	AES/EBU
BIT DEPTHS	16-BITS, 24-BITS
SAMPLE RATES	44.1, 48, 88.2, 96 kHz
SYNCHRONIZATION	WORDCLOCK I/O; AES WORD IN (INDEPENDENT OF 1296 SYSTEM)
METERS	19-SEGMENT (ALL I/O)
DYNAMIC RANGE	117dB INPUT; 116dB OUTPUT
WEIGHT	8 POUNDS, 14 OZ.
DIMENSIONS	19x8x3.5 INCHES
PCI-324	INCLUDED WITH THE CORE SYSTEM
AUDIO WIRE	(3) 1394 (PROPRIETARY) I/O CONNECTORS
CONTROL TRACK	RS422 DIN-8 CONNECTOR
ADAT	9-PIN ADAT SYNC IN CONNECTOR

the best players in town. The client requested that we deliver Pro Tools stem mixes, which we created as 16-bit Pro Tools sessions at 44.1 kHz. Although the stem mixes came out fine, the original masters had been recorded on a Studer 24-track machine at 15 ips with Dolby SR and had really sounded great. Something had definitely been lost in the translation between the original analog masters and the Pro Tools stems—mostly the "air" surrounding the band and the detail at soft volume levels. Because I was also going to create 2-track mixes of the sessions, I thought this would be a good opportunity to really put the 1296 to the test.

A few weeks later, I went into Luminous Sound in Dallas with the original 24-track masters, a computer setup running Digital Performer and the 1296. Setting up a desktop computer rig in the studio has never been my idea of fun, but within a few minutes we had the computer up and the 1296 patched: direct outputs split from the 24-track into the 1296 and the 1296 outputs straight into the console. Because I had only one 1296 for evaluation, each song transfer would take two passes, which wasn't a problem, as both the 24-track and the computer were resolved to house sync. A little tone matching between the 24-track and the computer, and we were in business.

I had previously created Digital Performer files for each tune at 24-bit, 88.2 kHz, which would potentially make for an easier sample rate conversion down to CD later. Rob Weschler, the chief engineer at Luminous, and I began our listening tests by comparing the direct outputs of the first 12 tracks of the analog master (rhythm section and trumpets) to the output of the 1296's converters as a simple patch-through: No difference in sound, whatsoever. Next, we recorded a pass into Digital Performer and compared it to the master: Again, no difference in sound, whatsoever.

All of the "air" surrounding the band that had been missing in the 16-bit stems was now just as present as on the original master. In fact, we could not tell the difference between the analog master and the 1296 output. After a second pass, all of the remaining tracks were now in the computer. After reducing the master fader in Digital Performer to prevent output clipping of the stereo bus (all of the faders in Digital Performer were still set to 0 dB), we verified that all of the tracks had made it across and happily moved on to the next song and repeated the process.

This was a recording of a live band (four-piece rhythm section, three trumpets, two trombones, four saxes and a *bunch* of mics), so the dynamic range was very wide on some songs and little to no compression had been used while recording the master. Some piano and horn intros and entrances were at a whisper level, and some big band swing sections really ripped. Never once did the 1296 clip or distort on input, while all of the really dynamic, low-level material retained its full detail and clarity. Those of you who have already made the jump from 16-bit to 20- or 24-bit digital recording already know the virtues of higher bit depths with dynamic material. In my case, I found that the pleasing detail and analog coloration from the 24-track master were perfectly preserved in the transfer process through the 1296. The result did not sound better or worse than the master—it sounded exactly the same.

CONCLUSIONS

The 1296 provides audiophile recording on host-based systems, bridging the gap that had previously existed between MOTU's other audio interfaces and the professional demanding sample rates higher than 48 kHz. The converters sound excellent, and the synchronization features solve several of the problems that occur when trying to resolve to different digital devices at the same time.

No, the 1296 does not record at 192 kHz; but I'm still not convinced that sampling rates above 96 kHz are worth the accompanying overhead, as long as the bit rates are high and the converters are good. In my tests, the 1296 output exactly what was put into it as far as I—or anyone else—could tell. MOTU has another winner. I'll buy this one and take a second, please.

Mark of the Unicorn Inc., 1280 Massachusetts Ave., Cambridge, MA 02138; 617/576-2760; fax 617/576-3609; www.motu.com. ■

Rob Shrock served as one of the music directors for the 72nd Academy Awards. He has recorded and/or performed with Burt Bacharach, Garth Brooks, Elvis Costello, Sheryl Crow, Faith Hill, Whitney Houston, Chrissie Hynde, Mikaila, 'N Sync, LeAnn Rimes, Dionne Warwick, Stevie Wonder, Wynonna and a host of others.

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SHURE PSM400

PERSONAL MONITOR SYSTEM

After the first week of rehearsal for last year's k.d. lang tour, the background singers decided that they would be better off with in-ear monitors (IEMs). The tour budget had already been set, but the money saved by sending the wedge monitors back to the rental company more than paid for the entire IEM rack. In order to provide dedicated stereo mixes for three background singers, plus a spare that doubled as my cue mix, I used four Shure PSM400 systems, supplemented with John Hardy mic preamps and three of TC Electronic's affordable M1 reverbs. Compared to Shure's more expensive PSM systems, the frequency response of the 400 drops off a third of an octave earlier, roughly at 12 kHz instead of 15 kHz. I missed it, but it didn't bother my singers much. The companding characteristic (common to all PSM systems), while noticeable under controlled listening conditions, is acceptable in rock 'n' roll applications.

The front panel of the Shure P4T transmitter ($470 list) offers a volume control for local monitoring (via a stereo mini jack), four-segment stereo metering, a single-digit RF channel indicator, and a permanently attached, quarter-wave antenna. The half-rack format allows two P4Ts to be mounted in a single rackspace and, unlike the previous Shure PSM600 and -700 systems, the P4T uses an external power supply, so its depth is shortened by three inches. The 5⅜-inch-deep chassis has extruded aluminum sides similar to the Lexicon LXP-1, with a single slide-in PC board. The transformer has two screw holes to mount it; it employs an AC plug on a cord rather than the common "wall wart" design, and its chassis connector has a locking ring.

Though there are no XLR connectors, the ¼-inch inputs are balanced. The transmitter has no Mono/Stereo switch; instead, the unit automatically switches to mono when only one of the ¼-inch inputs is plugged in. The unit operates at a nominal 0dB input level, and the absence of an input volume control and a +4/-10 switch effectively prevents these controls from being set incorrectly.

The gain structure of wireless in-ear systems dictates that, for best signal-to-noise figures, they should be driven close to their clipping points. With no input volume control, keep an eye on the meters, which aren't much more than idiot lights similar to those on power amps. The 400 transmitter does not clip gracefully, so it's especially important not to run into the red.

The P4R receiver ($490) is almost half the weight of the ½-pound, metal-bodied PSM600 and -700 receivers (often referred to as "hand grenades" by performers familiar with them tugging on their wardrobe). Although I'd guess the plastic case is not as durable, I've seen them take drops and abuse without failing. Battery life is a healthy eight hours when running on the recommended Duracell 9-volt, alkaline batteries, and a three-segment "fuel indicator" icon in the LCD screen shows the battery life status. Though battery life depends on many variables, I found that changing batteries every other day was sufficient enough to get through two soundchecks and two two-hour shows. When the battery is about to die, the entire LCD screen is illuminated with a red backlight that is easily noticed by the user.

The P4R receiver's controls are two momentary pushbuttons on the side—labeled Select and Scroll—and an LCD screen on the top, a layout similar to that found on Shure's professional UHF wireless mics. A lockout feature can be used to prevent performers from unintentionally changing the settings.

As with the other PSM models, a "MixMode" allows the user to listen to and balance a mono blend of the transmitter's two inputs, allowing for a "me vs. them" or "vocals vs. instruments" self-mixing strategy. The PSM400 also includes the familiar 6dB boost at 10 kHz and a defeatable limiter.

PSM400 (and -700) systems operate on one of 16 channels (0 through F), spread across UHF channels 56 to 59. Channels 0 to 4 are in TV 56; 5 to 7 are TV 57; 8, 9 and A are TV 58, and B to F are TV 59. In cities where one (or more) of these channels are being used by broadcasters, you'll want to avoid using the corresponding PSM400 channels. As for their other wireless products, a table on Shure's Website (www.shure.com/products/frequency/frequency.asp) helps with frequency coordination

BY MARK FRINK

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One of the useful features of Shure's PSM700 receiver is a Frequency Locator Mode feature that turns off the tone squelch, allowing the operator to listen for interference from outside sources and verify clear frequencies. Many bands often can't afford to carry a frequency analyzer or scanner with them, so this is a very helpful field tool. A similar feature on the P4R allows it to be used to scan its 16 channels. To engage this feature, press both the Select and Scroll buttons while turning the P4R on; the RF icon on the LCD will scroll, indicating that the tone squelch is off. The resulting white noise is quite loud, so be careful with the volume setting. If any sounds can be heard mixed in with the normal white noise of an open frequency, then there are other transmissions on that channel. These sounds may be anything from whistles, tones or rumbles, to the intermodulation product of an FM broadcast with another PSM transmitter or even the audio portion of a TV signal.

The P4R receiver is somewhat compatible with the PSM700 transmitter, as its 16 frequencies are the same as the 700's Group 1. Though the 400 offers 16 frequencies, Shure recommends running no more than eight simultaneously. This is because the P4R has less "front end" filtering, resulting in lower RF selectivity. When employing multiple units, it's best to skip channels so that transmitters are not susceptible to intermodulation. Aside from interference from outside sources, I had the best luck with channels 2, 4, 6, B and D when using four or five units together. What with trying to space out channels to avoid intermods and having to negotiate around TV broadcasts or other environmental RF, I wouldn't recommend trying to coordinate more than five PSM400 systems in a touring situation.

Despite some shortcomings for touring professionals, many features of the PSM400 make it simple to use. Changing the frequency on the transmitter is a simple matter of pressing a recessed button beside the single-digit display to increment the channel (easily done with the tip of an ⅛-inch plug) and then holding it in for a moment to set the new frequency. The receiver's channel is changed (when unlocked) when the user presses Select and then scrolls. On the 700, both operations require a tiny screwdriver, enough light and, if you're getting on in years, a pair of reading glasses.

A rugged antenna is permanently attached to the receiver so it can't get lost. The transmitter's antenna is also fixed, which doesn't allow users to run multiple units with a combiner and a single-directional antenna. Because the 400 is designed to be used with a companion half-rack P4M mixer onstage, this limitation is understandable. Without the benefit of a combiner or log antenna, I had occasional problems with dropouts, though my singers were typically only 30 feet away.

The P4HW hard-wired beltpack ($360 list) suffers from none of the frequency response or companding problems associated with wireless. I carried three as backups for the one day on the tour when I couldn't use the wireless (BBC: 'nuf said), but my singers didn't like having to worry about tripping on the cables while they danced, so we only used them that one time. For stationary players like drummers or keyboardists, this hard-wired beltpack option has both a sonic and a cost advantage. Also, Shure's recently unveiled AuxPander, which takes eight inputs from channel inserts and group outputs on an FOH console to create four stereo mixes, offers a way to create custom in-ear mixes without a dedicated monitor console.

All PSM400 products can be bought separately, and, in my opinion, those shopping for their first in-ear monitor system on a tight budget won't find a better value. Professional users with 700 transmitters may also want to use 400 receivers as spares or even primaries, because their Group 1 is the same frequency set and they're less than half the price. The money saved on the economical PSM400 system can easily pay for Shure's better two-way E5 ear piece [reviewed in February 2000 *Mix*] instead of the less-expensive E1. The E5 is more rugged and provides greater sensitivity, extended frequency response and a more enjoyable listening experience. I got nothing but compliments from my singers every night, and I found that I needed to do little for them except find clear frequencies, change batteries and smile.

Shure Inc., 222 Hartrey Ave., Evanston, IL 60202-3696; 847/866-2200; fax 847/866-2279; www.shure.com. ■

Mark Frink (mix@markfrink.com) *would like to thank Kate Markowitz, Windy Wagner and Amy Keys, three of the most talented and professional singers he's worked with.*

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AARDVARK DIRECTPRO 24/96

WINDOWS-BASED AUDIO INTERFACE

Well-known for making the reliable Aardsync II master clock, Aardvark touts its DirectPro 24/96 as the "all-in-one personal studio system." With four discrete mic preamps, 48V phantom power, 24-bit 96kHz converters, a headphone amp, digital I/O, six analog output channels and a virtual mixer, the DirectPro comes surprisingly close to a complete studio. Bring your own transducers—headphones, speakers and microphones—and you're almost there.

The actual recording and editing takes place in the software of your choice. The Aardvark package includes Cakewalk Pro Audio 9, but it should be understood that the DirectPro does not actually record. It is an extremely efficient input/output for a wide variety of available programs. The 10-channel virtual mixer features EQ, compression (on input only) and reverb, all with zero latency, so you can hear your adjustments in real time, without waiting for the computer to calculate the changes. Typical latency in similar devices is around half a second.

Out of the box, the system appears simple: two software disks, a manual, a PCI card, a breakout box and a sturdy shielded 25-pin cable. The breakout box has four combo ¼-inch/XLR inputs, a phantom power switch with LED and a headphone jack on the front panel; the rear panel has four ¼-inch outputs, two RCA outputs, and MIDI in and out. S/PDIF in and out can be found on the card at the back of the computer. All ¼-inch jacks allow both balanced and unbalanced connections at +4 dBu and -10 dBu, respectively.

Optional accessories include rack adapters for one or two breakout boxes (each occupy two rackspaces) and AES/EBU-to-S/PDIF adapters (manufactured by Aardvark to change voltage and impedance).

The manual is brief but effective, with separate instructions for installation on both Windows 95 and Windows 98 platforms. After consulting the recommendations for the placement of the PCI card into my computer, onscreen messages prompted me through the rest of the install. Thereafter, I only consulted the 35-page pamphlet for quick-start guides that explain integration of the DirectPro with Samplitude, Cubase VST, Cakewalk Pro Audio, Sound Forge and Wavelab.

THE INSTALL

For DirectPro, Aardvark recommends a Pentium PC or compatible, running at 200 MHz or higher, with Windows 95 or Windows 98, a minimum of 64MB RAM and one available PCI slot. For this review, I used a modestly equipped 300MHz Pentium II 300A PC with CD-ROM/DVD drive, 128MB RAM and 4 GB of available disk space.

Hardware installation was simple. However, the DirectPro software didn't load properly the first time I tried, but tech support at Aardvark is excellent (there was always more than one able-minded technician available when I called during East Coast business hours), and they e-mailed me the file I needed for a smooth install.

ONSCREEN

The virtual console—or "Control Panel" screen—is laid out well, with four channel strips on the left for the four inputs. Each of these includes gain, compression, EQ, reverb send, pan and a "fader," while the playback (or output of the recording program) appears on the right as three permanently linked stereo pairs with reverb sends. Each channel has a Mute and a Solo switch, but the playback pairs will not mute or solo one side of the stereo pair—this has to be done within the recording/editing program you've selected.

All 10 channels are summed to the stereo-linked master fader ("Monitor Out"). There are 12 replicas of LED-style meters, one next to each fader. Each meter uses over 40 segments in green, yellow and red, and peak hold is an option. There is also a large replica of a 2-channel VU meter, redundant with the Monitor Out "LEDs." The VU meter "needles" are understandably slow to react, as Aardvark has justifiably assigned their movement a low priority in terms of DSP operations.

Below the VU section is the Master Reverb panel, with controls for Decay, Diffusion, Brightness and Room Size ("Room," "Hall" or "Church"). A Preset button opens a window of reverb presets (initially blank until favorite settings are stored here), and the master reverb return is either on or off (no level control) according to the Bypass button.

Under the reverb section, there are buttons for Source Select, Presets (snapshots of the entire console available for instant recall), Advanced and Patch Bay. The Source Select button determines whether the sampling rate is internally clocked at 32/44.1/48/96 kHz or externally for incoming S/PDIF signals. (SCMS is thankfully deactivated.) The Advanced button opens a window that monitors the status of the I/O driver pairs (active or inactive), shows the serial number

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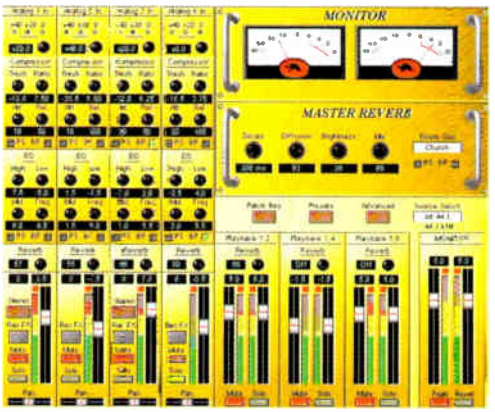
and registration key number, adjusts the ASIO buffer and sample size and gives the option for the program to issue warnings on sample rate errors. New in the Advanced window (Version 2.2) is output level selection for playback channels 1 through 4; all four can either output +4 dBu or -10 dBu—no mixed choices. Incidentally, output channels 5 and 6 are -10dBu RCA plugs.

The Patch Bay window allows most conceivable routings; for example, playback channels 1 and 2 can be assigned to output jacks 5 and 6. However, one cannot connect playback channels 1 through 6 correspondingly to outputs 1 through 6 while still monitoring all six through the DirectPro headphone jack. This limitation is surmountable with the use of external monitoring equipment, such as a small mixer. While "Analog 1, 2 Out" has its own patch point, "Analog 3, 4 Out" and "Analog 5, 6 Out" share their patch points with "S/PDIF L/R Out" and "Headphone L, R Out," respectively. This can create limitations as with the previously cited example. The Patch Bay also includes a test tone, which can route to all three output points at once.

PRACTICE

Using the DirectPro as a mic preamp and a digital mixer, I combined live tracks with a stereo DAT and recorded to the hard drive with a variety of multitrack editing programs. The S/PDIF input shows up on input channels 3 and 4 and allows a large degree of gain in the digital domain. A square at the top of the channels illuminates when digital interfacing is correct, even when tape is not rolling—a handy feature. Unfortunately, only one digital signal may be input at once, even when multiple DirectPro units are ganged together.



The DirectPro Control Panel screen

The gain for analog inputs is well-thought out, with three separate gain stages, all optimized for their range: one for large amounts of mic preamplification, one for nominal amounts and one for line-level inputs. Although the line amp only allows up to 9 dB of gain, the mic pre's provide up to 75 dB. Input gain is done in the analog stage to maximize audio level before the A/D conversion. The discrete, eight transistor-per-channel preamps sound very good—the specs boast a frequency response of 1.6 to 200k Hz (at -3 dB). Acoustic guitar, banjo, snare and vocals were captured extremely well, retaining their brightness without sounding brittle. While playing along to the DAT, DirectPro followed the clock of the DAT machine, which was playing at 48 kHz.

Next, I tried recording the same instruments at 96 kHz. Reproduction quality was predictably better—increased definition was accentuated by the quietness of the card. The combination of discrete mic pre's with 24-bit resolution makes this setup a real bargain.

One disadvantage of selecting a 96kHz sampling rate is that the EQ, compression and reverb are disabled,

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but I really didn't use them that often. Although the reverb is handy for monitoring while overdubbing, the EQ and compression are not very effective. For example, the low-frequency knob is fixed at 220 Hz—almost useless as a bass roll-off. The high frequency is set at 8 kHz, where 12 kHz or higher might have been a better choice. The mid frequency is adjustable but with no bandwidth selection, and it is stepped at frequencies that are too far apart, especially below 1 kHz and above 5 kHz. Additionally, the compressor cannot be used solely as a limiter, nor does it provide a gain-reduction meter. The lack of visual confirmation of its action was unnerving.

While not in 96kHz mode, the RecFX button on each input channel allows EQ and compression to be recorded along with real-time volume changes. Otherwise, the input gain stage is sent directly to the recording software, with the bulk of the console acting as a monitoring path. Reverb can also be recorded, but only after selecting inputs 5 and 6 in the Patch Bay window.

Auxiliary sends on each channel would have been useful, but I managed to fashion an effects loop by assigning one of the playback pairs to analog outputs on the breakout box. By panning individual instruments hard left or hard right, they can be sent to external processors and returned to one of the four input channels. Of course, software plug-ins can also be utilized. In both cases, one must make auxiliary output assignments within the chosen editing software (such as the mixer in CoolEditPro).

The DirectPro Control Panel is best used as an input stage and monitoring console—especially for overdubbing—rather than as a mixing device. Automation of Control Panel settings through MIDI is not possible—the MIDI I/O is only for conveying MIDI data to the host software. I had many digital and analog tapes in need of editing, and their sound was never compromised through the Aardvark. I also tried a variety of microphones—AKG 414s; Countryman Iso Omnis; Shure SM57s and other dynamic models—on various voices and instruments, always with great results.

On my wish list, I would have liked a knob on the breakout box for headphone volume (as opposed to adjusting the Monitor Out fader)—the knob is included on Aardvark's Direct Pro LX6, which does not feature XLR inputs. The DirectPro's EQ and compression leave a bit to be desired, but the wide variety of plug-ins available can take care of most situations.

Certainly, the unit's zero latency performance is a major plus, although DirectPro's real strength lies in the sound quality of the preamps and conversion process. The gain stages sound very good, certainly better than the ubiquitous preamps we find in many budget consoles, and, in general, the audio is extremely quiet. Credit is due to Aardvark for shielding the PCI card so well.

With the addition of 24-bit, 96kHz converters and the inclusion of Cakewalk Pro Audio 9, this package is hard to beat, especially at a U.S. list price of $699. It should also be noted that Aardvark expects to release Windows 2000 and Macintosh in the near future. Overall, DirectPro is an excellent interface for computer audio work. I've decided to keep this one!

Aardvark, 202 E. Washington, Suite 306, Ann Arbor, MI 48104; 734/665-8899; fax 734/665-0694; www.aardvark-pro.com.■

David Ogilvy is a Northern California recording and broadcast engineer and producer.

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CIRCLE #081 ON PRODUCT INFO CARD

CEDAR DNS1000

DYNAMIC NOISE SUPPRESSOR

CEDAR is no stranger to audio restoration tools. The company is known for its cutting-edge, PC-based systems and plug-ins for studio workstations, as well as specialized rackmount units that offer near-real-time processing—declicking, decrackling, azimuth correction, etc.—of problematic source material. Now, CEDAR offers the DNS1000, a dynamic noise suppression device for cleaning vocal and dialog tracks.

Like other recent CEDAR hardware, the stereo DNS1000 has no analog I/O, which keeps costs down and lets users choose their preferred converters—or simply stay within the digital domain. Between the rear panel's XLR AES/EBU and coaxial S/PDIF digital I/Os are four LEDs that indicate input sample rate (32, 44.1, 48 kHz) and whether the XLR or coax input is active. Although these LEDs offer useful indications of status and the presence of a stable signal, the rear panel location is inconvenient.

The DNS1000 has a deceptively simple interface—it's about the size of a console-top reverb controller—but there's a lot happening under the hood. The digital I/Os are 24 bits wide, and the unit is driven by dual 40-bit, floating-point DSPs. The DNS1000 works by dividing the input signal into multiple bands. There are six faders on the control panel, but many more analysis and processing filters within the unit. A noise "Level Control" acts as a global threshold slider to determine at what point the noise suppression action kicks in—or stays out—and the processing depends on the interaction of the level control, the signal content and the algorithm itself.

Just punch a button or two to select a filter frequency range: Low (20 to 400 Hz); Mid (200 to 6,000 Hz); High (4k to 18k Hz); Low plus Mid (20 to 6k Hz); Mid plus High (200 to 18k Hz) and Fullrange (10 Hz to 18k Hz). Six "Band Gain" faders (+6/-24 dB) determine the maximum amount of processing in each band, and their center points vary, depending on the selected filter range. For example, the filters are narrow if the High range only is set and much broader when Fullrange is selected.

The remaining controls (Left/Right/Stereo, for applying the processing to each of those choices, and Bypass) are much simpler to grok, and all operations become clear within a few minutes.

I began testing the DNS1000 by feeding it an assortment of dialog tracks with varying degrees of continuous noise problems. The key word here is *continuous*; the unit is not designed to remove transient noise sources, such as clicks, pops or burps, but steady-state noise problems, such as camera motors, rumble, rain, hiss, air conditioning, distant aircraft or traffic.

On a selection with excessive camera noise, a touch of midband processing attenuated the offensive sound almost completely, turning an unusable take into a clean track. Similar results were achieved on a vocal track with what sounded like hurricane-level amounts of wind noise. Here, the DNS1000 did the trick, offering deep noise attenuation without destroying the source material. Of course, it's possible to overdo the DNS1000 processing, resulting in a flat, lifeless recording, but the real-time controls make determining the right amount of filter action quick and simple.

One track that surprised me was some indoor dialog on which the mic placement seemed like it was 10 feet away. The take was boomy and reverberant, with poor intelligibility and way too much room tone. But, by selecting the Low and Mid filters, setting all the faders to -24 dB and adjusting the level control, I was able to use the DNS1000 to process the reverb tails on the end of each word, resulting in a clean track. I've never encountered a product that could do this—I'm impressed!

The DNS1000's ultrafast processing has a latency stated as less than 10 samples—about a quarter of a millisecond! So, for processing sync information (dialog tracks, etc.), latency isn't a factor; there's no need to slip tracks against timecode.

Priced at $5,895, the CEDAR DNS1000 is a fast, effective tool for dealing with noise problems in dialog tracks. And with today's skyrocketing production and talent costs, a product that minimizes the need for pricey ADR sessions is very valuable indeed.

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BY GEORGE PETERSEN

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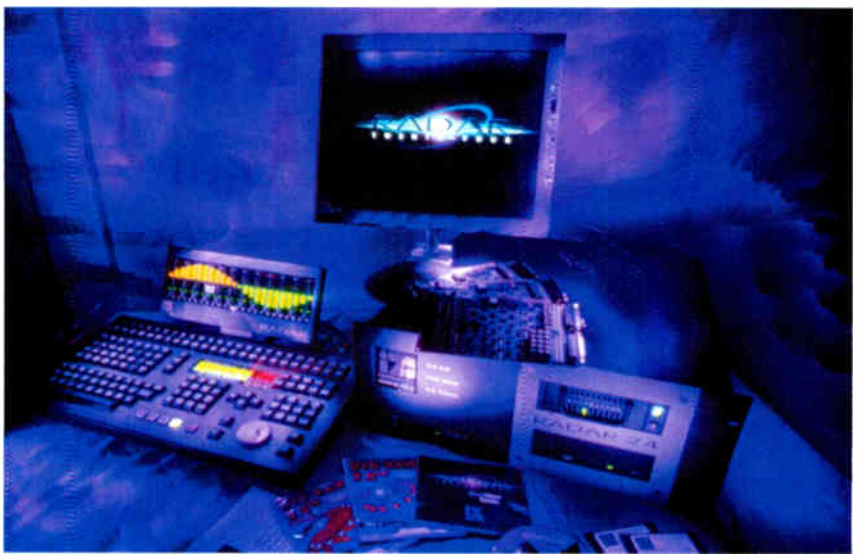
CIRCLE #082 ON PRODUCT INFO CARD

iZ RADAR 24

24-TRACK DISK-BASED RECORDER/EDITOR



Like it or not, we are fast approaching the time when linear tape-based machines will be a thing of the past. In 1992, RADAR (distributed by Otari) was the first stand-alone system to offer disk-based, 24-track recording. Now distributed by iZ Technology Corporation—the original creators of the RADAR system—RADAR 24 bridges the gap between the traditional linear tape decks and the more elaborate DSP-based editing systems. Offering a simple, stable and solid product is the philosophy that has always reigned at iZ, and RADAR 24 continues that approach, while offering new systems at a fraction of the cost of its predecessors.

THE BASICS

The unit I tested consisted of the RADAR 24 (a four-rackspace unit), the optional Session Controller, a 48-channel meter bridge and the Nyquist 24/96 I/O board set. All the units are attractive and well-made, and convey a feeling of quality. The front panel has an On/Off switch, floppy drive, 18-gigabyte SCSI drive in a removable Kingston Fast-Wide Ultra SCSI hard disk carrier, and a 9.2-gig 2x DVD-RAM drive for backing up the system and archiving projects. Operating system chores are handled via an internal IDE drive, while digital audio is written to the removable high-speed SCSI drive. Besides the DVD-RAM drive, factory installed back-up options are numerous, including Exabyte Eliant, Mammoth, Mammoth Lite, AIT and Orb.

RADAR main screen shows meters, status and waveforms.

The unit's chromed rear panel features six sets of DB-25 connectors for 24 tracks of audio I/O, as well as three sets of DB-25 TDIF connectors (with an additional three sets of DB-25 connectors for optional ADAT and multichannel AES for a total of 48 digital I/Os, which can be used simultaneously with the analog I/O). Stereo AES/EBU and S/PDIF connectors round out the selection.

Sync connections are via two pairs of BNC connectors for wordclock and video (house) sync, and there are also standard MIDI In/Out/Thru and Sony 9-pin machine control connectors. These provide access to RADAR's SMPTE timecode chase lock/generator, MIDI timecode chase/generator, video sync, wordclock sync and machine control. Additional interfaces include an UltraWide SCSI connection for external drives, standard parallel port connectors, keyboard and mouse sockets, and the proprietary RADARLINK connector, which allows for simultaneous operation of up to eight RADAR 24 (or RADAR II) units.

In addition to audio levels, LEDs on the meter bridge indicate the status of the track, including solo and edit states. All of this eye candy makes it entirely possible to operate the RADAR 24 and Session Controller without a monitor, though a monitor will be necessary if you intend to operate RADAR with the (included) standard PC keyboard alone. Projects can be named, and all menu options can be accessed using the front panel controls and the LCD window.

IN SESSION WITH RADAR 24

Anyone familiar with autolocator remotes will have no trouble getting around on the Session Controller. The familiar standard transport buttons, jog wheel, QWERTY keypad, numeric keypad and dedicated hot keys make all operations fast and efficient. Most of the

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buttons on the Session Controller contain an embedded LED that indicates status. The current operation is displayed both on the LCD screen on the Session controller itself and on a similar virtual window in the RADARVIEW screen (more on this later).

All connectors and cables are clearly labeled, and I found the setup to be about as simple as it gets. However, when I plugged a generic 19-inch computer monitor in the standard SVGA connector and flipped the Power switch, I found that RADAR generates a bit more fan noise than is necessary. I have been building PC-based audio systems for years and have found that a lot can be done to lower the noise level, simply by carefully choosing the case fans, power supply and CPU fans. In an ideal situation, the RADAR units should be located in an isolation box or in a separate room away from control room or recording areas. Perhaps this is not as big an issue as it first appears. I spoke to the people at iZ and was informed that RADAR is now shipping with a much quieter power supply and fan.

I repositioned the unit outside of the control room and rebooted. As RADAR is based on the PC platform running the stable and reliable BEoS 5 operating system, the familiar PC "post" screen appeared and was quickly followed by the BEoS logo. This was briskly replaced by the RADARVIEW track screen and after that, the PC and BEoS operating system became completely invisible to the user. RADARVIEW—the one and only screen you have to deal with—is an overall graphic view of all 24 tracks, similar to the track view screens seen on almost all editing software. Similarly, individual tracks can be zoomed into and out of for detailed waveform editing. Overall, I found RADARVIEW to be simple, good-looking and intuitive.

The sound of a digital recorder is primarily the sound of its converters, so I first checked out the AD/DA section to see what all of the fuss was about. A bluegrass session with acoustic instruments gave me a real chance to hear the detail the converters were capable of, and I was not disappointed. A Martin D-28 box guitar came though with a sheen I had not previously heard, and the transient punch of the banjo was remarkable. Such clarity is not inexpensive—the Nyquist 24/96 card is a $2,995 option.

Next I decided to try a real-time digital transfer from a friend's Tascam DA-88 via the TDIF connectors. Because the DA-88 offers SMPTE, MIDI and Sony 9-pin sync, and also included the SY88 synchronizer, I had a chance to test almost all available sync options. I didn't expect to find any issues with RADAR's sync capabilities, and I didn't. Later, using both SMPTE and MMC where appropriate, I was able to achieve rock-solid sync with my studio PC running Logic Audio, Cakewalk Sonar and Cubase 5.0. This brings me to my second and final gripe with RADAR. At the time of writing, RADAR 24 was not able to import projects from other editing systems, nor is it able to import audio files via the DVD-RAM drive; in fact, only small .WAV files can be imported via the floppy drive. [Editor's Note: Several of these concerns have been addressed with the upcoming release of Version 3.10 software. See the "RADAR 24 Software Update" sidebar for details.] However, iZ promises that RADAR 24 will soon have the ability to import Pro

RADAR 24 Pricing

The base RADAR 24 system is $4,995, with an 18GB drive; 24-channel TDIF I/O; 2 channels of AES/EBU and S/PDIF I/O; SMPTE/MTC/AES/video/word/9-pin sync; standard KC-24 keyboard; port for SVGA monitor; and all necessary software. By selecting from a wide range of options, RADAR 24 can provide a customized system to fit a variety of user needs.

Options include:

Session Controller: $1,195, with 33-foot cable. This full-function autolocator/controller features an LCD screen, dedicated transport controls, jog wheel, macro keys, dedicated editing keys and menu shortcut keys. An optional 66-foot extension cable is $150.

Meter Bridges: The $495 Meter Bridge 24 is designed for console-top or Session Controller mounting, providing full-range, 24-track LED metering without having to use the onscreen meters. The Meter Bridge 48 ($795) offers 48-track metering for dual-RADARLINKed RADAR 24 or RADAR II systems.

Digital I/O: Twenty-four channels of 96kHz-capable pathways in AES/EBU format on three DB-25 connectors, $995.

Classic Analog I/O: Essentially the same 24-channel, 48kHz AD/DA converters used in RADAR II, $1,695.

Nyquist Analog I/O: Twenty-four channels of 48/96 kHz AD/DA conversion, $2,995. The $3,995 S-Nyquist Analog I/O option is similar but offers improved conversion.

Drives: The standard 18GB Barracuda drive that comes with RADAR 24 can be upgraded with a variety of optional hard disks ranging up to 36 GB, for nearly three hours of 24-track recording at 48 kHz.

Backup: An assortment of auxiliary drives are offered for archiving or backup, including: double-sided 9.4GB 2x DVD-RAM, $695; 7- to 14GB Eliant 820S 8mm tape drive, $1,795; 14- to 28GB Mammoth LT drive, $1,995; 20- to 40GB Mammoth drive, $2,995; and the 60- to 150GB Mammoth 2, $4,995.

Cabling: To access the TDIF digital or analog I/O, you'll need D-25 sub-to-XLR (or -TRS) breakout snakes. These are available from numerous vendors, ranging from the ordinary to the exotic—depending on your budget needs and tastes, but they must be figured into your RADAR budget.

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Tools projects, and other file-import capabilities are planned.

Once the tracks were in RADAR, it was time to explore the editing possibilities. Those accustomed to editing on more elaborate, computer-based DAWs may find the editing functions of RADAR 24 rather limited. However, as RADAR is intended as a direct replacement for linear tape machines, the developers at iZ decided to stick to the editing basics: Anyone who is familiar with other digital editing platform will not have a problem getting around on RADAR 24 and will appreciate its plusses, such as real-time waveform rendering, the ability to perform multiple in/out paste marks on-the-fly, and its dedicated controls on the hardware controller for fast, one-touch setting of in/out/sync points and 10 Locate buttons.

After defining the in and out point of the area to be edited, the user can then place it in a virtual clipboard from which it can be cut, copied, pasted, moved, erased, slid, looped and reverse-pasted. It is a simple matter to position the clip, either by using the jog wheel or by using the autolocator, to find a pre-defined point. All edits can be auditioned, and there are up to 99 levels of undo. All of this is so simple that it is quite possible to edit on-the-fly during a session, something you may be afraid to try on a more complex system. Another nice feature is the Mark Sync button, which allows sound effects and audio cues to be easily and precisely positioned during video post-production.

In keeping with the tradition of simplicity, archiving and retrieving RADAR projects via the DVD-RAM drive could not be easier. From the LCD window, you can choose either the Backup or Restore menu, pick the project you want to archive or load and hit Enter. RADAR does the rest, and the 9.4-gig

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In keeping with its commitment to support the sizeable user base of owners of earlier RADAR systems, iZ now offers free downloads of Version 2.50 software for the award-winning RADAR II. Many improvements made during the development of RADAR 24 were ported to this new RADAR II software build, which adds features while addressing several operational and reliability issues present in RADAR II Version 2.20. Additionally, the V2.50 software is required to RADAR Link a RADAR II unit with a RADAR 24 system running Version 3.05 or higher.

RADAR II's upgraded Version 2.50 software features numerous improvements and updates, including enhanced graphics, accommodation of multiple SCSI backup devices and Macro import/export. RADAR Link protocol has also been im-proved, resulting in enhanced performance and stability. V2.50 software is available in the support/downloads area of iZ's Website: www.recordingtheworld.com. Software downloading instructions for the Mac are also available. —*George Petersen*

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Pete Leoni is the technical director at QPerformance, a division of East Coast Music Mall. He can be reached at demotech@qperformance.com.

RADAR 24 Software Update

As we went to press, iZ Technology was shipping its new RADAR 24 software Version 3.06, and the company had just announced Version 3.10, which should be available soon.

RADAR 24 Version 3.06 offers support for multiple backup devices, selectable via SCSI ID; increases the amount of addressable storage available for recording to 36,000 GB; macro import/export via floppy disk; and improves the RADAR Link protocol for sample-accurate linking of multiple RADAR 24 units.

Major features coming in RADAR 24 Version 3.10 include an "Export to Broadcast Wave and .WAV2" functionality, which allows RADAR 24 users to output projects and files to UDF-formatted, DVD-RAM media in the time-stamped Broadcast Wave format or the non-time-stamped .WAV format. Exported projects can be loaded onto Macs or PCs equipped with either a DVD-RAM drive or a standard DVD-ROM drive, offering the ability to drag-and-drop files and projects directly into other DAW applications for mastering/mixing. The 3.1 release also allows files to be moved between multiple RADAR 24 machines via Ethernet. Unique IP addresses assigned to each unit will allow transfers between machines, while avoiding backup and restore cycles or unnecessary drive swapping.

—George Petersen

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TOUR PROFILE

ERIC CLAPTON

19TH CENTURY ACOUSTICS MEET 21ST CENTURY TECHNOLOGY

ALL PHOTOS BY MIKE MANN

Eric Clapton and the band onstage at the Royal Albert Hall, London

The old Reptile himself

From 1989 until 1994, Eric Clapton's annual two-week residency at London's Royal Albert Hall became something of a tradition. Though the lineup of guest musicians varied over the years, the quality of the show's sound production steadily improved, and, despite the room's difficult acoustics (the RAH was designed in the late 19th century and was intended only for classical music concerts, for which many would claim it is poorly suited), Clapton's audio team consistently managed to produce finely tuned sound balances. (See *Mix's* January 1992 issue for a related article on the recording of Clapton's *24 Nights* album.)

Clapton's FOH engineer for many of the annual RAH shows and concurrent tours was Robert Collins,

BY MIKE MANN

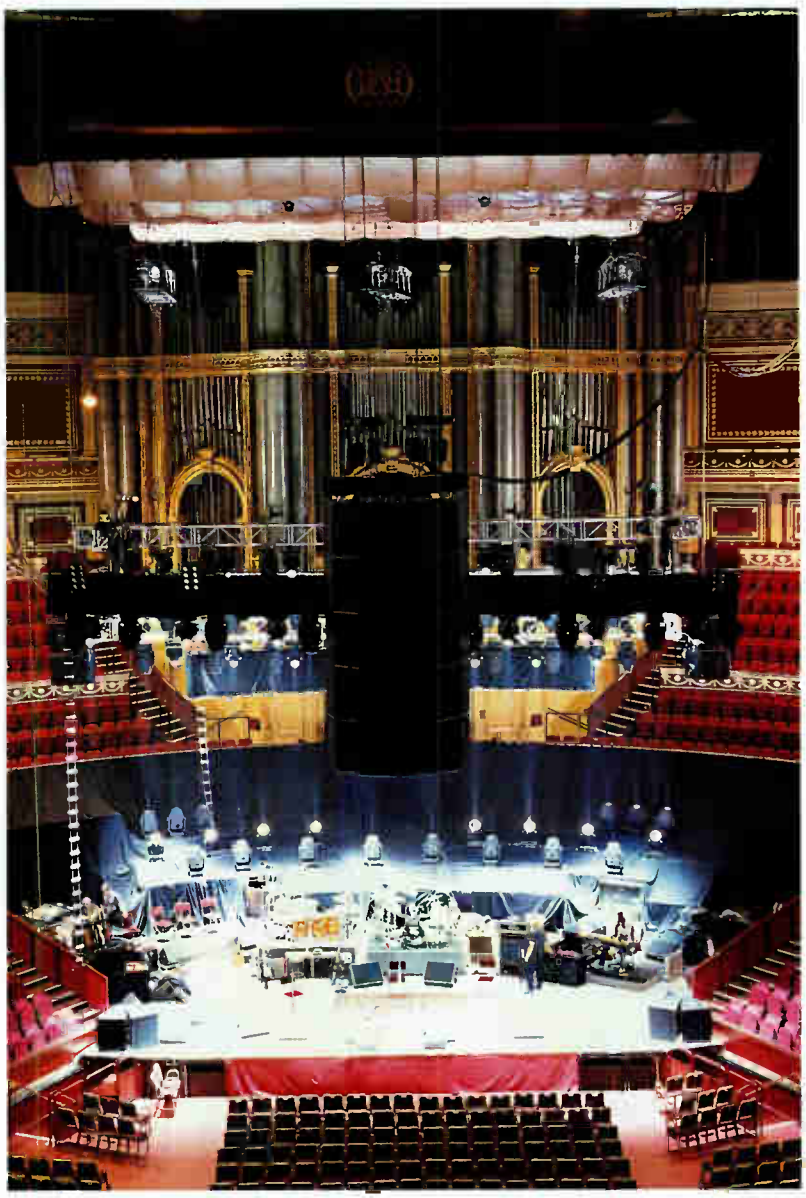
an independent engineer whose client list also includes The Who. When it came time to design the sound system for Clapton's 2001 tour, which kicked off with six nights at the RAH on February 3, Collins opted to move away from the traditional tools and methods that had made the "Clapton at the RAH" shows such a success. Instead, he placed his reputation on the line by using EAW's new (and previously untried) KF900 Series P.A. Not only was the Clapton tour the first in Europe to be equipped with the recently introduced KF900 "Phased PointSource Technology" system (supplied by UK-based Concert Sound), Collins compounded his bravery by choosing to take Yamaha's long-awaited PM-1D digital mixing console on its debut European tour.

Known for his dislike of unnecessary technical frills, Collins was keen to introduce some changes into his mixing environment, but not if it meant having to discard a lifetime's touring experience. "I looked long and hard at the various new boards that were around," he recalls. "When it came to the Yamaha, I thought, 'Maybe an old bastard like me could use this.' The jury's still out, but I haven't had any problems getting my head 'round the basics. Of course, it can do so much—it just depends on how far you want to go. At the moment, I'm trying to make it work the way I like to, in very much the same way as a traditional analog console." Though this may not be the way that the PM-1D's designers intended it to be used, Collins notes it is he who has to face the audience—and the band—every night, not the console designers.

MODULAR DESIGN AIDS MIXER CONFIGURATION

The PM-1D is based on a modular concept, providing for an almost limitless variety of console configurations, though all share the same 48-channel control surface. Inputs and outputs may be analog or digital, and digital formats include both the AES/EBU professional standard and S/PDIF/TDIF semi-pro options. A range of 3U and 4U input/output racks are available, each of which can handle up to 32 separate feeds. Auxiliary mixes, matrix sends and insert send/returns only appear as real connectors if required, saving rackspace and money by eliminating unnecessary hardware. Every adjustable parameter, including the analog gain control for the input A/D converters, is automated as a series of snapshots. While dynamic (i.e., continuous) automation is not yet available, it should be pointed out that the Concert Sound PM-1D started the Clapton tour equipped with Version 1.0 software.

The console's audio connections and converters, which are located onstage, are configured to the tour's exact requirements—48 analog inputs from the stage, plus a couple of stereo line inputs for pre-show playback. To enable the PM-1D to cope with the enormous dynamic range encountered in a live environment, the console's A/D converters are 28-bit—configured by cascading two 24-bit devices—so that even when a signal is at a low level, resolution is high. Headroom, according to Yamaha, is exceptional.



The EAW KF900 system hung as a center cluster. Front section of the audience is covered with ground stacked EAW KF750s.

Inputs—whether analog or digital—are linked digitally to the console's "engine," a powerful DSP rack that performs all of the mixing, equalization, dynamics and delay functions for the system. For this tour, this is positioned in the FOH enclosure, but would normally be onstage to cut down on the cabling from the input racks.

The control surface and engine are connected by a 32-pair digital audio cable (used for passing the FOH engineer's local monitoring signals and other local audio feeds) and a pair of coaxial control cables. Other connections include a 48-track Mackie hard disk recorder, which is fed from each channel's direct output as a pre-fade digital signal. Collins requested the Mackie unit as part of the team's rehearsal rider, and it has stayed for the tour. "I wanted a multitrack for rehearsals to let me hear what I was doing," he explains. "I would record tracks without any EQ or processing, so that I could replay them later and go over the mix."

Despite the fact that the PM-1D offers a sophisticated onboard package of dynamic processors and effects devices, Collins was keen to use some of his tried-and-trusted outboard gear. These include a number of dbx 160S compressor/limiters, which he has inserted into key channels via AD/DA cards in the PM-1D racks. Effects, which include an Eventide DSP7000, TC Electronic M5000 and D-TWO, plus a clutch of Lexicon reverbs, were originally fed from auxiliaries and returned to inputs in the analog domain. But, at Yamaha's suggestion, these were rewired to preserve the all-digital signal path. "I was impressed with the clarity and cleanness of the effects when we connected them digitally," noted Collins. "In fact, when we ran instruments through the board for the first time, they were so clean it frightened me!"

FLIPPING FADER BANKS

Collins, like most engineers, is accustomed to having his mixing console laid out in a certain manner and had to think carefully about how to condense a large number of inputs onto the PM-1D's comparatively small control area. The control surface includes four "banks" of 12 channels each, with a second layer of inputs hidden below the first, for a total possible input count of 96. Collins assigned his most important inputs (bass, acoustic bass, five guitar channels and vocals) to channels 13 through 24, immediately to the left of the console's output section. To the right, occupying channels 37 to 48, he assigned the percussion instruments; being wildly dynamic, these needed more attention. Above these

The Yamaha PM-1D (left) at the FOH position

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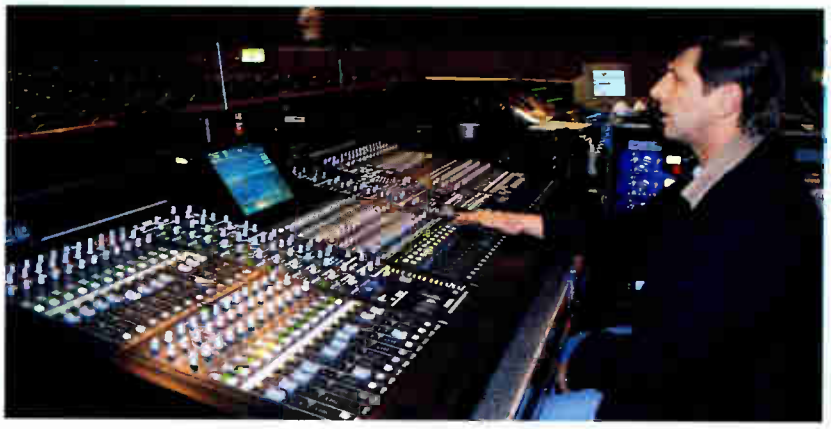


Eric Clapton's FOH engineer Robert Collins at the Yamaha PM-1D

key channels, Collins arranged the remaining 24 inputs, with the drum kit (kick, snare top and bottom, splash, hi-hat and ride cymbals, two overheads and four toms) as one bank of 12. Miscellaneous feeds and effects returns were assigned to the last bank. "After having had this board for a couple of weeks—mainly in rehearsal for this tour—flipping between banks of faders becomes second nature," says Collins, and watching him flip instantly between banks, bringing troublesome channels to his fingertips in an instant, dispelled any doubts about the console's intuitive design. "This is the beauty of this board—having 48 real faders," Collins adds. "If Yamaha had given me something with six faders and forced me to page through everything, I wouldn't even have put it in my bedroom!"

As is common with large and complicated P.A. rigs, the console is used to produce multiple mixes, and at the RAH, the PM-1D generated a main stereo feed and three auxiliary sends. One aux mix was used to drive a number of diminutive EAW JF80 frontfill speakers, essential for that section of the audience sitting on-axis with the backline of guitar amps. A second aux mix fed left and right ground stacked EAW KF750s, which were used to cover the audience located under the main array, while a third aux mix fed the "choir stalls" at the Royal Albert Hall, additional seating to the side and behind the thrust stage. "Up at the back, the audience is hearing a lot of the monitor sound, so we put a lot of vocals and the acoustic guitars into the rear mix," notes Collins. "One of the great things about the Yamaha board is that you'll never run out of outputs!"

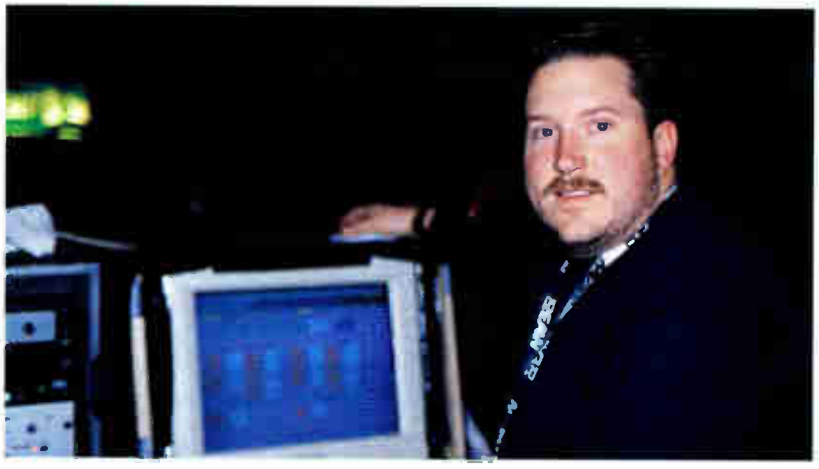
The main stereo feed would normally be fed to a left-right pair of flown loudspeaker arrays, but Collins and Concert Sound chose to use a single central cluster to deal with the circular RAH. Rusty King, formerly of Spectrum Sound in Nashville, takes care of the mighty rig. "We've zoned the center cluster to provide a stereo mix for the front and mono round at the sides, where stereo wouldn't make any sense," he explains. "Rather than dealing with the system as a number of loudspeaker cabinets, it's actually divided into 'cells.' Each of these is a single horn or pair of horns, and by changing the level and delay of the signal that we give to each of them, we can actually change the pattern of the coverage that the whole system gives."

At the RAH, three different cabinet types were combined to form the array; the KF930 long-throw, low-frequency enclosure (which has two independent 15-inch loaded horns), the KF920 long-throw midrange cabinet (fitted with a trio of 10-inch drivers, again horn-loaded) and a number of KF913 medium-throw/downfill HF boxes. These latter feature three 2-inch compression drivers mounted on EAW's SimplePhase horns, each of which is angled differently to produce a spreading coverage pattern. By flying one row of KF913s upside down, the team was able to cover the tall auditorium (which has no less than seven levels of seating) from a single vertically hung array.

DSP OPTIMIZES SYSTEM

The EAW system is heavily dependent on DSP to create the required system coverage, and no less than 10 BSS Soundweb digital matrix processors fed 33 separate audio channels to the system's LAB Gruppen power amps. As well as providing the required delay and level correction, the Soundwebs are also used for equalization, bandpass filtering for each driver type and dynamic control to ensure that the system is working optimally. Collins, faced with mastering an unfamiliar console, was happy to hand the system over to King. "It's quite amazing how much control you have over this system—whatever happened to the simple crossover with four knobs?" comments Collins. "The only thing you have to be careful about is that you don't change anything while you're doing something else—when I'm listening to the band, it's 'hands off!'"

Concert Sound's Tim Boyle has been working in the European live



System tech Rusty King at the Soundweb screen

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sound industry since its early days. "We've always had a close relationship with EAW and with Spectrum, who have been using the KF900 system for a while," says Boyle. "Twenty-five years ago, it was the normal thing to do to stack horns in columns—we knew how to couple more than one speaker to 'throw' a long way. Somewhere along the line, someone had the bright idea of putting all the elements into one cabinet, but for some applications, it doesn't work as well. What EAW has done is in some ways a big step forward, but in others it's like looking back in time. The advantage now is that with the technology we have at our fingertips, the result is much more coherent and completely controllable."

For Eric Clapton's other European dates, which included bigger arena shows in the UK, a more conventional pair of arrays was used. In the case of Manchester's 15,000-capacity MENA venue, the KF900 rig was used without delay speakers, a rare opportunity to save time and money on a tour of this scale. Interestingly, even at these larger venues, the Concert Sound crew did not need to call upon EAW's ultra-long-throw design, the KF910. (This HF cabinet contains a total of five 2-inch drivers on long horns, arrayed in a straight line and using line array principles to increase the system high-frequency coverage to over 700 feet.)

A dozen EAW SB1000s provided sub-bass (always an issue on tour, especially with acoustic instruments playing a major part in the music). The dual 18-inch SB1000 has become extremely popular in Europe where its tight low-end control and general musicality are greatly appreciated. For the larger arena shows, the SB1000 contingent was doubled to 24.

TRADITIONAL MONITOR SYSTEM

Faced with so much new technology, it almost comes as a relief to find that Clapton's monitor system is very traditional and has not varied much in the last few years. A Midas XL4, supplemented by a 24-channel XL3, handles the mixing, while Concert Sound's wedge monitors provide the band with their every musical wish.

Taking a new piece of equipment on the road is never an easy decision—and it is made many times harder when the equipment in question is critical to the show. Add the fact that Robert Collins has spent a long time developing a relationship of trust with Clapton and his band, and the temptation to play it safe must be very strong indeed. However, given the right level of manufacturer backup (and, at times, there were more technical people from EAW and Yamaha on the tour than actual sound crew), little problems should never get the chance to develop into major ones. The live sound industry has long been criticised for using technology that lags behind the lighting, set design, video and sometimes even catering departments—but according to Robert Collins, it's the engineers themselves who are to blame. "The bottom line is that, if it all goes wrong, give me a basic desk and a normal P.A. and we'll have a good gig tomorrow. They say you can't teach an old dog new tricks, but learning to work with this level of technology is only a minor problem for us old guys. I might go back to an old Midas after this tour—or I might become a convert. If you don't try, you'll never know, will you?"

Eric Clapton's 2001 tour takes him to 25 European cities before a rare performance in Moscow. Following a short break, the tour then heads for North America and will wind up in the Pacific Rim toward the end of the year. ■

Mike Mann is a freelance writer living in England.

JEFF BECK ON TOUR

"EARTHQUAKE" HITS SAN FRANCISCO

PHOTOS BY STEVE JENNINGS

On a world tour to promote his latest album, You Had It Coming, Jeff Beck began the U.S. leg on the West Coast in February, reached New York in March and is scheduled to tour Europe with Sting for six weeks beginning in June. Accompanying Beck are veterans Jennifer Batten (guitar, MIDI guitar, vocals) and Randy Hope Taylor (bass), with newcomer Andy Gangadeen on drums and loops. Independent engineer Andy May (left), on his first tour with Beck, is at the Yamaha PM4000 at FOH (using No. 23 from Clair Bros. extensive stock of 4ks), while Showco staffer Jerrel Evans (right) is using a Harrison SM-5 for monitors. Showco system tech Stephen Cross takes care of the Showco Prism® System.

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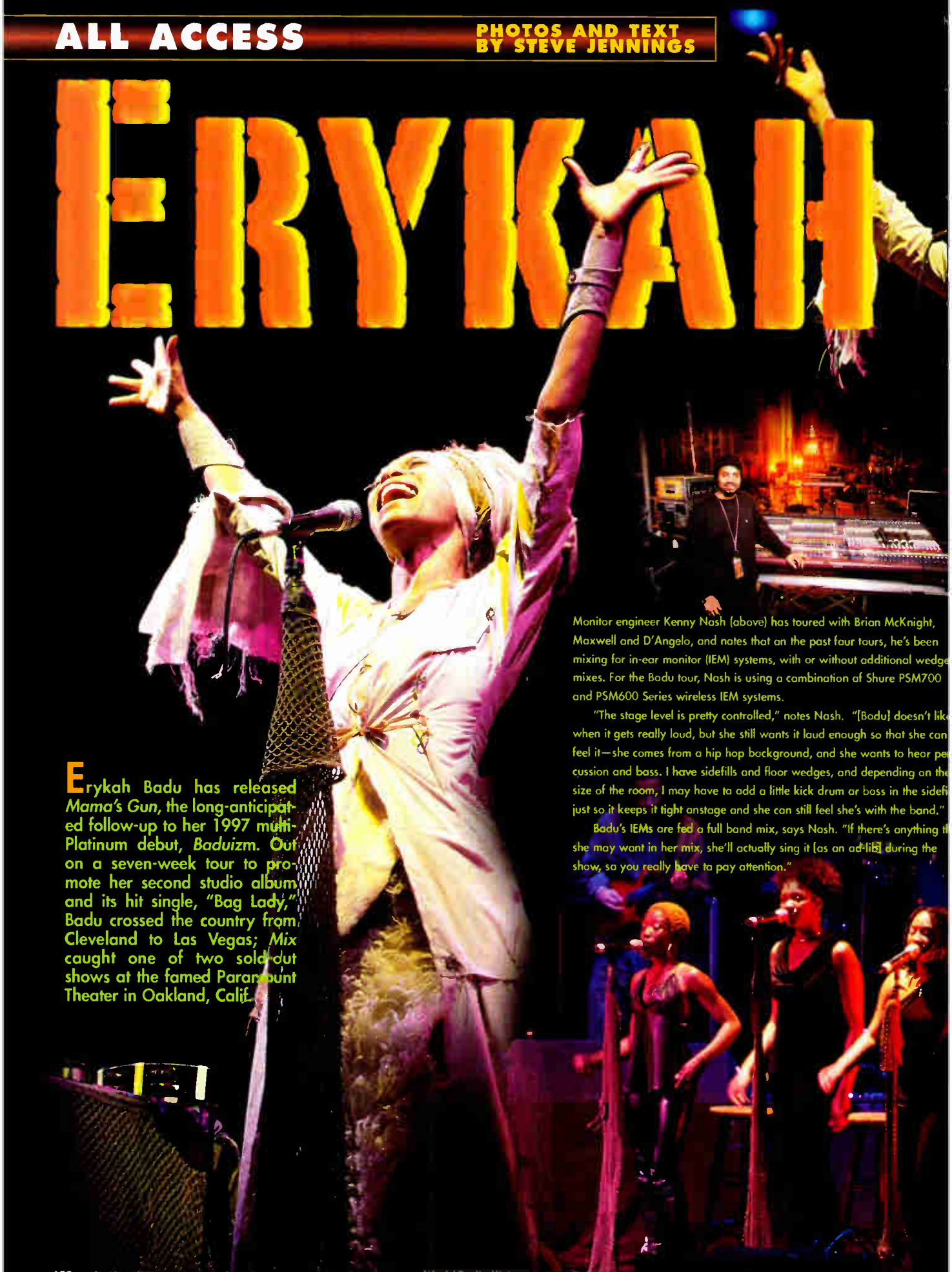


Erykah Badu has released *Mama's Gun*, the long-anticipated follow-up to her 1997 multi-Platinum debut, *Baduizm*. Out on a seven-week tour to promote her second studio album and its hit single, "Bag Lady," Badu crossed the country from Cleveland to Las Vegas; *Mix* caught one of two sold-out shows at the famed Paramount Theater in Oakland, Calif.

Monitor engineer Kenny Nash (above) has toured with Brian McKnight, Maxwell and D'Angelo, and notes that on the past four tours, he's been mixing for in-ear monitor (IEM) systems, with or without additional wedge mixes. For the Badu tour, Nash is using a combination of Shure PSM700 and PSM600 Series wireless IEM systems.

"The stage level is pretty controlled," notes Nash. "[Badu] doesn't like when it gets really loud, but she still wants it loud enough so that she can feel it—she comes from a hip hop background, and she wants to hear percussion and bass. I have sidefills and floor wedges, and depending on the size of the room, I may have to add a little kick drum or bass in the sidefill just so it keeps it tight onstage and she can still feel she's with the band."

Badu's IEMs are fed a full band mix, says Nash. "If there's anything that she may want in her mix, she'll actually sing it [as an ad-lib] during the show, so you really have to pay attention."

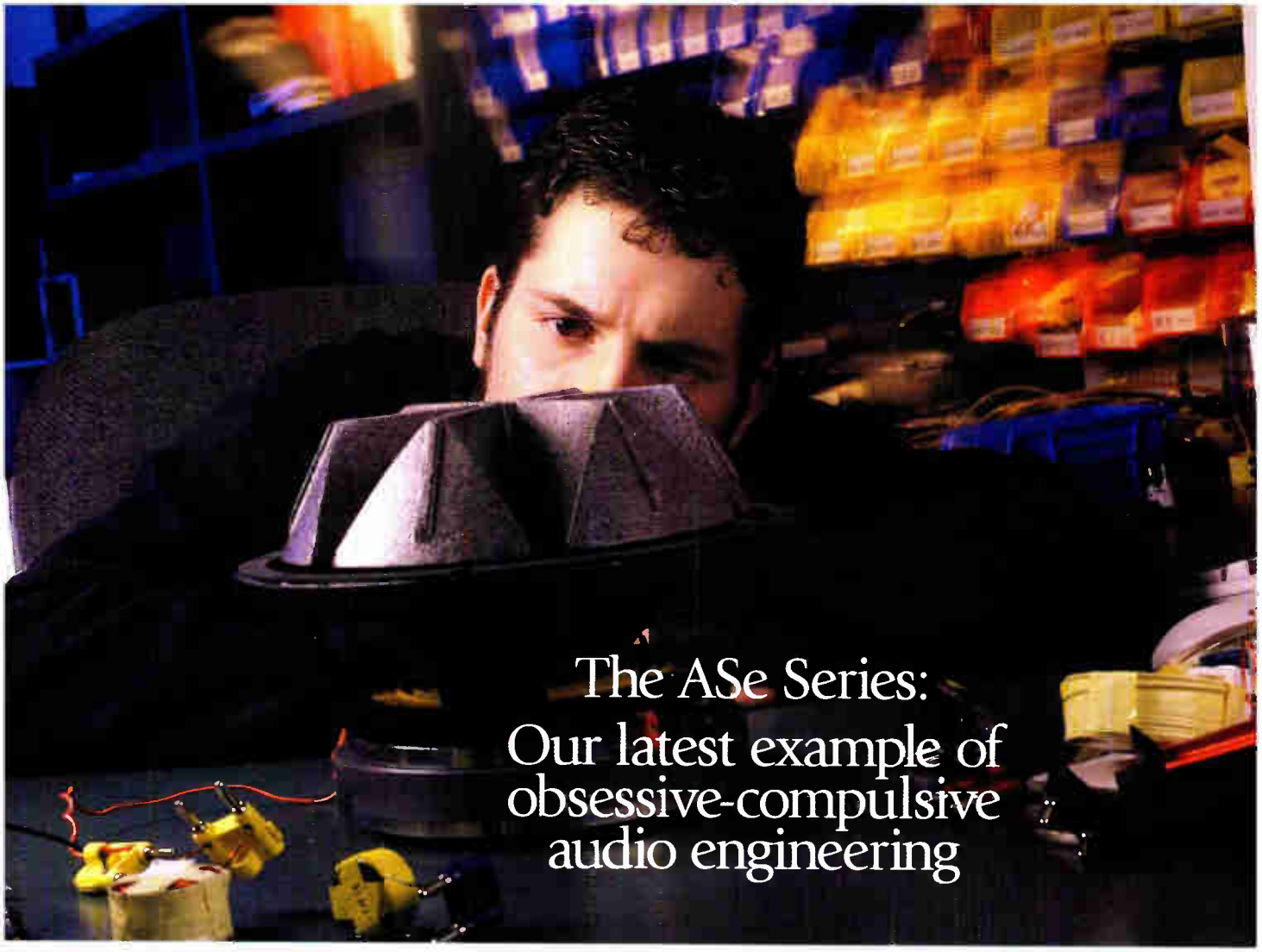
BADU

Combining the roles of FOH engineer, production manager and assistant tour manager is Gordon Mack III (below). Mack is mixing on a Midas Heritage 3000, using about 45 inputs and four stereo returns, and records the show every night to DAT and video. "Erykah checks them out and critiques them," says Mack, whose company, Siahson Entertainment, is providing production for the tour.

Mack uses relatively few effects. "We have one reverb, one delay and one multi-effects that I use two effects on," he says. "There's a flange that was on the album and a chorus. That's it. Everything else I try to run as dry as possible."

Erykah Badu sings into a slightly modified Shure SM58. "We tried different vocal mics," says FOH engineer Gordon Mack III. "Erykah's happy with the regular Shure 58, but she didn't like the wind screen, so we took that off and put a Beta 57 wind screen on it, and it works just fine."

The Erykah Badu crew, pictured left to right: Perry Winston (stage manager/backline tech), Jamie Adams (FOH tech), Phil Migeri (lighting tech), Kenn Dugan (monitor tech), Pamela E. Harris (production asst.), Drew Scott (rigger/etc.) and Martin Thomas (lighting director)



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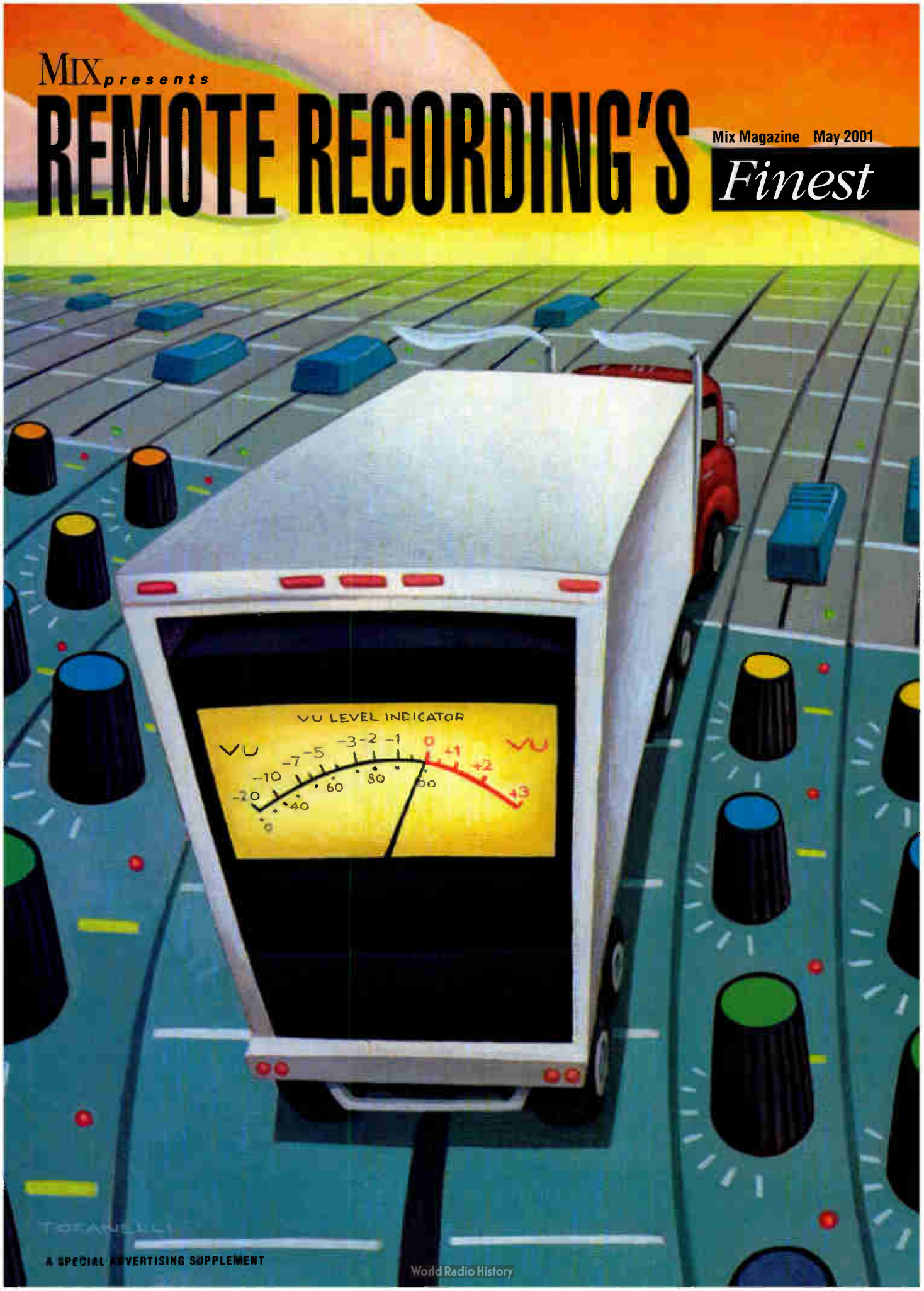

A SPECIAL ADVERTISING SUPPLEMENT

by Dan Daley

Where the Media
Meets the Road

They are the last of the professional audio cowboys. Whether in an independently owned rig or a corporate tractor-trailer, remote recording specialists have maintained a mystique that has survived the transformation of audio into a multinational mega-business. They've managed to do that with a unique combination of technical resourcefulness (not many people can wire harnesses for patchbays and spark plugs), recording and mixing acumen, and the ability to apply their talents and skills across a wide range of situations—from recording a large-venue music concert to a network awards broadcast to a critical club gig. And often in the same week.

Remote recording is one of the few threads that run the length of the professional audio industry. Starting with field recordists like Art Satherly in the 1920s and Alan Lomax in the 1930s—who exposed the world to music from outside the traditional recording centers—the notion of "taking it on the road" blossomed as rock became the primary driver of the music business in the 1960s and '70s. Live concert albums often became the career-makers for recording artists, most notably for Peter Frampton with the 1976 blockbuster *Frampton Comes Alive!*

With more music on television and a dramatic increase in live concerts broadcast in prime time, remote recording has become a critical link between the two entertainment domains. Audio, it seems, has been inching toward a parity with picture in the broadcast industry, laying the groundwork for the success of new broadcast audio innovations such as Dolby Surround and now Dolby E. With the explosive growth of cable and satellite television in the 1990s, remote recording trucks proved crucial in helping the entertainment industry develop new content to fill scores of new channels. There are now, as *Daily Variety* has noted, more awards shows on television than ever before, and each of them has at least one audio rig parked outside the venue, making sure they all sound great. And as programming ranges further and further afield to capture content (can you say "reality TV"?), the trucks will roll with them.

The fact that remote recording vehicles are self-contained studios has compelled the leaders in that market to stay as cutting-edge as possible, artfully devising ways to integrate new systems and platforms into limited spaces. On the other hand, the owner/operators must retain the best of the classic gear to assure that the music tracks are on par with any top-flight, land-based recording facility. That's a balancing act that deserves its own awards show.

The need for high-quality remote recording and mixing services will continue to expand for all of the reasons noted above, and because one of the Internet's most significant effects on show business has been decentralization, making almost anywhere a potential Media Mecca. New business has also broadened the base of mobile facilities, as have new and cost-effective digital technologies. Add a computer room, and you have a Webcast remote. There are now more remote companies that can service more strata of the music and media business. And it will only keep growing.

Still, there will only be a few that occupy the high end. And those are commemorated in this edition of "Mix's Finest." When you only have one chance to get it right, you'd better be relying on the best. ■

Contents

PHOTOS: MARK DIAMOND OF PANORAMIC SERVICES

Artisan Recorders—Mobile

Founded in 1977 by president and chief engineer Peter Yianilos, Artisan Recorders Inc. is the oldest continuously operated remote recording company in the Southeast. Yianilos' philosophy is reflected in the name of the company—Artisan—and he has focused the company on one market: music. "I love to make music and make it well," says Yianilos. As a result, Artisan has become the truck of choice for a lengthy list of leading recording artists, engineers and producers. These include the Rolling Stones (*Steel Wheels* live album), Luciano Pavarotti, Whitney Houston, Trisha Yearwood with the London Symphony Orchestra, the Dave Matthews Band, Smashing Pumpkins, and many more. And for two years, Artisan has been the mobile control room throughout the country for Tom Joyner's acclaimed live music syndicated radio program.

Artisan's first incarnation was as a clever conversion of a GMC motorcoach, which Yianilos remembers fondly as more of an expression of youthful exuberance than the result of careful analysis of studio design. But that willingness to keep the music at the center of every decision, business or technical, has been at the core of Artisan's success over the last 24 years.

The current Artisan truck came online in 1993, and in 2001, underwent a comprehensive upgrade, with new acoustical, technical and aesthetic additions that further enhanced Artisan's already renowned reputation for music recording and mixing. The extensive remodeling of the control room by John Arthur of Miami-based John Arthur Design Group included enhanced isolation, thanks to over 2-tons' worth of mineral-loaded vinyl (no lead content) and MDF board suspended on springs. "The ability to get this level of isolation in a remote truck is critical for music," says Yianilos. "In concert situations, we can get this control room as close to the venue as needed and not have the recording affected by high SPL." And this Artisan truck is designed with a very human touch—Yianilos purposely had the 38-foot-long trailer positioned at just 24 inches off the ground. "It might seem like a small thing, but what that serves to do is to make the truck much more inviting from the first moment you encounter it," he says. "Standard-height trucks can be intimidating. This one actually beckons you aboard."

An Amek Hendrix console fitted with Super True automation offers analog warmth and high flexibility; combined with onboard analog and digital sidecar mixers, Artisan offers up to 120 inputs. Vintage analog outboard gear, such UREI 1176 and LA-4 units, and a microphone array including Neumann, AKG and Sennheiser, truly bring a classic music studio right to any doorstep. Artisan director of operations Natalie Eckart says that building a truck and a business around music has proven to be a successful plan. "Peter is a musician, and there's always at least one other musician on the crew," she says. "The technical excellence has always been there—Peter wouldn't have it any other way. But there is also always the fact that we can communicate with musicians in a very unique manner. We speak the same language. We always have, always will." ■

SPEC SHEET

Company Name: Artisan Recorders Inc. **Contact:** Natalie Eckart, Director of Operations. **Services Offered:** Remote audio recording, editing and mixing; audio production and mastering; audio remote broadcasting; customized equipment flight pack also available. **Main Technology Platforms:** Amek Hendrix (40 mono, 4 stereo, 4 stereo returns; 24 group, 12 aux sends, full Super True automation); Hill Multimix 16x4 submixer (2); Yamaha 02R V.2 (2); Yamaha 01V; Sony PCM-800/Tascam DA-78 HR digital 8-track with timecode and remote (10); MCI JH114 24-track (14-inch reel capacity) with Dolby SR/A noise reduction (2); Ampex ATR102 1/2-inch stereo mastering recorder; Dolby 363 SR/A stereo noise reduction; Pro Tools 5.1, 24IMix system, 888/24 I/O, software from Waves, TC Works and Bias; Hafler TRM 8 active monitors; custom 50-channel active splitter systems, three-way line-level output, plus direct out/channel 800-foot cable (2). **Truck Information:** 36x8.5-foot custom-designed trailer, 370-h.p. Cummins-powered Volvo tractor. **Partial Credit List:** Barenaked Ladies, Disney/ABC, Gloria Estefan, MTV Networks, Prince, Sony, Universal, Univision.

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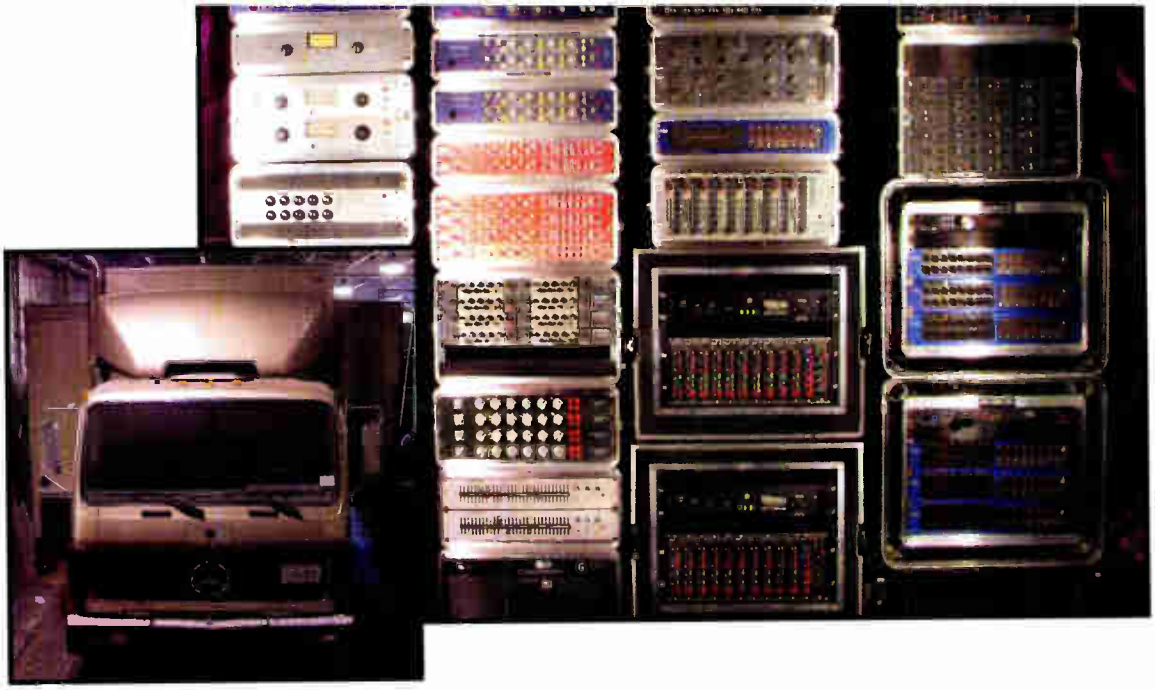

PHOTO: STEVE REMOTE

Aura Sonic Ltd.

Aura Sonic Ltd. (ASL) was established in the late 1970s by Steve Remote to provide a variety of location recording and broadcast production facilities. Remote has arranged his resources in a flexible manner to allow for a number of custom configurations, ranging from ASL's two fully equipped remote trucks to portable "break-away" audio recording and mixing packages, customized for each project. ASL custom systems can be set up at any facility, venue or location for local or global remote recording and live mix coverage.

ASL's two well-outfitted trucks are just as flexible. Analog and digital audio components can be configured to meet the client's request in an "a la carte" style. The new "multifunction" mobile unit with hydraulically expanding control cabin (available summer 2001) can handle 2- to 144-track audio recording, with over 264 inputs available. The second mobile unit can handle 2- to 96-track audio recording with over 172 inputs available. The ASL trucks are customized for each and every project from a full complement of analog and digital gear.

Both ASL mobile control cabins have been ergonomically designed for maximum efficiency. Complete control and overview of the console, signal processing and video monitors are possible from the mix position, and the main patchbay system is centrally located. Additional ASL and/or guest equipment, including mic pre's, mixers, processing, multitrack machines, etc., can be interfaced to the ASL system via various audio/video panels. Separate air conditioners provide consistent, reliable cooling, and Ultra isolation and power conditioning keep the AC power clean.

Though its beginnings were in live music recording, ASL, today, is a multifaceted mobile and location facility, with credits in recording, film, video, radio and the television broadcasting industries. ASL clients include ABC, BBC, CBS, ESPN, FM Osaka, FM Tokyo, FOX, HBO, Matsushita/Panasonic Visuals Inc., MTV, Netherlands Programme Service, NHK, NPR, PBS, Paramount, Showtime, Tokyo Broadcasting, Turner Broadcasting, USA Networks, VH-1, Warner Bros. Pictures, WBCN-FM, WBGO-FM, Westwood One, WNYC-FM, WQCD-FM, plus many record labels.

Capturing the sound the client wants is, of course, key to the success of Steve Remote and ASL. Remote also attributes his longevity to ASL's unique position in the business. "The niche I fell into was having the truck that is between the large and small trucks that are around," Remote explains. "Today, our mobiles and portable packs can complement any production venture, big or small, from a super-small box to a multifunction expanding truck.

"ASL takes a fresh look at each and every audio recording and live mix project it gets involved in," continues Remote. "The company is designed to provide an efficient and economical way to integrate quality audio components with the finest on-location audio production techniques. We've always been dedicated to satisfying the needs of our colleagues and clients, and we've succeeded consistently with this approach." ■

SPEC SHEET

Company Name: Aura Sonic Ltd. **Contact:** Steve Remote, President/Chief Engineer; Victoria Bonadonna, Director of Client Relations. **Services Offered:** Truck-based and portable audio recording, editing and mixing; audio engineering and consulting services for broadcast, music recording, film sound, teleproduction audio, streaming media and live sound reinforcement. **Main Technology Platforms:** Otari Status 18R 48-channel, 96-fader dual-path console; Millennia Media Mix Suite (3); API 3124 48-channel mic pre's; True Systems Precision 8 48-channel mic pre's; 48 channels of Focusrite ISA215. Audio Toys Pro6, Midas XL42, Daking 52270; Yamaha 01V (3); Otari MTR90 MkII 2-inch analog multitrack (2); Tascam MX-2424 (2); Tascam DA-88 (14); Tascam DA-45 HR (2); Alesis ML9600 Masterlink (2); M&K 2510P (5); M&K 5510SUB (2); Genelec 1031A (4); K&H 92 (2); Mackie HR824 (4); Over 240 microphones by AKG, Audio Technica, B&K/DPA, Bever, Coles, Crown, E-V, Milab, Neumann, Royer, Sennheiser, Shure. **Partial Credit List:** Rod Stewart; Netherlands Metropole Orchestra; The Corrs; 'N Sync Bon Jovi, Staind; POD; Sinead O'Connor; Stone Temple Pilots; Everclear; Carlos Santana; Christina Aguilera; Tori Amos; Chick Corea & Origin; Marc Anthony; Joe Jackson; Red Hot Chili Peppers; Live; Silverchair; Faith Hill, Fuel; Wynonna.

Aura Sonic Ltd
THE HOME OF ASL MOBILE & LOCATION PRODUCTION

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PHOTOS GEORGE BENNINGTON

CSP Mobile Productions

The latest addition to CSP Mobile Productions' remote recording fleet is Unit Six, a cutting-edge, dedicated audio truck. This state-of-the-art studio on wheels is crafted around Yamaha's new PM1-D digital console, already widely acclaimed for a design that performs excellently in both live and studio settings. The 96-input Yamaha console is supported by 48 tracks of Tascam DA-78 MDMs, 48 tracks of hard disk recording/editing capability and a Macintosh G4 editing front end with MOTU interface. Also integrated into the original design is 5.1 surround monitoring and mixing capability, with monitoring provided by Genelec self-powered units.

The truck also offers a full complement of analog processing gear and a wide array of microphone choices. CSP VP/operations manager Len Chase designed the tight and remarkably accurate acoustical environment, which features diffusion in the control room's ceiling and bass traps in the corners. Two 43-inch plasma display monitors are easily visible, both from the engineering position and from the client lounge, features that make Unit Six one of the most comfortable remote units on the road.

CSP's two remote video trucks were also designed by Chase and his engineering team and constructed at CSP's Maine headquarters by New England craftsmen. That design combination of comfort and cutting-edge technology is part of a strategic plan to position Unit Six as a leader in remote music production and mixing.

"With our emphasis on 5.1 surround, Unit Six was designed to be as close to a recording studio as feasible in a remote facility," explains CSP Mobile Productions president Nat Thompson. "Our aim is to make recording artists, producers and visiting engineers as comfortable as possible." Adds Lance Vardis, the mixing engineer who helped significantly in the design of Unit Six, "It's as close as you can get to being in the club or the arena for a performance. But going one step further, what we're doing here is basically bringing the surround capability out of the studio and right to the venue. What we hope is that when broadcasters and concert promoters hear how much surround adds to a music broadcast, it'll encourage them to pursue more and more music broadcasts in surround." Thompson also says that DVD is rapidly becoming the format of choice for in-concert music videos—such as the one that Unit Six recorded for the Foo Fighters recently—and that DVD-A will create further demand for surround capability in remote recording operations.

CSP Mobile Productions is a division of Maine Radio and Television Company, an icon of American broadcasting since 1925, and still owned and operated by members of the founding family.

CSP offers an entire package of audio- and video-remote capability, along with a technical and creative team that underscores the company's long heritage. "And we offer one more thing," adds Thompson, "and that's a vision of the future of remote music recording." ■

SPEC SHEET

Company Name: CSP Mobile Productions. **Services Offered:** Full-service remote audio and video recording, mixing and editing; discrete 5.1 surround audio monitoring and mixing; production services, including scripting, directing and post-production in conjunction with Tupelo Honey Productions. **Main Technology Platforms:** 96-input Yamaha PM1-D digital console; Tascam DA-78 and hard disk multitrack recording; Genelec monitoring; processing includes Lexicon, Drawmer, Eventide, TC Electronic; 42-inch plasma displays (2); control room: 8'6x13; lounge: 8'6x9; engineering area: 8'6x6. **Truck Information:** 1996 Chevy W7, 6-cylinder/270-h.p. w/a 2,000 28-foot Morgan box. **Partial Client List:** Foo Fighters, Allman Brothers, Barenaked Ladies, Tibetan Freedom Concert, Woodstock.com, Aerosmith, Stone Temple Pilots, Third Eye Blind, Wynton Marsalis. (Many of these performances were distributed by Spring Communications.) CSP also provided facilities for a long list of major league sports, corporate and network broadcast productions.

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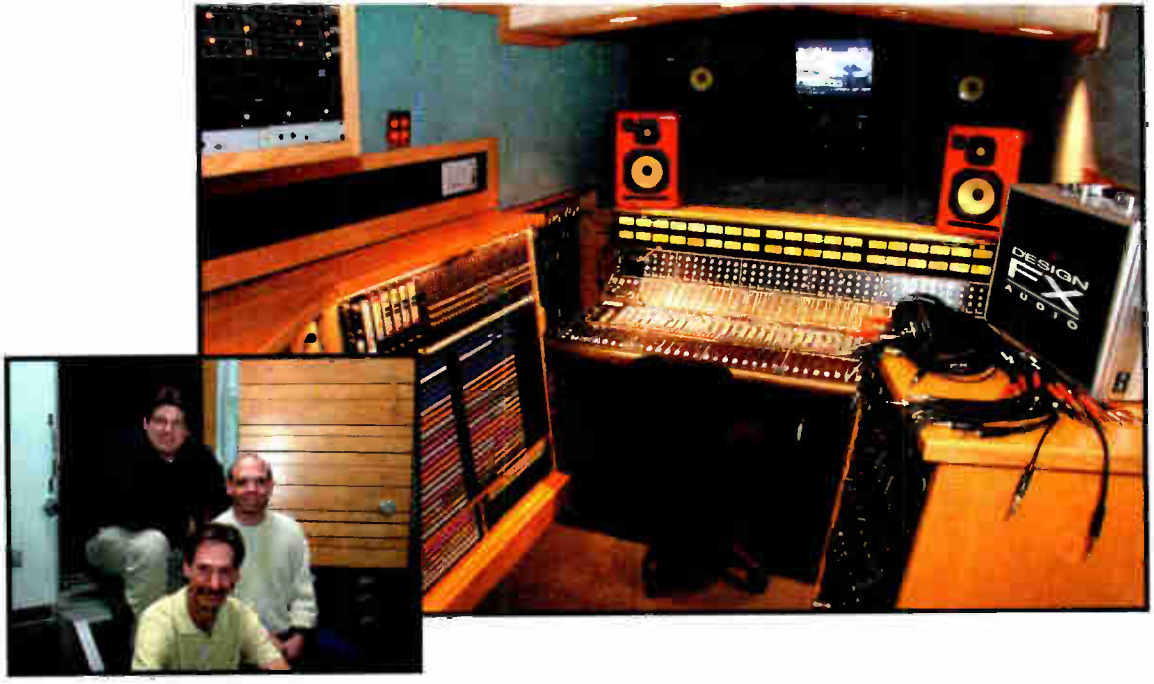

PHOTOS: DAVID GOGGIN

Design FX Remote Recording

Design FX Remote Recording came into being in 1991 when Design FX Audio, one of the professional audio industry's leading equipment rental companies, purchased one of the original Record Plant remote recording trucks and proceeded to completely remodel and upgrade it. Jack Crymes, the original designer of both the Record Plant trucks and the early Wally Heider trucks, came onboard to oversee and direct all of the technical engineering, along with Design FX tech Allen Baca and master carpenter Dave Mailand. The result is a superb combination of technology, creativity and mobility.

The remodeled truck, equipped with a vintage 44-input API console, made its debut at the 1991 MTV Music Awards, which were broadcast live from L.A.'s Universal Amphitheater. The mobile studio was later moved onto a more powerful International cab, and since then, the Design FX Remote unit has been from Vancouver to Mexico City and many points in between.

In 1994, Design FX decided to further upgrade the truck's classic API console. Jack Crymes, a pioneer in remote recording for the past 25 years, joined forces with API specialists John Dressel, Jeff Bork and Design FX Audio president Gary Ladinsky to design a new custom API input module, one adapted especially to live music recording. Retaining the classic API components, such as the 2520 op amps and the legendary 550A EQs, the design team added an entirely new level of flexibility for live recording applications with modifications such as additional aux sends, dual-mix buses, direct outs, P&G faders, fader flips and a versatile solo system.

Design FX Remote Recording has an unusual advantage: As a division of a leading equipment rental company, the remote truck operation can call upon an extensive menu of both stock and exotic audio devices, from mixers to microphones, outboard gear to hard disk recording systems. And, as Ladinsky points out, access to such a wide array of equipment has given the staff of Design FX Remote Recording a tremendous depth of knowledge and operational experience. "We're in the unique position of being able to not only supply any hardware you could want, but also the expertise to operate it to its maximum potential," says Ladinsky. "Our clients get a crew that has probably done it all on anything you can think of under any circumstances and at every type of venue. We've done live recordings directly to Pro Tools, and we can do that with the same level of confidence that you would get with an open-reel multitrack machine. The range of hands-on experience we can bring to a project is very, very intense."

That kind of performance is what's behind a long and acclaimed list of Design FX Remote Recording clients. In addition to an Emmy Award for Best Sound for a Special Presentation (Natalie Cole's "Unforgettable-With Love"), the truck and its crew were responsible for this year's Grammy for Best Jazz Album (Dianne Reeves' *In the Moment*), plus five Emmy nominations, various TEC Award nominations and Golden Reel awards.

"It's a great remote truck," says Ladinsky. "But behind the door, there's more than a control room—there's a huge wealth of human and technological resources at your service." ■

SPEC SHEET

Company Name: Design FX Remote Recording. **Contact:** Scott Peets, Remote Recording Manager. **Services Offered:** Remote audio recording, remote broadcast, mixing, transfers, field packages available. **Main Technology Platforms:** 44-input API analog console with 55A EQ and expanded input modules; every type of recording media, from tape (analog and digital) to MDM to hard disk is available through Design FX Audio Rental Divisions. **Vehicle Information:** International cab, 37-foot box. **Layout:** Control room area: 14x6'6" (from console edge). **Partial Client List:** Elton John, Vanessa Williams, Babyface, Faith Hill, Seal, David Foster, Clint Black, Eagles' Hell Freezes Over tour, Sheryl Crow, Tony Bennett, Aerosmith, Neil Young, Barbra Streisand, Guns N' Roses, American Music Awards, Tom Petty, Santana, Sting.

DESIGN FX REMOTE RECORDING

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Eurosound Mobiles

Eurosound Mobiles has truly broadened the definition of the term "mobile recording." Since its founding by veteran live sound engineer Jan de Groot in the Netherlands in 1971, Eurosound's trucks and systems have ranged around the world, from Moscow to Athens to Nicaragua to Curacao. Celebrating its 30th anniversary this year, Eurosound now operates from bases in the Netherlands and Germany, where the company established a presence in 1989. Chief Engineer Peter Brandt heads the group.

Six mobile trucks are now in operation, along with Eurosound's globe-trotting Airpack System, a compact and flexible flight case-based recording system for both analog and digital, which can be configured for up to 96 channels and can play back and mix in 5.1 surround.

Each of Eurosound's mobile units has unique characteristics, but they all share the common attributes of being highly flexible and configurable, having advanced technology and high-maintenance standards with accurate acoustics. More specifically, to enable them to cover a wide range of applications, each Eurosound mobile unit is equipped with triple-standard (PAL, SECAM and NTSC) video monitors and cameras, one- and two-pair wired communications, wireless communications adaptable to any local frequency standards, full timecode and sync capability, active and passive splitter systems and a massive microphone selection. Each mobile unit also has a broad selection of outboard gear, including models from Lexicon, UREI, Eventide, Drawmer, Dolby, GML and Summit, as well as a variety of 36, 48 and 96-input Raindirk consoles and other consoles, including Crest Vx and Yamaha submixers available.

Options for each mobile unit include vintage Neumann tube microphones, a 6-channel headphone system with up to 100 headsets, surround recording and monitoring, and 64-channel Pro Tools systems, with a variety of A/D converters available.

Eurosound Mobiles' trucks and systems have been used by a broad range of artists, engineers and producers, in an equally wide variety of applications and venues. Rock artists such as Bon Jovi and The Scorpions, producer/engineers including Ed Cherney and Elliot Scheiner, and the Berlin Philharmonic Orchestra have all used Eurosound's resources. Little wonder that Chris Stone, founder of the World Studio Group, called Eurosound Mobiles "the finest remote recording company in Europe."

They certainly are the most multicultural. Says Peter Brandt, "Europe is a huge market to service. While the EU has made getting around it easier, we still have to be fluent in several languages, and we have to have the technical and aesthetic ability to go from recording rock to Bach. Much of Eurosound's success is based on our technical abilities and our cost-effectiveness. But it's also because we know how to treat both Luciano Pavarotti and the Rolling Stones." ■

SPEC SHEET

Company Name: Eurosound Mobiles. **Contact:** Peter Brandt. **Services Offered:** Live recording; broadcast audio; recording and production for DVD, television, video and film; stereo and 5.1 surround recording and mixing. **Main Technology Platforms:** Raindirk Symphony consoles (4), Crest Vx console; Sony 3348 HR, Studer and Otari analog multitrack and Tascam DA-88 (16-bit) and DA-98/78 (24-bit) tape formats; Pro Tools: Genex 8-track hard disk recorder, Euphonix 48-track hard disk recorder. **Vehicle Information:** Mercedes 809, 914, 1117, Daf 1900 Ns, VW Lt. **Layout (in meters):** Mobile 1—7, 15x2.2x3.45; Mobile 2—8, 3x2.4x3.45; Mobile 3—9, 4x2.45x3.6; Mobile 4—11, 3x2.5x3.82; Mobile 5—(under renovation); Mobile 6, 6x2.3x2.5. **Partial Client List:** The Rolling Stones, The Eagles, Sting, Elton John, Bruce Springsteen, Bon Jovi, The Scorpions, Luciano Pavarotti, Genesis, Toto, Dire Straits, Peter Gabriel, Madonna, Bryan Adams.

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March 1, 2001 Universal Studios, Florida
Ikegami DNS-201 digital disk camera in action. Dave Faires, producer and Athena Barton, actress in production of the feature film *The Calendar*.

PHOTOS: STAFF

March 1, 2001 Universal Studios, Florida

Native Country Studios

Mobile Disk sets a new benchmark for the future of integrated, disk-based multimedia remote production and post-production. The truck, which was nearly two years in development, design and construction, combines complete digital audio, video and graphics capabilities into a single, highly sophisticated mobile unit with applications that range from film and television production and post-production to Internet and satellite data transmission. Owned by Native Country Studios, the truck is ready for the advent of HDTV, even as it covers all of the bases in contemporary broadcast and film production.

While Native Country Studios was intended to be a highly comprehensive mobile multimedia suite, the vehicle's design put a considerable emphasis on audio. All signals in the truck, including audio, are routed through a central digital PESA routing system, and AES/EBU and analog I/Os are included. Two Avid 9000 Media Composer stations and one of the two Mac G4-based graphics stations have a dedicated Yamaha 03D digital mixer. An 8-channel Digidesign Pro Tools system with Mac G4 front end is the truck's main audio recorder/editor, but any other format, digital or analog, can be specified. As Wayne Wolfe, Mobile Disk chief engineer, observes, "Someone once told me that picture without great audio is just surveillance. We really put a lot of thought into this truck's audio capabilities."

Furthermore, the truck offers many of the technical and comfort amenities of the most sophisticated post facilities, including an iso booth designed for ADR and voice-over applications. "Having the ability to do ADR onsite is a tremendous asset to any type of production," says Wolfe. "Audio fixes can be accomplished immediately while the talent is still at the production site. That has significant artistic and economic implications." The truck also features a very comfortable VIP lounge, which can seat up to seven people.

Mobile Disk's audio design also includes dedicated 5.1 surround capability, using Tannoy Active Reveal main monitors in the front and rear arrays, with a Bose center channel. Acoustically, says Wolfe, the truck's audio areas approach anechoic accuracy, thanks to the use of advanced absorption materials and a control room design that virtually eliminates reflections.

State-of-the-art video capability includes Ikegami DNS-201 disk-based digital cameras and Sony 42-inch plasma display, easily viewable from both the workstation and VIP areas. Audio and video are fully synchronized within the routing system, and all of the truck's technology platforms—from hard disk recorders to interior lighting—can be self-sufficient, thanks to a Litepower 120kW/933-amp onboard generator.

Lewis Barton, president of Native Country Studios, notes that, "This is what remote recording is moving toward: an integrated, multimedia, nonlinear digital environment that can go anywhere and work in virtually any application. This truck is ready for the future. Fortunately, it's here now." ■

SPEC SHEET

Company Name: Native Country Studios. **Contact:** David Ferris, manager of remote productions; Wayne Wolfe, chief of engineering. **Services Offered:** Remote recording, mixing, 5.1 surround encoding/decoding, DVD authoring, ISDN, ADR, real-time satellite transmission, digital hard disk video recording, editing and graphics. **Main Technology Platforms:** Yamaha 03D digital mixers (3); Dolby 5.1 Surround codec, Pro Tools w/Mac G4 front end, Avid Media Composer (2); all analog and digital audio formats available upon request, Pesa AES router, Tannoy main monitors w/Bose center channel, Ikegami DNS-201 disk video cameras. **Vehicle Information:** Peterbilt tractor with 120kW/933-amp onboard generator; 50-foot Gerstenlager trailer. **Partial Client List:** Universal Pictures, ESPN, Native Country Studios of Nevada, Channel 4 Orlando.

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PHOTOS: DAVE KING STUDIO

Record Plant Remote

Record Plant Remote has been a leading presence on the highways and at music venues for over two decades. Originally the mobile arm of the legendary Record Plant Studios in New York City, Record Plant Remote has retained not only the studio's heritage but its human heart as well, in the person of Kooster McAllister, who first came to Record Plant in 1978 and became chief engineer for the studio's remote operations in 1983. In 1989, McAllister acquired the remote operations and has continued to add to its legacy and reputation. Both man and truck have accumulated a slew of industry accolades, including four TEC Awards for Remote Recording Facility, and the past two TEC Awards for McAllister himself as Remote Recording Engineer.

McAllister has always been Record Plant Remote's guiding force, but in the dozen years that he has been its owner, McAllister has deftly managed to balance the classic elements of the mobile studio—which was originally designed by Tom Hidley—with an evolutionary thread that has kept the truck at the cutting edge of audio, technologically and acoustically. Over the years, the outboard signal processing has grown to encompass the best digital systems available, yet vintage items such as UREI 1176 compressors still lend warmth to the sound. The venerable 54-input, all-discrete API console has been constantly upgraded and meticulously maintained and still retains the classic sound that has made Record Plant Remote the first choice for leading producers and engineers, including Kevin Shirley, Elliot Scheiner, OB O'Brien and David Thoener, to name just a few.

"It's amazing how many people come back, year after year, saying that the sound of this truck rivals any studio they've ever worked in," McAllister says. "And I believe that's due in large part to the fact that Record Plant Remote has always been cultivated as a recording studio control room first, with the fact that it's mobile an added attraction."

Record Plant Remote has supported dozens of live network, cable and satellite music broadcasts—for instance, the studio does the vast majority of the live music acts appearing on ABC-TV's *Good Morning America*—and has developed significant expertise in multichannel audio, from Dolby Pro Logic matrixed surround to 5.1. In fact, Record Plant Remote is in the process of carving out a significant niche in the new high-resolution DVD-Audio format, having done the recording for two groundbreaking multichannel best-sellers (Peter Frampton and Janet Jackson). Furthermore, Jackson's DVD was also edited and mixed to picture aboard Record Plant Remote, underscoring how the truck has evolved into a mobile music post-production environment.

Last year, Record Plant Remote underwent another round of upgrades, with many cosmetic changes to enhance the truck's interior and the addition of a dedicated producer's desk area. What will never change, McAllister stresses, is his and Record Plant Remote's dedication to making the music the primary mission. As he puts it: "The music has always—and will always—come first in this truck. Our reputation speaks for itself." ■

SPEC SHEET

Company Name: Record Plant Remote. **Contact:** Kooster McAllister. **Services Offered:** Audio remote recording, editing and mixing; broadcast; audio post-production. **Main Technology Platforms:** 54-input/48-bus API console w/Touch Reset and API 560 EQ and GML Moving Fader automation; Sony 3348, Pro Tools, Ampex MM1200 24-track (2); Tascam DA-98 (12 units/96 tracks); monitors include Meyer HM-1 and HD-1, Genelec 1031, Yamaha NS-10 and Tannoy 6.5; large selection of vintage and digital outboard gear; Panasonic and NEC color monitors (3); 56-input splitter box w/Jensen transformers, Apogee PSX-100 converters. **Vehicle Information:** 1990 Volvo FE7-15, 36x8-foot. **Partial Client List:** Bruce Springsteen, Korn, Billy Joel, Aerosmith, Sarah Brightman, Pearl Jam, Black Crowes w/Jimmy Page, Itzhak Perlman, Tom Petty, Mariah Carey, Godsmack, Dave Matthews Band, Collective Soul, Sevendust, Faith Hill, Vince Gill, Bela Fleck, Alan Jackson, Macy Gray, Metallica, Stone Temple Pilots, Limp Bizkit, Ozzy Osbourne.

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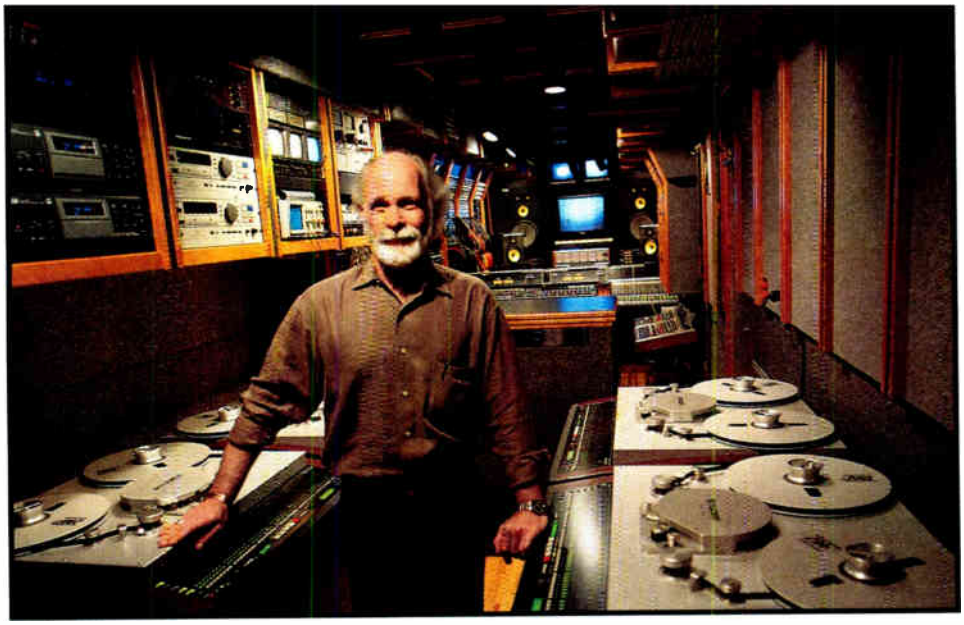

Remote Recording Services

Founded in 1979, Remote Recording Services is one of the longest-running, top-tier, independently owned remote operations in North America, and owner David Hewitt is widely considered one of the deans of the remote recording industry. It's also still a family business, with Hewitt's sons Ryan and Nathaniel often sharing engineering responsibilities with their father. As a result, Remote Recording Services offers a unique combination of cutting-edge technologies and highly personalized service.

Hewitt—who has won seven TEC Awards and numerous Grammy and Emmy Awards—presides over one of the most efficient and effective crews in the business, including director of operations Phil Gitomer and engineer Sean McClintock.

Designed by Hewitt, Remote Recording Services' Silver Studio features custom-built double walls and ceiling for optimal sound isolation. Construction is of MDF sandwich over sprayed foam insulation, finished in cherry hardwoods, fabric panels and carpeting. The floor is 1.75-inch ship lap oak over 3-inch steel I-beams with foam insulation.

The main technology components of the Silver Studio are a 48-input Neve VR M console (with Studer Series 900 submixers), flanked by dead front wall-mounted cabinets holding an assortment of outboard gear, patchbays and machine remotes. There is banquet seating to the rear for the producer and other VIPs, and numerous tielines allow this area to function as a second mix position or other production, communications or video tasks. There is complete wiring for up to five 48-track decks, with sync, timecode and house video reference control. Monitoring is via custom-built soffited main monitors with KRK components, and the Silver Studio can accommodate multichannel monitoring with additional self-powered KRK speakers. The control room's media array features two Studer D827 digital 48-track decks, a pair of Studer A820 analog 24-track machines and Sony PCM-800 MDMs. Hewitt has configured the truck for any type of interface with the rest of the technological universe, from video trucks to venues.

In fact, it's that very adaptability that characterizes Remote Recording Services. "If you ask me what our specialties are, I'd have to say it's whatever the clients' specialties are because of our flexibility, and that's been our biggest asset over the years," observes Hewitt.

That flexibility has led to a broad array of clients over the company's 22 years of operation, including the Academy Awards, the Grammys and the Emmys. The Silver Studio has also pulled up for Live Aid and, more recently, A&E's "Live by Request" with k.d. lang, the Dixie Chicks' CBS-TV special, Neil Young's *Red Rocks Live* DVD and PBS's acclaimed "Live From the Met" series. Hewitt's long career in music recording—he directed remote operations for Record Plant Studios in New York City in the 1970s—has attracted myriad top artists and producers who choose Hewitt and his truck. "I'm a music guy at heart," Hewitt says, "but I've learned to speak all of the languages you need to interface with television, broadcasting and the rest of the world." ■

SPEC SHEET

Company Name: Remote Recording Services Inc. **Contact:** David Hewitt **Services Offered:** Remote audio and broadcast recording, editing and mixing; flexible equipment package configurations, many equipment rental options available; full interface capability with film and video. **Main Technology Platforms:** 48-channel Neve VR M console w/Total Recall and Flying Faders 3.0; Studer 900 Series submixers; Millennia and API outboard mic pre's; KRK and other monitoring; Studer D827 (2), Studer A820 (2) w/Dolby A, SR or Telcom noise reduction; Sony PCM-800 (48 tracks); Video: Sony XBR 27-inch color monitor w/switcher; NEC 12-inch monitors (2). **Truck Information:** 1997 Peterbilt tractor with 400-h. Cummins turbo-diesel engine, 44-foot Dorsey Air Ride trailer; 6'8" square engineering area; 7x7'6" VIP seating area; 12'8"x7'6" machine area; 6'4"x7'4" acoustically treated multi-use area. **Partial Client List:** (Artists) Aerosmith, Miles Davis, Pearl Jam, Don Henley, Rolling Stones, Billy Joel, Elton John, Berlin Philharmonic, Backstreet Boys, Madonna, Bruce Springsteen, Eric Clapton, Barbra Streisand, U2, Aretha Franklin, Nine Inch Nails. (Producers/engineers) Phil Ramone, Ed Cherney, Bob Clearmountain, Tom Dowd, Mutt Lange, Elliot Scheiner, Arif Mardin.

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MAIN PHOTO: DAVE KING

INSET PHOTO: DUKE GORE

Sheffield Remote Recording

The name Sheffield has been synonymous with high-end professional audio for over 30 years, and as part of the larger Sheffield Audio Video Productions, Sheffield Remote Recording has been in existence for over 20 years. Sheffield's remote truck has evolved in that time, starting with a 30-foot Mack truck loaded with a Neve 8068 console, and is considered by many to be one of the best-sounding remote recording trucks in the world.

Designed by Sheffield Audio Video Productions CEO John Ariosa, Sheffield Remote's new 48-foot truck came online five years ago. This spaciously configured air-ride trailer houses the only Solid State Logic Axiom MT digital console on wheels in North America, confirming Sheffield's position at the forefront of recording technology. With the Axiom MT, Sheffield Remote can offer up to 96 digital inputs; the signal chain includes a fiber-optic connection to remote A/D converters/mic pre's, which can be placed on the stage. "The integrity of the signal is simply amazing," observes Vance, president of Sheffield Remote Recording.

The need to keep clients on the cutting edge of new digital audio technologies stems from Sheffield's roots in both music and audio and video post-production. The company maintains state-of-the-art facilities in Maryland, where there are digital editing suites and a full soundstage, as well as a fully equipped 48-foot video remote truck. However, adds Vance, "As much as we keep the technology up to date, we always make sure that it's proven, tested and reliable technology. The very core notion of remote recording is that you're going out there, and you are going to have one chance and one chance only to get it right. So the equipment has to be the best, the people running it have to be the best, but the technology has to be totally reliable."

Flexibility has been another key feature of Sheffield's operations. For instance, the Axiom MT has Instant Reset of all parameters on the console, allowing instantaneous transitions between events onstage or in the studio. Also, the truck's patchbays and external interfaces allow it to shuttle between diverse situations with ease. "In less than a month, we had worked with NFL Films on the Super Bowl doing voice-overs, set up next to Mariah Carey's house for music recording and we just got back from Ellis Island, where we recorded the Three Irish Tenors for a PBS show," Vance notes.

Sheffield Remote is also equipped with the latest in monitoring—a full 5.1 surround playback system includes Genelec 1031 self-powered speakers and a sub, soffited in the control room area. In addition, a TC Electronic 6000 multichannel processor has been added to outboard racks that are already laden with a wide array of state-of-the-art processors.

"This is a high-end, cutting-edge truck, this is a digital truck, and digital high-technology is the language of the future of music, television, film and Internet audio," says Vance. "But the beauty of this truck is that it strikes a perfect balance between what clients in all those areas need now and what they'll need in the future. It's a tight line for us to walk; it takes constant vigilance. But it's worth that effort to stay on top." ■

SPEC SHEET

Company Name: Sheffield Remote Recording. **Contact:** Vance, President. **Services Offered:** Audio location recording, editing, mixing, voice over and overdub capabilities. **Main Technology Platforms:** 96-input SSL Axiom MT; 48-track Studer D827; Otari MTR-90 MkII; DA-78 (48 tracks). **Truck Information:** 48-foot air-ride trailer with White Freightliner with super sleeper cab. **Layout:** 10-foot ceilings throughout, 8x8 raised client area; 40x8 control room. **Partial Client List:** Mariah Carey, Luis Miguel, Sting, New Orleans Jazz Festival, Boston Pops, NFL/Super Bowl.

Sheffield AUDIO-VIDEO PRODUCTIONS

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MAIN PHOTO: ED AIONA

INSET PHOTO: CHRISTOPHER BUTTNER

Skyelabs Mobile Recording & Broadcast

Skyelabs Mobile Recording was conceived from the beginning as a balance of high technology and human comfort. "Rover," as Skyelabs' highly customized GMC motor coach mobile recording unit is affectionately known, offers the finest in mobile acoustic environments and equipment for live concert recording, remote broadcast, audio for picture and in-house recording. Rover is flexibly configured and can efficiently and accurately handle any type of project with the appropriate technology—from live to 2-track to multiple 3348s, from complex live broadcasts to straight-ahead multitrack recordings. In any configuration, Skyelabs delivers clean, accurate recordings and broadcasts.

Rover's acoustical design is equally advanced and flexible, featuring both stereo and full 5.1 surround sound mixing capabilities, utilizing Genelec powered monitors. In fact, says Skyelabs president and chief engineer Bob Skye, "This was a case in which acoustics came first, well before the technology platforms were chosen. Job one was to create an environment in which ears came first." And that was definitely achieved with the significant help of noted audio expert Neil Muncy. The result was the first mobile recording studio to offer a certified Live End, Dead End™ acoustical control room design. The accuracy of Rover's control room remains an industry standard to this day.

Rover first rolled out in 1982, when it and Skye were based out of Dover, Del., a central location that enabled the remote unit to cover the major Eastern cities and venues. Since 1986, it has been based in the San Francisco Bay Area, where Skye also owned The Plant Recording Studios in Sausalito from 1986 to 1993. Rover's technology complement has changed over the years, keeping the rig at the forefront of changes in pro audio, yet deeply invested in the best that analog has to offer. However, in the course of the most recent upgrade last year, Skye chose to install dual Mackie D8B digital consoles, augmented by Mackie 1604 VLZ analog submixers. "I admit, I'm an analog-oriented engineer," says Skye. "But in recent years, the sessions that clients have been bringing in have become increasingly challenging: There's more broadcast interaction, more input demands, more recall issues all taking place in shorter periods of time. I'm a bottom-line-type of thinker, so, I've chosen technologies that not only sound great, but are also fast to operate, cost-effective and easy to maintain. It's not about brand names anymore—it's about getting the job done right and within budget."

Still, Skye made sure that Rover's creature comforts were on par with its technology. A spacious lounge that overlooks the mixing area has comfortable amenities within easy reach. The coach has been fitted with central air and heat for complete comfort in all weather. Power cables, audio snakes, mic stands and associated hardware are located in the coach's cargo bays, along with the electrical isolation transformers and A/C line regulation. It is, says Skye, a unique overall design that combines ergonomics, aesthetics and efficiency into a single, very well-maintained, self-contained environment on wheels. ■

SPEC SHEET

Company Name: Skyelabs Mobile Recording & Broadcast. **Contact:** Bob Skye. **Services Offered:** Remote recording, mixing, broadcast. **Main Technology Platforms:** Mackie D8B Digital Consoles 48x48 with API mic preamps (2); Mackie 1604 VLZ Pro 16x4 (2); Genelec 1031/1029 monitors; Otari MTR-90 MkII 24-track analog decks (2); Sony PCM-800 digital recorders (3); Panasonic 3700 DAT recorders (2); RTS/Telex audio communications with wired and wireless systems, CCTV color video monitoring and camera, full video truck interface. **Truck Information:** "Rover" is a 1962 GMC PD4106 35-foot diesel coach completely redesigned for mobile studio work. **Layout:** 8x18-foot control room with two work tables and producer's desk; 8x10-foot lounge wired for overdubs and other production uses. **Partial Client List:** AC/DC, the San Francisco Opera, U2, Herbie Hancock, Van Morrison, Chick Corea, Dave Matthews, Bruce Hornsby, Keb' Mo', Brian Setzer, Ozzy Osbourne, Arrested Development, MTV, Santana, Direct TV, ABC in Concert, National Public Television and Radio.

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Studio on Wheels

Studio on Wheels' CEO John Falzarano started in remote recording while still in his teens, literally learning the trade from the ground up. A young hi-fi enthusiast, he would modify mixing boards and record his own drum kit onto a 2-track machine. When a local jazz group began rehearsing in his garage, Falzarano experimented with 4-track, eventually becoming the group's live sound engineer. Later, Falzarano would pack his multitrack, mixer and microphones into a 1961 Ford Econoline van and head out to other musicians' homes to record. "One day, instead of taking the gear out of the van and into the house, I left the gear in the van and ran the cables inside," he recalls. "From that moment on, I was in the live remote recording business."

Since then, Studio on Wheels has grown to a top-tier, three-truck company, with two vehicles based in Southern California and the other in Nashville. All of the trucks have become known for their ample assortment of vintage analog equipment and significant history—each was acquired from major remote operators, including the Record Plant. Outfitted with classic analog Auditronics, API and Amek consoles, as well as a combination of analog and digital recording gear, each of the Studio on Wheels vehicles has garnered a reputation as true musicians' trucks.

"We have a vintage analog orientation with our trucks and equipment choices," Falzarano explains. "A lot of the live radio broadcasts prefer the digital tape formats, of which we have plenty. But so many individual artists come to us specifically for our analog consoles, tape decks and vintage outboard gear. For instance, D'Angelo and Rage Against the Machine both used Mobile Unit 3, originally designed by the Record Plant, which has the API console and Ampex 1200 tape machines to capture their live shows for album releases. Like any good recording studio, each truck has its own distinctive sound. Studio on Wheels regularly uses the trucks to mix a world-wide syndicated radio program called 'The Road,' as well as other projects. We are equipped to handle any remote situation."

That ability to make musicians feel at home is the reason that Studio on Wheels has garnered favor with such a diverse range of artists from virtually every major genre, from rock to pop, country to gospel, blues to jazz.

In addition to technology, Studio on Wheels brings three decades' worth of experience to projects. Falzarano notes that a predilection for perfection and a large microphone selection—over 100 on hand—have enabled him to capture live performances in more detail. For instance, he says, "When doing large gospel choirs, a lot of engineers would choose to use a few microphones placed around the choir. We use a lot of microphones and therefore attain a very high degree of isolation throughout the choir, which makes a big difference in terms of options when it comes time to mix."

Studio on Wheels offers an experienced staff, including Falzarano and engineer Kathleen Yore. "It's about the equipment, the technique and the people," Falzarano says. "But in the end, it has to be about the music." ■

SPEC SHEET

Company Name: Studio on Wheels. **Contact:** John Falzarano. **Services Offered:** Remote live recording, mixing. **Main Technology Platforms:** (Mobile 1) Auditronics console, Otari MTR-90 MkII 24-track, 48 tracks of DA-88, 48 tracks of ADAT; (Mobile 2) Amek console, 3M M-79 24-track, 48 tracks of ADAT; (Mobile 3) API console w/550A EQ, Ampex 1200 (2), 48 tracks of DA-88; large selection of contemporary and vintage outboard gear. **Vehicle Information:** MU1: 20-foot; MU2: 25-foot; MU3: 30-foot. **Partial Client List:** D'Angelo, Dwight Yoakam, Moby, Rage Against the Machine, Beck, Dixie Chicks, Trisha Yearwood, Johnny Cash, LeAnn Rimes, Red Hot Chili Peppers, Soundgarden, Van Morrison, Mötley Crüe, Joni Mitchell, Andre Crouch, Edwin Hawkins, Trenora Parker, Herbie Hancock, Billy Taylor, Westwood One and United Stations Radio Network.

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PROFESSIONAL RECORDING EQUIPMENT

MANLEY

Langevin

COMPANY PROFILE: Manley Laboratories, Inc. in recent years has expanded and thrived under EveAnna Manley's leadership. Our 11,000 sq. ft. building houses our own machine-shop, printed circuit board manufacture, audio transformer winding, engraving, and silk-screening facilities. All custom design, R&D, assembly, testing, and quality control processes are performed with precision and pride at the Manley factory, located just 35 miles east of Los Angeles.

NEO-CLASSIC: MANLEY ALL-TUBE GEAR

We take a purist approach to everything we build; refining, executing, and expanding upon Manley's legacy of vacuum tube design philosophies proven over years of real-world experience, using high quality modern components, many of which are fabricated in-house. This attention to detail delivers the rich, present, and natural sound our vacuum tube designs are renowned for. Never small, sterile, or boring.

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BIG BANG FOR THE BUCK: LANGEVIN

LANGEVIN is a legendary marque of premium electronics whose lineage goes back to World War II. **MANLEY** acquired the **LANGEVIN** brand name several years ago. With these products we offer you the different sonic flavor that **ALL-DISCRETE CLASS A CIRCUITRY** brings using fresh, original designs built alongside and to the same exacting standards as the Manley equipment.

We believe that good music and those who create it deserve the finest gear.

The choice is yours.

CIRCLE #088 ON PRODUCT INFO CARD

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XDR. The finest microphone preamp design ever built into a compact mixer.

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The VLZ PRO Compact Mixer Series:

■ Premium XDR mic preamps and VLZ circuitry for ultra-low noise ■ New high-performance 2068 op-amps ■ Musical, sweet-sounding equalization at useful, logical frequencies ■ Sharp 18dB/octave Low Cut filters ■ Stereo In-Place Solo ■ Easy channel level setting via Solo ■ Constant Loudness pan pots ■ Inserts on all mono mic/line channels ■ 60mm long-wearing, logarithmic-taper faders (except 1202-VLZ PRO) ■ Sealed rotary controls ■ Thick MIL-spec fiber-glass circuit boards ■ Built-in high-current power supplies ■ Steel chassis ■ Easy-to-understand manuals ■ Best Technical Support in the industry

Call your nearest Mackie office for a 72-page brochure/ hook-up guide that explains the VLZ PRO line in excruciating detail. Or log on to our web site. Then visit a Mackie dealer to decide which VLZ PRO model best meets your creative needs.

CIRCLE #037 ON PRODUCT INFO CARD

New Sound Reinforcement Products

CREST CPX AMPS

Crest Audio (www.crestaudio.com) debuts its CPX Series power amplifiers in three power ratings. The CPX900 produces 450 W/channel at 2 ohms (900 W at 4 ohms, bridged mono), the CPX1500 delivers 750 W/side at 2 ohms (1,500 W at 4 ohms, bridged mono), and the CPX2600 produces 1,300 W/channel at 2 ohms (2,600 W at 4 ohms, bridged mono). Frequency response is 20-20k Hz; THD is less than 0.1% at rated power for all models. CPX Series amplifiers provide a built-in crossover (150 Hz, 24 dB/octave tuned for subwoofers) with individual in/out switches for channels A and B. Features include thermal/DC protection, on/off output muting, barrier strip and combo XLR/¼-inch TRS inputs and Speakon outs. A two-speed fan combined with a unique heat sink configuration enhances cooling. All CPX Series amps are 2U tall, offer switched-stereo or bridged-mono operation and have a three-year warranty.

Circle 314 on Product Info Card

EAW KF760 LINE ARRAY

Eastern Acoustic Works (www.eaw.com) announces the KF760 Series Line Array, consisting of two horn-loaded, three-way loudspeaker models used in multiples to create a curved line source. Using a technique called "divergence shading," the KF760 Line Array is designed for minimal signal processing with all loudspeakers set for equal output levels. Used together, model KF760 (medium- to long-throw coverage) and model KF761 (short-throw coverage) can provide uniform SPL and frequency response to the entire audience, from the front row to the farthest seat. Both models offer a usable 45-16k Hz range and are constructed of Baltic birch plywood with polyurethane structural foam, integral flying, and rigging hardware with captive, retractable hinges. The KF760 is about 190 pounds, and the KF761 is about 160 pounds, while their overall dimensions are the same: 14.5x45x31 inches (HxWxD).

Circle 315 on Product Info Card

E-V QRX SPEAKERS

Electro-Voice (www.electrovoice.com) intros the QRx line with three full-range, two-way cabinets offering a rotatable 75x50° constant directivity horn and three direct radiator subwoofers. All QRx two-way systems are designed for pole mounting, and two (the QRx112/75, featuring a 12-inch woofer, and the QRx115/75, loaded with a 15-inch woofer) have five-sided cabinets for use as floor wedges or as wall-/ceiling-mount speakers. All three Q-Rx Series full range units are bi-ampable (a secure external switch selects Passive or Bi-amp modes) and include high-frequency driver protection circuitry. Safe-Grip handles, standard pole mount and L-track fittings are standard. The QRx215S dual 15-inch sub and the QRx218S dual 18-inch sub are also available in Flying versions. A QRx212/75 (dual 12-inch) and QRx118S (single 18-inch) sub are available.

Circle 316 on Product Info Card

10 CO. ROAD CASES

The TP 5025 truck pack road case from 10 Co. Industries (www.10co.com) is a light and sturdy container, suitable for equipment, cables and instruments. Made of lightweight, high-impact polyethylene, the steel-reinforced road cases are designed for stacking and have tightly locking lids. The TP 5025 (shown) is available with internal dividers for ½-ton and 1-ton chain hoist motors. 10 Co. also offers a range of wheeled utility trucks in several colors. Options include security lids, handles, shelves, dividers, garment hanging bars, drains and caster upgrades.

Circle 317 on Product Info Card

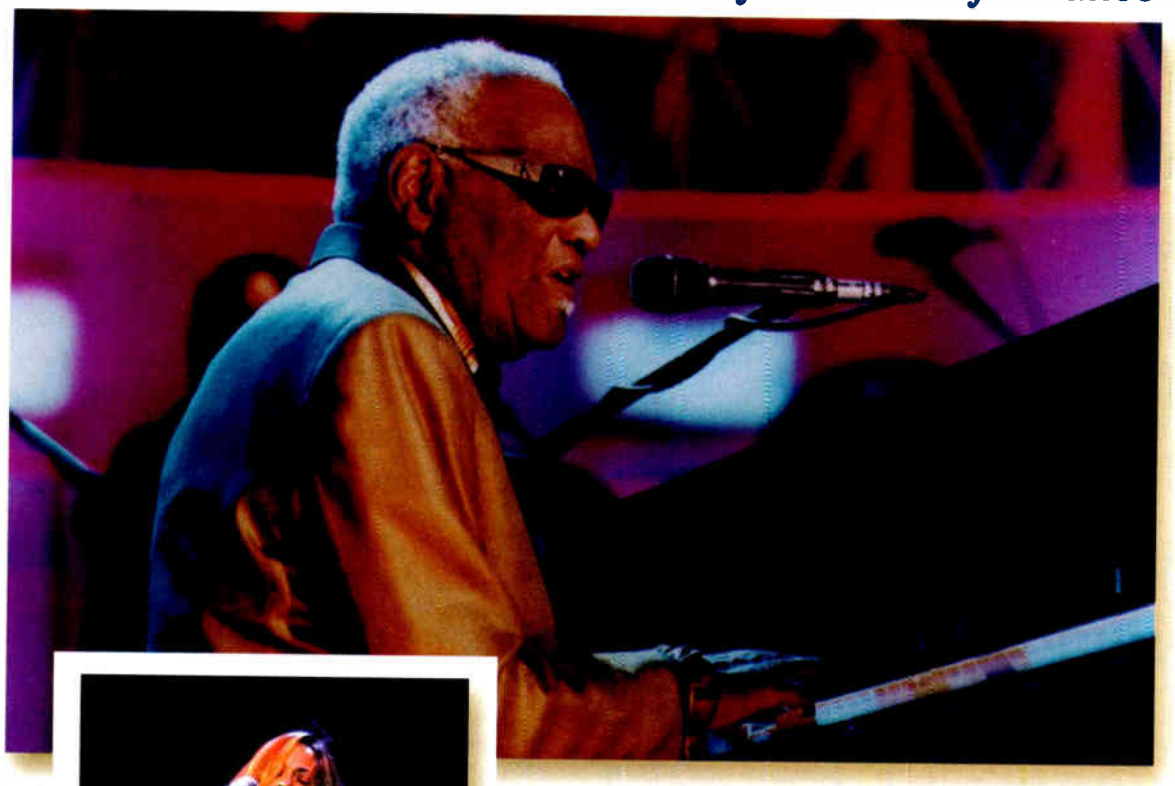
STUDIOMASTER FOUR-BUS MIXER

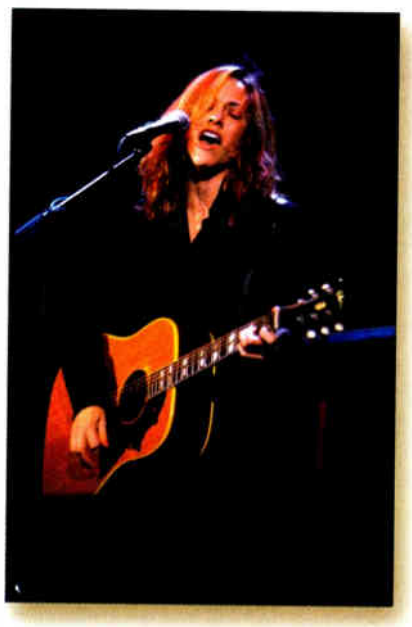
The Trilogy T 406 4-bus console from Studiomaster (www.studiomaster.com) provides 32 inputs (28 balanced mono mic channels and four stereo line inputs) and is designed for use as an FOH board, stage monitor mixer or recording desk. Mono channels feature inserts and direct outputs, 3-band EQ, 100Hz highpass filter, six pre/post selectable aux sends, channel mute and signal present LED indicators, PFL and solo-in-place and 60mm faders. The four subgroups may be assigned to the main left/right, and direct outputs are also available. Four stereo returns offer individual level control, PFL/AFL switches and may be assigned to groups and/or the main stereo bus. Other features include: 48V global phantom power, stereo control room outs, 2-track tape outs, headphone monitor bus and rackmount PSU. The T 406 can be expanded to 42 channels (62 total inputs) or 52 channels (76 total inputs) with Studiomaster's T 140ex 10-channel expander. Price is $1,895.

Circle 318 on Product Info Card

Handheld Vocal Microphones

Top-of-the-Line Dynamic and Condenser Models for Live Performance



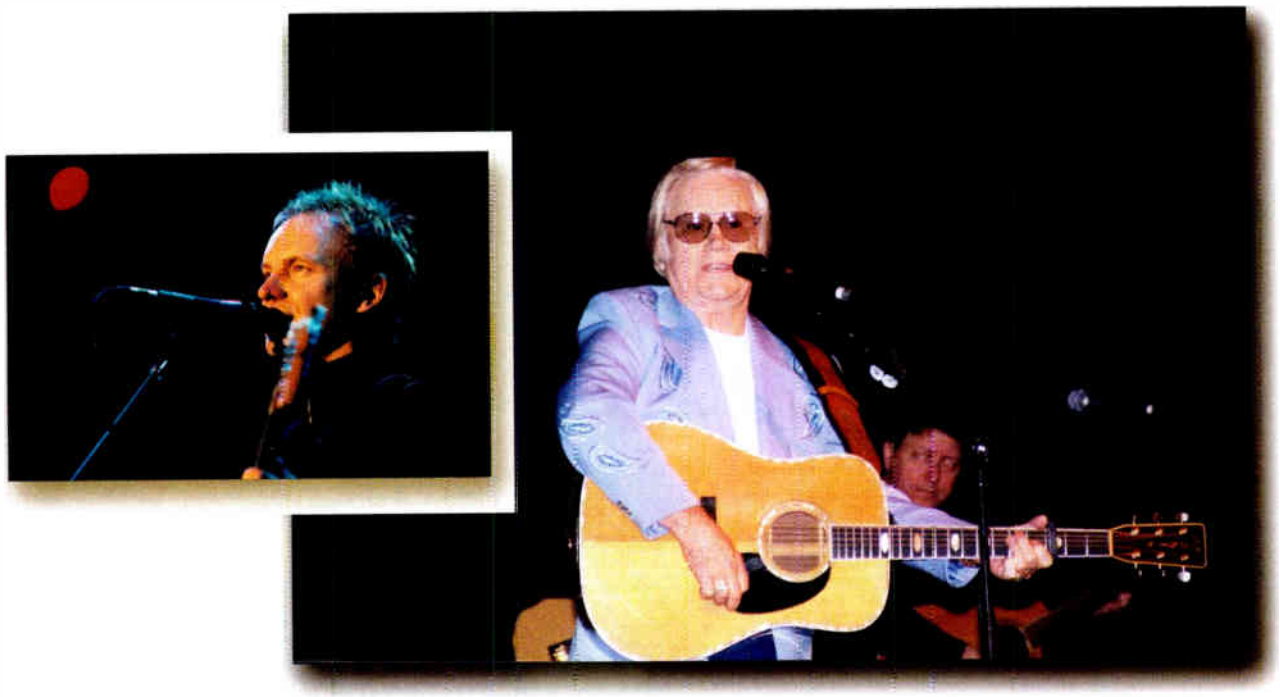


by Randy Alberts

Studio users spend years searching for the ultimate *vintage* mic, but the situation is reversed with live sound. Mics for onstage performance keep getting better, and the market for old handheld models from the '40s, '50s and '60s is virtually nonexistent. Most performers and sound reinforcement engineers are constantly checking out recent models, looking for the ultimate new mic.

Technically speaking, most high-quality microphones could be handheld, but those specifically designed for vocal use in live performance offer advantages such as internal shock-mounted capsules, nonreflective finishes and a high degree of feedback rejection to improve performance.

There's no shortage of good-sounding condenser and dynamic mics at every price, but for the purposes of this article, we decided to focus on top-of-the-line, hard-wired models from various manufacturers, and we limited each mic builder to one condenser and one dynamic mic each. All prices quoted here are manufacturer's suggested retail (street price may vary considerably), and besides vocals, many of the models listed are also suitable for instrumental miking, both onstage and in the studio.



Some vocal mics in action: Sheryl Crow with a Shure Beta 58; Ray Charles with an Audio-Technica AT4055; Sting with a Sennheiser ED 865 and George Jones with a Neumann KMS105.

AKG

The condenser Model C-5900 features a no-roll triangular body, along with AKG's InterSpider internal suspension system and a recessed access panel with -12dB low-frequency cut and -6dB/octave roll-off switches. The hypercardioid C-5900 lists for $378. AKG's Model D-3800 Tri-Power uses a patented moving magnet system to reject handling noise, is equipped with separate high- and low-frequency contouring switches and can take up to 147dB SPL without distorting. The D-3800, like the AKG C-5900, is a hypercardioid mic, and it features the same triangular body shape. Retail is $300.

AUDIO-TECHNICA

Audio-Technica's 40 Series handheld condenser mics, including the AT4055 ($499), are essentially handheld versions of the company's well-used AT4050 studio mic. The AT4055's large-diaphragm element brings out an extended low end and handles high SPLs and features internal shock-mounting. A-T's top-end vocal dynamic, the $270 ATM-61HE, has a high-output neodymium with a patented floating diaphragm that reduces handling noise. This hypercardioid mic has a frequency response of 50 to 18k Hz and is available in the ATM61HE/S model with integral On/Off switch and nonremovable grille. Retail is $270.

AUDIX

The Audix OM-7 ($359) was designed as a tough hypercardioid dynamic mic that can take up to 144 dB before cracking up. The mic comes in a satin black finish and uses a controlled output stage to net higher gain before feedback onstage. The company's $599 VX-10 is a new handheld vocal condenser that wears the same black finish and has a 16mm gold vapor diaphragm and a 40 to 20k Hz frequency response.

BEHRINGER

The XM8500 from Behringer is a dynamic model with a mid frequency presence boost to increase vocal projection and an overall response of 50 to 15k Hz. The mic features a cardioid polar pattern and a gold-plated XLR connector. Retail is $49.

BENSON AUDIO LABS

BAL's ND80 is a hypercardioid dynamic mic with a hot-output neodymium magnet, steel windscreen, and an easy-to-hold, ergonomic "Soft Touch" finish.

Handheld Vocal Microphones

Retail is $350. Also priced at $350, Benson's RC22 is a cardioid condenser mic that incorporates a low-mass mylar diaphragm and is intended for general vocal and instrument applications.

BEYERDYNAMIC

Beyerdynamic's TG-X 80 ($469) is a sharp-looking handheld dynamic mic with a fire-engine-red shock absorption ring that helps with structure-borne noise attenuation. Part of the company's TourGroup Series, the TG-X uses a hypercardioid polar pattern and has a 30 to 18k Hz frequency range. The MCE 90 is a condenser model with cardioid polar pattern and an 139 dB SPL to fit a wide range of singers. Retail is $649.

CAD

CAD's CAD90 dynamic microphone features an internal multistage pop filter to minimize breath noise. This cardioid model is priced at $239. The CAD95, the company's top-end vocal condenser, which is also priced at $239, is a transformerless cardioid electret mic. The CAD95 also features an internal multistage pop filter, CAD's exclusive INR (Impact Noise Rejection) shock-mount system and a rugged Flex-For grille screen.

CARVIN

Carvin's CM67 cardioid pattern microphone is designed for both instrument and vocal miking, with a frequency response of 40 to 15k Hz and a slight presence rise. The mic has a list price of $199 but is sold direct through Carvin for only $89, including a 20-foot XLR cable.

CROWN

Featuring Crown's patented Differoid technology, the CM-310A is a cardioid electret condenser mic with a 60 to 17k Hz response. Retail is $309, and the

CM-310ASW model with a built-in magnetic reed On/Off switch is also available.

EARTHWORKS

Earthworks offers handheld vocal mics in cardioid (SR69) or hypercardioid (SR68) versions. Both are phantom-powered condenser designs with frequency response extending beyond 20 kHz and 145dB SPL handling capability. The mics are available in black, silver and crimson finishes, and each includes a removable windscreen for use in instrumental live or studio applications. Retail for the SR68 is $450; the SR69 is $400.

ELECTRO-VOICE

The Electro-Voice N/D767a is a dynamic design featuring a N/DYM magnet structure for high output. This supercardioid mic features a 25 to 22k Hz response, multistage capsule shock-mounting for low-handling noise, a comfortable Warm-Grip handle and VOB (Vocal Optimized Bass) tailoring that's intended to provided a smooth proximity effect without muddiness. Retail is $252.

NEUMANN

Neumann's TEC Award-winning KMS105 ($595) is a supercardioid condenser mic with a triple-layered acoustic filter windscreen that dramatically reduces popping and wind noise. The KMS105 also includes special mechanical and electrical filters to virtually eliminate handling noise, as well.

PEAVEY

Part of Peavey's Diamond Series, the PVM 22 dynamic cardioid mic has a neodymium magnet with more than twice the sensitivity of conventional designs. The mic also features a diamond-coated diaphragm and a new shock-mounting system using high-tech polymers for reduced handling and cable noise. Retail is $149.99.

ROLAND

The Roland DR-20 is a hypercardioid

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dynamic mic with a 60 to 15k Hz frequency response and a built-in On/Off switch. Retail is $150, including cable.

SAMSON

Samson's Q1 ($400) is a cardioid condenser mic slated for live and project studio recording use. Like every condenser, the Q1 requires phantom power. A built-in windscreen and gold-plated XLR connector are standard.

SENNHEISER

Sennheiser's handheld line includes the MD-431 II ($495) and ED 865 ($399). The dynamic MD 431 II is an improved version of its predecessor, featuring a steel-mesh grille, shock-suspended capsule, a humbucking coil, recessed On/Off switch and internal electronics for refining proximity effect. The ED 865 is the first condenser handheld mic in the company's new Evolution Series that's great for live performance or recording vocals in the studio. This supercardioid mic sports a metal housing and steel-inlet basket.

SHURE

The Shure Beta 87A is an electret condenser mic with a new, slightly thicker handle design and break-resistant swivel adapter. This supercardioid model features a three-stage pop filter and high isolation with minimal off-axis coloration. The Beta 87A retails at $445. Shure's top-end dynamic mic is the Beta 58A, a model with a high-output Neodymium element. The supercardioid mic features a shaped frequency response for close-up vocals, a pneumatic internal shock-mount system, a hardened steel-mesh grille and a 50 to 16k Hz bandwidth. Retail is $289.

SONY

Sony's F-780/9X ($375) handheld dynamic mic is an improved version of the company's F-780, its previous top-of-the-line dynamic vocal mic. An improved capsule design, tightened unidirectional polar pattern and a new urethane coating for lower handling noise further enhance this mic's performance.

STEDMAN

The Stedman Transonic TR1 is a supercardioid dynamic microphone offering two distinct response curves for stage and studio applications. With its recessed switch in the "stage" position, the TR1 offers a subtle bass boost and presence peak to cut through on live performances. The "studio" position provides a smooth response, ideal for recording vocals, instruments and cabinets. Response is 33 to 19k Hz; retail is $159. ■

Randy Alberts is a musician, engineer and writer exploring music and recording technology in his Pacifica, Calif.-based studio.

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Earthworks	www.earthwks.com
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L.A. Studios

Resurgent in 2001

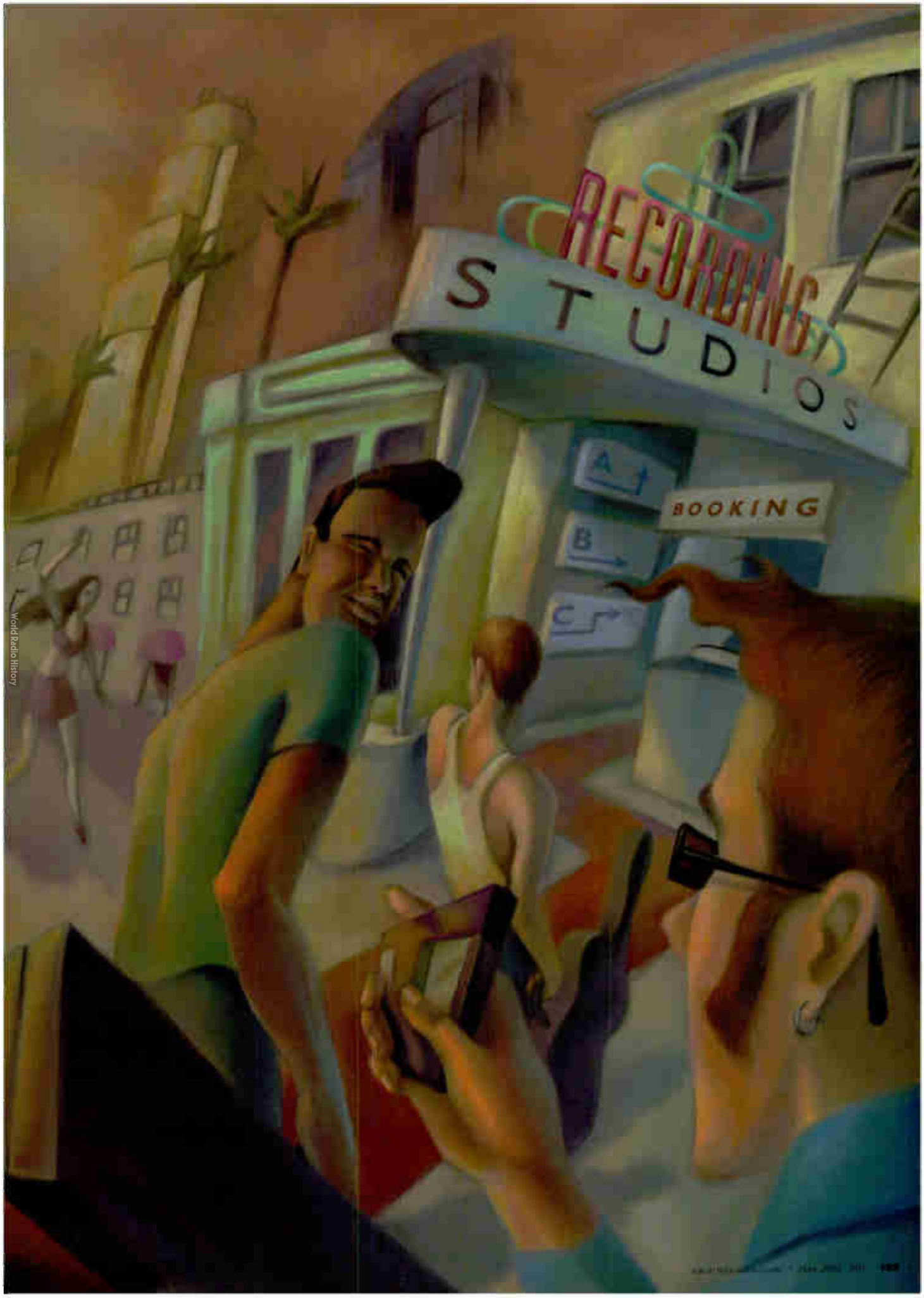
Many Los Angeles studios experienced a severe business downturn during 2000, leading to speculation that, perhaps, finally, the long-anticipated fear that home studios would render commercial studios obsolete had become reality. However, not long into 2001, facilities both large and small were reporting that they were on their way to a banner year of bookings, with musicians, producers and engineers apparently deciding that both home and commercial recording environments have their pros and cons, and their time and place. Both options, for the moment at least, are enjoying a seemingly healthy co-existence, a situation that makes for thriving studios of every kind, as well as for a flourishing market in both equipment rentals and sales.

Technology Has Changed the Landscape, But Not the Rules for Success

The continuous advance of technology, though, constantly changes the variables, and there seems to be an overwhelming awareness in the industry that what is true today may not be so tomorrow. A sense of foreboding shadowed some of the responses of those questioned for this article, along with the pervasive knowledge that tomorrow's invention could affect the industry either positively or negatively. Still, industry vets know that the damage caused by yesterday's concerns—the advent of synthesizers, drum machines and digital workstations, for example—has not been realized to the extent that the original fears warranted. And they seem bent on enjoying these good times despite ambivalence toward the future.

BY ROBYN FLANS

ILLUSTRATION BY KITTY MEEK


RECORDING
STUDIOS
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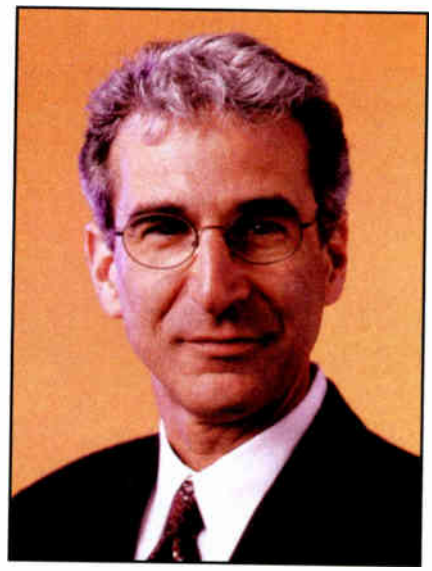
L.A. Studios

David Angress, executive VP of Guitar Center, notes that L.A. is a unique recording market, packed with individual musician/composers creating at home, as well as high-, middle- and low-end commercial venues and a huge film and post industry. Retail outlets cater to all of these, and according to Angress, 2001 is looking like a stellar year for sales. While Guitar Center has long been selling Portastudios, ADATs and the like, the last few years have, of course, seen a huge upswing in computer-based recording. Now, technology permits much more affordable gear, and customers are better able to get more value for their money.

"Specifically in the last year, higher-resolution audio has gotten less expensive," Angress says, "so we have more vendors, and, in turn, more customers buying products who are recording 24/96. A lot more of the recording equipment we're selling has moved out of the hardware rack and into the computer. We're Digidesign's largest Pro Tools dealer, and we've also been very successful with their Pro Control and their upgrades over the last year. At the same time, the lower end of the market has been expanding. The lower-end recording system that Digidesign introduced last year is doing very well, as is Steinberg's. Customers are getting a better value, and we're selling a lot more systems—so many more systems that even with lower price points, our business is up in dollars and in systems and units."

There's no doubt that while Guitar Center's clients run the gamut, their primary customer is the individual musician and project studio. "If I had to focus on one thing, I'd have to say that there's a remarkable amount of Pro Tools product being purchased in the L.A. market," Angress continues. "But we also sell a lot of microphones. Many of the studios being put together now are designed for electronic music, so miking of acoustic instruments is less and less important. But, at the same time, those studios are putting in the one or two good mics that they'll need when they're recording an acoustic instrument or a vocal. So there tends to be more attention paid to getting those one or two mics to be really good ones. We sell a lot of the Neumann high-end and also B.L.U.E., and we do particularly well with a line we import from Russia called Oktava—a studio microphone patterned after the Neumanns. The physical construction isn't as pretty, but they're amazing-sounding microphones and very inexpensive. Of course, we sell lots of Shure, Audio-Technica and AKG.

"High-end mic preamps are very popular for the very same reason—you've got to get a good signal into these hard disk recorders somehow. Some of the popular ones are Avalon and Focusrite, both in terms of their hardware products and their software plug-ins. We also sell a lot of the integrated multitrack recording, mixing and effects systems: Roland, Akai and Korg are very strong in that area, as is Tascam's new offering, the 788. Alesis



David Angress, executive VP of Guitar Center

continues to be a strong performer, and the Mackie D8B digital mixer has been a huge hit for the past couple of years. Five years ago, you would have had to spend $100,000 to get equipment that does what it does for about $8,000, so it's become the heart of many of today's project studios. The other area doing tremendously well is the high-end keyboard workstations. These kinds of products tend to blur the line between keyboards and recording products. Trinity and Triton from Korg, in particular, have really revolutionized the way composers operate. They have also just started shipping a product they introduced at the January NAMM show called Karma, and we're already finding that we can't keep them in the store."

Even with all the equipment currently available to outfit the project studio, Dusty Wakeman, owner of the three-room Mad Dogg Studios in Burbank, confirms the positive climate in L.A.'s commercial studios, stating that the last quarter of 2000 was Mad Dogg's best period ever. This was also the year that the facility invested in a major makeover, replacing the "mid-era" Neve previously housed in Studio A with what Wakeman calls the "queen mother vintage Neve console"—an 8088 fitted with Flying Faders.

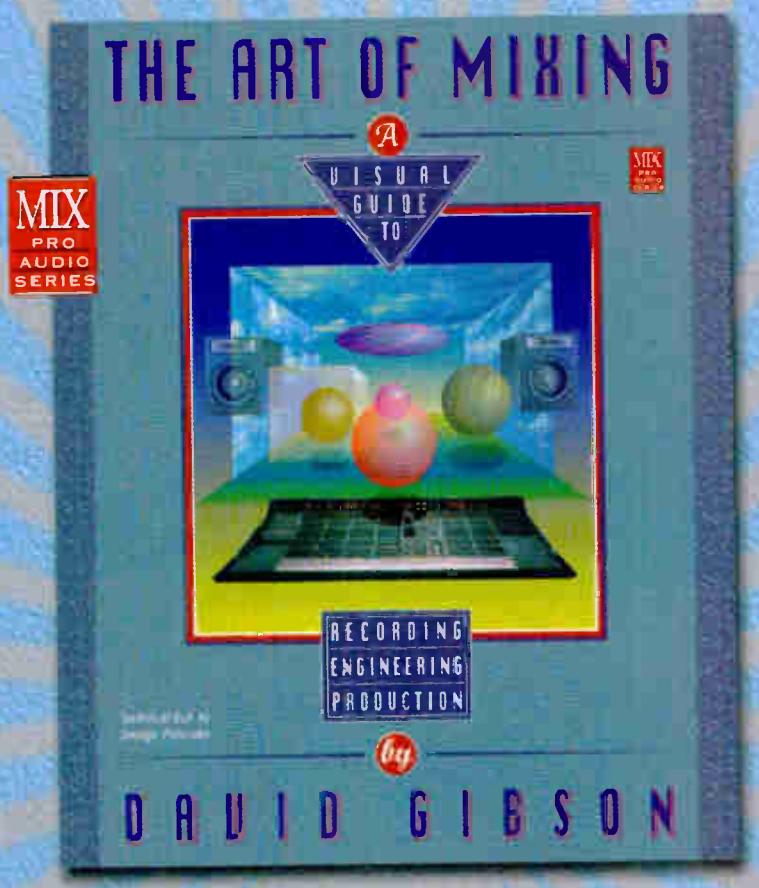
"One of the things that people really need to go to a commercial studio for is tracking," he comments. "This Neve is the ultimate tracking console, so that's increased our business in that room. Then, we've set up Studio B as an all-digital room for surround mixing, which is starting to take off. It's fitted with a Sony DMX-R100 console, DA-88s and DA-78s. We also have a couple of regular producer clients, like Sylvia Massy and David Bianco, who like working in the open-studio environment of our third room, The Stage, which is a studio without walls. That seems to be a trend right now. It's band-friendly—the ultimate garage studio. So we're very diversified. Having something for everybody is working for us."

At Mad Dogg, where recent clients have included such artists as Heather Miles, Keb' Mo, From Zero, Insolence, The Virgos and The Damned, three Pro Tools systems are available for client rental. Wakeman notes that, while equipment options have made home studios a viable working environment for many projects, some composers feel overwhelmed by the multitude of rapidly changing choices offered on the market.

"I think people have learned that just having a Pro Tools rig doesn't mean you have a studio," he says. "If you want to record a band, you need a lot of infrastructure—stands, cables, a headphone system and a good acoustic environment. Plus, Pro Tools rigs are computers and they crash, so you need people around who can get you back online. I think the realization of these things has actually brought a lot of work back to the studios."

Larrabee Studios owner Kevin Mills echoes Wakeman's sentiments. "Just because you have a kitchen at home doesn't mean you're never going to go out for dinner," he remarks. Larrabee

Once you know what can be done, you have the power to make art out of technology.



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David Gibson

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L.A. Studios

Studios, which now encompasses seven high-end rooms in three facilities, also has its own pro audio equipment arm, dubbed Gear Works, which services Larrabee's rooms, as well as outside commercial and home studios.

"The way it is now," Mills explains, "one day a project can be on analog, the next day it can be 3348 HR, the next it can be DA-88 and the day after it can be Pro Tools. We've found that with seven rooms, the best way to be able to effectively handle the changeovers that are going on during any given day is with Gear Works. It has five dedicated employees who just handle the gear. We have five Pro Tools systems, HR machines and, because I've been collecting it for years, what is probably L.A.'s largest inventory of outboard gear."

> I don't think the taste for analog is going to go away completely. I don't think people hear in bits and bytes; I think they hear analog.
>
> —Ellis Sorkin

Like many observers, Mills sees that trends are moving away from tape "toward things like RADAR, Pro Tools, the R-1 from Euphonix or DA-88s—a bigger variety of storage media that come from home studios."

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L.A. Studios

ment is still being rented, as is studio time. Ellis Sorkin of Studio Referral Service concurs that business is up in 2001, and conjectures that the end of last year was a slow period for the studios due to a number of factors, including the Napster situation, the class-action lawsuit on price fixing that was brought against major labels and, of course, the large number of Pro Tools systems purchased. "I think people bought them and thought, 'I'm going to be doing everything at home now,'" he muses. "But once they got into them, they realized it wasn't that simple."

Sorkin says that while Pro Tools is practically ubiquitous at this point, he believes there are still plenty of people working who love the sound of tape. "I don't think the taste for analog is going to go away completely. I don't think people hear in bits and bytes; I think they hear analog."

As far as the preferences that he sees among his clients, Sorkin states that the SSL 9000 is the top choice for mixing consoles. "There are still those who want to be on vintage equipment and will go to the large-frame vintage Neve consoles, but it seems that more are pushing the 9000 edge. As far as the SSL vs. Neve situation, the people who are in each camp tend to stay where they're at.

"On the lower end of things, there are certainly a lot of people going into that Sony DMX-R100, which is a digital 5.1-capable, very multifunctional console that is not terribly expensive."

Sorkin, who has a daily pulse on the finger of the recording community by virtue of booking studios for producers and artists, notes, "A successful studio is a mixture of knowing what to do and when, knowing how to present what you're doing and giving the proper service."

Larrabee's Kevin Mills agrees that presentation is the name of the game that sets the commercial studio apart from home digs. And to prove his point, Larrabee, which has recently completed a number of client comfort-oriented renovations, has been booked almost solid this year, so far. Over a quarter of a million dollars was spent developing an additional 4,000 square feet of lounge space at the three-room Larrabee North. "Studios aren't just equipment anymore," he states. "They're a space where clients can come and know they will be provided with services: runners to get their food, a variety of lounges and places to hang out, as well as assistants to help with their equipment needs, full-time, around-the-clock technical maintenance, desk people to handle the phones, gated security and clean bathrooms. This is stuff that can't fully be gotten at home. I think home studios will continue to proliferate, but there will always be room for the high-end commercial facility.

"But unlike 10 or 20 years ago, it is definitely becoming about value-added. When you take a look at one of our rooms and realize that it costs perhaps $400,000 just to build the room acoustically, including floating, isolating and wiring it, adding dedicated electrical and AC and then installing the big double-woofer monitors, you just can't do that at home."

Ellis Sorkin of Studio Referral Service

Whether it's the trickle-down effect, or because it offers its own particular niche of amenities, even Sonora Recorders, a much smaller (two rooms—one large and one small), funkier environment (Los Lobos' Steve Berlin described it as his favorite "nondesigned" room) is enjoying a steady stream of clients. Not long ago, Sonora even managed to nab the Backstreet Boys for some sessions. Conjecturing on the state of the business, Sonora co-owner (with engineer/producer Jeff Peters) Richard Barron remarks, "With

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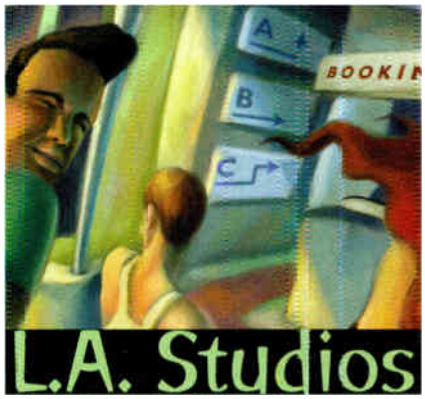

all the home studios, I'm not sure why commercial studios are doing well right now. But maybe it's because people might try to do a whole band in their living room and bathroom one time, but the second time, the wife is going to say, 'No way!'"

Barron adds that the Backstreet Boys ended up at his facility after trying to record at the home studio belonging to their engineer, Tony Shepperd. "But there were so many people involved and so many security guards that it was just too much."

About his studio's draw, Barron notes that, as well as being a great-sounding facility with a main recording space that is particularly popular with drummers, Sonora is known for its vintage equipment, including an API console that once belonged to Laura Nyro and a Stephens analog 24-track recorder. The convenient location is also a plus, as is the fact that Sonora is a "free-standing building and there aren't other bands around." As for amenities, Sonora boasts a somewhat notorious snack table stocked with Twinkies, Ding-Dongs and other classic trash foods that musicians love to eat. "I try to go with vintage junk food, just like the rest of the vibe in the studio," Barron laughs.

Vintage lovers, though they may be, Sonora's owners have also heavily invested in Pro Tools so that their clients may go back and forth between their home setups and the studios. "A lot of times, people will track their drums and bass on the 2-inch machine, then we'll do a transfer for them to Pro Tools so they can take it away to do vocals, guitars, synths—whatever they can at home. Then they'll come back here to mix. And a lot of times when they mix, we move it back to the 2-inch, because it really does sound better. Pro Tools allows us to talk to all the home studios really accurately."

As a successful small studio owner, Barron comments, "I look at some of these places that own SSL J boards and I think there's no way I could make the arithmetic work. That board is a half a million dollars. My board is gorgeous and draws people in, but it only costs a fraction of that. Yes, those studios maybe get twice or three times what I get in a day, but still, the arithmetic doesn't make sense to me."

As Barron notes, the investment is major for a studio that wishes to compete for commercial business. It can take years to get a payback on the amount of financial output necessary to buy all of the latest toys to lure the customer. Hence, the attraction of the personal home studio. In that realm, however, the composer must not only be the creative force, but the engineer and producer. Delegating the responsibility to others can become something worth buying.

As Guitar Center's Angress says, "The studio that adds value, that has a tremendous acoustic space, really creative engineers and a nice environment, is always going to prosper." ■

Robyn Flans is a freelance writer in the Los Angeles area.

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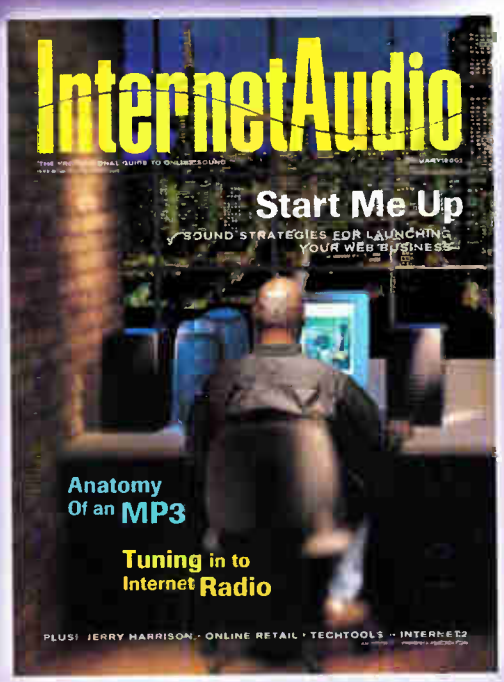

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CLIFF MARTINEZ

SOUND GENERATION AT HOME

When you listen to the suspenseful rhythms at the core of the score for the hit movie *Traffic*, it comes as no surprise that the composer once made his living as a drummer. After performing and recording with The Weirdos, Lydia Lunch, Captain Beefheart, The Dickies and the Red Hot Chili Peppers in 1989, Cliff Martinez decided to trade in his sticks for recording gear. Actually, not just his sticks.

"I decided I didn't really want to be wearing a sock on my weiner for the rest of my life," he says with a laugh. "Plus, my taste in music changed, and after being on the road with the Chili Peppers on and off for three years, bouncing around in a smoke-filled van all day and living on deli plates kind of wore thin."

So, naturally, he gravitated toward the film world, working with an SP12 sampling drum machine and a Prophet 2000 sampling keyboard in his West Hollywood apartment. "I had drums used for planters and table tops and literally slept under the keyboard," he recalls. "I began sampling household items, sound effects recordings and rude body noises and with them, created a series of semi-musical sound collages. At the time, I thought I was being brilliant and highly original, but was frustrated that I couldn't come up with an outlet for it. Then I was channel surfing one day [in 1987] and stumbled on Pee Wee Herman."

After scoring an episode of *Pee Wee's Playhouse*, he was invited to work with sound designer Mark Mangini for the film *Alien Nation*. He hit it off with Mangini's good friend, Steven Soderbergh, who then asked Martinez to score his first film, *sex, lies, and videotape*.

In 1993, Martinez bought a house in Topanga Canyon and built a project studio in the 20x15-foot family room. "I put up a couple of double-glass doors and double-glass windows so I could keep the music in and the external noise out," he explains. "I have a line out for all the mics so I can record elsewhere in the house. There's one large space downstairs—the kitchen, dining room and living room—which has a high ceiling and makes a great area for live recording.

PHOTO: MAUREEN DRONEY

"I haven't recorded a lot of human beings in the house," he continues. "So far, I've recorded mainly percussion and guitars. The most ambitious home recording so far has been a choir. We [with engineer Leanne Ungar] overdubbed four singers who swapped parts and mic positions to create the illusion of size."

For *Traffic*, Soderbergh showed Martinez a rough cut of the film with a temp score. "Steven wanted a score similar in style to *sex, lies, and videotape*, which was slow, ambient and had a conspicuous absence of melody, harmony and rhythm. It was an unusual approach to take back in 1989, and I was a little surprised that Steven wanted to go down that road again with a $50 million dollar picture."

Martinez estimates that about 60% of the music for *Traffic* was "recorded" via samplers in his studio. Pianist Herbie Hancock and guitarists David Torn and Michael Brook were recorded in their respective home studios, while Flea and percussionists Alex Acuna and Paulinho Da Costa were recorded at Media Ventures in Santa Monica. Because it was primarily an ambient score, Martinez and scoring mixer Alan Meyerson decided to add space and size to the sound by pumping the elements into a live space and recording the ambience. This enabled them to create a full, warm surround mix without using much in the way of electronic processing. They chose the famous Capitol Studios for the task with excellent results. The score was mixed by Meyerson at Media Ventures.

While Martinez has an elaborate home theater with a surround system (Snell speakers, Aragon amps and Lexicon CP3) and a 53-inch projection set, the heart of his home studio is the sound-generating capability. His main controller is a Fatar SL-88 keyboard, and he makes frequent use of the Roland SP-700 sampler, three Akai S1000 samplers, a Studio Electronics SE1 synthesizer, an Access Virus synthesizer, an E-mu Proteus/2 module, a Kurzweil PX-1000 module and a DrumKat MIDI percussion controller. He is dual-platform, running MOTU PCI and Logic Audio off of a 500MHz Apple G4 and GigaSampler off his PC. Digital video is through a MiroMotion DC30 software. Rough mixes are done on a pair of Mackie 1604s, and he monitors on Genelec 1031As.

"It's hard to imagine how composers ever did film soundtracks before MIDI and SMPTE," he laughs. "If it weren't for computers, I'd probably still be playing drums, or maybe I'd be an accountant." ■

BY ROBYN FLANS

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BY BLAIR JACKSON

RECORDING NOTES

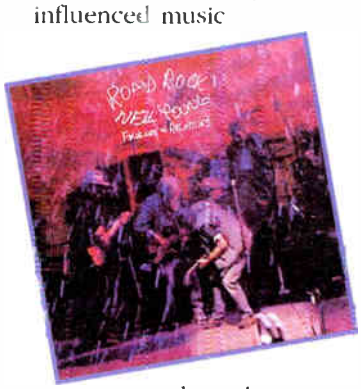
PHOTO: DANNY CLINCH/COURTESY R. TWERKS & CO. (GARY BURDEN)

NEIL YOUNG ON THE ROCKS

A LIVE CD AND DVD SHOW THE ROAD WARRIOR AT HIS BEST

by Bob Buontempo

Neil Young has encompassed many different musical styles over the course of a nearly 40-year career, from delicate folk-based acoustic music to hardcore country to rockabilly to electronically processed rock, to feedback-saturated proto-grunge. He's touched on punk and reggae and horn-driven, big band-influenced music



and much more, yet, through it all, he always sounds like Neil. It's in the voice, the songwriting, the distinctive harmonica style, the guitar solos dripping with feeling. He may be a musical chameleon, but he is always unmistakably himself.

Technically, he has covered just about all of the bases, as well. Young has employed all sorts of different methods of recording, from traditional analog multitracking to his experimental "digi-tube" technique. That term was coined for a process Young explored to record tracks well over a decade ago. During those sessions, he virtually pioneered the use of a digital storage media, softened by an all-tube, analog front end. To this day, that methodology continues to be a common practice, used by many engineers and producers when making digital recordings.

Young was also one of the first private owners of a Sony 3324 digital multitrack, at a time when only major recording facilities would have expected to see any financial returns from offering their clients the use of that extremely expensive machine. Then again, Young is not above using a crude recording of himself singing by a crackling fire at home on an album. That's Neil Young, too.

While we all patiently await the long-promised and longer-delayed first installment of the Neil Young box set series (volume one is reportedly eight CDs and only goes through 1972!), Young has been characteristically busy, and last Christmas he released both a fine live CD, *Road Rock Vol. 1*, and a concert DVD, *Live at Red Rocks*. Handling the recording for both projects was David Hewitt's Remote Recordings Services, based in Lahaska, Pa. "I called David because he's the *best*," says John Hanlon of Young's production crew. They were looking to book Hewitt's mobile Silver Studio for three days in late September 2000, for Young's performances at Red Rocks, a breathtakingly gorgeous amphitheater situated in Morri-

—CONTINUED ON PAGE 202

PHOTO: PEGGY YOUNG

BUCKCHERRY

LOUD AND PROUD

by Elianne Halbersberg

"Rock and roll all night and party every day" is the *modus operandi* of any band worth their weight in piercings, or so we're led to believe. But spend time with Buckcherry—brash, loud, covered in body art—and the stereotypes quickly disappear. No one knows this better than John Travis, who produced the band's new album, *Time Bomb*.

L to R: Yogi, Jonathan Brightman, Joshua Todd, Devon Glenn, Keith Nelson

Travis met with vocalist Joshua Todd, guitarists Keith Nelson and Yogi, bassist Jonathan Brightman and drummer Devon Glenn at their request. He'd received a 35-song work tape from the band and was familiar with their self-titled debut. "I took the meeting because they were interested in me as a producer," he says. "I thought they were an interesting, cool band who could make a great record. When I met them, I realized how focused and driven they are, how intelligent and committed. That's why it was important to me to do the record—because they were so passionate about it."

Buckcherry introduced themselves to radio two years ago with the single "Lit Up," a three-minute assault of cocky, aggressive vocals and driving guitars. While so many of their colleagues relied on DJs, samples, computers and assorted technology, Buckcherry's back-to-basics approach owed much to early Aerosmith and the Rolling Stones and nothing to the Korn-field of new bands. *Time Bomb* remains true to those roots, its only change being that the

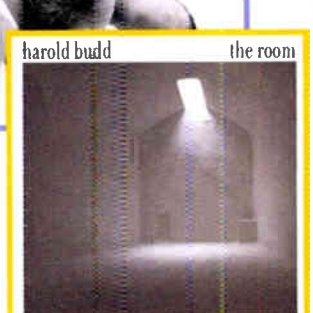
—CONTINUED ON PAGE 208

IN "THE ROOM" WITH HAROLD BUDD

by Blair Jackson

The music of Harold Budd is steeped in mystery. It bubbles up from deep silences and softly reverberant spaces, insinuating itself like some sort of pleasant, mind-altering soma. His music has been variously dubbed ambient, minimalist, avant-garde, neoclassical, even new age (gasp!), but none of those quite captures it. His piano and keyboard melodies float in the ether like beautiful hallucinations, at once calming and yet strangely compelling. Though a native of L.A.

PHOTO: CHAPMAN BAEHLER



(where he still lives), Budd has long enjoyed a greater following in Europe than America, in part because he first came to prominence at the wing of Brian Eno—the two made the landmark late-'70s ambient album *The Plateau of Mirrors* together and later cut the superb record *The Pearl*. Budd has also worked with such intriguing, forward-thinking European musicians as the Cocteau Twins, XTC's Andy Partridge and Hector Zazou.

Intriguing as these collaborations are, it is Budd's solo works that are most inviting to me. Album after album since his EG Records debut in 1978, *The Pavilion of Dreams*, Budd has carefully painted sonic landscapes of often breathtaking beauty, allure and aural poetry. Eno summed it up best when he noted, "Harold works with simplicity, clarity and sensuality. He's a great abstract painter trapped in the body of a musician." His tools are relatively simple—usually

—CONTINUED ON PAGE 212

NEIL YOUNG'S "HEART OF GOLD"

by Elliot Mazer

Introduction by Blair Jackson

By the time Neil Young rolled into Nashville to begin recording his *Harvest* album, 30 years ago this past winter, he had already enjoyed several different careers as a musician. And, as we learned subsequently, he was only warming up for what has been one of the most fascinating odysseys of any rock musician.

After playing folk and rock in his native Canada during his teens, Young and his friend/bandmate, bassist Bruce Palmer, moved to Los Angeles in 1965 and, the following spring, formed the groundbreaking country-influenced rock band Buffalo Springfield with guitarists Stephen Stills and Richie Furay and drummer Dewey Martin. Over the next two years, Buffalo Springfield would go

through various personnel changes (including the departure of Palmer and the addition of Jim Messina) and record two well-received albums for Atco. It was a band filled with strong singers and songwriters, and Young quickly established himself as an utterly distinctive presence, as songs such as "Mr. Soul," "Broken Arrow" and "Expecting to Fly" showed. However, by May of '68, the battles between Young and Stills had led to the dissolution of this promising group. At that point, Young became a solo artist, releasing his eponymous first album, produced by the eccentric genius Jack Nitzsche, in January 1969. In the course of making that album, Young encountered a group called The Rockets (guitarist Danny Whitten, bassist Bill Talbot

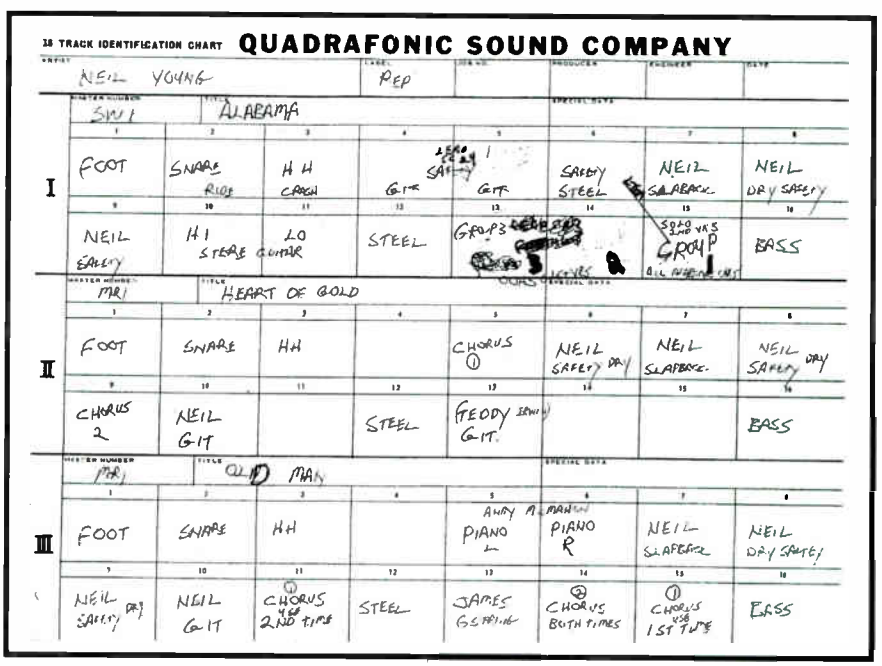
Neil Young (left) and Elliot Mazer listening to playback at Young's Redwood Digital studio during January 2001 remix sessions for the* Harvest *DVD-A.

and drummer Ralph Molina), and he hooked up with them and changed their name to Crazy Horse. Together, they cut the classic, hard-rocking *Everybody Knows This Is Nowhere* album, which contained such defining Young numbers as "Cinnamon Girl," "Cowgirl in the Sand" and the epic "Down By the River." Then, just as that album was taking off, Young joined Crosby, Stills & Nash for a tempestuous year or so that included the making of the multi-Platinum *Déjà Vu* album. A third solo album, *After the Goldrush* (featuring Crazy Horse, Stills and an up-and-coming young axe-slinger named Nils Lofgren) came out in September of '70, and continued Young's incredible rise. At this point, Young took a turn in a somewhat different direction, heading to Nashville to record *Harvest*.

Elliot Mazer, producer of that album (and subject of this issue's Producer's Desk on page 54) tells the story of the recording of this issue's "Classic Track", the Number One single "Heart of Gold."

. . .

"Heart of Gold" was recorded during the first set of the *Harvest* sessions at Quadrafonic Sound Studios in Nashville in early 1971. This project was full of coincidences and surprises. Neil, Linda Ronstadt, James Taylor and Tony Joe



Track sheet for "Heart of Gold." The "Neil safety dry" vocal recorded on track 8 is identical to that on track 6, but recorded at -4 dB. (The version of "Alabama," shown here, is not the one used on* Harvest*.)

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White were in town to shoot the final *Johnny Cash Show* for ABC-TV. I was living in Nashville, working mostly at Quad, which I co-owned with David Briggs—the Nashville musician, not the David Briggs who had produced other Neil Young records—and Norbert Putnam. I decided that the studio would host a dinner for some of the [Cash show] guests and some of our studio friends. I called Elliot Roberts, Neil's manager then and now. Elliot and I had known each other in New York; I produced some demos with a group he called Roberts Rules of Order. He took Neil to the party. I had produced Linda's *Silk Purse* LP. So, I called Peter Asher, Linda's manager, and he brought Linda and James Taylor. We had around 50 people for dinner. During dinner, Elliot introduced me to Neil, and we started talking about studios and musicians. Neil had heard of our band, Area Code 615, and asked if I could get the drummer, a bass player and a steel player into my studio the next day. Kenny Buttrey was available and keen to play [drums] with Neil. Norbert had gone home to Muscle Shoals for the weekend, and Weldon Myrick, the steel player in Area Code 615, could not make it, because he had to do his regular gig on the *Grand Ole Opry*. So we found Ben Keith—he's still working with Neil after 30 years [see story in "Recording Notes"].

Neil and I met for breakfast Saturday morning at the old Ramada Inn, and we decided to meet up at the studio that afternoon. Neil showed up and asked us to move things around so that he could be next to the drums. We got Troy Seals, an amazing songwriter, to play bass, and Teddy Irwin, a session player-friend, played guitar. A few hours later, Tim Drummond showed up with his bass. Marshall Falwell, the photographer, had seen Tim walking on the street and told him to go to Quad with his bass.

"Heart of Gold" was the second song we cut. Teddy, Ben, Tim and Kenny played on it. I used a [Neumann] U87 on Neil's voice; a [Neumann] KM86 on his guitar; drum overheads were KM86s, snare most likely a [Shure] SM56, hi-hat a 224E; bass was direct; we had a KM86 on Teddy's guitar and an 87 on steel. We were recording to 2-inch 16-track Scotch 206, 30 ips, no noise reduction. The console was a Quad Eight 20x8x16. No compressors were used. I hand-rode his voice, which meant I had to learn the song and anticipate his moves. The vocal effect on Neil's voice is 15 ips tape slapback, and it is on the multitrack.

A vivid recollection of the session that produced "Heart of Gold" was hearing Neil play and sing the song for us the first time. The song and arrangement came alive. Kenny Buttrey and I made eye contact while listening, and we both raised a finger that said we knew it was going to be a Number One hit. It took a few minutes for the band to learn the song and figure out how to capture the magical feel that Neil was laying down. Neil was very specific to Kenny about what *not* to play. Tim Drummond and Kenny played together so much that they just connected to each other. Teddy Irwin found some harmonics and rhythm chops, and Ben Keith just sailed through the song. We did one or two takes. Neil and the band played live, same as every song on *Harvest*. After we got the master take, we got Linda and James to add their harmonies in the control room while sitting on the couch. They were facing the control monitors and the vocal

—CONTINUED ON PAGE 202

Cool Spins

The Mix Staff Members Pick Their Current Favorites

The Spanic Boys: *Torture* (Checkered Past Records)

The Spanic Boys are father and son, and their concoction of interwoven Fenders and provocative vocals isn't easy to pigeonhole, but here's an attempt: It's sort of like George Harrison playing with Chuck Berry, with David Lowery and the Everlys on vocals—retro and rocking with lots of roots influence, but totally irreverent and original. All original songs, too. It's said that family members have a special ability to harmonize, and in their vocal duets, the Boys sound exactly like what they are: made for each other. They've also got a superb rhythm section in drummer Brad Elvis (formerly an Elvis Brother) and

Melanie X of Big Hello. Generations of rock 'n' roll somehow come together beautifully in the Spanic Boys to form something really new.

Producer: Ian Spanic. Recording engineers: Ian Spanic, Trevor Sadler, Shane Olivo. Mixer: Ian Spanic. Studio: Lone Scout (Milwaukee, Wis.) Mastering: Trevor Sadler/Mastermind Productions.

—Barbara Schultz

Tortoise: *Standards* (Thrill Jockey)

A veritable who's who of the Chicago underground music scene, Tortoise's collective membership—Dan Bitney, John Herndon, Doug McCombs, John McEntire and Jeff Parker—have come back together after a three-year hiatus to create a tem-

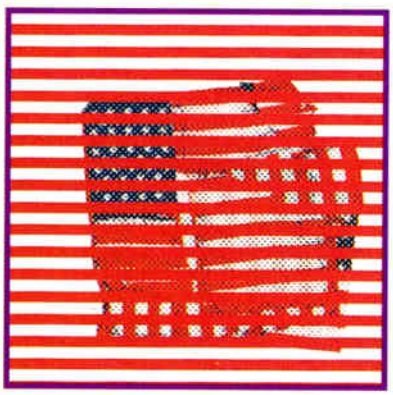

plate from which many an indie rock band will be formed. Instead of continuing to create and perfect the studio-manipulated sounds of 1996's *Millions Now Living Will Never Die* and 1998's *TNT*, Tortoise returns to a more organic approach that is quite direct, while still maintaining the exploratory aspects that have been the heart of their post-rock style. The first track, "Seneca," rumbles through one-and-a-half minutes of processed and manipulated synths and guitars before exploding into a heavy break beat that is tempered with vibes, marimbas and guitar. The absence of the ever-intrusive studio can be best heard in "Blackjack," where the musicianship of Tortoise truly shines through with soaring melodies that are reinforced by percussion sounds reminiscent of Can and Kraftwerk. Recorded mostly on Pro Tools by Tortoise's own John McEntire at his own Chicago studio, Soma Electronic Studios, *Standards* was spawned by a nonlinear approach where segments of groove and melody are layered on top of one another, leaving very little room for traditional verse-chorus-verse arrangements.

Producer/Engineer: John McEntire.

—CONTINUED ON PAGE 216

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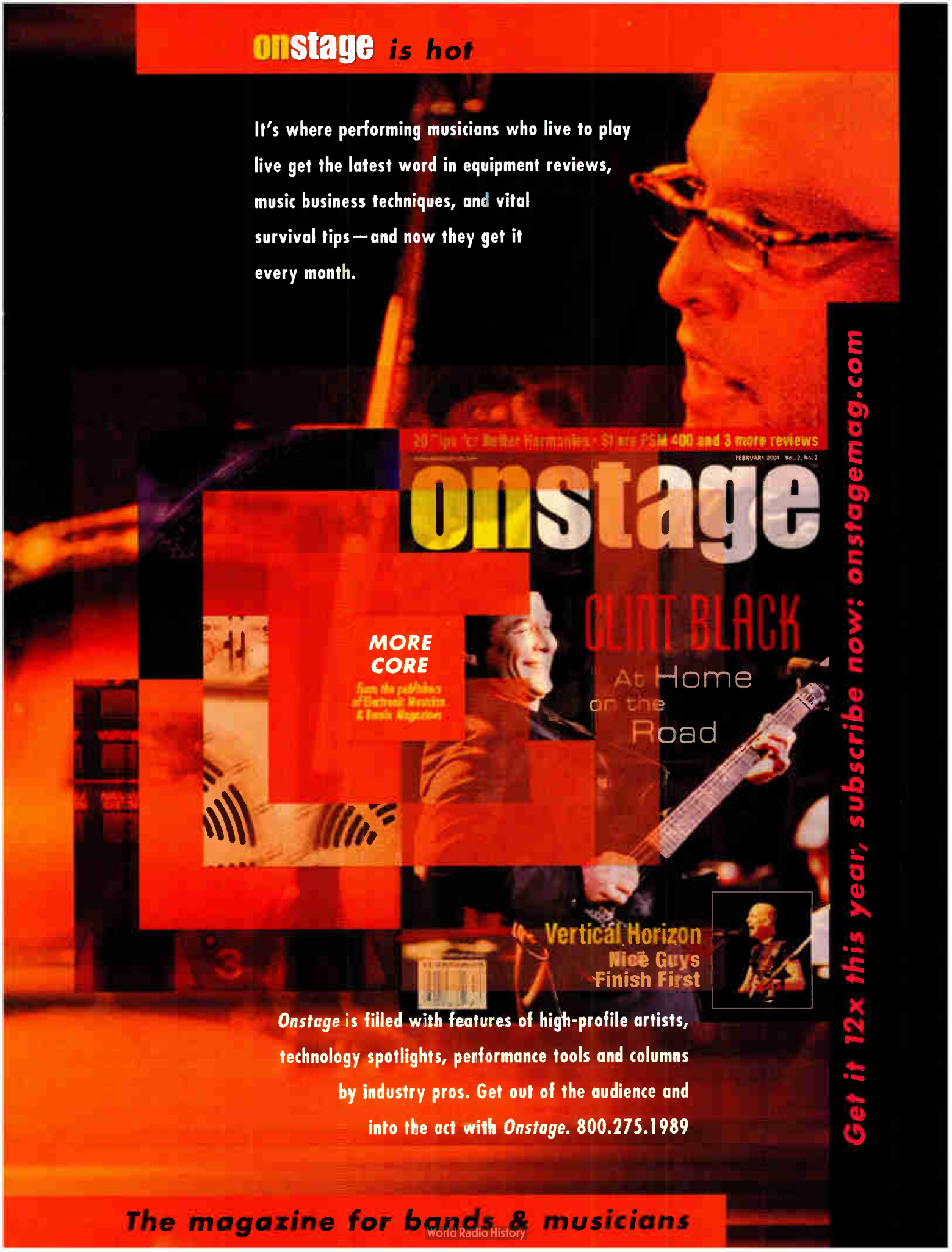

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MICK GUZAUSKI

HIS LATEST PROJECT IS A "THRILLER"

by Paul Verna

If a great mix truly contributes to the commercial fortunes of a record, then Mick Guzauski has got to be the King Midas of pop music. By a recent count, he had mixed 27 Number One singles by such artists as LeAnn Rimes, Eric Clapton, Mariah Carey, Earth, Wind & Fire and Boyz II Men. And that's just the tip of the iceberg. Factor in the artists Guzauski has worked with who *didn't* happen to peak at Number One, and you've got names like Kiss, Aaliyah, Kirk Franklin, Whitney Houston, Jennifer Lopez, Quincy Jones, Britney Spears, Joan Jett, Talking Heads, Barbra Streisand and many more.

Given Guzauski's impressive track record, it's no surprise that the self-proclaimed King of Pop himself—Michael Jackson—called on the veteran engineer to mix the 5.1 channel version of his 1982 masterpiece *Thriller*, still the best-selling album of all time.

Without a firm deadline or a specific release plan for the new version of that classic LP, Guzauski has been able to approach it at a leisurely clip, starting with two mixes ("Wanna Be Startin' Somethin'" and "Billie Jean"), then moving on to other projects and eventually returning to *Thriller*. We caught up with Guzauski at his Barking Doctor studio in Mt. Kisco, N.Y., just after he had completed those two mixes. He seemed to take great pleasure in playing them for visitors, while also talking about some of the other work he has been doing recently.

For *Thriller*, Guzauski had transferred the original analog masters—which were on two synchronized reels of Scotch 2-inch tape—to 24-bit DASH reels, using the converters on his Sony Oxford digital console to feed his Sony 3348HR multitrack. Once in the digital domain, the tracks were mixed through the Oxford, using a minimum amount of outboard processing, and recorded to six channels of Pro Tools via the AES/EBU outputs of the Oxford, which fed the Digidesign 888|24 Pro Tools interface.

Guzauski also transferred the original version of *Thriller* onto the same Pro Tools session that contained the multichannel information. This allowed him to refer quickly to the 2-track master as a template for how to do the surround mix. "I really wanted to respect what Michael did," he says. In addition, the stereo version gave Guzauski a

—CONTINUED ON PAGE 216

—FROM PAGE 200, "HEART OF GOLD"

mic; an 87 on cardioid was facing them. They listened to the studio monitors and sang along listening to each other. Two passes, and it was finished. I guess it took less than two hours to record everything on "Heart of Gold." I can't remember where we mixed it—either at Quad or in Neil's house. We did a mono and a stereo mix—15 ips, no noise reduction.

A side note: It was very easy to get good sounds in the studio in Nashville. The rooms were set up properly, the musicians knew how to tune and make their instruments sound good, and the engineers were expected to get sounds quickly and to give the musicians good earphone mixes. At Quad, we had a 3-channel cue system that sounded great. In my studio in San Francisco, His Master's Wheels, we had a 4-channel system. Each musician got a box with controls for level. We only spent a few minutes getting sounds for Neil. I had listened to *After the Gold Rush*, and we all seemed to respond to the intimacy of Neil's music. I don't recall why we started to use slapback on Neil's voice, but that worked wonderfully. Neil really got excited when he heard the first playback. Later on, after he had gone home to California, he told me that this was the first time a tape sounded better at home than in the studio.

In the '70s, Bob Dylan said that when he first heard "Heart of Gold" on the radio, he got mad, because it should have been him; it sounded like him! The song peaked at Number One in *Billboard*, as did the album.

Where's everyone now? Neil, obviously, is still writing, making records and touring. Ben Keith is still playing; he also produced Jewel's first album. Teddy Irwin is living in Nashville, playing and composing music for TV shows. Teddy has toured with Roy Buchanan, Petula Clark and Doc Sevrenson, among others. Tim Drummond worked with Neil and CSNY and Bob Dylan and many more in what has been a long and brilliant career. Kenny Buttrey made many, many great records over the years; he is retired now. And these days, I'm living in New York, working in the technology world and making the occasional record. Quadrafonic Sound Studios is now associated with Quad Studios of New York, which is owned by Lou Gonzalez, who was an engineer I worked with on a Gordon Lightfoot record back in the '60s! ■

—FROM PAGE 196, NEIL YOUNG ON THE ROCKS

son, Colo. Besides the planned CD and DVD releases, Young also wanted to do a live Webcast of one of the concerts.

Normally, this sort of gig wouldn't cause Hewitt—a six-time TEC Award winner for Outstanding Remote Engineer—much consternation. However, due to the location of the venue, combined with the lack of cooperation from the weather, Young's project ended up presenting quite a challenge.

"Red Rocks, a beautiful amphitheater, formed by nature from stone, is located at the peak of a sharp incline in the Rocky Mountains," Hewitt explains. "Access to the location is via a very steep, rather narrow, cliff-edged road. So, they've built a loading station at the base of the site, allowing the semi trucks hauling the P.A. and band equipment to unload the gear onto smaller Bobcat straight trucks, in order to more easily proceed the rest of the way up to the performance area. However, since my Remote Recordings studio is permanently installed in a tractor-trailer and not designed to be dismantled, that situation didn't work for me. We considered running cabling from the loading station up to the

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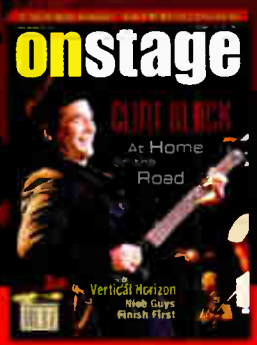

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PHOTO: JOHN DRANE

The load-in and setup at Red Rocks

stage, but that was quite a long distance, so we dropped the idea rather quickly."

So, Hewitt and his son, Ryan, who was the assistant engineer for the sessions, attempted to drive the truck to the top of the grade. "We tried to make it up several times, but it was virtually impossible, and we started to burn up the clutch in the cab," Hewitt recalls. "So, ultimately, we called a local heavy-duty tow truck service. They ended up *carefully* maneuvering around us and got up to the summit, right where we wanted to park our trailer. Luckily, the tow cables on their truck were quite long, and they lowered the extended towlines down the pavement to us. We attached them to our vehicle, and when we started to drive up the road again, they started reeling the cables back onto their wrecker. That caused us to get pulled up a bit by the now recoiling cables and helped us make it to the top of the site. Working together, we were finally able to get the studio to the stage."

Hewitt was hired as the "remote engineer" rather than the principal recordist for the shows, because Young tends to use the same personnel he has for the last 20 to 30 years for all of his projects. In fact, the tour that these projects document was named "Friends and Relatives"; the Friends being the musicians and crew that Young works with, and the Relatives being his wife, Pegi, and his sister, Astrid, who are the background vocalists in the band. Young's all-star band for the tour included Jim Keltner on drums, Donald "Duck" Dunn on bass, Spooner Oldham on keyboards (he also co-produced the CD) and Ben Keith on various guitars, from dobro to pedal steel and other instruments.

Young's son Zeke is also involved behind the scenes; he records every show to 48 tracks on six Tascam DA-78s. He assigns one of the machine's eight tracks in this manner: First, he grabs the FOH mix, taking it pre-fader, post-EQ and post-effects. That stereo mix is printed on the first two of the tracks. The remaining six tracks are used as three additional stereo pairs, which are dedicated to the audience and stage ambience mics. The other five DA-78s consist of 40 tracks taken from the FOH board.

"Neil uses digital media to archive all his shows," says John Hanlon, who was the principal engineer on the project. "First, there are Zeke's DA-78 tapes of every concert. Neil also takes a DAT of the FOH mix home with him after the gig, so he can listen to, and study, the performance of that show. The performance is *everything* to Neil, so he is constantly evaluating each one."

Still, Hanlon notes, "Neil insists on 2-inch analog tape for all his commercial releases," which is one reason why Hewitt's truck was chosen. The mobile control room has a pair of Studer A820 analog 24-track recorders, as well as a Neve VR M48 console and plenty of outboard gear, which Hanlon supplemented with some of his own.

Hanlon explains the approach to recording these shows: "We split the mic signals from the stage three ways: one split was for the recording truck, one for the FOH mix and one for the monitors. Each feed was transformer-isolated, by a Whirlwind box, which was custom-built for Neil. I took my 60 inputs and subgrouped them so I could fit everything on one 24-track machine. I needed one track for timecode, which was provided as house sync by the video crew, and I used a guard band track, as well. So, I really only had 22 tracks to work with. We ran the two Studers with about a five-minute start time stagger and fed them both, simultaneously, with identical signals, which consisted of a mult from the console's outputs. That way, we could have two first-generation, 2-inch analog master tapes at the end of the night: one for mixing the CD and the other to be used for the DVD. Since we had to make some tight deadlines in order to have product out for Christmas, the CD and DVD were mixed concurrently, at two different locations."

Hanlon adds, "All the tape machine reel changes were timed out to happen during cues and were done live and 'hot' during the show by the tape op, Phil Gitomer."

Hanlon had to be very active during the performances. He also did a lot of pre-production homework. "I submixed the drums to four tracks," he explains, "kick, snare and a stereo pair of the rest of the kit. Then I also had a pair of tracks for each of the keyboards. I made sure that I had a mic for each instrument feeding one of the two tracks of the pair and a direct box output of that same keyboard feeding the other track. When you consider all the different guitars Neil uses, plus the variety of keyboards onstage, there's quite a few instruments that are played during each show. And that's before you include any miscellaneous items, like the squeezebox, pump organ, lap steel or harp. Between Neil and the other four musicians, they play a total of about 21 different instruments during a concert. Then, if you add to that the bandmembers' background vocals, the two female background vocals, plus Neil's lead vocal, you have a lot of things going down to 21 or 22 tracks. I was constantly muting and moving faders to get the appropriate instrument up at the right time for each song.

"With the redundancy of the direct and mic feeds assigned to opposite channels of the pair, if I missed a cue for a channel mute or a fader move on one track, I had that instrument covered by its other feed to the second track."

During band rehearsals in both Hawaii and at Young's ranch in Northern California, Hanlon studied the songs that were going to be performed during the show in order to learn his cues. "I needed to know where each instrument and vocal came in on every tune and when they finished their parts, as well,"

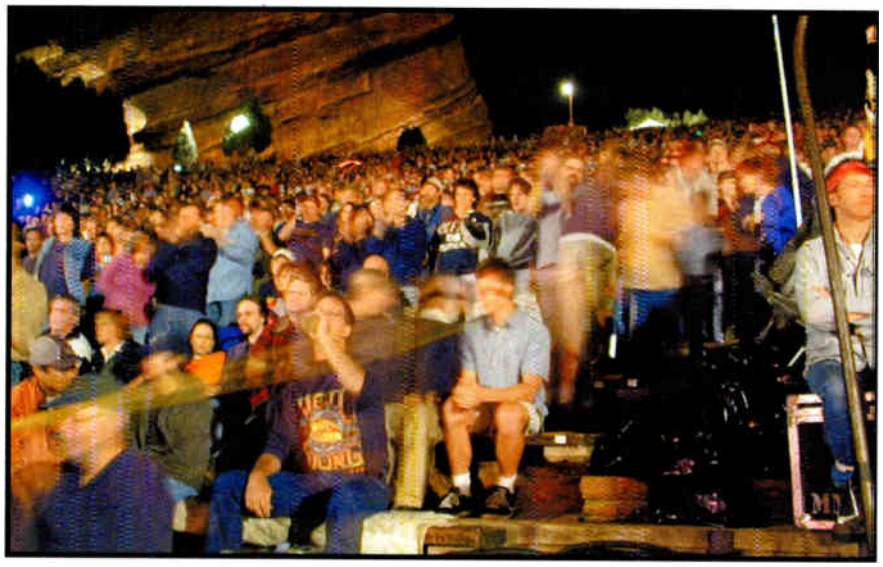

PHOTO: JOHN DRANE

The crowd goes wild during Young's performance.

he notes. "Plus, I had to know which of the many instruments onstage were going to be used on each song and who would play it. A couple different musicians play several of the instruments, and each guy has his own touch, style...and level. There's a lot of swapping that goes on during shows.

"I made color-coded charts for each song," Hanlon continues. "Because of the limited number of available tracks, I had a few instruments share tracks. I found out which ones weren't used together in a song and bused them to the same tracks. So, I wanted to be sure only the correct mic or DI was open on each track at the right time. That way, I could cut down on the noise, leakage and mud that the unused open mics would have added to the track. This pre-production would come in very handy later on during the shows."

"The mic preamps were all remote, staying on the side of the stage," explains Hewitt. "They were mostly Millennias, with a few APIs used as well. We ran everything into the truck at line-level. Sean McClintock, the stage manager, would trim the levels to John's specifications."

Hanlon set the levels once before the show rather than adjusting for the different players. "I just set them for the hottest level they would get and left them alone all night," he says. "For instance, although the acoustic piano is played by a few musicians during the show, I know that Neil bangs it the hardest. He only plays piano for one song, 'Tonight's the Night.' So I'd just have the preamps for the piano adjusted so they didn't clip on that tune, and then it was good for all the others. That just comes from knowing and working with these guys for so many years."

The microphone list for the dates was extensive, as might be expected. Neumann KMS150s were used for all the vocals. The drum set had a Sennheiser 421 on the kick, a Neumann KM184 on the hi-hat, a Shure SM56 on the snare, E-V 408s clipped onto the rims of all the toms and a pair of Neumann KM84s for overheads. AKG 460s were used on the acoustic piano, along with a Heppinstill pickup for the direct feed. That and the rest of the direct signals ran through Demeter DI boxes. Other mics included an SM56 and AKG 414 on the Leslie for the Hammond B-3, a Shure SM98 and Audio-Technica Pro-35R on the pump organ, ECM-33Ps on the vibes, Sennheiser 409s on the guitar amps and KMS150s for the dobro and squeezebox. Young's acoustics had FRAP contact mics with FRAP preamps on them, and the harmonica went through a Nady system.

A pair of AKG C-460s, augmented by an MKH 60 shotgun mic, were used for the stage ambience mics. Three additional shotguns onstage and a couple of pairs of Shure SM81s, fitted with omni capsules, were set up in the house for audience pickup.

"I had them set up in stereo pairs," notes Hanlon. "Tracks 1 and 2 were 'stage ambience,' with the shotgun mic placed center stage, facing the band. Tracks 3 and 4 were 'close audience,' with three shotguns onstage, facing the crowd but pointing a bit toward the sky. Tracks 5 and 6 were 'mid-audience' at the FOH position, and 7 and 8 were the 'far audience' tracks. The audience/ambience mics were printed to an additional DA-78, synched to the Studer 820s. I got the levels for those during the opening act, The Pretenders. A Studer 962 console on Hewitt's truck was used for the audience/stage ambience microphones.

"All the inputs going to the multitracks were EQ'd, and any additional signal processing was added prior to them being assigned to buses or on the bus inserts," continues Hanlon. "I used an API EQ and half of a modified Quad Eight compressor on Neil's vocals. The other half of the Quad Eight went on Spooner's vocals. There was a Pultec EQP-A inserted on the kick, and the rest of the drums were EQ'd by the Neve console in David's truck. The bass had a Neve 1084 EQ, a Neve 2254 compressor and a Pultec EQ-1A3 in series on its mic insert, and the same processing but with an EQ-1A on its direct signal.

"Neil's two guitar tracks each had a Neve 1084 and a Neve 33609 on them. The pedal steel amp had a Summit compressor, and the harmonica, a Tube-Tech compressor. Both the acoustic piano tracks and the other pair of additional keyboard tracks had Empirical Labs Distressors on each of them. The background vocals for Ben Keith, Astrid and Pegi all had UREI 1176s on their inserts.

"I monitored through KRK E8s and Yamaha NS-10s, powered by an H&H Mosfet V-800 amp. Occasionally, I threw the mix up on the mains in the truck [custom KRK 15A3s] for bottom-end reference."

Young's regular crew handled the sound reinforcement end of the show: John Drane was the system engineer and crew chief, Tim Mulligan did the FOH mix and Mark Humphries handled the monitors, assisted by Tommy Sterling. Randy Aspilliaga also assisted onstage.

Upstream Multi-Media of Sherman Oaks, Calif., supplied video for the DVD shoot and the Webcast. Larry Johnson, who has known Neil since working on the original *Woodstock* movie, was the producer/director. "Larry is like a dancer, coordinating all his shots and switching them himself," comments Marcy Gensic, the assistant producer for the project. "We had no video truck, so we constructed a little video tent on the side of the stage. The six digital betacams were switched live through an SDI digital switcher for the feed to the digital beta deck that would be used for the DVD, as well as the Webcast, and the two large projection screens for the audience. All the cameras were also taken as ISO signals, in case we needed to add or change anything in post." The video was shot in a 16x9 widescreen format.

The audio and video teams had their

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systems in place and were working smoothly together, but what they hadn't foreseen was the impact the weather would have on the project. "It started out being 80 degrees and sunny that first day," Gensic says, "but things started going downhill from there."

"The weather was atrocious for all three shows, with heavy rain, snow and high winds," adds Hanlon. "Now I had to be *extra* vigilant and mute any open mics constantly, because the wind noise made them unusable when no signal was present. The mics in the audience also started to crap out. We tried to cover them, but the noise of the rain hitting the plastic covering was way too loud to do that. The 'roof' on the stage was 60 to 100 feet above the stage floor, and since the wind was blowing the rain horizontally, it was no real help. Fortunately, no mics or equipment onstage went down, except for the change of a soaked drum kit."

"We needed to build a shelter over the FOH console," notes crew chief Drane. "We only had a little slit to look out to the stage. Otherwise, we were ensconced in that tarp."

"But, the worse the conditions, the more determined Neil was to do a good show," adds Hewitt. "Looking at him on the stage, with his hair blown back and a look of defiance on his face, standing in the rain, with lightning in the background was something else. He looked like some sort of Norse god."

"The audio got a little messed up from some of the audience mics failing," says John Nowland, who mixed the DVD at Redwood Digital, Young's studio in Northern California. "But we were able to work around it, by and large, by manipulating the different audience tracks. We also were able to take the occasional track from Zeke's 48-track tapes to get around a few problems."

Nowland, who has been with Young since 1983, mixed the DVD-Audio on Young's Neve 8078, assisted by John Hausmann. The studio has custom monitors with TAD drivers. Mixes were stored to Studer 827 2-inch, as well as a Genex 8500 optical hard disc recorder fed through a Pacific Microsonics Model 2 converter using 24-bit/48kHz sampling rates. The audio was also HDCD encoded.

"We usually mix to both formats and pick the one that sounds best for the project," Nowland says. "The added bonus is also to have the analog for future archival purposes, as sampling rates and bit depth increase down the road."

DVD-Video post was handled by Complete Post in L.A. The video had a few minor problems, as well. "We got video noise from the weather and the cables running through puddles," says Gensic, "but we were able to replace those shots from the ISO cams where needed."

That *should* be the end of the story. However, there are two little plot twists that remain.

After Young listened to all the FOH DATs from the tour, he decided that his best performances were *not* from the Red Rock concerts. Although all those performances were used for the DVD and live Webcast, the *Road Rock* CD was compiled from the 2-track FOH mixes, printed on the DA-78 from *other* shows during the tour, augmented by some of the stage ambience/audience tracks. These included one song each from Cleveland and Santa Barbara and three each from San Diego and Vancouver. A DVD-A using the same performances as the CD was compiled in a Sonic Solutions system, upsampling to 96 kHz from the DA-78 tapes, sequenced and configured for 5.1 by Tim Mulligan. Mulligan then took his hard drive to Bob Ludwig at Gateway Mastering for some final touches.

It was a marathon of hard work on every front. But the deadline was met, and Neil Young fans were rewarded with a bounty of Christmas treats. ■

—FROM PAGE 197, BUCKCHERRY

band now has two guitarists, completing Keith Nelson's mission.

"Things started changing while touring with Yogi," he says, "because, for the first time, I started hearing the music as big as it was on the record. It changed the songwriting process, showed us where we could take things sonically. It was a big adjustment, but it was always the goal. The recording process [for *Time Bomb*] was a lot of fun, trading licks. For example, 'Whiskey in the Morning' was done live with the two of us facing each other, blowing solos at each other, adding textures and bouncing ideas.

"When Yogi joined the band, some of the pressure was taken off of me to cover all the bases. I could focus more on songwriting and honing in on what I do instead of just being the guy who carries the record and everything outside of the vocals and rhythm. Yogi's an educated guy who'll say, 'You should go to the fourth,' and I'll say, 'Is that the one with the dot on it?' That's not far from the truth. It's an interesting combination. I think we both have a lot of respect for what the other guy does, so the key to it working is that we know when it's on and when it isn't."

Buckcherry was again thoroughly prepared before entering the studio. "The first thing I was involved with was song selection," says Travis, "myself, the band, Michael Goldstone [A&R, DreamWorks Records] and [manager] Scott McGhee. Then it was six to eight weeks of me driving to their rehearsal room every day, sitting with them, making suggestions on arrangements, bridges, chords, then leaving them alone and letting them work on it. There are very talented songwriters in this band; they're all talented musicians, and it was better to let them take it in their direction. Then I'd come back and say, 'I like it' or 'Try something else.' Some of the songs were written several times until everyone was happy. I think every song stands on its own as being great. Some songs that didn't make the record were still great."

Because of this groundwork, songs were recorded in just one or two takes. "We were always going for the great overall track to add to the album, not to spend nine months in an overdubbing process," Nelson says. "This band operates best when we don't have to create at $2,000 a day. It's so expensive and hard to survive in this business, so to try to make the *White Album* is ridiculous. You hear about people holed up in the studio and locked in for five months—don't they know what they want? We've either got it or we don't. When something doesn't feel right, we move on."

A musician himself, Travis was perfectly suited to complement Buckcherry. "I was a guitar and bass player in various bands in England and Germany," he says. "Every time we recorded, the recordings never came out like I wanted them to. The guitars weren't big enough; the drums weren't big enough. One day I said, 'Let's pay for one more day and let me remix.' Then other bands asked me to remix them. I interned in a studio, became assistant engineer, then engineer." Travis worked in Berlin, England and then New York, where he spent several years producing rap records. "After a while, I thought I should be working with rock, because that's the music I played and was into, and it seemed a waste to be a player who wasn't playing. I spent two years engineering with Michael Beinhorn, who did Social Distortion's *White Light White Heat White Trash* [Travis recorded the CD and

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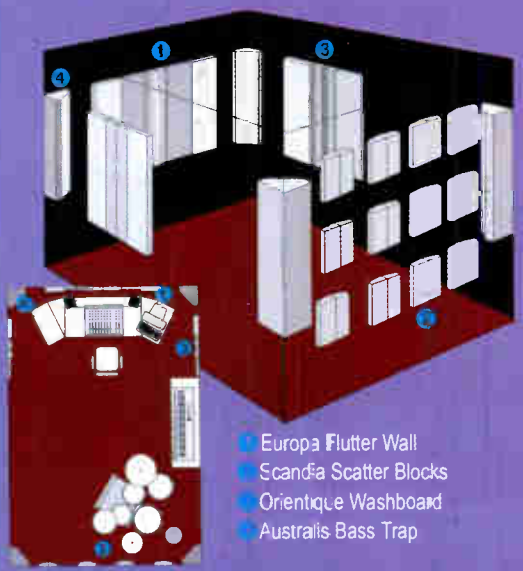

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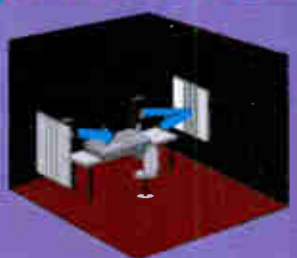

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mixed it with Social Distortion frontman Mike Ness] and David Kahne, who did two Sugar Ray records and a bunch of other things." Travis' diverse production credits include Dope, Wilco, Kid Rock, Chris Isaak, Monster Magnet and No Doubt.

Buckcherry's tour ended on January 2, 2000. The band worked on songs until May, then tracked for six weeks at Sunset Sound with Travis, engineer Jason Corsaro (Soundgarden, Madonna, Robert Palmer) and assistant engineer Geoff Walcha. James Barton spent two weeks mixing at Encore Studio. While the band did not co-produce, Nelson says they were involved from start to finish. "We're very hands-on," he says. "At the same time, we're open to taking directions. We're dealing with professionals, and that's the reason they're there in the first place—because we have a lot of respect for what they do. The real challenge is knowing when to stick up for something you really want to hear and when to shut your mouth. Some songs we definitely had ideas for. I had a vision I needed to see through for a few, whether it worked or not. Others, it was, 'We have the songs, you're the producer, where do you want to take it?' There was a lot of interaction in the pre-production process of writing, moving songs in and out, working on parts with John. From what I hear from other bands, there's not a lot of that kind of producing going on. They say, 'I create the vibe for you.' We know how to light incense; we don't need that. We need someone to help make our songs as good as they can be."

I have no hard and fast rules on how to make a record. It's always different, and you have to set up in a way to make the band as much at ease as you can, because the studio is a strange environment.

—John Travis

For Travis, that simply meant "getting the performances and making sure the band was comfortable enough in the studio to shine and do what they do best," Travis says. "I have no hard and fast rules on how to make a record. It's always different, and you have to set up in a way to make the band as much at ease as you can, because the studio is a strange environment. The whole band was set up all playing at the same time, and everything was miked up so they played like what they are: a live band. It was just a matter of getting takes, and they got them in one or two. They played live, and we got it on tape. It wasn't really tough at all. Everyone is a great musician.

"The whole record was done analog," he continues. "The drums were recorded at 15 ips, 16-track, 2-inch. Everything else—guitar, vocals, keyboards—was at 30 ips on 16-track, 2-inch. The record was cut through Sunset Sound Studio 3's custom Demidio console. So many mics were used; we used an insane amount of equipment. There's nothing in particular

I have to have. I can use whatever's around. I bring in lots of guitars, amps, basses and compressors, a truckload of gear, and some gets used. We used a '65 Vox AC 30 Soldano rack; a Mellotron on a couple of songs. We didn't record in Pro Tools, but a couple of sounds were manipulated in Pro Tools with a plug-in.

"My favorite part of making the record was, at one point, on 'Whiskey in the Morning,' Keith and Yogi were both playing through several amps with the sound blaring and solos live together and guitars sparring with each other. It goes on pretty much through the song—they answer the vocals with little licks, and there's a part where they both play lead. That was a great moment. A lot of cool things happened in making this record."

"One of the reasons we love John," says Nelson, "is because he could have a conversation with us about T-Rex and Bowie and *Exile on Main Street* and *Give 'Em Enough Rope* by The Clash, and he can transcend that to make modern records like [Kid Rock's] *Devil Without a Cause*. I love what he did with Social Distortion. He understands the past, the present, he has amazing ears and a sense of song and is a true producer in every sense of the word. He can get the sounds. He understands the dynamics of how bandmembers interact. He understands songwriting and how important this record is to us. He pushed us, inspired us to overachieve, and I think through that process we ended up a better band, better songwriters and better musicians.

"I think there's something going on here that's not present in music today," he continues. "It's the swagger and the energy of punk, a little sex appeal in the music and the vocals, combined with an amazing frontman with definitely his own take on lyrics and life. Joshua's favorite artists are Michael Jackson, Prince, The Ramones and the Sex Pistols, and so as a band we have that whole spectrum...and he's got to be able to dance to it, too.

"We're not any more real than what's going on, but hearing rich white kids from the suburbs talking about their bitches doesn't seem real. In this day and age, to make it happen, the quick fix would be to get a DJ or a rapper on our record and have someone remix it, but that's not a concern for us. It's not a sprint; we're in it for the long term. Who wouldn't want to sell a million records? But earning our fans one show at a time, taking the slow road, is more fulfilling, because we're doing so on our own terms. Being like our peers is not a concern of ours, because we get to make the music we want the way we want. This is the best job in the world; how can you complain about it?" ■

—FROM PAGE 197, HAROLD BUDD

just a few keyboards and processors. And there's nothing flashy about his playing; he's the first to admit he's not a virtuoso pianist. But he is a great conceptualist. He works in mysterious ways, as they say, and he has become quite adept at using the recording studio to his advantage.

Budd's latest album, *The Room* (on Atlantic Records), offers a fascinating glimpse into the working methods of this singular artist. As is often the case with Budd's work, the CD's 13 pieces (one hesitates to call them "songs") began as titles—though the inspiration actually goes back much further, first to a painting Budd saw in the late '80s called "The Room," and then to a more recent visit to the Museo Marino Marini, which is situated in a medieval church in Florence: "The architects had left a lot of things," Budd explains, "like stairs that just end, going nowhere. Pillars that don't hold anything up. It was completely renovated and modernized, but they kept the spirit of the old alive. I thought it was quite remarkable. I loved the interior—it was haunting, striking, dark, brooding, and just out and out weird. I thought, 'If I take "The Room" as a base and begin exploring the aspects of what rooms can be, then I have an almost inexhaustible source to begin working from.'" For this series of pieces, titles of finished pieces include "The Room of Ancillary Dreams," "The Room of Stairs," "The Room of Corners," "The Room Alight," "The Room of Forgotten Children," "The Room of Accidental Geometry" and "The Flowered Room."

From there, Budd's process involved writing copious notes about the qualities and characteristics of these rooms. Some were musical ideas, some specific sonic notions, but there were also impressionistic literary conceptualization and free association. "I'm sitting at my desk with titles and concepts and ideas and writing them down in longhand," he explains. "Sometimes I write them down in musical notation as a trigger to remind me about certain directions to go. Or I can be specific about a sound I'm looking for. I remember that for 'The Room Upstairs,' I wrote down to myself, 'Remem-

ber, there is a treated windbell track on one of my earlier CDs that's on tape at the studio where I'm going to be. Be sure to drop that on and see if it works.'" To Budd, this stage of the process is every bit as important as the piece that eventually flowers in the studio. The art is in the act of creation as well as the result.

It's noteworthy that, from start to finish, the album took three years to make, but only a small part of it was actual recording time. When it came time to make the CD, Budd returned to a studio that's been his recording refuge for the past several years, Orangewood Recording in Mesa, Ariz. The L.A.-based Budd discovered the studio on a trip to Arizona to visit his musician friend Daniel Lenz. The pair decided they wanted to make a CD of music and poetry, a project that became *Walk Into My Voice: American Beat Poetry*. It was recorded at Orangewood with owner/engineer Michael Coleman handling the technical end, and Budd says, "I just loved the atmosphere there, and I loved working with Mike." Orangewood is equipped with a Trident Series 65 console and, important for this project, a Yamaha concert grand piano. "The room is like the rest of Mesa, Arizona—dead," Budd says with a laugh. "But that's fine, because I like to have control of the ambience. So, all of the echo-type effects were digitally produced, not spatially produced." The CD was recorded to ADAT, with most cuts requiring fewer than a dozen tracks. Piano was captured with two AKG 461 mics. The Hammond M-3 was recorded in stereo, as well, while electronic keyboards—such as his "primitive analog piece of crap Casio 202 that I adore," an "ancient" Ensoniq digital and a couple of Rolands—were cut direct. Chas Smith contributed a pedal steel guitar line to one piece, and Budd's son Terrence played acoustic guitar on another.

Budd's working method in the studio usually combines some careful planning with bursts of improvisational playing and, always, an openness to serendipity. For example, on the complex track "Room of Mirrors," which features piano, synth, M-3 and various effects, "The piano bit that starts out after a minute-and-a-half or so was planned, but where it went after that was totally improvised," Budd explains. "I had originally planned and composed out in standard notation two pages of so-called mirror canons for celeste, and my idea was to play them all, upside-down and backward, so I would have this glittering curtain in the background that would be all mirror canons. No one would know what they were except for me. That was my idea. But when I got into the studio, I realized this curtain made it impossible for anything to happen in front of it, irrespective of how far back I put it in the mix. It just sucked up all the oxygen in the piece. So I reluctantly scrapped the idea and replaced it with little pieces [of the sound curtain instead]."

Comments engineer Coleman, "He loves to experiment. I think he comes in with some ideas in his head, but he's certainly open to change. Usually, we'll start a track and I'll say, 'You want a click on this?' and he'll say, 'Yes,' so I'll set up a click; maybe he'll ask for it to be a little bit slower or a little bit faster, and then he'll start playing, and it will have absolutely *nothing* to do with the click! At the end he'll say, 'Maybe we won't use the click.'" Adds Budd, "I always go into the studio with a very solid conceptual idea of what direction I believe I'm going to take. But I also know that in the working environment things are going to change, sometimes radically, and I take that as a given.

"Michael's got me pegged to a T," Budd continues. "He knows what I want, and he knows how to get to it fast. He knows that I like to play with effects, and by this point he knows what my taste is there. We like to improvise with effects, too; we get into some very, very

elaborate effects, where we harmonize [sic] it, put it through another chorus, re-chorus that in another way, with no real plan. We're just throwing it in there and seeing what we get, and then trying to fine-tune it. Like on 'The Candied Room,' we have some very elaborate improvised feedback and the live piano. It sounds like a zither or something, but it's just a piano, and we messed with the sound until I got something magical on it." Among the reverbs and delays Coleman and Budd used on the CD are Lexicon PCM 60, PCM 70, PCM 42, Yamaha SPX 90 and REV7.

"When a piece is done, I mix it before going on to any other piece," Budd notes, "so there isn't really ever a mixing session per se. I like to work that way to retain the freshness of the inspiration and improvisation." Because of the degree of experimentation with effects, there is usually just one master take of each composition. Occasionally, Budd will take notes about how certain finished effects were achieved, but for the most part, these sonic events are undocumented and, perhaps, cannot be reproduced without considerable effort.

Budd performs infrequently and rarely in the U.S. He lived in England from 1986 to 1991 and says, with a touch of wistfulness in his voice, "I had a wonderful life there. I had a British version of a green card, and I traveled all over the continent and concertized a lot and had quite a professional life there. I had to get out of America to get a professional life going where I could actually make a living. I'm not complaining, mind you," adds this warm self-effacing gentleman. "It's just something you have to do." These days, his concerts usually consist of him improvising on piano against a CD containing some of the electronic backdrops he has conjured in the studio.

He rarely plays when he isn't working on a specific project; in fact, he no longer even has a piano in his L.A. digs. "I'm not really a pianist," he says with typical humility. "I'm somebody who plays the piano...sometimes." But when he does sit down at the keyboard, he makes the most of it, as his impressive discography from the past 25 years attests. And there's always something interesting on the horizon. When we spoke, it was a prospective group collaboration with British guitarist/composer Bill Nelson, bassist Jah Wobble, singer/accordionist Anna Domino and several others that had the wheels spinning. He knows, more than most, that his next inspiration might be just around the corner...or in the next room. ■

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—FROM PAGE 202, MICK GUZAUSKI

roadmap for the edits that were done on the original master so that he could duplicate them in the Pro Tools domain.

With a dedicated surround mix matrix and panning joysticks, the Oxford is made to order for multichannel mixing, according to Guzauski. "It's set up pretty much so that you can go into the multichannel mix mode, in which case every channel feeds the multitrack buses, and you can pan to 5.1 or 7.1 channels," he explains. "Panning is easy. There's a divergence control and a sublevel control on every channel. The console is made for 5.1, so you don't have to resort to a makeshift method. You can concentrate on the mix rather than, 'How do I bus *this* to make it do *this*?'"

Rather than start with a stereo mix and then pan elements to the rear channels, Guzauski tried to conceive of his *Thriller* mix as a multichannel experience from the ground up. "I thought to myself, 'Now that I have the space to put things in, where do I put them?'" he recalls. "I didn't do any live panning or movement right away, but I basically tried to set up a nice sound field, starting with the center and building out." The center channel in Guzauski's *Thriller* mixes consists of kick drum, snare, bass and lead vocal, with different degrees of divergence into the front side speakers for each of those elements. "In the case of music with a lot of punch, like *Thriller*, it's nice to have three [front] speakers to do that with," he says.

The subwoofer channel predominantly contains kick and bass, sometimes with a small amount of added subharmonic synthesis from a dbx 120X Subharmonic Synthesizer, according to Guzauski. Among the outboard effects he used for the mixes are two Sony 777 sampling reverbs, an Eventide SP2016, a TC Electronic 3000S effects processor, a Sony V-77 and an EMT 140 plate. He also used Distressor dynamics processors and Drawmer analog gates on some signals.

Ironically, Guzauski had not done much multichannel mixing when he got the call to do *Thriller*. His surround experience was limited to a couple of quad albums in the late '70s and a few experimental 5.1 mixes in his studio. Undeterred by his lack of experience and not intimidated by the prospect of working with Jackson (after all, Guzauski has worked with virtually every pop star *other* than Jackson), the award-winning engineer took on the project with the same level of gusto he applies to all his endeavors. "I just thought it would

be fun," he says. "I was planning to get into doing 5.1 mixes, so I had collected three pairs of Tannoy SRM-10Bs, which I love. I hadn't set them up yet when I got the call to do *Thriller*, so we set them up and listened. [Sony Music Studios VP of engineering] David Smith came down with a real-time analyzer and the room measured very well, so we kept it that way."

Asked if his quad experience was relevant to *Thriller*, Guzauski says, "Not at all. The quad mixes I did [for jazz artist Chuck Mangione] were designed to try to create a natural front-to-rear ambience of an orchestra in a room, rather than using it for effects. On the other hand, *Thriller* lends itself to being creative. There's a lot of movement in the music. You can really choreograph the sound."

Although *Thriller* was not recorded with surround mixing in mind, the disposition of the original multitracks worked well in a circular medium, Guzauski says. "All the elements are there to spread out," he says, adding that producer Quincy Jones and engineer Bruce Swedien "did a great job recording [the album]. The parts that work well in the rear aren't married to the elements that are in the front. It's not so much that each sound has multichannel ambience on it, because it doesn't. It's more about movement and choreography than a live performance in the hall."

As he proceeds with the surround mixes for *Thriller*, Guzauski has a few other 5.1 channel projects to add to his schedule: the Eric Clapton/B.B. King album *Riding With the King* and Clapton's latest solo project, *Reptile*, both of which Guzauski mixed in stereo. Now that he has enough perspective on surround mixing to compare it to stereo, Guzauski offers the following comparison between the two arts: "I find 5.1 easier. You don't have as much competition for available space. If you're doing a stereo mix and it's complex, you have to carve around stuff frequency-wise, reverb-wise and level-wise. In 5.1, you have that much more space for placement. You can move stuff out of the way for something else."

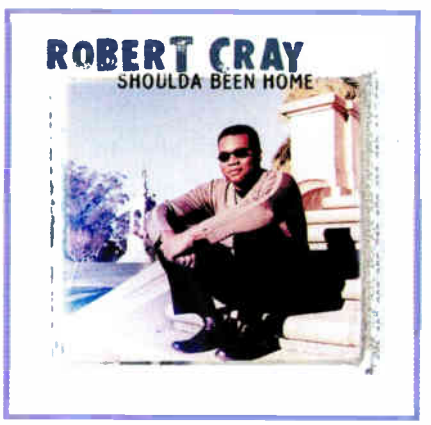
If anyone should know about frequencies, levels, reverbs and placement, it's Guzauski. He's got the hits to prove it. ■

—FROM PAGE 200, COOL SPINS

Studio: Soma Electronic Studio (Chicago). Mastering: Roger Seibel/SAE Mastering (Arizona). —*Mike Mott*

Robert Cray: *Shoulda Been Home* (Ryko)

I'm happy to report that the Cray band's dynamite, Memphis-soul influenced last album *Take Your Shoes Off* was not just a one-off. The group's latest, which comes out May 15, is cut from the same cloth and stands as a nice companion to that 1999 Ryko effort. As with that CD, *Shoulda Been Home* is loaded with songs—most written by Cray; a few by other



bandmembers—that sound like they could have been penned with Sam & Dave or Al Green or Otis Redding in mind. Most of this CD shoots for a classic late '60s, early '70s soul sound, but with a healthy dollop of Cray's blues sensibility thrown in for good measure. The smooth-voiced Cray is up to every vocal challenge the material presents, and his crack band—keyboardist Jimmy Pugh, bassist Karl Sevareid and drummer Kevin Hayes—provides sterling backup worthy of the MGs or BarKays. Cray only cuts loose on guitar on a few tracks here, but, as always, his playing shows impeccable taste throughout—a Steve Cropper trademark. Strong tunes, solid tracks, great vocals. These guys are onto something!

Producer: Steve Jordan. Recording Engineer: Don Smith. Recording Studio: Woodland Studios (Nashville). Mixing Engineer: Don Smith. Mixing Studio: Bay 7 Studios (Valley Village, Calif.). Mastering: Greg Calbi/Sterling Sound (New York City). —*Blair Jackson*

Endo: *Evolve* (Columbia)
You can feel it in your stomach: the punchy bass, searing guitar power chords, the schizophrenic tonality of the vocals and the hell-bent drive of the drums. Endo's debut release, *Evolve*, sounds more like a sophomore release than a first-time outing for this Miami group. It is a well-produced, well-oiled product: The tracks are clean, the transitions are seamless and it has enough fire to perk up the ears of even the most forlorn metal fan. Endo melds the likes of Ministry, PJ Harvey and even some Pantera to create the most diversified production the metal scene has heard this past year. With all of these influences, it is no wonder that each track has a distinctively different sound, from the Rage Against the Machine-like "G.A.D." to the Korn-inspired "Suffer" and "Bum," and they even blend in a bit of Filter, just for good measure. But there is always the heavy metal attitude piercing through songs such as

"Mindset" and "Malice." The group's ultra-modern, post-industrial attitude never lets up throughout the entire release, exposing a knife-edged assault on the listener each step of the way.

Produced and mixed by Paul Trust. Mastering: Tom Baker at Precision Mastering (North Hollywood, CA). Studios: Criteria Studios and Audiovision Studios (both in North Miami, FL). —*Sarah Benzuly*

Sharon Shannon & Friends: *The Diamond Mountain Sessions* (Grapevine/Compass)
Irish accordion virtuoso Sharon Shannon continues to distinguish herself from other traditional players by spicing her arrangements with all sorts of influences. *Mix* last covered her in 1996 when she had recorded a reggae-influenced album with producer Denis Bovell. Her latest album stems from a session she did in Dublin with Steve Earle that moved her to record with a variety of special guests. She and her band, The Woodchoppers, set up a studio in Letterfrack, County Galway, and invited some favorite singers to join them. The Earle track, "Galway Girl," is a standout; his earthy, sardonic voice

makes a perfect foil for the traditional music. Other highlights include recordings with John Prine and Mary Staunton and the Hothouse Flowers. There are a couple of tunes that come off a little too jazz fusion-y for me, but on the whole, this is another delightful, inventive album by an inspired Irish player.

Producers: Sharon Shannon, John Dunford, Donal Lunny. Location recording: Totally Wired Mobile/Tom Skerritt and Ciaran Byrne ("The Galway Girl"). Digital editing: Keith McDonnell. Mixers: Tom Skerritt, John Dunford, Keith McDonnell, Sharon Shannon, Donal Lunny. Studios: The Old Monastery (Letterfrack, County Galway), Totally Wired Studios (Dublin), Westside Studios (London) and Sharon's House (Galway). Mastering: Aidan Foley/Windmill Lane Master Labs (Dublin). —*Barbara Schultz* ■

COAST TO

L.A. GRAPEVINE

by Maureen Droney

It was an easy run from the Valley through a spring-green Topanga Canyon to 4th Street Recording in Santa Monica, where I found producer/engineer/studio owner Jim Wirt cranking out overdubs with (Valleyites themselves) Hoobustank for their debut release on Island/Def Jam.

PHOTO: MAUREEN DRONEY

Studio owner Jim Wirt (far right) and the members of Hoobustank at 4th Street Recording, Santa Monica, Calif.

Although Pro Tools was running in a corner, 4th Street's Studer 827 was getting a rapid-fire workout as Wirt kept the session jumping, laying down bass and guitars on tracks that had been recorded at The Village's Studio A.

Wirt, a bass player in his own right and a definite band maven, purchased 4th Street in 1989. Since then, he's become known for his production and engineering work with Incubus, Sprung Monkey, Fiona Apple and 24-7 Spyz, among other projects. While he does much of his work at the cozy 4th Street, as a producer he tends to tailor studio choices to fit both the budget and style of his clients.

"Our room here is really good for drums," he comments, "but for this project, we wanted more of an ambient sound, so we went to The Village and worked on their old Neve. We did four takes of each song, with a little punching, then some comping in the computer. I think it's really important to have good solid takes before you send them over to the computer. In my opinion, the whole mentality of Pro Tools is really lazing up the business. You can't expect the computer to do everything for you. If you do, you end up losing fills, looping the same thing over and over. Eventually, it just sounds like a big drum machine, and then you're asking a lot of your guitars to make it work. I think you've got to make the music hap-

—CONTINUED ON PAGE 220

NY METRO REPORT

by Paul Verna

Let's face it. These aren't the easiest of times for owners of recording studios. With costs escalating, label budgets shrinking, and more and more work being lost to home and project studios, proprietors of top-flight commercial facilities are having to work harder than ever to keep their rooms booked and draw ancillary revenues from studio-related activities like management and sound design.

In New York, the rigors of the recording studio business are exacerbated by skyrocketing overhead. However, in true New York style, studios here are toughing it out, determined not to let a little thing like an economic slowdown or an inhospitable business climate break their stride.

At Sound on Sound Recording—a four-room, midtown Manhattan facility that has weathered numerous financial storms since opening in 1987, starting with that year's stock market crash—staying afloat means simply doing what the studio has always done: giving clients their money's worth, plus a little more.

Sound on Sound founder/owner Dave Amlen says, "It has become more and more of a creative gambit of, 'How do you pay for the million-dollar room—which is more than a million, by the way—charge a rate that people think is fair, pay your staff, pay your vendors and still make money at the end of the year?' The answer is, you've gotta be really careful. You've gotta watch what you're doing and treat your clients well so that you don't have too much down time."

Giving customers want they want involves providing them with the equipment they need. In the not-so-distant past, that meant a large, state-of-the-art console, 48-track digital recorders, 24-track analog recorders, an

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PHOTO: MAUREEN DRONEY

Producer/engineer Greg Ladanyi inside his home project studio, Los Angeles

COAST

NASHVILLE SKYLINE

by Dan Daley

Spring has sprung again in Nashville, bringing with it a few new studio developments. Here, you can see the ongoing trends in the industry: New studio start-ups are increasingly predicated on computer-/software-based technology platforms—as opposed to the heavy machinery of analog consoles and machines—and on the pursuit of niche business.

Soundstation Studios and Franklin Mastering are part of a complex of independently owned facilities linked to a new contemporary Christian record label created as a joint venture with Zomba. (At press time, the label name was still being formulated.) Although the recording studio and the mastering facility are independently owned, each owner realized the potential benefit of huddling the facilities together in the same building with the label. "Projects are getting channeled from the record labels—there's another one close by called Inpop—to the studio and the mastering studio," says Franklin Mastering owner and chief engineer Jeff Baggett. "They're not the only sources of business for the studios, but it's nice to have them as kind of anchors for the businesses."

Both Soundstation and Franklin Mastering are built around the upper end of the mass-market digital technology revolution. Soundstation, owned by Paul Wright, features a 64-channel Pro Tools 24|MIXplus with a 32-fader Pro Control, RADAR II, ADATs and DA-78s. Franklin Mastering is based on a SADiE system, with other gear such as Z-Systems z-Q2 digital mastering EQ, Waves L2 limiting, Apogee PSX-100 with UV22 dithering and Z-systems routing.

"This is a whole new way to do things for this area," says Baggett. "We're not targeting the country artists as intently as the studios on the Row do. There's a huge group of people here who make music that's not country, and they don't have the budgets that studios on the Row need."

With mastering services going for about $125 per hour, and the studio for $750 to $1,000 a day, the technical infrastructure available is sophisticated, considering the budgets those artists have to work within.

"The Nashville studio infrastructure, as it is, can't address all the [economic] needs of the growing base of different types of music that are out here that major labels don't sign," Baggett says. "They need more budget options than the traditional studio setup can give them."

Another somewhat higher-toned niche is also being addressed in what will become Georgetown Masters' new 5.1 surround mastering suite. In February, owner and chief mastering engineer Denny Purcell began gutting the mini-movie theater he had in the studio's basement, and, with input from consultant Rick Loomis, he expects to have a dedicated 5.1 mas-

—CONTINUED ON PAGE 223

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

In an attempt to prove just how much cooler they are than the rest of us, singer/songwriter Marianne Faithfull and ex-Smashing Pumpkins frontman Billy Corgan were recently in at The Village (West Los Angeles) conjuring dead spirits, sipping absinthe and co-writing songs for Faithfull's follow-up to the 1999 release *Vagabond Ways*. The Village also recently hosted a session with Harry Connick Jr., who was in working on the soundtrack for the film *Life Without Dick*...Producer engineer Don Gilmore (Eve 6, Linkin Park, Sugar Ray) was at NRG Studios (Los Angeles) cutting tracks for new Dreamworks act the Apex Theory...Weezer was busy putting the final touches on a long-awaited new album for Interscope Records at Music Grinder Studios (Los Angeles); Ken Allardyce was there to engineer with Peter DiRado assisting...Graham Nash cruised into Conway Studios (Hollywood) to work on a solo project with the father-and-son production team of Russ and Nathaniel Kunkel. Mariah Carey was also hanging out at Conway with engineer Dana Chappell; the two were working on the soundtrack to Carey's new movie *All That Glitters*... Ocean Way Recording (Hollywood) hosted Buena Vista Social Club alumni Eliades Ochoa. Ochoa was in working on a new album with his group Record One. John Wooler was given the nod to produce the effort with engineer Sally Browder... Out at Bernie Grundman Mastering (Hollywood), mix engineer Alan Meyerson and mastering engineer Pat Sullivan added the final tweaks to *Gladiator II*, the second CD from the Hans

—CONTINUED ON PAGE 228

Billy Corgan, of Smashing Pumpkins fame, gives Marianne Faithfull a squeeze while tracking at The Village (West Los Angeles).

—FROM PAGE 218, L.A. GRAPEVINE

pen first; then that stuff can get it even better."

The four members of Hoobustank, who cite Faith No More, Mr. Bungle and Fishbone as their influences, have been together for six years. They hooked up with Wirt about five years ago. "They were friends with Incubus," recalls Wirt. "And they used to come and hang out at the studio."

"We've known Jim so long that when it came time to get a producer for the album, there was really no contest," remarks drummer Hesse. "He helped us learn how to write. We used to come to him with all sorts of crazy parts, and he helped us figure out how to put them together. And he's always been a lot of fun."

"[Guitarist] Dan [Estrin] and I originally started out about nine years ago in a Chili Peppers-type band, doing crazy funk, total silliness," explains bassist Markku. "And [singer] Doug [Robb] was in another rival band playing bass. We got together, then we got Chris from an ad we placed in the *Recycler*."

"We went through a lot of changes in the kind of music we played," says Hesse. "Like we used to have saxophones and kind of a ska direction. We had a lot of industry interest a few years ago before the [PolyGram/Universal] merger. When that happened, a lot of people were losing their jobs, and it all kind of fell apart. It was a funny time, and we just kind of threw up our hands, got rid of the horns, fired our manager and started writing rock songs—heavier stuff like we all like to listen to. The first three songs we wrote, we recorded with Jim, and right away people got interested. It clicked.

"Paul Pontius from Island/Def Jam, who used to work at Immortal and who signed Korn, made an offer," he continues. "We liked him a lot. We didn't have a manager at the time, but with the help of our lawyer, Jeffrey Light, we did the deal."

Asked to describe the band's music, Wirt says: "The combination of melody and heaviness is what makes it unique. I wouldn't say it's pop, but it's got great melodies and really strong choruses."

As a studio owner, engineer and producer, Wirt often burns the candle at several ends. In between Hoobustank sessions, he was shuttling to Larrabee West, where he was mixing Maverick artists One Side Zero. The right studio for the right job, even though it must be difficult to leave 4th Street's idyllic four-blocks-from-the-beach-best-weather-in-L.A. location.

"I do like the way it sounds here [at 4th Street]," he admits. "It's a good, punchy tracking room and great for overdubbing guitars. It does look a bit like the Winchester Mansion—very quirky—there are a lot of surfaces, both soft and hard, most of them are at different angles. But the guy who built it did a pretty good job. It's extremely solid."

4th Street's MCI JH-428 console is also a holdover from the previous owner. "It's the only thing that fits in here," laughs Wirt. "It used to belong to the Beach Boys' studio that was over on 5th Street."

Along with analog tracking, 4th Street also offers a Pro Tools 24 system with 888 24 I/O and Audio Logic Platinum software. Monitors include Genelec 1031As, Yamaha NS-10s and T.O.C. mains. Among the outboard selection are Neve 1066, Focusrite and Telefunken V-72 mic pre's, UREI 1176, LA-3A and dbx limiters, and Klark Teknik DN22 and DN360 graphic EQs. The recording space features a Yamaha C7 grand piano, a Hammond C-3 with Leslie, Fender, Vox, and new and vintage Marshall amplifiers.

In addition to Wirt's projects, 4th Street counts among its clients No Doubt, George Clinton, Brian Setzer, David Hildalgo, Michel Penn, the Beach Boys and Spinal Tap.

Dropped in at producer/engineer Greg Ladanyi's spiffy home studio for a listen to singer/songwriter Jo Davidson's upcoming release, *Kiss Me There*. Co-produced by Davidson and Ladanyi, the CD is scheduled for a May release on a joint venture between edel America Records and Ladanyi's own Tidal Wave Entertainment Group Inc., with the single of the same name already creating a buzz on radio.

Ladanyi, of course, is well-known for his production and engineering for artists such as Jackson Browne, Don Henley, David Lindley, Jaguares, Fleetwood Mac and Toto. (He won a Grammy for Best Engineered Album for *Toto IV*.) Although he's spent much of his career in high-end studios working on top-of-the-line technical setups, these days, he's found that the digital home studio is a pretty good place to be making records.

"It was an experiment; I was just kind of messing around," he explains. "I moved in, and because of all the digital equipment I was using, I had the idea to put a studio here. I love the analog world, but unfortunately it's become much more expensive to record that way. A setup of this kind allows you to work with an artist in a way where you have more time to be creative and flexible and maintain the sonic quality."

Although just a vocal and mixing space, the studio has expanded to fill two rooms.

"It just grew," he muses. "First, it was for vocals and some rough mixing. Then, on one project I did a mix here and also on an SSL 9000. The mix from here felt better. I imagine most of that had to do with the fact that I could leave it up for two or three days and work on it when I wanted to, whether it was six in the morning or 11 at night. When we A/B'd the mixes, there wasn't a decisive sonic difference. That was an eye-opener."

The nuclei of Tidal Wave's setup is a pair of 32-channel Panasonic Digital DA-7 consoles. Ladanyi is a recent convert to Steinberg's Nuendo recording software, but for Davidson's album, he recorded onto Alesis M20 ADATs and mixed to an Alesis MasterLink 9600, using almost exclusively TC Electronic signal processing. Monitoring is on both Westlake Audio BBSM-4 and -5 speakers and Yamaha NS-10s.

The Ladanyi/Davidson collaboration seeds were planted when Ladanyi first heard Davidson's music some six years ago. The two kept in touch, and when she began working on songs for what became *Kiss Me There*, he offered to help out. "I'd always related to Jo's music," he says. "She's very independent and very focused, with a lot of great songs and ideas. But she didn't have a deal at the time and no real money to pay people. So it became a labor of love."

The project started on 16-bit ADAT at a Sherman Oaks guest house where Davidson's piano was set up. When Ladanyi came onboard, he enlisted the help of friends to enlarge upon the equipment options with Panasonic consoles, ADATs and TC Electronic outboard.

"Jo had started recording a lot of the songs herself; I came in and helped her organize and clean it up," he explains. "I brought over the Panasonic boards, which I think sound really great, and the tracks ended up on ADAT M20s as we progressed and transferred stuff around. We got a lot of help from a lot of people like Ed Simeone at TC Electronic, Peter Chaikin at Alesis and Fred Jones at Panasonic, who were really supportive of the project. Doing a project like this reminds you that people do

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care—a lot of people were touched by Jo's music and wanted to help out."

Although some cuts used as many as 54 tracks, the bulk were 48-track with the ADAT tracks being mixed from a chain that ran through the Panasonics, a TC Electronic Finalizer and into MasterLink.

"We used the Finalizer for overall compression," Ladanyi comments. "It's also got some really good presets in it for stereo enhancing and for dance mixing.

"Actually, I think we used everything that TC makes," he continues with a laugh. "We have the FireWorx for special effects; we used that a lot on Jo's piano and vocals. We have two 3000s, one for long reverb and one for short chorus reverb. The 2000 we use either for chorus or flanging, or specific lead vocal delay and reverbs. The M-1, which is a more hard-sounding reverb, I use specifically on drums. The D-2 is a really cool delay box where you can do different kinds of delays, ping-pong or tap in your own delays to make it follow a certain rhythm. It's also got reverse chorus, flangers and all kinds of greatness.

"The Helicon, the vocal effects box, is fantastic, great for doubling lead vocals. It also creates harmonies. In a mix, it's a good tool; they're not real vocals, but they cover the notes and they sound really cool."

The studio does have a couple of boxes that aren't TC—a Tube-Tech MEC LA, which was used on Davidson's vocals, electric guitar and bass, along with another favorite Ladanyi weapon: GT's Vipre tube mic preamp. "It's got five tubes in there, and you can control the impedance," he enthuses. "You can raise the highs and bring the mic closer to you, or smooth it out and make it rounder. There's a rise time control that will push the mic away or bring it closer. If somebody has hard 'esses,' you can slow it down, and they become softer without having to go into using a de-esser. It's a classic."

Additional "secret weapons" at Tidal Wave include a pair of Mastering Lab mic pre's and the Panasonic 8-channel A/D converter mic pre.

Microphones include a Soundelux U95S and an Audio-Technica AT40, both of which were used for Davidson's vocals. An AT404 was used for pianos. Groove Tubes, both FET and tube, were also put to use on piano, guitars and drums.

"When I did Jackson Browne's *Running on Empty* at a very young age, it broke a lot of rules," Ladanyi notes. "You recorded anywhere, and you did whatever you had to do to get the music on tape. I learned that there is no one right way to do everything.

"I love tracking and going to the big studio—it's a lot of fun. But when you get into overdubs, vocals and mixing—all the things that paint the picture—it takes time, and it's nice not to have financial pressure over it."

Got L.A. news? E-mail MsMDK@aol.com.

—FROM PAGE 218, NY METRO REPORT

ample supply of outboard gear, top-notch microphones and preamps and a crack maintenance team that could keep the gear running fault-free.

Today, ensuring client satisfaction involves all of the above, plus Pro Tools. Lots of Pro Tools.

"One of the things we noticed about Pro Tools is how it became integrated into the professional environment," says Amlen. "When we picked up on that, we decided to make a serious investment in the technology. We now have three systems for four rooms. One is a Pro Tools edit room that you could mix in, with a Pro Control and up to 48 channels of I/O. Then we have one in our AMS Neve Capricorn digital room, and another system that goes back and forth between our two analog rooms, which have Neve VR and Solid State Logic 9000 J consoles."

Sound on Sound COO Christopher Bubacz notes that Pro Tools has infiltrated areas that used to be dominated by analog recording, such as jazz—traditionally one of Sound on Sound's fortes.

"There are more and more jazz sessions being done in Pro Tools," says Bubacz. "Even some of the diehard analog fans are, if not recording to Pro Tools, at least editing and sequencing in the format before they go to mastering."

Even though Sound on Sound is committed to Pro Tools, it has by no means de-emphasized the many other formats it offers.

"For most home studios, Pro Tools is their console, their multitrack, their outboard—everything other than, maybe, what they burn their CDs on," observes Amlen. "On the other hand, we have Sony 3348s, Studer A827s and A820s, racks of DA-88s and Sony PCM-9000s. There really isn't anything you could walk in with that we wouldn't be prepared to handle."

The Sound on Sound staff's approach toward Pro Tools mirrors their attitude toward the MDM movement of the early '90s. Rather than fight the trend, as some professional studios did (and continue to do), Sound on Sound embraced the new technology without abandoning core products.

"Years ago, when ADATs and DA-88s were such the rage, we were sitting here with our A827s and 3348s, trying to figure out what to do," recalls Amlen. "We decided to buy DA-88s and make them available to our clients. We told them, 'Here they are. The rate's the same whether you use an A827 or a rack of three DA-88s or ADATs.' We thought to ourselves, so many people are using this technology, and they're not going to pay extra to rent it from outside or inside. But we, being a state-of-the-art studio, can afford to embrace a technology that a home studio is totally based upon and can't build upon. To us, it's an add-on—a value-added item that our clients can use and integrate into the larger picture, as opposed to it just being the beginning and end unto itself."

The technology mix at Sound on Sound includes a healthy assortment of outboard gear—and a punctilious approach toward how that gear is positioned in each control room. Amlen explains: "My former employee [engineer] John Siket used to call this the Noah's Ark of studios, because we have two of everything," says Amlen, laughing. "He always teased me about it, because we even reached the point where the gear is in the same position in the respective racks."

Bubacz adds, "It allows our clients to move from room to room and not have to think, 'This room doesn't have a Lexicon 480L, but the other one does.'"

On a recent visit to Sound on Sound, Amlen and Bubacz were gathered in Amlen's office while the studios hummed with activity. Contemporary jazz guitar icon Mike Stern was doing overdubs in the Capricorn suite, while rock act the Verve Pipe had the two analog rooms locked out. The band was mixing with Chris Shaw on the Neve VR in Studio A and with John Holbrooke on the SSL 9000 J in Studio B. Producers Brian Malouf and Adam Schlesinger (of Fountains of Wayne and Ivy fame) were overseeing the project.

Among the topics on Amlen's and Bubacz's agenda were the ancillary businesses that Sound on Sound is exploring in an effort to supplement the revenue from its rooms. Like many fa-

cilities with experienced, well-connected owners and dedicated staffs, Sound on Sound has ventured into management, with clients including mixing engineers Matt Hathaway, Mark Partis, Jason Standard, Joe Pirrera and musician/producer Ted Cruz.

"We're trying to diversify from the main core of just being a recording studio," says Bubacz, who joined Sound on Sound after managing Bear Tracks Studios in Suffern, N.Y., for nearly a decade. "We're trying to put together a situation where the main members of the company are actively involved in these new revenue streams."

Besides the management wing—which goes under the name SOS Management—the company has launched a mastering division aimed at servicing indie clients who are looking for a more affordable alternative than New York's world-class mastering studios.

"We're not trying to compete with Sterling or Masterdisk," says Bubacz. "It's an entry-level mastering operation for regional and local acts."

In addition, Sound on Sound has entered into an alliance with sound designer/composer Fred Samalin, who runs New York-based Eagle Peak Music. Operating mostly out of the Capricorn room—which is equipped for 5.1 channel mixing—Samalin brings to the table a long trackrecord of writing original music for film and TV hits (including *The Sopranos* and *Dharma & Greg*), as well as extensive production music and sound effects libraries.

"The goal," says Amlen, "is to not be at the bottom of the food chain where you get told what you're going to be able to charge, but to be more high up and have more discretion as to how things are going to be done."

Send your New York news to pvernacular@vernacularmusic.com.

—FROM PAGE 219, NASHVILLE SKYLINE

tering studio up and running by the beginning of summer.

The design could be called minimalist: There will be no specific console, just whichever small analog or digital mixer Purcell feels is right for each job. Monitoring will be via Nova speakers and custom subs powered by Nelson Pass amplifiers.

Purcell won't discuss the costs associated with the new studio, but he did say that a slew of surround titles from Warner Records are already com-

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ing to his door, perhaps a sign that the major labels are beginning to turn their attention toward new releases and away from legal battles with online music companies and the huge mergers they've been going through.

"I hope so," says Purcell, "because I think that DVD-Audio is the last chance for the professional audio business to present the consumer with quality, with an idea of how good music can sound. This [format] is the closest they're ever going to get to being in the same room with the artist while they're performing. It's that good. So it's worth the risk."

School of Audio Engineering's Nashville location now has a new 5.1 surround classroom. The studio, equipped with Mackie-powered monitors and a Mackie 8-bus console, was built by Nashville-based Michael Cronin Acoustical Construction. The studio has one unique wrinkle: Cronin added a second pair of rear surrounds behind the first rank to widen the surround field for a class of 20-some students.

Cronin will also be building the classroom studios at SAE's next location, which is in North Miami, not far from the Hit Factory Criteria complex. The 30,000-square-foot building will be a departure from SAE president Tom Misner's otherwise boilerplate designs for the company's other 30-plus studio/schools. In Miami, three control rooms, equipped with an SSL G-plus, a Digidesign Pro Control and a console to be named later, will face on a large central recording area. It will also, Misner explained, be an aesthetic departure. "This is going to be much more of an up-market type of facility in terms of design," he says. "It will be closer to Studio 301 [Misner's opulent flagship facility in Sydney, Australia]." The reason? "Miami is critical for developing our school in the South American market," the always-candid Misner replied. "Down here, we want the glitz."

Contact Dan Daley at danwriter@aol.com.

—FROM PAGE 219, SESSIONS AND STUDIO NEWS

Zimmer film score...**Future Disc Systems** (West Hollywood) put the final coat of gloss on Kina's (Dreamworks) current remix single "Me"; the cut was remixed by **Barry Harris** and **Chris Cox**. In on the mastering session were Future Disc engineers **Kris Solem** and vinyl specialist **Kevin Gray**. Solem also mastered the new album by artist **Rome** entitled *To the Highest*, set for release on JTJ Empire Records.

NORTHEAST

Out promoting his latest album, *Eat at Whitey's*, **Everlast** treated a lucky few at **Indre Studios** (Philadelphia) to an acoustic set hosted by local radio station Y100; studio owner **Michael Comstock** recorded the session...Sound on Sound Recording (NYC) saw a number of high-profile artists pass though in recent weeks: **Jennifer Lopez** got the remix treatment from producers **Puff Daddy** and **Mario Winans**; **Jim Janick** and assistant **Bojan Dugich** were in to engineer. Arista's **Faith Evans** cut some vocals with producer **Mario Williams**, engineer **Janick** and assistant **Alison Lauth**. **112** also camped out at Sound on Sound with producer **Saint**, engineer **Wayne Allison** and assistant **Stennett Cyril** working on some vocal takes...It's been a busy spring at **Shelter Sound** (NYC): **Bob Power** produced the new **Citizen Cope** CD for Dreamworks. **Joe Ferla** mixed the new **Chris Cheek** album for Fresh Sound records. Producer **Gary Katz** and engineer **Dave Dill** worked with artist **Sarah Buras** on an upcoming release for Dreamworks. **Steve Addabbo** produced a new effort with **Love Seed Mama Jump** for Plump/Artemis; **Matt Kane** was in to engineer.

NORTHWEST

A moody '80s synth pop classic gets a facelift at **Toast!** (San Francisco). Studio owner/producer **Philip Steir** recently remixed **New Order**'s "True Faith"; Steir created entirely new music for the song, keeping only the original vocal tracks. Also at Toast!, **Butterfly Jones**, which includes **Michael Gurley** (formerly of Dada), were in Studio B with Steir working on their debut effort for Vanguard Records. And, as always, SF locals **Third Eye Blind** spent some of their label's money working on a new song for an upcoming film...Studio 880 (Oakland, CA) hosted the shooting of VH-1's *Behind the Music* for **Green Day**. Members of the band returned to Studio 880, where they tracked their Platinum record *Warning*, to talk about their musical career. Also, **Castro Sinatra**, the new project of the rhythm section of **Faith No More**, tracked drums for 12 songs. Tone engineered the session, and **Reto Peter** assisted. Artist **Shane Kelly** also cruised out to Studio 880 with producer **Jeffrey Chin** and engineer **Mark Needham** to work on her new record; Tone was in to assist...**Full Spectrum Jazz** recently stepped into **Annex Digital** (Menlo Park, CA), formerly Music Annex, to work on their second album. The effort was tracked and mixed by senior engineer **Tom Carr**...Rainstorm Studio (Bellevue, WA) hosted hardcore industrialists Contingence. They were tracking a new album with staff engineers **Paul Speer** and **Steve Carter**. Additionally at Rainstorm, punk rock outfit **Bound by Fate** were in working with Carter on their debut single, and Speer finished mixes for **Room XIII**'s latest EP...**Chris Bingham** stopped in at **Audio Logic Inc.** (Seattle) to begin work on his fourth CD. **Jay Kenney** got the nod to engineer the effort, and Chris Bingham and Sue Tin-

PHOTO: EDWARD COLVEP

L to R: engineer Tim Nitz, producer Battlecat and Soundcastle owner Buddy King behind the new SSL SL 4000 G Plus inside Studio 2.

PHOTO DAVID GOGGIN

Mastering engineer Pat Sullivan (left) and recording engineer Alan Meyerson in working on Gladiator II at Bernie Grundman Mastering, Hollywood

ney shared production duties. Jim Evans put three more songs in the can for his upcoming release *Boundless*; Kenney was again in to engineer, and the production was handled by Jim Evans and Bingham. A cappella sensation m-pact tracked vocals for their contribution to an all-vocal tribute to The Beatles. Britt Quentin's arrangement of "8 Days a Week" was engineered by Kenney and Guy Staley and produced by Quentin.

SOUTHEAST

New England's Staind finished up their new album at Southern Tracks Recording (Atlanta). Nü metal-god Josh Abraham was in to produce the effort with Brendan O'Brien mixing. Ryan Williams was the second mix engineer, and Karl Egsieker was tapped to assist...Ruby Red Productions (Atlanta) recently hosted Island/Def Jam recording artists Injected. Butch Walker of the Marvelous 3 switched gears to produce and co-engineer the forthcoming project. .Union Station stepped into the Neve room at Seventeen Grand (Nashville) with producer Alison Krauss, engineer Gary Paczosa and assistant Chris Scherbak to work on a new project for Rounder Records. Artist Chris Thile was also hanging around mixing and making some final tweaks to a new self-produced release; the sessions were engineered by Paczosa and assistant Bobby Morse.

Gold Sound president Bryan Gold seated at the facility's new AMS Neve Logic 3 console.

PHOTO GEORGE PETERSEN

Farmer Beach Boy Al Jardine was at Shark Bite Studios in Oakland, Calif., mixing his recent concert CD, which was recorded live at the MGM Grand in Las Vegas. L to R: studio owner/engineer Mark Keaton, Jardine and producer Stevie Heger.

MIDWEST

Sunsinger Recording artist Edwin Ray recently completed tracking at Pogo Studios (Champaign, IL) with producer Mark Rubel. The upcoming release features Starcastle guitarist Matt Stewart. Also recording at Pogo was Tibanna, of Portland, Ore, with Paul Malinowsky engineering...Grammy-nominated artist Billy Branch recently finished his latest blues album *Super Harps* at Paragon Studios (Chicago) with engineer Jack LeTourneau.

STUDIO NEWS

Allen Sides of Ocean Way and Akira Taguchi of JVC have teamed up to open the new Ocean Way/JVC Mastering Studio (Hollywood). The new room boasts a dizzying array of both digital and analog mastering solutions... Soundcastle (Los Angeles) recently installed a Solid State Logic SL 4000 G Plus console. The 80-input board will reside in Soundcastle's Studio 2...Soundtrack Boston, a seven-room recording and post facility, upgraded its Studio E with the installation of a Sony DMX-R100 digital console...Gold Sound (Southfield, MI) an audio post facility, recently installed a 16-fader Logic 3 mixing console and AudioFile audio editing system in its new room, Audio Post 3. ■

Send your sessions and studio news to rbanson@intertec.com or fax 510/653-5142.

PHOTO DAVID GOGGIN

Alan Yashida (left) and Allen Sides hanging out at the recently opened Ocean Way/JVC Mastering Studio, Hollywood

—FROM PAGE 16, HOW DO I WRITE THEE

time, time wasted stalled, has been cut by 90%! And here is the wisdom of the ages, embarrassingly simple, said daily but never heard—walk away. Take the Harley out for a sandwich somewhere in the next state. Go home and take your family out for a nice long dinner and do *not* discuss or think about the stall. Maybe you could watch Lexx backward (it almost makes sense that

Of course, if the dot is there, you had better jump on that sucka real fast, because its zeitgeist assures that it has also appeared to a hundred other people around the world at the same time.

way) or crack open that bottle of Patron. Or, better yet, do both at the same time. (Then *everything* makes sense.)

When it comes to games for breaking a block, there is an old saying: "It don't matter, it's all good." Anything goes, as long as it has absolutely nothing to do with the dreaded stall.

2. Crunch.

About one half of everything I create is done this way—the hard way. I sit down and with an even-paced, methodical follow-through, I literally *build* the project. Piece by piece, hour by hour, I construct the thing, review and destroy parts only to redo and re-evaluate them, as well. Slowly, but steadily (and this is important), the piece emerges. It always gets done, and it is always done just about when I tell people it will be. More or less, kinda sorta.

But the thing about working this way is that I never really feel it is my best work. As in a vocal that took 18 takes, there is a certain structured coolness. I sense magic lost forever.

Let me give you an example. About one half of my *Mix* columns are crunched, methodically built on the kernels of concepts. I work hard to slip in the hidden meanings, the inside references, the double and triple entendres, and even the horrible puns and pointless alliteration. I move and splice paragraphs over and over until I feel the flow is right. They take me four to eight days each, and I can spot these crunched columns easily when I read one later, even if it's 15 years old.

3. But the other half are flashed.

I either wake up with them already in my head, or I sit down on the last day of deadline and they instantly appear, all done, ready to transcribe. These are my best columns, the ones that get the most response, the ones that generate a feeling of bidirectional communication with you. These take me one-and-a-half hours, and I never even re-read them for spelling errors. They are the real thing.

Let's take music. The single challenge when flashing a song is getting it down before that crystal clear, 100% complete, tracked, mixed and four-color packaged vision fades. It's just a race to see if you can get it captured before you lose it. And, for me, it is complicated by the fact that the act of capturing it is apparently destructive. That is, once I start the process, the fade begins with a vengeance. So I get one shot, and it must be in one sitting. Maybe some of

you are more lucky (read disciplined) than that.

SO WHAT'S ALL THIS REALLY ABOUT?

It's all about the kernel—that tiny dot floating in the cosmos. Every column, every painting, every song is built around a *dot*. An idea, a concept, a vision that is almost infinitely small, yet can be opened, with skill, to encompass and display a complete and satisfying story or feeling.

But if the dot isn't there, the piece can't flash, and you must then resort to constructing it, to synthesizing it, using what you have learned from flashing.

Of course, if the dot *is* there, you had better jump on that sucka real fast, because its zeitgeist assures that it has also appeared to a hundred other people around the world at the same time.

But there are even cosmic rules that help you here as well. (The world actually *wants* you to succeed.) So 100 people got the same exact vision dropped into their heads at the same time—the perfect three-minute tune. Thirty-one of them are farmers and really don't even remember it the next day; 17 hate their jobs so much that they never even heard it; 19 are too young to know that they can do anything with it; five are in high school bands; one is a tone deaf welder; one a rodeo clown; and two are lounge lizards who will screw up *any* song they hear, be it from the radio *or* the cosmos.

Of those 76, trombones are the instrument of choice for three, so they are not a threat, but the other 24 are racing to get the thing jotted down as fast as possible. It will sound way weird to most Chinese musicians, so 13 more walk away wondering why that stupid, decadent, western pop tune appeared in their heads at all. This leaves 11 after your tune, including two in Nashville! You had better get on these flashes as soon as they appear.

SO WHO REALLY CARES ABOUT WHAT THIS IS ALL REALLY ABOUT?

Ahh. This finally brings me to the important difference between flash and crunch. I see in others what I feel in myself—the flash is real, but the crunch is just we being technicians. Skilled techs, for sure, but still only techs, copying the true artistic creativity that we know well from actually having done it before. When we crunch, we are in a way forging work. We are copying our best flashed work, or at least constructing a piece using all of the components and techniques that we believe made us successful with our flash work.

Granted, there is nobody better qualified to rip us off than ourselves, but the fact remains that a copy is never as good as the original. The range of expression, integration, flow, detail, the seemingly effortless brush strokes, guitar licks, or even the unfolding of a story or idea in prose is always less and even a bit stilted to the most discerning.

But since Mickey the Angel and the Sistine Chapel, artists have been struggling to keep a healthy balance between pure creation and working to pay the rent. And you know that we all—you all—do both. I guess the trick is to get so good at the crunch that almost nobody can tell it from the flash. You want the day to come when they know you flashed *and* crunched your way through life, but they say: "It don't matter, it's all good." ■

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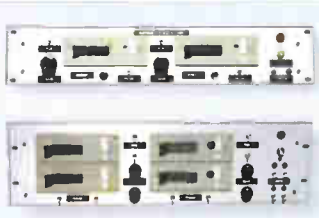

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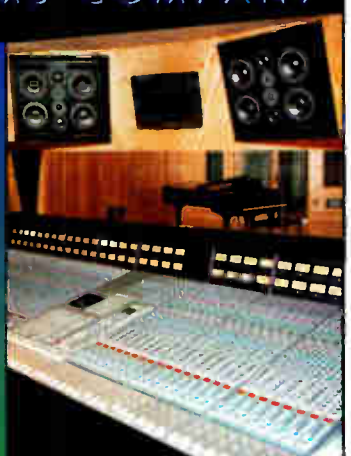
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—FROM PAGE 22, NAMM BITS

being shown in a prototype of a configurable music and/or mixing controller, called Surface 1 at the MIDIMan booth around the corner. Tactex also says that its fabric will show up as a left-hand controller on a new analog synthesizer that will soon be introduced by Moog. Max, which was formerly marketed by Opcode, was thankfully spun off before that company's demise to Cycling '74, which is owned by David Ziccarelli, one of the authors of the software; his booth was right across the aisle.

Besides weird musical instruments, there were a number of other somewhat obscure but very exciting technological developments unveiled at NAMM that bear reporting. The smallest booth with the biggest crowd belonged to Celemony Software (www.celemony.com), a tiny three-month-old German company that was demoing an early-in-development voice-processing program called "Melodyne." It looks very simple: You record a vocal (or solo instrumental) line into it and it shows up graphically on the screen, with vertical position as pitch, vertical width as volume and horizontal length as duration. So far, no big deal. But then the bearded gentleman doing the demo would grab a note and move it to another pitch, grab another note and change its duration and reverse the order of two other notes, and you'd swear the soprano re-recorded her solo with different sheet music—the algorithm they're using, whatever it is, is that good. For four days, the duo manning the booth played the same demo over and over, but the reaction they got was always, undoubtedly gratifying, the same: jaws dropped. It will be interesting to see how this evolves and what it will look like when it comes to market—not to mention how well it works on other program material.

On the other hand, the biggest company with the smallest booth was Apple Computer. They were in a little room with no chairs upstairs from the show floor, which you had to be told how to find ("turn right at the Pepsi machine") or else you'd never make it. There, industry veteran Kord Taylor, now the company's music and audio market manager, was demonstrating a G4 hooked up to one of Yamaha's new mLAN8P audio/MIDI interfaces for IEEE-1394, also known as FireWire. The two companies have agreed to cooperate in implementing Yamaha's mLAN "media layer" extension to the Apple-invented 1394 standard, which could be a significant development for our industry: Hopefully, it means a much smoother path for implementation of FireWire—which has already had a tremendous impact on the video world—in music, audio and post-production tools.

Finally, one company was highly conspicuous in its absence from NAMM. Sonic Foundry, maker of products like Sound Forge, Acid and Vegas Pro, which have become standards for audio and video types who use Windows, and who, by any reasonable measure, should be considered highly successful, was supposed to be occupying a 600-square-foot booth in an extremely desirable location right by the entrance doors. Instead, there were just a few potted plants and empty chairs.

Three weeks before the show (i.e., the week before Christmas), the company announced it was cutting spending by $20 million, first by laying off 40% of its staff, and second by canceling its NAMM presence. In fact, according to the company's corporate communications manager, they will not be at *any* trade shows this year and, instead, will be "concentrating on developing new products." No doubt the downturn in high-tech stocks last year had a lot to do with their problems, but still, for a company as well established as Sonic Foundry to have its stock lose 91% of its value in the past year was pretty astonishing. Some observers were saying that the company's costly acquisitions—of a streaming media company and a company that "repurposes content for international development"—were too far away from its core strengths, as well as too much for it financially. Let's hope the company survives this bout with economic distress: We've seen too many innovative music software companies bite the dust thanks to greed, recklessness, over-reaching or just plain stupidity.

Speaking of companies that didn't deserve to die, I've received quite a bit of mail regarding my little diatribe against Gibson's treatement of Opcode, all of it from folks, like me, who are trying to continue to use Opcode's software despite the lack of upgrades and support. Two excellent resources are the Vision Info Site, at www.fmmusic.com/v/, and a discussion and support group at www.topica.com/lists/opcode-users. ■

Paul Lehrman is glad to be back home. Visit his home at www.paul-lehrman.com.

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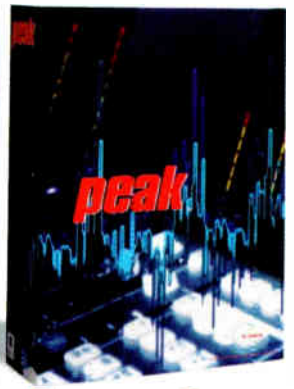

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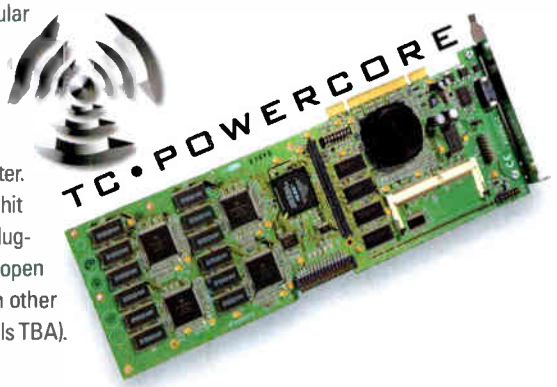

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SONIC FOUNDRY SOUND FORGE

TIPS FOR AUDIO RESTORATION

Beyond cleaning up old vinyl recordings and forensic audio chores, Sonic Foundry's Sound Forge 2-track editing system (with its DirectX Noise Reduction plug-in) can be used for mastering as well as for day-to-day enhancement of audio files. Here are some techniques I used on the CD re-releases of vinyl recordings, such as Martin Luther King's "I Have a Dream" speech and Freddie Fender's *Live at Gilley's* (where it looked as if someone took a knife to the grooves). I used Sound Forge Version 4.5g and Noise Reduction Version 1.0b, which have since been upgraded to Versions 5.0 and 2.0a, respectively, but these tips will work on any version of the programs.

TURN THE CLICK AROUND

The Noise Reduction plug-in can remove clicks and pops from old recordings as well as in brand-new ones, such as occasional clicks/pops in digital files. Usually, the Click and Pop (V.1.0b) or Click and Crackle (V.2.0a) removal plug-in handles the problem nicely. But, every once in a while, a click is so stubborn that the preset won't do it successfully. You can adjust the parameters of the software to try and remove that pesky pop or try the Vinyl Restoration algorithm. However, this may cause audible side effects if you use extreme settings.

A Pencil tool is available in Sound Forge, but I shy away from redrawing audio waveforms. Here's another way to handle the click problem: First, define the close region around a click or pop and double-click to highlight it. Go to Sound Forge's Process menu, and use the Reverse function on that region. Apply the Click and Pop/Crackle Removal algorithm. In Version 1.0b, use the Interpolate rather than Replace function. Then, re-reverse the highlighted region. In 99% of the cases, the click is gone, without audible side effects.

PRINT ME SOME HISS, PLEASE!

The Noise Reduction feature does a good job of getting rid of hiss, but capture a "noise print" of the hiss in a mix before the track starts for an accurate, song-specific sample of the noise you want to remove. When mixing, print some hiss before the song's count off, with all of the effects units on, faders up, etc. —*sans* any automation, mutes and gates.

Sound Forge offers 2-track editing and mastering features.

Capture that noise print where the hiss is steady-state, as described in the manual. Apply a few dB of the Noise Reduction twice, rather than a lot in one shot. The noise reduction will be virtually transparent if used in this manner, with no audible side effects.

Check the Keep Residual Output box during your real-time preview to hear what the program is removing. If it sounds like swirly, dithery zipper noise, then it's probably okay. If you hear any of the program material, then you're overdoing the NR, so back it off. Find what works without side effects and remove that amount of noise. Then try re-applying it a second time, at the same or less amount. On difficult passages, you might try a little bit a third time, if you're daring. When you get it right, you will truly believe that digital audio can perform miracles.

You might want to keep these noise prints on file (in the presets location), so if you get a tape without any hiss before the song starts, you'll have a library of prints to try out, and see if these work better than a default.

NEED SOME AIR?

The Noise Reduction program has a nice high-shelving EQ that defaults to +3 dB at 7k Hz. Designed to compensate for overusing the Noise Reduction, it's designed to sound like an air band-type EQ. The corner frequency is adjustable from 500 to 15k Hz, with a ±20dB gain range. Sometimes, a 1 to 2dB boost works nicely, even without any noise reduction, giving you a bonus signal processor you didn't even think you had.

MP3 ME!

If you're working on material to be used online—data compressed, downloaded or streamed—you can encode the sound file and find out what gets ruined when you convert it. If a tune needs some bottom, a little compression and a bit of top to fix it, then try doing that same processing to the file *before* you convert it. After some experimentation when it's converted this time, it should sound the same as the "fixed" file you tried to restore the first time. Also, try taking a noise print of some hiss from a bit of pre-roll on the converted file and add that to the preconversion processing to remove some of the hiss you're sure to get after it's converted. ■

BY BOB BUONTEMPO

Bob Buontempo is a freelance engineer, producer and writer based in the New York City area.

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Antares' Auto-Tune for the D8B uses advanced DSP algorithms to detect the incoming pitch of a voice or solo instrument as it's being tracked and instantly pitch-correct it without introducing distortion or artifacts. Fully automatable.

Massenburg Parametric EQ. MDW 2x2 High-Resolution Parametric Equalizer plug-in from Grammy-winning engineer/producer George Massenburg. Mono/stereo EQ at 96kHz sample rate for unprecedented clarity and high frequency smoothness.

Drawmer ADX100 includes their industry standard frequency conscious gating, plus compression, expansion and limiting.

IVL Technologies' VocalStudio provides real time vocal doubling, multi-part harmonies and pitch correction in an easy-to-use interface. A free demo is built-into the Digital 8 • Bus. Just add a second MFX card to own this innovative plug-in from a world leader in vocal processing.

TC Electronic Reverb (bundled with the D8B UFX card) provides Reverb 1 and Reverb 2 algorithms from the renowned TC Electronic M2000 Studio Effects Processor.

3 1999 TEC AWARD WINNER!

Normally we don't name competitors in our ads. But in this case, Mix Magazine published the other nominees for the 1999 TEC Award for Outstanding Technical Achievement in Small Format Consoles: Allen & Heath's GS-3000, Digidesign's ProControl, Panasonic's WR-DA7, Spirit's Digital 328 and Yamaha's 01V. Thanks to all who helped us win this prestigious award.

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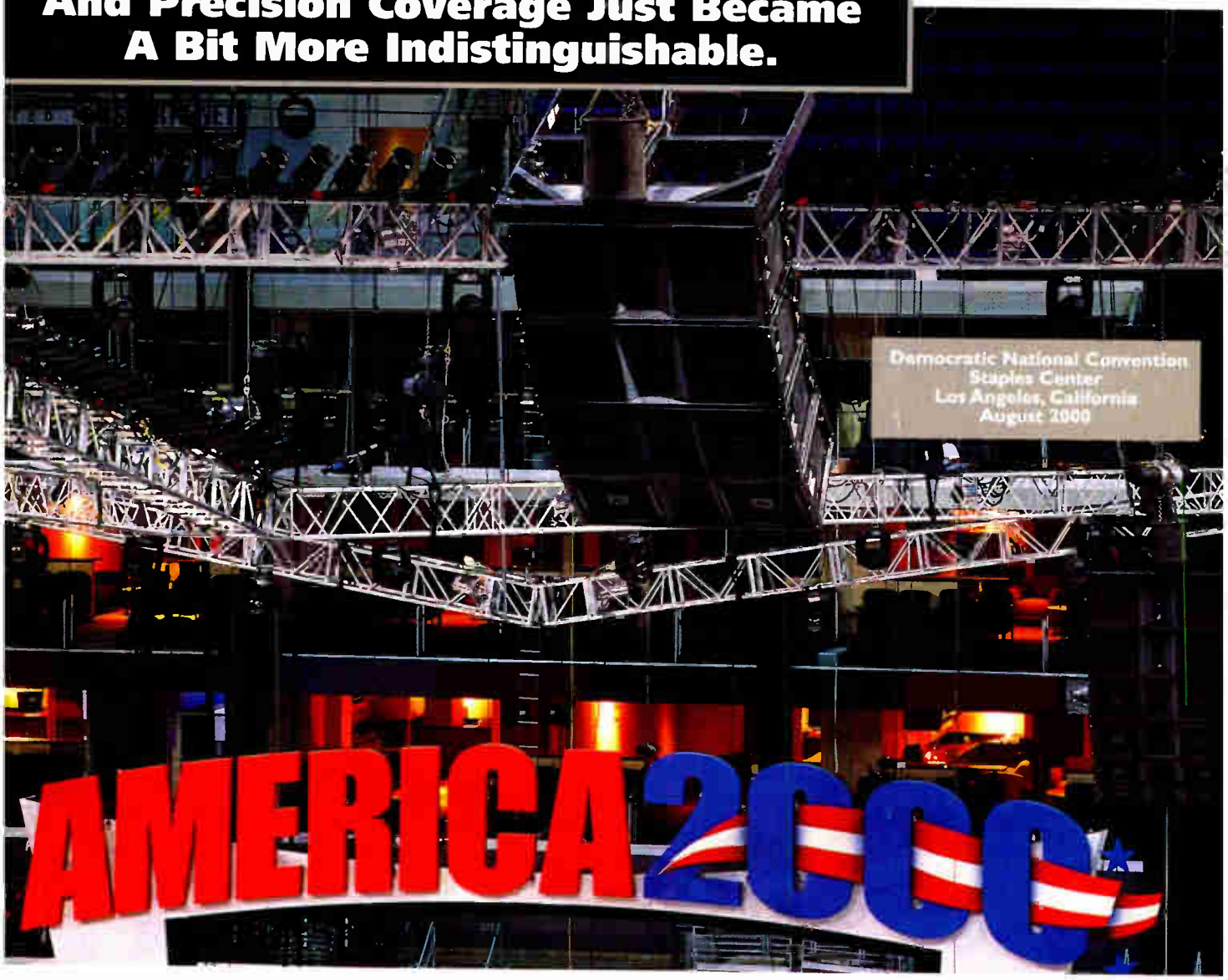

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