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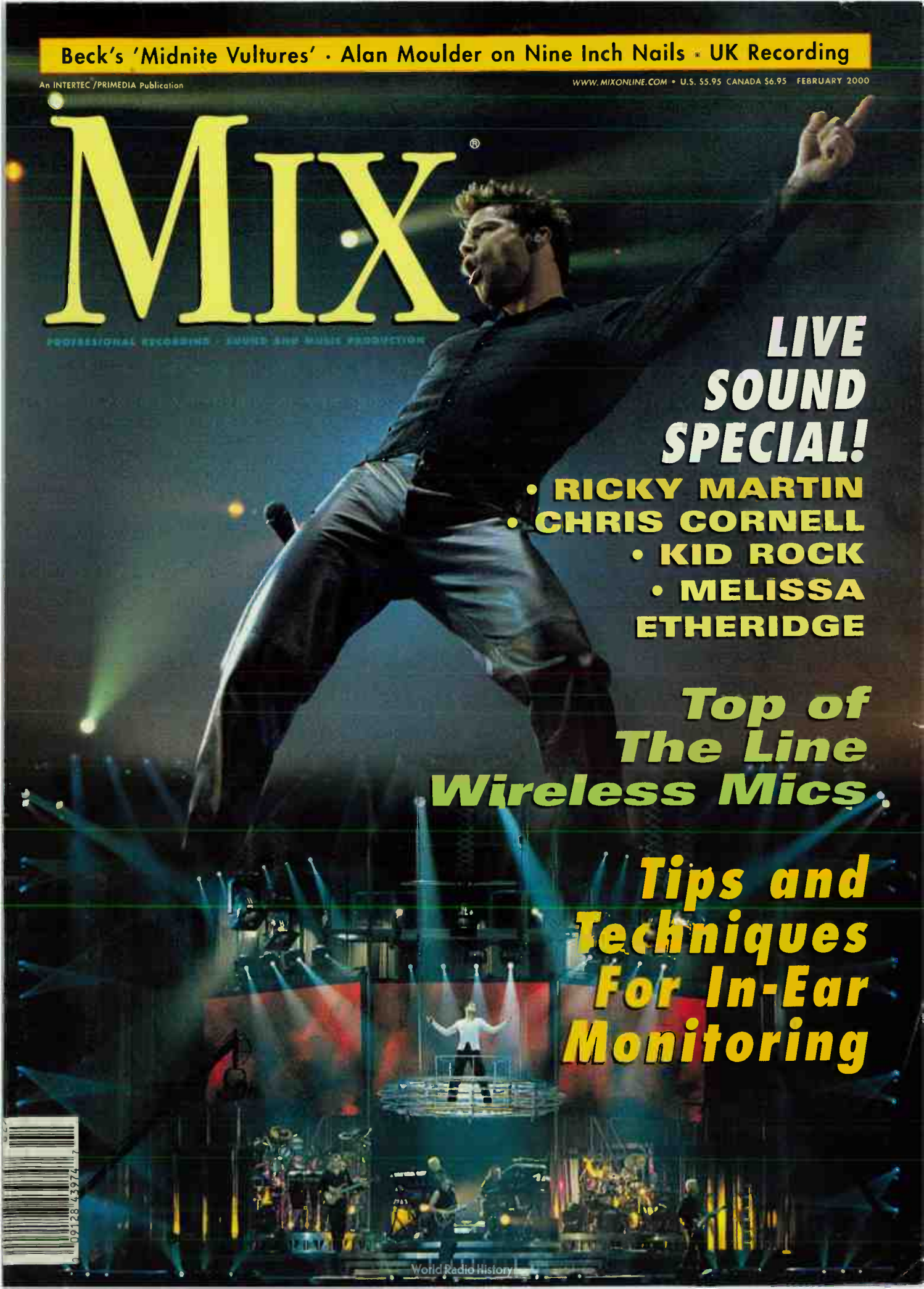

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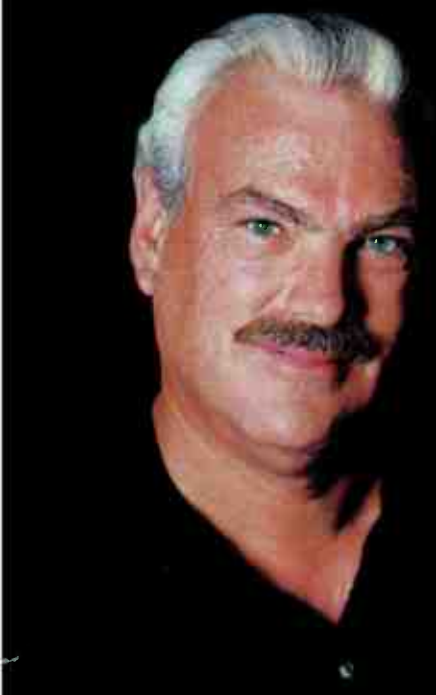
A Passion for Sound



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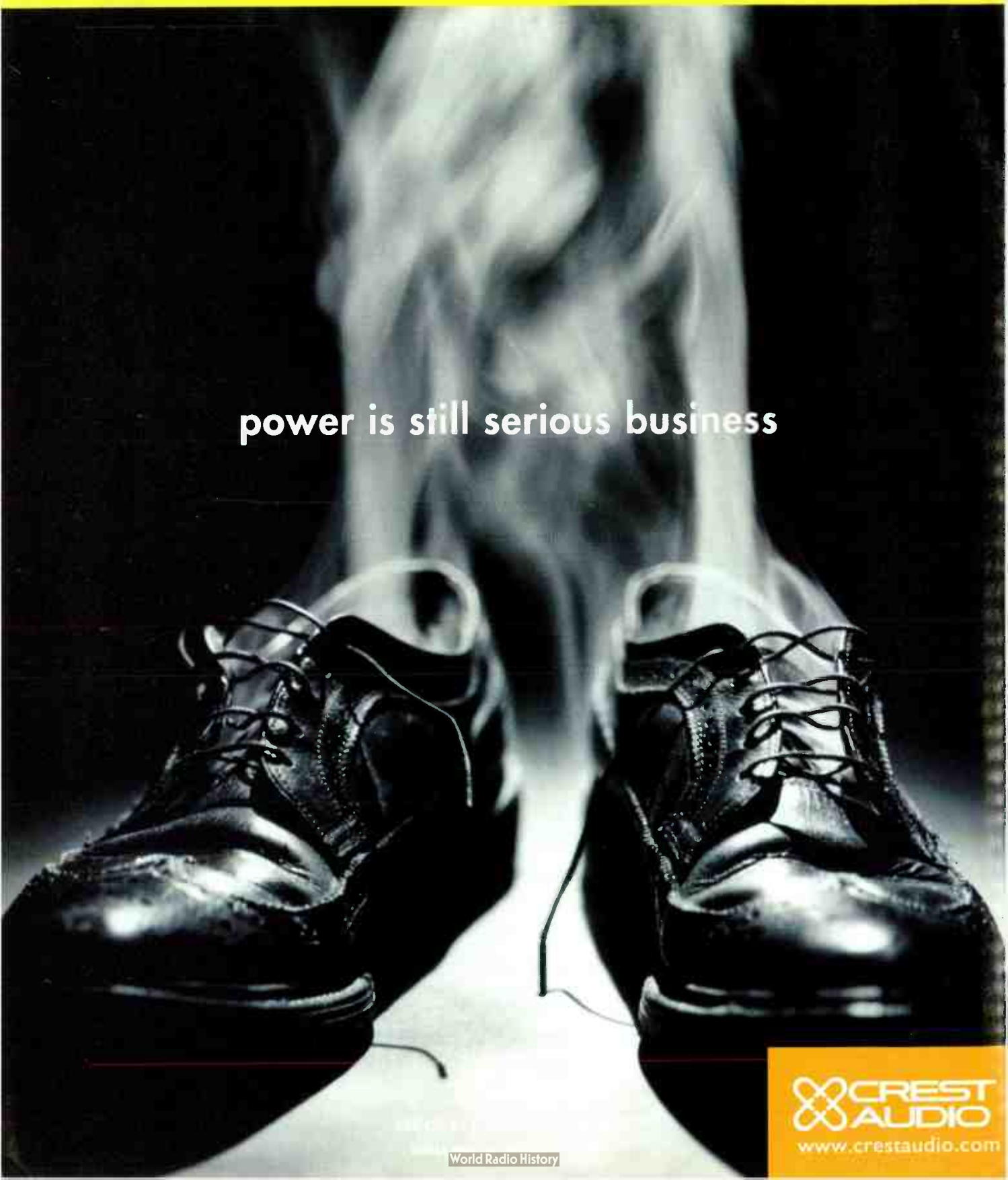


PS110B

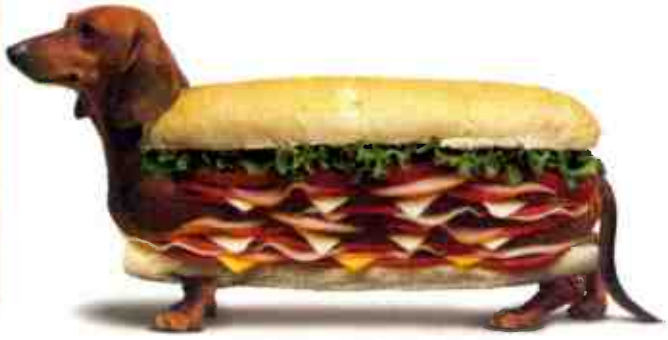
PS110B with grill

PS110B Back

PS115B

PS115B Back

It's a Dog Eat Dog World



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FEBRUARY 2000, VOLUME 24, NUMBER 2

AUDIO

PAGE 67

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LIVE SOUND

PAGE 20

SOUND FOR PICTURE

PRODUCTS

PAGE 42

DEPARTMENTS

On the Cover: This month, Ricky Martin begins another leg of his "Livin' La Vida Loca" world tour in Puerto Rico. Firehouse Productions provided the tour's V-DOSC P.A. system, and Audiotek supplied the Midas XL4 console. For more information on the production, see page 65. **Photos:** Steve Jennings.

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

At the 1999 NAB show in Las Vegas, our Digital 8•Bus console received POST Magazine's coveted 8th Annual Award for Innovation in Post Production Products.

1 SEE 24-CHANNELS AT A GLANCE. Instead of a microscopic gray LCD display, you plug in an SVGA monitor and get the whole story on a big screen: channel and aux levels, EQ and effects, mutes, record status—even an electronic "scribble strip." When you switch fader banks, the display automatically switches, too.

2 RECORD 24-CHANNELS AT A TIME. The Digital 8•Bus is the only digital console in its price range that lets you record 24 channels at once. Every channel has a Record Ready button; you can punch in and out to your heart's content.

3 56 INPUTS AND 72 CHANNELS. Greg Mackie really wanted us to make sure that we got this point across. This is NOT a mere 24-channel console!

6 A REAL PAN POT ON EVERY CHANNEL. A no-brainer right? Tell that to the other digital mixer and workstation companies. We're guessing that you want to get down to mixing, not clicking and mousing, so we built a real mixer.

7 A SOFTWARE PLUG-IN ARCHITECTURE AND ONLY THE BEST DEVELOPMENT PARTNERS. Add incredible software options like Massenburg EQ, Antares Auto-Tune, IVL Vocal Studio and more. Turn your console into an easy to control sound design pallet.

8 APOGEE LOW JITTER CLOCK I/O. Since the quality of your audio is only as good as the clock that controls your console, we went to Apogee Electronics, the best in the business, to design our Clock I/O card.

9 24-BIT PDI•8 CARD Our 8-Channel AES/EBU I/O card offers optional real-time sample rate conversion on every stereo input.

10 24-BIT DIO•8 CARD The DIO•8 card features both ADAT and T/DIF formats and allows you to convert from one format to the other with a single card.

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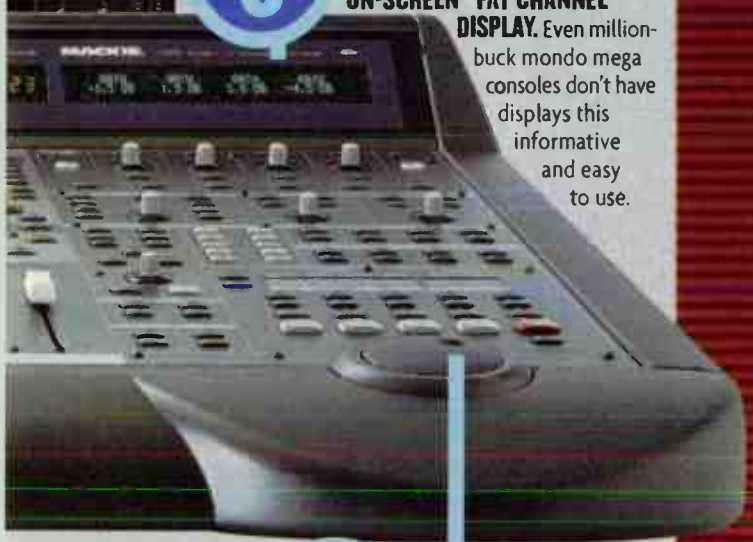
12 TWELVE REASONS WHY

3 **56 INPUTS AND 72 CHANNELS.** It's harder to impress clients when your console isn't twenty feet long, but the D8B gives you the same performance. One-touch switching gives you 24 tracking channels (Chs 1-24), 24 tape return channels (Chs. 25-48), 16 FX returns, 8 alt returns, 8 virtual fader groups, 8 bus masters and 8 control faders.

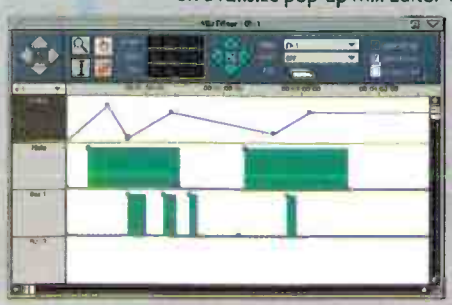
4 **EQ, COMPRESSOR AND GATE ON EVERY AUDIO CHANNEL (W/O ANY CHANNEL LATENCY).** Most other digital mixers or work stations "bus" your audio to a DSP pool for EQ and dynamics. The resulting propagation delay causes phasing problems with your audio. The D8B has dedicated DSPs for each channel pair, so you don't run out of DSP and you incur no DSP latency. (One reason it sounds so good.)

5 **A CHANNEL AT A GLANCE VIA ON-SCREEN "FAT CHANNEL" DISPLAY.** Even million-buck mondo mega consoles don't have displays this informative and easy to use.



11 **EASY-ACCESS TRANSPORT CONTROLS.** Run the transport controls of any tape or hard disk recorder that has MMC. Add cue points anywhere. Create song start and stop points or loop between two points. The D8B speaks SMPTE or bars/beats/ticks. You can use the keypad to dial in to any point with frame accuracy.

12 **AUTOMATION EDITING MADE SIMPLE.** The Digital 8•Bus' Version 2.0 software provides you with the most comprehensive automation and automation editing tools ever found on an automated console of any size. View levels and mutes on a fullsize pop-up Mix Editor window that scrolls in real time with the audio. Then make changes graphically with the flourish of a mouse — or by typing in exact time code.



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48 Windows, Walter Afanasieff, Arista Records, David Arnold, The Bomb Factory, Jeff Bridges, Ed Cherney, Cinemuse, Columbia /Black Music Division, Michael DeLorenzo, Tim Dubois, The Dungeon, Earth, Wind & Fire, Ed Green, Mick Guzauski, Scott Hendricks, Islandlife Records, Wayne Linsey, Little River Band, Machine Head Post Production Studios, Binky Mack, Bobby Mackston, MXPX, Keith Olsen, Glen Phillips, Poke, Trent Reznor, Lance Rubin, Michael Score, Soundelux, South Beach Studios, Chester Thompson, Virgin Records, Bruce Willis, Dwight Yoakam, & the CIA are among those who

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FROM THE EDITOR

IS RETAIL DEAD?

A couple of years ago, I needed an external 56K modem for my Mac. Seeing an ad for a bargain-priced unit at a local CompUSA, I headed over and found the shelf empty. I asked a clerk for some help. He handed me an *internal* modem for a PC! I asked whether they had any more in the back room of the model that would actually work with my computer. He disappeared for about 15 minutes and, reappearing, began talking to a customer in the laptop section. I asked him where the modem was, and he shrugged, saying, "I guess we don't have it." I proceeded to the cashier who told me they don't issue rain checks. I haven't gone back since.

With similar bad shopping experiences in mind, I bypassed the retail scene entirely last month when looking for a new computer monitor. I wanted a flat-panel display, but they're still pricey, and after some research I discovered ViewSonic's PS790, a sharp 19-inch model that's just 16-inches deep—a "poor man's" flat panel that was perfect for the 20-inch counters over my outboard racks. The street price was $549, but refurbished models from ViewSonic's Web site were $399. No 800 number here. I simply entered my credit card and shipping info onto an encrypted screen form, clicked the "order" key, and three days later, FedEx delivered the goods. It was definitely cyberspending, but it felt odd.

So is retail dead? It doesn't have to be. Depending on the store, shopping can be either delightful or horrific. These days, with competition from mail order, megastores and the Internet, operating an MI or pro audio dealership is no picnic. Too many retailers think their role is merely to provide a walk-up outlet where customers somehow appear with cash in hand. At the other end of the scale, there are too many customers who spend hours at local dealers getting product demos, only to leave and order that same unit from a catalog or Web site.

In the face of rising competition, local retailers can survive, but they simply have to be smart. A store that doesn't offer in-house repairs, rentals or music lessons is missing out on opportunities to provide services that differentiate them from box retailers, while building traffic with customers who come into their store on a regular basis. Another traffic generator comes from offering in-store manufacturer clinics and seminars, something that benefits both retailer and supplier.

A year or so ago, a number of independent stores in the San Francisco area formed a coalition, combining their resources to do joint newsletter/sales mailers. The result? All of these once-rival stores increased their slice of the pie—a textbook case of the old "united we stand..." adage. Or, as Mr. Spock might have put it, "Work smart and prosper." And as retailers walk the expo floor looking for new toys at this month's NAMM show, they should also think about what they can do differently to make sure they remain competitive. Change isn't necessarily a bad thing.

On that note, we're making some changes around here, too. Musician/composer/engineer Robert Hanson, a recent UC Santa Barbara grad, comes onboard as editorial assistant. Meanwhile, long-term sales pros Shawn Yarnell and Terry Lowe have left to pursue other interests, and we've added Greg Sutton as Midwest/Eastern ad sales manager in our Chicago office. On the West Coast, Dan Hernandez has been promoted to Northwest advertising director, and Carrie Anderson (formerly associate publisher of our sister publication *Electronic Musician*) is now *Mix*'s national sales director.

Onward and upward!

George Petersen

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"After working with the Oxford in my studio, I don't want to mix on any other console."

– Mick Guzauski, Barking Doctor Recording

Mick Guzauski, whose client list reads like a "Who's Who" of the Hot 100, recently purchased an Oxford console for his own studio. After over a hundred mixes in just a couple of short months, Mick has a few opinions to offer: *"The flexibility of the Oxford is much greater than any conventional console. And the work surface is a big improvement over the traditional console - intelligently laid-out and easy to use. As for sound quality, it's simply the best console I've ever heard. The EQ is the most musical sounding, and the A/D and D/A converters are the cleanest I've ever heard. The Oxford is an incredibly precise tool. For example, not only does it have five band EQ, but it has five different equalizer choices and four different compressor choices - unheard of in any console until now. As for my clients, I've had 100% great response. For technology and sound quality, the Oxford is the way to go."*

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FEEDBACK

MONO SUBMARINE

After reading about the *Yellow Submarine* remastering (Sept. '99), I got so excited I couldn't stand myself. I had not seen it on the big screen since it was released (yes, I was there in '68!). I did buy the official video release in the '80s and had to agree with the writer [that] the sound quality is poor. But now I was psyched! One of my favorite animated films was finally being remastered and re-released! I was hoping Boston was one of the nine cities where it would be playing.

Well, I ran to the mini-mart and grabbed a *Boston Phoenix* and immediately found the article about the movie. It was already at the Brattle Theater in Cambridge. Hot dog! I called my [fellow] Beatles fan, Alan, and he said "I'm there too!" We headed into town on a Sunday to catch the 2 p.m. show. We "pahked the cah," ran to the theater, bought two tickets and entered.

It didn't take long to see there would be no surround mix. The theater is an old art-house room. There were two P.A. monitors (a 15-inch and a tweeter), on chairs, on the stage in front of the screen. But, being an eternal optimist, I was glad I could see the movie on a larger screen anyway—stereo would be fine for now.

The truth unfolded in beautiful 5.1 mono...can you say 5.1 mono? I knew you could! I was disappointed to say the least. They didn't even have a stereo mix. Parts of the basic stereo tracks were gone completely! However, I still enjoyed the film and the new footage was a treat.

So I guess I'll have to get a DVD player ($$$), the DVD ($$$) and install 5.1 ($$$) in my studio (tax-deductible!) just to experience it the way it was intended. Wanna come?

Stuart Covington
Powerhouse Studio
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ONE MORE FOR THE HIP HOP ROLL CALL

I have just received the latest issue of *Mix* magazine (Nov. '99) and was more than pleasantly surprised to see that you finally included a column on hip hop engineers. Not only that, you gave credit where credit is due and acknowledged their credibility as vital components in the making of today's music. While I am grateful for the attention that was bestowed, I have to say that I was *very* disappointed to see that one of hip hop music's most influential engineers was not included. He is probably the premier engineer on the scene, yet there was not a word mentioned of him in any of the multiple pages of this article. The exceptional talent to whom I refer is none other than Ivan "DeeJay Doc" Rodriguez. While Mr. Rodriguez was diligently creating the basis for what all of today's hip hop engineers have come to reference, a number of the engineers listed in your article (as deserving as they are of mention) were still chasing girls in the school yard.

Without detracting from the achievements of these fine professionals, or taking away from what they have added to the fine stew of mixing hip hop records, I just wanted to be sure that Jimmy Douglass [knew] where this genius and innovation originated, where it is now, and certainly where it is headed. If he truly knew, then he would have acknowledged "DeeJay Doc" as a pioneer, who has vast experience in recording and mixing hip hop records. He has been credited with over 20 Gold and Platinum records in his 13-plus years of mixing and recording. He has contributed his expertise to such phenomenal artists as Boogie Down Productions and EPMD. We also cannot forget The Fugees' first album, which is largely regarded as a masterpiece. Rather than merely being included in this piece, he deserves to have his own article detailing [his] techniques and chronicling his history of working as a engineer in the hip hop field.

He pioneered the sound and then had the decency and graciousness to let others learn from his artistry. This includes many assistants, producers and artists. Now I think it's time for someone to recognize Ivan "DeeJay Doc" Rodriguez for the blood, sweat and tears that he's put into this game called hip hop.

Christopher Irish
engineer/producer

DID SOMEBODY KIDNAP LEHRMAN?

I finally got to the bottom of the pile of paper I brought home from AES, and there was the October issue of *Mix*. I opened it, albeit a month late, and dug into Paul Lehrman's "The Play's the Thing" column. I thought this would be an interesting article, since I work in theater sound and since Lehrman's and Stephen St.Croix's columns are the two things I always read first in *Mix*.

This time, however, Lehrman totally baffled me. The bizarre column seems to be a personal attack on one of his own students and goes on to condemn all theater sound on the basis of an amateur workshop designed by a student [who] Lehrman admitted was "in over his head." Well if he is Lehrman's student, whose fault is that? And what the hell does that have to do with theater sound in general?

In the same issue, Mark Frink talks about the work of two of the best sound designers working in musical theater: Tom Clark and Jonathan Deans. Had Lehrman attended a few of their productions and then condemned the state of [theater sound], then I would simply have a difference of opinion with him. However, Lehrman takes to task a group of extremely talented professional sound designers and engineers based on the work of one amateur who is in over his head. This is as bad as the music critics who think that performance sound systems are just big home stereo systems with a giant volume knob that is broken off at 11.

And, by the way, NO theater sound designer I've ever known (and I've known a lot) wants to turn up the systems as loud as they get at the average Broadway show. Who keeps asking for it to be louder? The producer, the director and the audience.

John Huntington
www.zircondesigns.com

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CURRENT

SSL SOLD TO 3I, PLC

Solid State Logic—one of the world's leading manufacturers of consoles for music, film and broadcast—has been sold by Carlton Communications to 3i, plc (Investors in Industry), a British investment concern. After 3i's due diligence, the news came to SSL headquarters in Begbroke, England, on the day before the Christmas holiday. SSL just celebrated its 30th anniversary.

"We're extremely happy and pleased," says John Andrews, SSL marketing director. "And there's a tremendous sense of relief."

Carlton announced midyear its plans to divest itself of non-core businesses and gave SSL the opportunity to find a buyer. SSL then went after the same type of comfortable home it had with Carlton. "At this crazy time when tech companies are coming to expect 100% growth, we feel very lucky to have found a realistic investor," Andrews adds.

Rick Plushner, SSL US president, will now report to the SSL UK board of directors. He says: "No management changes are anticipated. Over the past two-and-a-half years, SSL US has enjoyed stellar performance and growth in all of our product lines. As far as we're concerned, it is business as usual."

The deal was reported at £43.5 million (approximately $70 million USD). In November, Carlton underwent a £7.8 billion merger with United News and Media plc, in an apparent effort to concentrate on its core interests in broadcast.

SPARS FORMS MASTERING GROUP

Realizing that the issues surrounding new release formats and Internet audio have a profound effect on mastering engineers, the Society of Professional Audio Recording Services has formed a Mastering Group within the organization. Mastering facilities have long been SPARS members, but the new group will focus on disseminating information specific to mastering engineers and serving as an interface between manufacturers and facilities.

Separate meetings will be held at SPARS Biz/Tech conferences and at the Fall AES convention in Los Angeles, and the group will have access to the SPARS listserve, as well as direct links from the organization's Web site (www.spars.com) to member facilities. Some early members of the new organization include Masterfonics Mastering, Airshow Mastering, Digital Domain, Bob Ohlsson Audio, Colossal Mastering and 3D Audio Inc. Glenn Meadows of Masterfonics will serve as spokesman for the group. For more information, e-mail spars@spars.com or call 800/771-7727.

CRL BUYS ORBAN

Circuit Research Labs, Tempe, Ariz., has signed a letter of intent with Harman International Industries to acquire Orban. The $15 million transaction was expected to close at the end of January 2000 and was expected to be financed by debt.

Based in San Leandro, Calif., Orban is a leading manufacturer of audio processing gear for radio and TV stations worldwide. Circuit Research Labs manufactures audio processing, transmission encoding and noise reduction equipment for the worldwide radio, television and professional audio markets. Circuit Research Labs will retain the Orban brand and employees, including founder and chief engineer Bob Orban.

AUDIO AT MACWORLD

More than 400 exhibitors and 70,000 attendees packed into San Francisco's Moscone Center last month for Macworld Expo 2000. The show, which took place from January 4-8, featured nine special-interest areas, including the first Music and Audio Pavilion, where developers such as TC Works, Digidesign, Mark of the Unicorn, Emagic and Rocket Network showcased Mac tools for audio production and music and audio networking. Accompanying seminars included forums on music on the Web, remixing, hard disk recording and software synthesis.

Although most audio manufacturers at Macworld were there to maintain their industry presence, saving announcements for this month's NAMM show, there were a few debuts: Yamaha was showing new products that feature its mLAN "music networking" technology, which is based around IEEE 1394. For information on this protocol, visit www.yamaha.co.jp/tech/1394mLAN/index.html. And Swissonic was showing the Swissonic USB Studio D, a USB-compatible rackmount unit that offers mic, line and Hi-Z inputs, S/PDIF I/O, a USB Interface (compatible with Windows 98/2000 and Mac OS 9)

—CONTINUED ON PAGE 16

NEWS FROM THE MIX FOUNDATION

TEC AWARDS SITE CHOSEN

The Mix Foundation for Excellence in Audio announced that the 16th Annual Technical Excellence & Creativity Awards will return to the Regal Biltmore Hotel in Los Angeles on September 23, 2000. For ticket and sponsorship information, contact Karen Dunn at 925/939-6149 or e-mail: KarenTEC@aol.com.

SCHOLARSHIP APPLICATIONS AVAILABLE

Applications are now available for the 2000 TEC Awards Scholarship Grant. For an application form, write to TEC Awards, 1547 Palos Verdes Mall No. 294, Walnut Creek, CA 94596, or e-mail: KarenTEC@aol.com.

MIX L.A. OPEN ANNOUNCES DATE

The Fifth Annual Mix L.A. Open is scheduled for Monday, June 19, at the Malibu Country Club. Space is limited, so make your reservations early. For information about sponsorships or entry fees, contact Karen Dunn at 925/939-6149 or e-mail: KarenTEC@aol.com.

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386

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- **+48V phantom power**
- **235V tube plate voltage**
- **Phase invert switch, and low cut filtering**
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- **Selectable dithering and noise shaping**
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How much would you expect to pay for a mic pre with all these features? A thousand? Eight hundred? Less than six hundred? **You're getting warmer.**

Visit www.dbxpro.com to find out how you can upgrade your home workstation to 96kHz for under six hundred bucks (and while you're there register to win some free stuff).

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INDUSTRY NOTES

Recording industry veteran **Hector G. La Torre** has stepped down as executive director of *EQ* and *Gig* magazines to concentrate on the development of an online resource for the recording industry: "The Web presently is a great source for information but not knowledge, and I want to change that," La Torre says. The new site, www.modernrecording.com, will be up and running this month...**ThinKware** (San Francisco), distributor of computer-hosted audio/video production hardware and software, has named **Doug Smith** as president. This announcement comes on the heels of the company's largest sales increase in its history...**Shure Inc.** (Evanston, IL) announced the appointment of **Markus Winkler** as managing director of **Shure Europe Gmbh**. Winkler has been associated with Shure since 1993, previously working as the European sales manager...**KRK Systems Inc.** (Huntington Beach, CA), has named **Jim Arvantis**, formerly of Kenwood USA Corporation, VP of sales and marketing...The **Internet Underground Music Archive (IUMA)** has teamed up with **Listen.com**, enabling unsigned artists to create MP3-based sites quickly and easily, while at the same time uploading their material to Listen.com. IUMA has been pioneering music on the Web since 1993 and is considered one the premier places on the Internet for new music...The **AMS Neve Logic Digital Film Console** was recently awarded a Scientific and Technical Oscar from the Academy of Motion Picture Arts & Sciences... **Manhattan Production Music** (NYC), makers of music libraries MPM, Apple Trax, Brg and others, launched its new Web site, www.mpmmusic.com. The site allows users to audition and sample cues, search catalog listings and order CDs...**Digigram** (Arlington, VA) has announced a deal to distribute the Digigram VX222 with **Digital Voodoo's** (South Melbourne, Australia) D1 desktop as a bundled package. In other Digigram news, the company has announced the acquisition of **Aztec Radiomedia**, a French telecommunications designer...**CE Distribution** (Tempe, AZ) has become the new U.S. distributor for **Jensen Vintage Series Guitar** and **Jensen Pro Audio** speakers...**Tascam** has opened a new research center in Palo Alto, CA. According to the company, the center will take advantage of the wealth of software engineers and designers in Silicon Valley...**Harris Corporation** (Cincinnati) has acquired **Audio Broadcast Group Inc.**, a national system and product supplier for the broadcast and recording industries...**Coxaudio Engineering** has moved to 201 E. Celsius Ave., Suite C, Oxnard, CA 93030; phone 805/604-0577; fax 805/604-0858...Chairman of Casio Computer Co. **Toshio Kashio** and *Twice* editor-in-chief **Bob Gerson** were awarded the first-ever **Consumer Electronics Association (CEA)** Lifetime Achievement Award at this year's CES show in Las Vegas. In other CEA news, **Tim McNarra**, formerly of Ogilvy Public Relations, has been appointed manager of communications...**beyerdynamic** (Heilbronn, Germany) appointmented **Dr. Karl-Götz Arnold** as general manager of worldwide operations and **Hartmut Reichert** as director of international marketing and sales... Broadcast technology provider **Leitch** (North Yolk, Ontario) has picked former Bell Gateways president **Terry A. Canning** as its new corporate VP of marketing...**Bag End Loudspeaker Systems** (Barrington, IL) has created a rep network in Canada, consisting of **Audio Visual Methods** (Toronto). **Commercial Electronics, Ltd.** (Vancouver, B.C.), **Hirtle's Stereo** (Charlottetown, Prince Edward Isle), **Precision Sound Corporation** (Calgary, AB) and **Unitech** (Whitehorse, YK)...**Barry Seiden** has joined **Gem Sound** (Bronx, NY) as the new director of sales and marketing. ■

—FROM PAGE 12, CURRENT

for recording/playback to and from a computer, and a recording output for tape—plus a monitor output for amplifier/active monitoring with volume.

Other big news at the show: Apple's unveiling of its OS X operating system (available this summer—for more information, visit www.apple.com/macosx), demonstrated during the keynote speech by Steve Jobs.

In the Eddy Awards, which honor the best new products of 1999, Emagic's WaveBurner 1.0 won for the best audio-CD-recording software on the Mac. Steinberg's Cubase VST 4.1 and MacSourcery's BarbaBatch 3.0 were also honored. One of the "Best of Show" awards, selected by the editors of *Macworld*, was given to Creative Labs' Sound Blaster Live! Platinum PCI card, which marks Creative's entry into the Macintosh market. —*Sarah Jones*

YORKVILLE ACQUIRES ART

Yorkville Sound (Pickering, Ontario), manufacturer of a wide range of equipment primarily for the touring and live sound industries, has purchased Applied Research & Technology, a company perhaps best known for its tube dynamics products in the live sound and music recording markets.

ART will continue operations in Rochester, N.Y., according to company president Phil Betette, who adds that no management or personnel changes are expected.

CORRECTIONS

In the January 2000 article on sound for *The Green Mile*, we made a few errors in the captions. On page 75, the man with the beard is music editor Bill Bernstein, and on page 77, re-recording mixer Michael Herbick is on the left, and Bob Litt is in the center, with Elliot Tyson on the right.

Also in January, producer Brad Wood's new Chicago studio was incorrectly identified in "Sessions & Studio News." Wood is associated with Engine Music Studios, which is owned by Jep Thornton. *Mix* regrets the error.

In the Laurie Anderson "Tour Profile" in the January issue, the correct headset microphone model is the CM311, available from Crown International in Elkhart, Ind. ■

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views of creation

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BIG CHAIR, BIG DEAL

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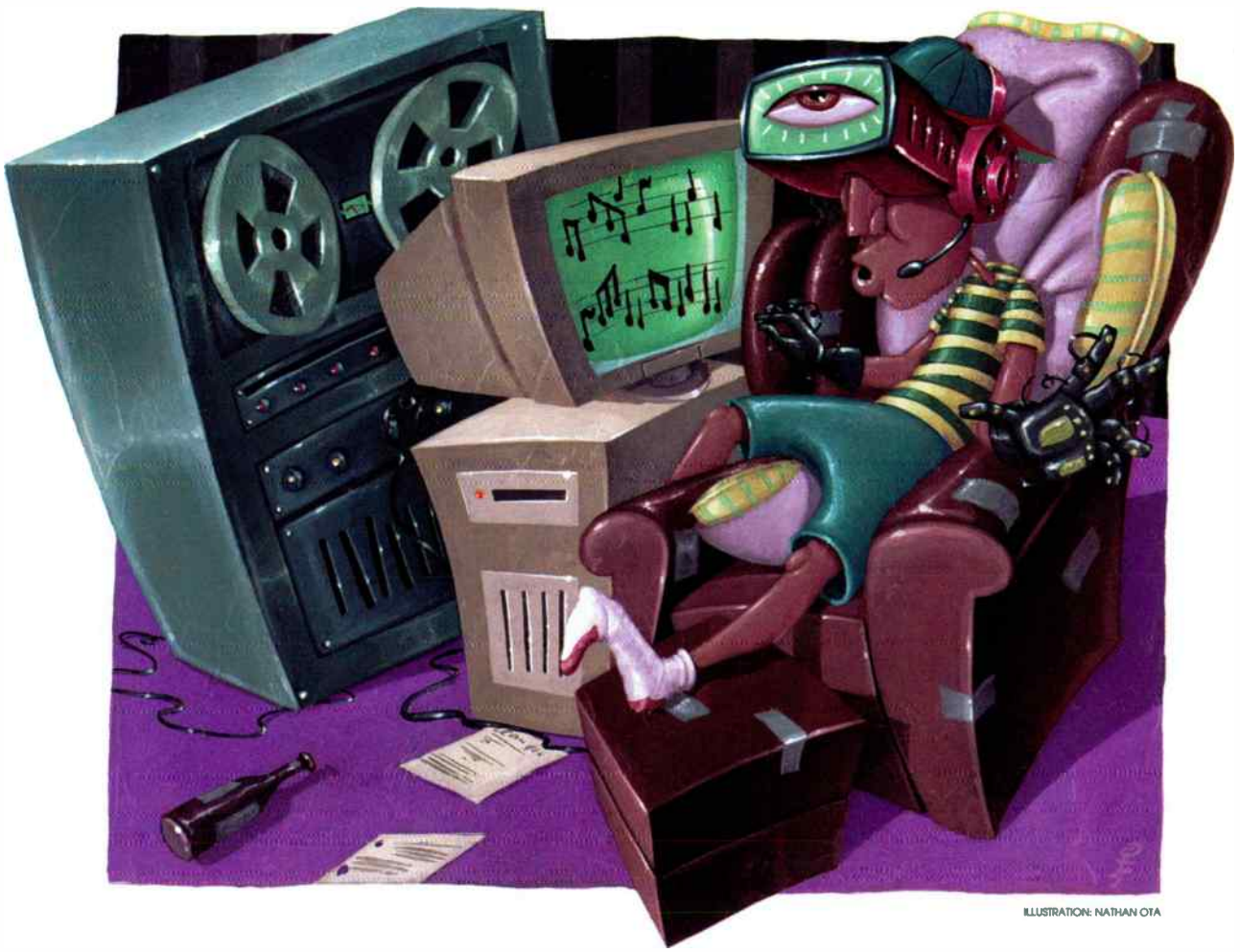

ILLUSTRATION: NATHAN OTA

I am sitting in a ridiculous chair, punching out this column on my laptop. The chair is important—it actually has a great deal to do with this month's topic.

I have spent many years sitting in various fashionable European chairs. In my living room there used to be a Stressless lounge chair, a slim, sleek Northern European steel-and-leather thing that I was taught was comfortable. For decades I dutifully followed my training and happily sat in this chair, or one like it, telling myself I was properly comfortable. But in the last of those years, I heard a growing inner voice that told me these things were too small, too flimsy and too sophisticated to properly potato in.

And finally the day came when I decided to lose the trendy Euro-chair, much as I had lost my trendy Euro-pipe decades before.

And I replaced it with the most ugly-ass thing I had ever seen. It turns out that La-Z-Boy will custom-make almost anything if you are willing to wait. They will make you the biggest, most stupid-looking, tilting, reclining, rocking and rotating throne on Earth, and even cover it with rich Montalbanian leather if you want to take the joke all the way.

I have always had a sort of morbid fascination with the whole "Dad's Ugly Old Chair" phenomenon. When I used to come across one in a friend's house, I would stare in horror, yet wonder what it would actually be like to sit in it and command all that lay before me (or with one of the spinning ones, all that lay anywhere around me).

Well, now I have a living room with modern Italian oh-so-chic white leather furniture cleverly placed on an oak-and-white-tile floor, with this one slate gray leather La-Z-Boy "Grand Canyon" model chair looming ominously in the corner. I hid the thing while the decorator was there, and moved it in after she left, essentially ruining all her work. For those of you who remember past columns, this is the chair with the Clark LF transducer bolted to it. Big chair, big bottom.

—CONTINUED ON PAGE 209

BY STEPHEN ST.CROIX

MOTU

Digital Performer

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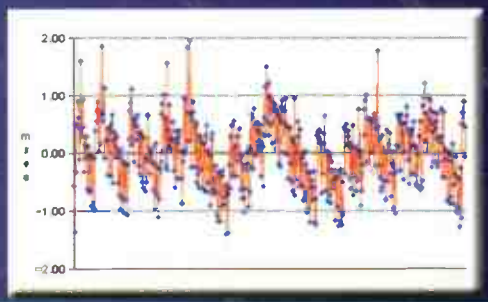
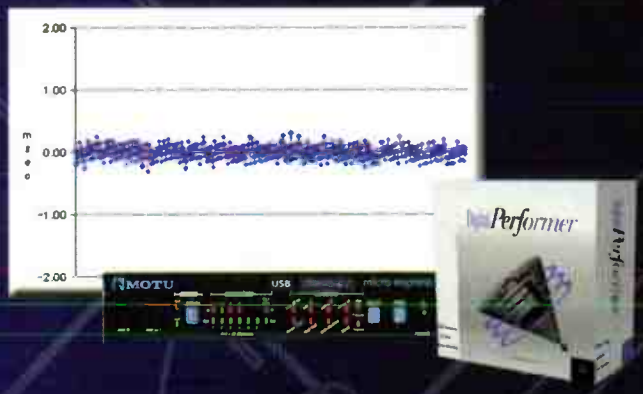


Ours.



Our closest competition in hardware-based MIDI timing has inherent jitter of 1-2 milliseconds, with spikes that are even higher. Digital Performer's MTS timing is as tight as one third of a millisecond — five times better

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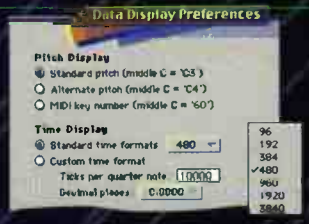
Digital Performer's new MIDI Time Stamping™ technology produces the best MIDI timing resolution and accuracy ever achieved. Other sequencers (even ones with MIDI hardware support) offer 960 or 1920 PPQ. But Digital Performer lets you choose any PPQ resolution you want: 96, 384, 480, 960, 1920, 3840, 10000 or anything in between. And MTS, our hardware-based MIDI timing engine, delivers that precision to your MIDI gear with sub-millisecond accuracy. So if you believe that timing is everything, all you need is a USB-equipped Power Mac, Digital Performer, and a rack-mountable MOTU USB MIDI interface (like the affordable micro express shown above). Ask your Mark of the Unicorn reseller about our competitive crossgrade.



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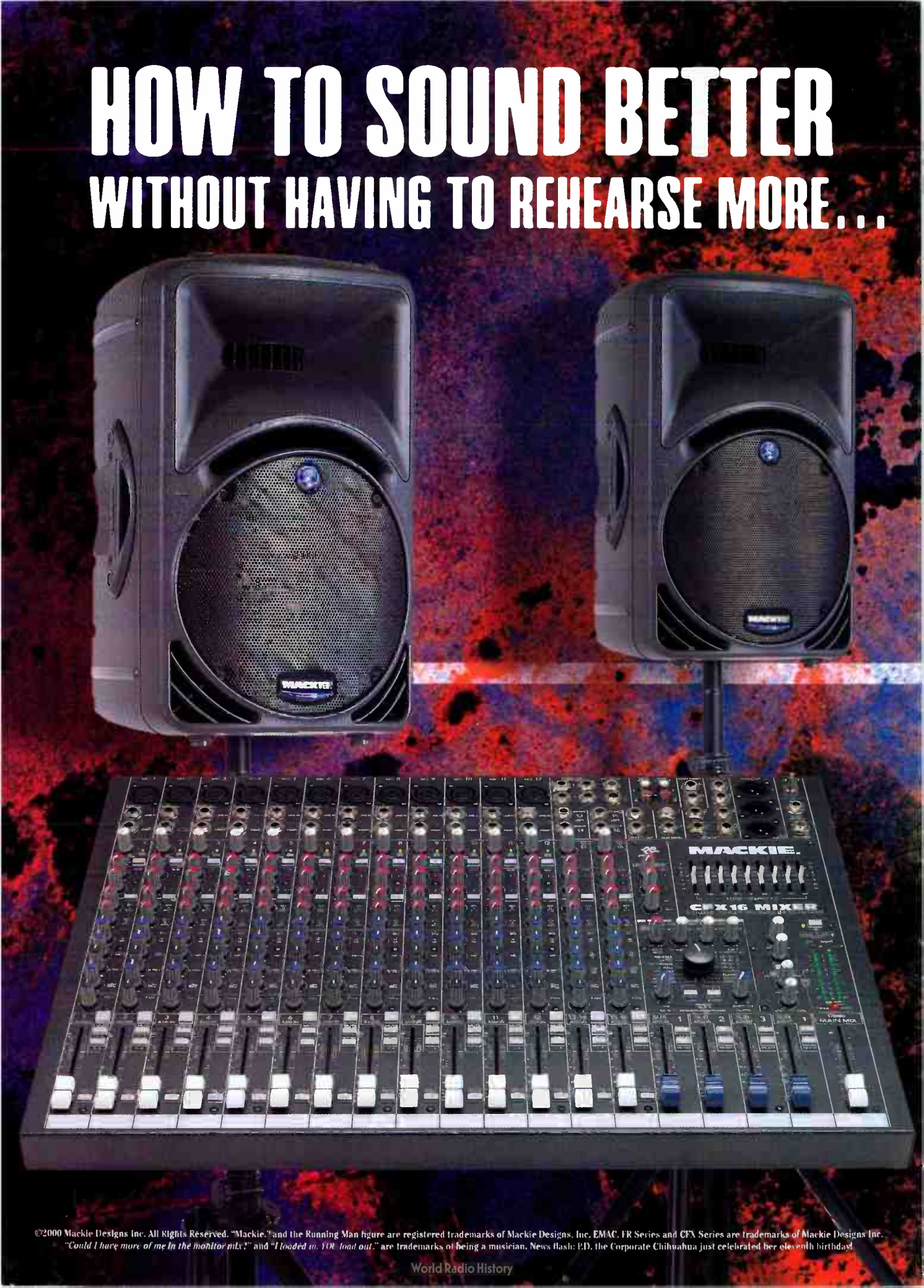

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CFX Series mixers are easy for non-technoids to set up and use, yet are packed with features seasoned pros appreciate, such as 3-band EQ with sweepable midrange, variable effects parameters, and a way-cool Break Switch that mutes all channels and automatically switches to tape input (which has its own level control, no less).

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CFX•12 12 total channels • 4 buses • 8 mic/line channels • 2 stereo line-level channels • 8 channel inserts

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SUPPORT YOURSELF!

MAKING YOUR CALLS FOR HELP COUNT

ILLUSTRATION: RICHARD DOWNS

Last month, I decried the problems of dealing with tech support lines at companies whose hardware and software we expect—often unrealistically—to work as advertised. This month, with the help of Beto Carvalho, a tech support veteran at Digidesign, I'm proposing a few guidelines that might help you get through the tech support morass and emerge not only with the information you need, but also more or less intact emotionally.

First, some basics before you call. Number one: Read the manual. In tech support jargon, this is called RTFM, in which the "F" does not stand for "Fine" or "Fat." You don't have to read it cover to cover, but look in the index for all possible terms that might pertain to your situation and examine the table of contents—sometimes indexes overlook "big" topics, and you'll only find them at the front of the book. It may sound like tech support people love to tell you, "Well, if you look at page 23 of the user's guide...," but, actually, they hate it.

"Some people call support every time they try to do something they haven't done before, without ever consulting the manual," says Carvalho, "and they say, 'Walk me through this.' When we tell them to read the manual, they'll say, 'I don't have time for that!' or 'I don't understand it.' We understand that manuals are not exactly light reading, but it's not support's job to read it for you. As a colleague of mine once said, 'That's why we call it Pro Tools and not Amateur Tools.'

"Of course, if you've read the manual and it still seems incomprehensible, or something doesn't work the way the manual says, then by all means call," he continues. "Then, with the manual in hand, you can tell the tech that on page so-and-so it says this is supposed to happen, but something else is going on. This is a much more useful and efficient approach."

Number two: Use the online support, if there is any. (And if there isn't, send a nasty note to the company telling them to get into the '90s already. Oh...too late?) A few companies have really done a

BY PAUL D. LEHRMAN

The Legend Continues

Otari's MTR-90 two-inch, 24-track analog recorder was introduced in 1979. Still in production and available today (as the MTR-90 Mark III version), it remains the choice of those who prefer to record their masters to tape. Over the years, this machine earned a reputation as "The Workhorse."

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nice job of getting their support information online in a logical fashion, organized by product and version, but others are more, shall we say, haphazard. Fortunately, search engines are now ridiculously inexpensive and easy to install, so more sites are using them: You type in the name of the thing that's causing you trouble and get a listing of all pages in the support file where the word appears. Granted, as with any search engine, the vast majority of what you come up with will be garbage, but you should be able to spot the roses in the dung heap.

Okay, you've exhausted those possibilities, and you've decided you really do have to call. One way to make sure your minutes count is to call as early in the day as possible. A lot of us folks in the music/studio biz are late risers, so you will get in ahead of the queue if you call early. And if you live on the East Coast, you've got a built-in advantage: Many West Coast companies open their support lines very early (primarily to accommodate us impatient folks on the Atlantic), and if you call first thing in the morning, you'll get through before two-thirds of the country is even conscious.

When a human being finally picks up the phone, it's usually not a good idea for you to be frothing at the mouth over how much time you've wasted. One good way to avoid this is to have something else to keep you occupied while you are on hold. Balance your checkbook, fix up your mailing list, label last month's tapes, pay your bills (on second thought, maybe that's not a great idea), surf the 'Net for jokes (mixonline.com is a great source!), or read the rest of this issue of *Mix*. If you're just sitting there stewing while listening to a loop of dumb lo-fi techno, incessant marketing pitch or that unctuous voice that says, "Your call is very important to us...," your first impulse when someone finally picks up the phone is to bark at them—and that's not the way to start off a relationship that is supposed to be for your benefit. Have a speaker phone or hands-free headset for these moments—it helps not to have your hands tied up or your shoulder scrunched over while your patience is being tried.

Okay, now you've gotten through to a support technician, so far everything is cordial, and it's time to get some answers. But first, they are going to have a lot of questions for you—and you need to be able to answer them.

First and foremost, know what you have. "In an informal survey I took among tech support reps, the number one frustration-causing factor is when a user doesn't know the model numbers or versions of his or her equipment," Carvalho says. "Too often, when the tech asks which version the user has, the answer comes back, 'The latest.' Rarely does that happen to be true. We hear a lot of people say, 'I've got Pro Tools.' But there are a dozen different configurations of cards, interfaces and so on, and lots of different versions of each. We have to know exactly what we're dealing with if we're going to help."

Also, if you're dealing with computers, know what's under the hood. "If you are working with a Mac, you have to know the location of the Control Panels, Extensions, Preferences, etc., because the tech has to ask about them," Carvalho says. "If you say, 'I'm on Mac OS 8,' we have to know which OS 8—8.0, 8.1, 8.5.1, 8.6? There are big differences in these, and the tech has

to have accurate information if he's going to help. If you're on a PC, it's more complicated: You have to know how to access the BIOS, and how to change IRQs and port settings. This may all seem obvious, but I've overheard techs trying to explain what a 'menu' was."

You have to be willing to spend some time troubleshooting with the support technician. Carvalho again: "Sometimes users call wanting to hear magical answers: one button they will press, one preference they can trash, or one upgrade they can download which will immediately fix all of their problems. When they are asked to actually do something, they seem surprised. You have to realize that the tech is many miles away from you, and he has to probe your system. He can't assume anything—so when he asks you to do something, he's really using you as his eyes and ears.

"When a tech asks, 'What's the order of the cards in the PCI slots of the expansion chassis?' the correct answer is not, 'Aw, man, the chassis is in a rack, and I can't get back there. I'm sure they're fine. I mean, it was working yesterday!'" Carvalho continues. "My response to that has always been, 'Yeah, but it isn't working now!' Be willing to pull gear from a rack, to triple-check the wiring and so on. If you have a legitimate reason why you can't do something right then, write down what the tech says to do, and then try it out when it's more convenient—and get back to the tech with the results."

One problem that support people often encounter is users who just don't understand the technology. "It's amazing how many calls we get asking what dither is," Beto says, "or why an audio tape striped with 30-frame SMPTE won't lock with video, or when to use pull-up or pull-down, or how to set up a compressor on a vocal track. A tech may very well take time to explain this as best he can, but for the most part, this is not his job. The tech's job is to fix malfunctioning systems, and if he is staring at a call board showing five waiting calls while he's explaining sample rate to someone, he may get very testy."

If your problem doesn't get solved right away, and it looks like there's any possibility you may need to call again, find out who your tech is. Once you start a dialog with a tech, it can be very valuable to be able to continue that dialog with the same person, so that if you do have to make a second or third call, you don't end up starting over each time. In well-organized companies, each tech support call generates a memo with all the pertinent details, which goes into a database that all support techs can access. But not all companies have it that together, and if the problem is really complex, it's not the ideal way to handle it. So write down your tech support person's name and, if they give it to you, their extension. The next time you call, if they're not available, at least you can get their voice mail, and they can get right back to you—which is a lot better than waiting on hold and not knowing who will pick up.

On the other hand, don't expect one support technician to know everything. Carvalho could help me with the problem I was having installing a new hard disk drive, but when it came to getting the skinny on a nasty little problem I was having with a SampleCell card, he had to talk to someone else. "It's nearly impossible for techs to master every aspect of every piece of gear they have to support," he says. "So, don't get immediately upset if a tech doesn't seem to

be an expert on your problem. In fact, since you use the thing every day, you may know more than they do about the issue. But the importance of the tech doesn't necessarily lie in the superior knowledge—it's in his superior resources. They'll have access to internal company documentation, the other techs in the department and the engineering department, as well as a whole history of calls that have come in that might be relevant.

"But it's usually not wise to question the tech's knowledge and say, 'Can I talk to somebody who knows more about this than you do?' If you've given them an honest chance to solve your problem, and you think it's not getting anywhere, you can ask politely to talk to a supervisor: 'You've been quite helpful, but I feel like I need a more immediate solution. Maybe a supervisor could suggest some other options?'"

And speaking of tech abuse, it's also not wise to blame a support technician personally for gripes you have against the product or the company. "The cold reality," says Carvalho, "is they are at the bottom of the decision chain. They don't decide on product features and modifications, and they don't decide which bugs get fixed and which don't, and they are definitely not the ones who come up with the marketing campaigns. If you're upset about something a company is doing, and you want to talk about it in a tech support call, that's okay, but don't direct your anger at the tech: Let him know that your dissatisfaction is with the issue, and not with him. And don't bother to threaten a tech with sales-related issue—they're not on commission, so saying, 'You have to get this to work right now, or I'll return the whole thing,' is not likely to move them much."

Contrary to the way I've always worked (see last month's column), Beto says it's useless to "pull rank or drop names. There is very little that will plunge a tech support call to the depths of unproductiveness faster than the phrase, 'Do you know who I am!?' They don't care who you are or what supergroup you're working with—their contractual obligation is to fix all systems, whether they're being used by Joe Blow or Mr. Famous. And the actual reality is that these attitudes are usually copped not by the famous, but rather by the semi-famous. Developing a good rapport with the tech will get you a lot further than pulling rank."

And finally, says Carvalho, be appreciative. "This is the single most important thing you can do to receive good tech support. I hate to admit it, but even if you've screwed up everything else, if you get this one right, you will probably end up getting good help. In that survey I mentioned, the overwhelming majority of techs said that what drives them to go the extra mile for a customer is simply appreciation on the customer's part. It's amazing how far a person can get if they are simply nice to techs. A colleague of mine in Japan puts it this way: 'Anybody who says thank you at the end of a call, I'd like to help them again.'"

Well, thank you, Beto Carvalho, for your help with my disk problem and for your insights into how the process works. I don't know if this column is going to change anybody's attitude—but it might. And at least now they can't say they haven't been warned. ■

Paul D. Lehrman has straddled both sides of the tech support fence, and he is still uncomfortable thinking about it.

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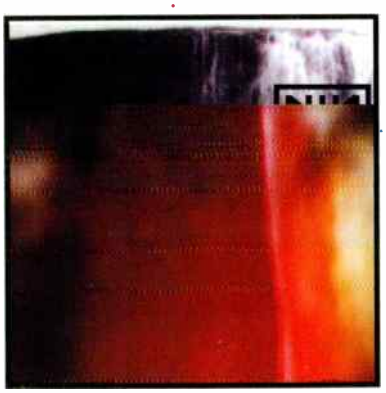
ALAN MOULDER

FROM TRIDENT TO NINE INCH NAILS

An ochre harvest moon rises over the eastern rim of New Orleans. It rotates smoothly across the black sky, and just before it sinks below the horizon, the door of a nondescript building (a converted mortuary, actually) creaks open. Soft light from inside briefly illuminates two night creatures, who exit and go their separate ways, eager to reach shelter before the morning sun burns their pale skin. That was how I first pictured Trent Reznor and Alan Moulder, at work at Reznor's Nothing Studios. Okay, it's a bit heavy on the Anne Rice, but listen to Nine Inch Nails' latest release a few times and see if your thoughts don't drift toward the dark side. The sound is elegant, wicked and occasionally bloodcurdling—by turns both open and claustrophobic. A line from *Rolling Stone*'s review puts its controlled insanity into perspective: "In a pop year silly with baby talk and plastic mambo, the thundering overindulgence of *The Fragile* is not a trial, it's a f—king relief!"

Yes. Well, co-producer, recordist and mixer Alan Moulder is no stranger to this kind of creativity. In addition to *The Fragile*, his lengthy



discography boasts numerous other credits best described as "intense." He was co-producer and mixer on the Smashing Pumpkins' *Mellon Collie and the Infinite Sadness* and mixer on their *Siamese Dream*. He also mixed NIN's *The Downward Spiral*. Delve a bit further and you'll find Moulder was behind the desk for works by singular artists such as the Jesus and Mary Chain, Moby, My Bloody Valentine, Marilyn Manson, Erasure, U2, Shakespear's Sister, Curve and, neither last nor least, Tom Jones.

Alan Moulder (center) at work on the Nine Inch Nails CD with Trent Reznor (right).

Just off a two-year stint at the New Orleans studio where *The Fragile* was constructed, and hoping for some holiday time in his English homeland, the affable and rather soft-spoken Moulder instead found himself hard at work. *Mix* nabbed him for this phone interview during a week when he was mixing projects for both NIN and the Pumpkins. (Like I said, intense!) We got our conversation started when he took a short break from sorting takes at London's Rak Studios while Trent and the boys were off shooting footage for a video.

How did you get started in recording?

I started off playing guitar. I'm from a small town in Lincolnshire, where I was in a band and very interested in music. After I was done with school I managed to get a job at Trident Studios in London as a runner—a tea boy as we call them.

BY MAUREEN DRONEY

But I left after a month; I hadn't quite finished being in bands, and I realized that if I was working in the studio I'd have no time for it. Instead, I went to work in the Ministry of Agriculture, doing research into plant diseases. It was a job that gave me the freedom to play in bands at night and on weekends.

After four years of that I thought, "You're not going to make it, and being in the studio is more fun anyway!" Meanwhile, the guy who used to be head engineer at Trident had bought the studio, so I rang him up. I got lucky and walked into an assistant's job without having to go back to being a tea boy. Which was a bit difficult, actually, because I jumped over three tea boys who'd been there six months; I wasn't very popular in the beginning. Fortunately, two of them got fired very quickly and the other got promoted, so after a month all was sweet. But I was starting quite late, you see. I was 24.

God, yes, so old. Well, at least you had that training as a musician.

That's true; it was very good learning. It gave me the musical point of view, and it also gave me the knowledge that I'd done that route, and was making a decision to put it away and go for another career. I could put 100 percent into engi-

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CIRCLE #018 ON PRODUCT INFO CARD

neering, which you need to do; you have to be committed or you won't get on.

Was Trident still all Trident consoles at that time?

When I first arrived there were three rooms. Two of them had old Trident consoles, and one room had an SSL. So, yes, we used the old A Range Trident board, which was great, but I ended up spending a lot of time in the SSL room, which was mainly for mixing.

Trident was a fantastic studio for training; we had an incredible staff when I was there. There was Flood, who I used to assist a fair bit; we had Mark "Spike" Stent, Paul Corkett and Steve Osborne. A lot of people would use the house engineers, and part of the job of the house engineer was to train the assistants. Also, Trident pushed you into engineering very quickly. It was a baptism of fire; they'd toss you off the deep end, and you sank or swam.

That concept of having staff engineers is almost extinct these days.

Yes, that's a big demise, I think, a real shame. I was very lucky [at Trident] because they gave you so much freedom, and you were encouraged. It was very tough, of course; if you did mess up you were out. But at least you were given the chance.

What kind of music were you working on?

A cross section. There was a company called Record Shack that did high-energy disco that we all used to end up cutting our teeth on. It was mainly drum machines and DI stuff; you didn't need fantastic technical expertise to record it. And they worked very quickly, so it made you get your speed together.

And then, because it wasn't a particularly high-tech studio, and it was cheap, we used to get a lot of alternative bands. They could get the studio at a reasonable price, and they'd get the house engineer included. I remember Flood doing Nick Cave & the Bad Seeds, stuff like that. I stayed there about four years, then the studio changed hands, and I went freelance.

Once you went freelance, how did you get work?

I'd met Dave Stewart of Eurythmics because my wife, Toni Halliday, is in a band called Curve that's signed to his record label; I started doing work with Dave and some of his other bands. He signed me to his management company, where I worked with Karen Ciccone, who is still my manager now, and I had a few clients from Trident. Actually, I was doing a lot of dance stuff at this time, and it looked like I was going to be a dance mixer.

I also knew Alan McGee from Creation Records. Alan managed the Jesus and Mary Chain—that's how I'd got to work with them. They asked me to do *Automatic*, and when Alan heard it, he asked me to do some of his other bands like Ride and My Bloody Valentine. So I took a bit of a change into the kind of music I was actually into and then went on that way.

Still, the dance music wasn't bad training.

No, I enjoyed doing it. It was when they were beginning to construct tracks up from just solo vocals; you were re-creating everything, and in a way, it was kind of punk rock—you could throw everything at it. It was great fun, and it helped me get my low end together.

ALAN MOULDER: SELECTED CREDITS

PRODUCER

The Clean: *Vehicle* (Rough Trade, 1990)

The Sundays: *Reading, Writing & Arithmetic* (Geffen, 1990)

Shakespear's Sister: *Hormonally Yours* (London/PolyGram, 1991) (also engineer)

Adorable: *Against Perfection* (EMI, 1993)

Swervedriver: *Mezcal Head* (A&M/Creation, 1993) (also engineer and mix engineer) and *99th Dream* (Zero Hour, 1998) (also mix engineer)

Tom Jones: *Lead & How to Swing It* (Interscope, 1994)

Smashing Pumpkins: *Mellon Collie and the Infinite Sadness* (Virgin, 1995) and *Thirty Three* (Virgin, 1996) (also mix engineer)

Remy Zero: *Villa Elaine* (Geffen, 1998) (also mix engineer)

Nine Inch Nails: *The Fragile* (Nothing/Interscope, 1999) (also engineer and mix engineer)

ENGINEER

Eurythmics: *Savage* (Sire, 1987)

Erasure: *Crackers International* (Sire, 1988)

Depeche Mode: *101* (Sire/Warner Bros., 1989)

The Jesus and Mary Chain: *Automatic* (Warner Bros., 1989) (also mix engineer) and *Honey's Dead* (Warner Bros., 1992) (also mix engineer)

My Bloody Valentine: *Glider* (Sire, 1989) and *Loveless* (Sire/WEA, 1991)

Curve: *Cuckoo* (Virgin, 1993)

Marilyn Manson: *Portrait of an American Family* (Nothing/Interscope, 1994) (also assistant producer and mix engineer)

Echobelly: *Everybody's Got One* (Epic/Fauve/Rhythm King, 1994)

Various Artists: *S.F.W. soundtrack* (A&M, 1995) (also mix engineer)

Various Artists: *Ocean of Sound* (Ambient, 1996)

U2: *Pop* (Island/PolyGram, 1997)

MIX ENGINEER

Ride: *Nowhere* (Sire, 1990) and *Smile* (Sire, 1990) (remix engineer and engineer)

The Boo Radleys: *Giant Steps* (Sony, 1993) (remix engineer)

Lush: *Split* (4AD, 1994)

Nine Inch Nails: *The Downward Spiral* (Nothing/TVT/Interscope, 1994)

Elastica: *Elastica* (Geffen, 1995)

Monster Magnet: *I Talk to Planets* (A&M, 1995)

The Cure: *Wild Mood Swings* (Elektra/Asylum, 1996)

Laibach: *Jesus Christ Superstars* (Mute, 1996)

Blur: *M.O.R.* (Food, 1997)

Various Artists: *Lost Highway* soundtrack (Nothing/Interscope, 1997)

Moby: *Animal Rights* (Elektra, 1996) (also engineer) and *I Like to Score* (Elektra/Asylum, 1997)

David Arnold: *Tomorrow Never Dies* soundtrack (A&M, 1997)

Depeche Mode: *The Singles 86>98* (Reprise/Warner Bros., 1998) (remix engineer)

Various Artists: *Never Been Kissed* soundtrack (Capitol, 1999)

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How did it help with your low end?
Club stuff has to have heavy bottom end, and you have to get it tight and punchy. I grew to really like that. When I went to work with rock bands, I tried to incorporate that kind of low end, which is probably a more American-type sound—rock with a big, thick bottom. It's just having the bass and bass drum loud, and getting them to sit without compressing them too much, which takes the low end out. Also, normally with SSLs, I put a Focusrite EQ across the mix and add a bit of low end as well as a bit of high; the Focusrite seems to work really well with the SSL board.

Meanwhile, you also had an affinity for guitars.
That helped I guess, doing bands like the Mary Chain. I loved working with them—their sound was so irreverent and abnormal.

Yes, you seem to have an affinity for that as well.
[Laughs] One thing has led to another. I've been fortunate, I must admit, in the bands that have picked to work with me. You're only as good as the bands you've been working with.

Trent Reznor's studio really is a converted mortuary, right? What's it like?
Amazing. He has two rooms—the main room is an SSL G-Plus with Ultimation. The main thing is, it sounds good—no surprises when you leave. It was designed by Coco, and despite the fact that it's a large control room, the big monitors are really good. The mains are Tannoys built into the wall. Then, Trent decided that he wanted to get some of that "jeep going past" kind of thing, so he's got 18-inch JBL subwoofers and a 2K amp just to drive them. When you turn the subs on, your back starts shaking; it's great.

Equipment-wise, you've got every piece of gear you could want, and there's two of nearly everything. Also, everything is very accessible. Brian Pollack, who looks after the studio, is an engineer, so it's set up the way you like to work.

In general, you stick to SSL consoles.
I like the way they work. I know some people are funny about the sound, but I think it's good. I'm not tied to SSL; I'll work on Neves or pretty much anything. I think all desks have their good and bad points, so it's best to focus on their good points, and there are plenty of good ones on SSLs. I know some people think they're not as open, or as deep, or whatever. I've never had a problem with them.

Do you like them for both recording and mixing?
It depends. If I was doing a live band it wouldn't be my console of choice. I find that old Neve recording with SSL mixing is a happy marriage. Although I haven't used the J Series yet; that might change my mind.

Really, I use whatever; I think that's more of an English thing as well, by the way. We don't tend to have the finances or resources to be quite so fussy; you have to go with what you've got. I used to work a lot on indie bands who didn't have large budgets; I've been stuck with a band in a tiny studio with a desk I can't even remember, and all I had was SM57s. You have to make a record with that; you can't start complaining because you haven't got the right Neve modules.

I think a lot of American engineers are lucky enough to be spoiled in that way, whereas we've had to rough it a bit. You're given a budget that's low, and you have to get on with it and make the best of it.

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***Can you describe the process of making* The Fragile?**

The process changed, as you can imagine. Trent had some demos and a list of atmospheric territories he wanted to attack in different ways—electronic, or more organic and funky. So, we just started experimenting. When we'd gone through the demos, we started doing new stuff, which would involve, sometimes, just making sounds. We set Trent up in a room with a whole pile of junk, really, and four mics, and he'd just hit things and we'd record it. Sometimes we'd play a loop of something and he'd play along on different boxes, or big plastic water bottles, or shakers—he'd pick up whatever appealed to him. We spent a long time cutting that together, and we made quite a few songs out of it. Sometimes it was based on him playing to the loop, and sometimes, it was just based on the samples.

Then we'd build on it—put some basses on and guitars—and then we'd move on. We never got stuck on anything for too long; we just kept moving. What was good about that was, when you'd come back, after not listening to it for a month, it was a pleasant surprise, much better than we thought. We were having a lot of fun creating stuff, and we kept doing more and more. The down side was we ended up with something like 117 tracks. I knew definitely then that we were into it for the long haul.

One hundred seventeen tracks.

Yes. The strong ones survived. We just kept going round, improving, and then we'd have big review sessions where we would go through everything and say, "No, that one's out." Sometimes we'd get bored and have lab days, making percussion banks or putting drum kits in different rooms and running them though P.A.s. A new piece of gear would arrive, and we'd spend half a day exploring it—you know how it is, when you get a new toy you always get fantastic things out of it in the beginning.

Well, you ended up with a lot going on for the vocals to cut through. How did you record them?

In the end, it got down to two main chains: the 58 for the more loudly sung, cutting vocals, into a Neve 1066, then into a Distressor. Everything went straight into Pro Tools, and it wasn't 24-bit. Twenty-four bit came out when we were in the middle and we thought, "We're committed, we're not going back, forget it!" We did go through an Apogee, the stereo one; some of it was self-limited, and some of it wasn't.

For the other chain, for the more breathy, high-sounding vocals, Trent has one of the new AKG C-12 valve mics, and we also used the Sony, the one with the big hair-dryer heat sink, into an Avalon VT737P. Sometimes we'd use an 1176, but those were the main chains. Trent always sings in the control room; we just turn the speakers down and put headphones on. It's the quickest, much easier for communication.

You've got piles of guitars to deal with. I suppose stereo placement is one of your tools to make them all work.

Yes. Rather than just going for "down the middle" or "hard left or right" or "9 o'clock," you can find little bits; just by wiggling them around a bit you'll give them a different space.

Writing songs for *The Fragile*, we never got stuck on anything for too long, we just kept moving. What was good about that was, after not listening to it for a month, it was a pleasant surprise. The down side was we ended up with something like 117 tracks.

This is really dull to say but, generally, on guitars in the mix, I do absolutely nothing. A little bit of EQ to separate if there's a whole wodge of them and a very slight board compression. I use the channel compressor on the SSL set so it's hardly working. That gives it a bit of warmth or fatness.

I do use filters a lot, probably more than EQ. On guitars, I sometimes find that if you put the highpass filter in slightly, it can clear out a lot; also, sometimes I filter the top off.

I know you used all sorts of different guitar setups on* The Fragile, *but isn't there something basic you'd start with?

I don't have a particular setup. With other bands, it's what the guitarist likes to use; then if we're struggling, I'll suggest something. In this case, Trent had a few preamps; in particular, we used the DigiTech 2112 a lot. It's stereo, and you can route a tube preamp to one side and a solid-state one to the other. We'd do that, then send them to a Boogie power amp and out to a pair of Boogie 4-by-12s. It sounds really wide with different preamps on each side.

Distortion is one of the main artistic linchpins of the record. What are some of the things you used to get it?

We'd go on pedal-buying trips a lot. Swollen Pickle was very popular, by Way Huge. They don't make them anymore. We used Lovetime, Big Cheese, Fox, The Tone Machine, and some things were done on the Eventide DSP 4000.

There's a pedal called the Fuzz Factory we liked, and we used the Shinai fuzz/wah which the Jesus and Mary Chain used to get their thin, wiry distortions. There's the Roger Mayer Voodoo Axe, the Danelectro Daddy-O...I could keep going on. Also, often they were strung together.

With so much going on, and so many different kinds of distortion, how do you carve out niches for each part?

I suppose some of it's done by taste and fine-tuning while you're recording. You get a sound that works with what else is there. The way Trent works, you're always trying something different. He'd want to do a guitar overdub, without particularly having a part in mind, so we'd grab a load of pedals and plug them together—either plug the pedal chain into a valve DI, or sometimes we'd put it into an amp through speakers or sometimes through an amp into a speaker simulator. He'd get a sound and go, "Well, that's quite interesting," and he'd come up with a part based around the sound, which is quite a liberating way to do guitars.

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That's opposite to how a lot of people work.

It is. On this album there was no real agenda or plan; it all kind of unfurled as we went along. In hindsight, when I listened back to it, it seemed that we knew what we were doing, but we didn't. We just didn't want to pull out the old tricks. For a lot of the sounds that Trent had gotten in the past, particularly on *Downward Spiral*, people seem to have created plug-ins that do them immediately. So, he couldn't use those; he had to move on.

It really was a different way of making a record. We both said we were glad we did it, and that we enjoyed it, but we wouldn't do it again. Both of us were, I think, at the point that we wanted to have that indulgence. Especially as an engineer, it's a dream to be able to indulge yourself in sound as much as we did.

What did you mix to?

DAT, 16-bit. Through the Apogees. In hindsight, I would have liked to have gone to half-inch, but since I thought we would be doing more post-production, going digital back to Pro Tools, I thought we should go to DAT.

Do you think you have a special talent for working with people with strong personalities?

My preference is working with people with strong personalities. They know what they're doing; they're not looking for you to give them a sound. You work together, which I like; I always work as a co-producer. I believe in working with bands that inspire me; it would be a complete con to take solo production on any of these bands' records because they have such massive input. You're there as devil's advocate, somebody to push them, as a sounding board, or to give them ideas. A lot of the time, you're there to filter through their ideas. A lot of the people I work with are not short of ideas or parts—they've got too many! They just want somebody to go "that one!"

To help sort it out.

Yeah. So, if somebody says, "The guy in the band's a control freak," I think, "Fantastic." Because, for me, they're much easier people to work with.

Is there a piece of equipment you can't do without?

I've got a Forat F16 that I use to trigger kicks and snares. Most people don't admit doing this, but I'm going to put my hand up and go, "I do." I don't use them to replace; I use them to put behind, because I don't really like reverbs on drums. Instead I'll put a low, whoompy-sounding kick beneath the kick drum to give it sub. Sometimes you can't EQ that in, or if you EQ it in, it gets muddy. I find it works with a blend, with the recorded kick drum as the main sound, the low one underneath, and then you just sneak in the subharmonic dbx on that.

The dbx boom box?

Yes. You don't have a lot of bleed going on and you can get a very present kick drum. So I'll have a whoompy one or sometimes a clicky one just to give it a bit of definition, and just behind the snare I'll put an ambient snare sample instead of using a reverb. A lot of people are a bit Luddite about samples, but I don't see the difference between putting an ambient snare sample behind the snare and using reverb. Some people reach for the same reverb to put on the snare all the time—they think that's fine and a sample isn't. I don't see the difference, apart from the fact that, to me, the snare sample sounds more natural than the digital reverb.

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—CONTINUED ON PAGE 212

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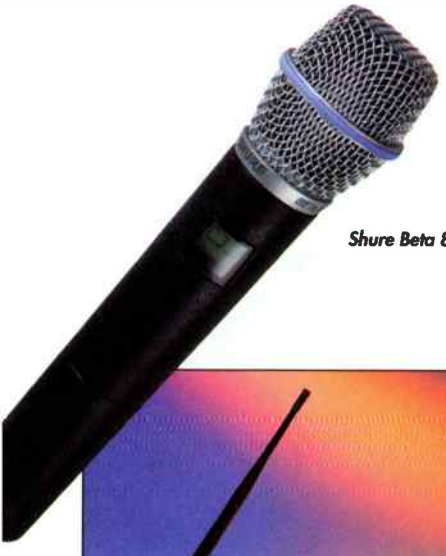

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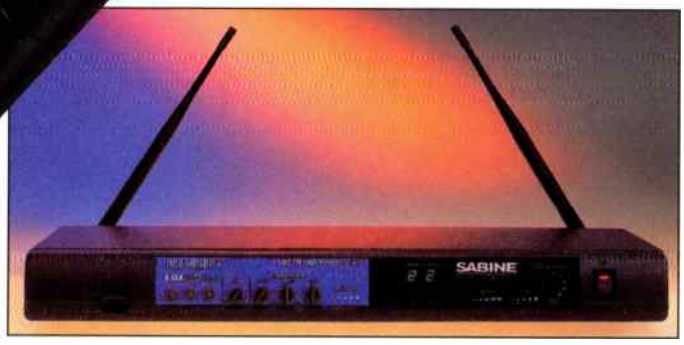

Sabine True Mobility Wireless Microphone System

Audio-Technica 7000 Series

In many ways, professional audio performs as a microcosm of the capitalist system: The market picks the winners and, with some exceptions, tends to reward those manufacturers whose products offer the best technology at the best price. However, there is one sector of the pro audio market where the government—rather than technological advances and customer needs—has the biggest influence over product development. Wireless microphone manufacturers must not only compete against each other, but must also keep a close watch on changing rules and regulations set by the Federal Communications Commission (FCC), which regulates radio, television, wire, satellite and cable communications. (For more info, visit www.fcc.gov.)

During the past 30 years, improved RF technology and a number of favorable FCC rulings have opened up the airwaves to wireless transmissions, setting the stage for the current state of wireless in pro audio. After a rocky start (who can forget how bad Mick Jagger's early '70s wireless mics sounded?), wireless microphones have become an accepted fact of live performance, and more than a dozen manufacturers now compete in the still-growing market. But, thanks to recent FCC regulations, television is fast crowding into the bandwidth that wireless mic systems depend on. Digital TV is expected to gobble up 1,600 secondary channels by 2006, licensed and unlicensed two-way radio use is on the rise, and even hospitals are now claiming channels that were once available to touring sound system operators.

Despite these challenges—or perhaps because of them—wireless microphone systems are better than ever. Many wireless systems now offer 16 channels or more and a vastly improved array of transmitters, receivers, amplifiers and antennae that now rival the sound of traditionally wired systems. Thanks to FCC rulings dating from the '70s, most of today's wireless systems operate in the UHF band, although increasing channel congestion may lead to an increase in VHF-based

A Guide to Top-of-the-Line

HIGH WIRE

BY RANDY ALBERTS

systems. To assess the current state of the industry, we asked manufacturers to pick their best or most representative wireless system. For more information on these and other models, see the manufacturers sidebar for Web addresses and phone numbers.

The AKG WMS81 UHF Wireless Microphone System ($805 to $2,040, depending on options) is a half-rack model with a rackmount kit that offers 15 selectable frequencies, switchable mic/line outputs, interchangeable mic elements, tone code squelch, RF and AF signal strength indicators, and a removable rear-mounted antenna. The WMS81's transmitter packs operate on two AA batteries for up to ten hours and feature adjustable frequency and gain control, power on/off, mute switch and a signal peak indicator. Options include a wide-band antenna splitter, directional antenna, external antenna, three modular mic capsules and a bodypack system that includes two head-worn mics, two lavalier mics, and a wind/brass instrument mic.

The 7000 Series Multichannel UHF True Diversity Wireless System ($975 bodypack version, $995 handheld) from Audio-Technica offers as many as 100 switch-selectable PLL-synthesized channels above the 700MHz frequency band and is designed for live performance, public address, aerobic instruction and other applications. Both bodypack and handheld versions include the ATW-R73 receiver featuring balanced XLR and unbalanced ¼-inch jacks, adjustable volume and squelch controls, and the ability to select the superior signal from one of two independent receiver sections. The bodypack option includes a wide selection of lavalier, head-worn and gooseneck-mounted microphones to choose from.

Azden offers the 311DRH VHF ($375), a new half-rack wireless receiver that adds an on/off switch, RF/Audio/TD display, squelch control and detachable antennae to the company's popular 311DR receiver. Featuring true diversity reception and a frequency range of 25 VHF channels, the 311DRV VHF also sports output

Beyerdynamic U 400

Sennheiser EM1046

Sennheiser SKM 5000

Wireless Microphone Systems

AKG WMS81

level controls, balanced XLR and unbalanced ¼-inch outputs, and a 12VDC power input. Optional transmitters include the 31HT handheld, 31LT bodypack lavalier and the 31XT, a plug-in converter that turns any dynamic handheld mic into a wireless unit.

Beyerdynamic has released four Diversity Wireless Systems, including the U 400 UHF ($1,999). As many as 16 frequencies can be accessed within a single UHF channel with the U 400, and

Electro-Voice MS3000E

optional antenna distribution amplifiers make the system well-suited for integration with existing wireless systems. The half-rack U 400 receiver features a multifunction LCD for viewing chosen frequencies, RF and VU level and antenna data, and is available in handheld and pocket transmitter formats.

At this month's NAMM show in Los Angeles, **CAD** (a division of CTI Audio) will unveil its 40-channel digital wireless system, which operates at 2.45 GHz and features an advanced ASIC-based RF drive engine. The receiver features a large, four-color vacuum fluorescent display of metering and full operational status. Available transmitters include handheld, head-worn and lavalier/beltpack versions—the latter offering both instrument and mic inputs.

Electro-Voice's new MS3000E Wireless Microphone System ($1,038) is a UHF-based unit operating between 690 and 720 MHz (channels 50-59) on custom-tuned frequencies using E-V's Secure-Phase signal reception technology. Featuring a signal-to-noise ratio of 104 dB, the MS3000E offers a choice of handheld or bodypack transmitters, with a number of microphone models to choose from. The receiver has LED audio input and output level meters, diversity circuitry LED indicators, rear-panel squelch adjustment control, and balanced-XLR and unbalanced ¼-inch audio connectors.

The JW300 Series Wireless Microphone System from **Jensen Music Industries** is available in nondiversity ($279), diversity headset ($373), and true diversity lavalier ($369) models. The tabletop/rackmountable units feature balanced XLR and ¼-inch unbalanced connectors, as well as front-mounted detachable antennae, dual audio level and signal reception meters, and level controls. The JW300's rubberized mic body also provides an improved grip for performers. A further refinement is the use of contact points inside the mic itself (rather than traditional wiring) for protection from the road punishment wireless mics are often subjected to.

Lectrosonics offers the UT200VM ($1,435) wireless microphone/transmitter, which uses an internal dipole-type antenna and features machined brass and aluminum internal parts, signal attenuator, tone controls and a durable PVC housing. Additional features include gain adjustment, wide-range input limiting, a low-noise Motorola OP amplifier, and 256 synthesized frequencies to choose from. The UT200VM can also suppress input signal peaks up to 30 dB above full modulation. The Lectrosonics UDR200B wireless receiver ($4,295) employs fixed and synthesized frequency agility to avoid interference problems,

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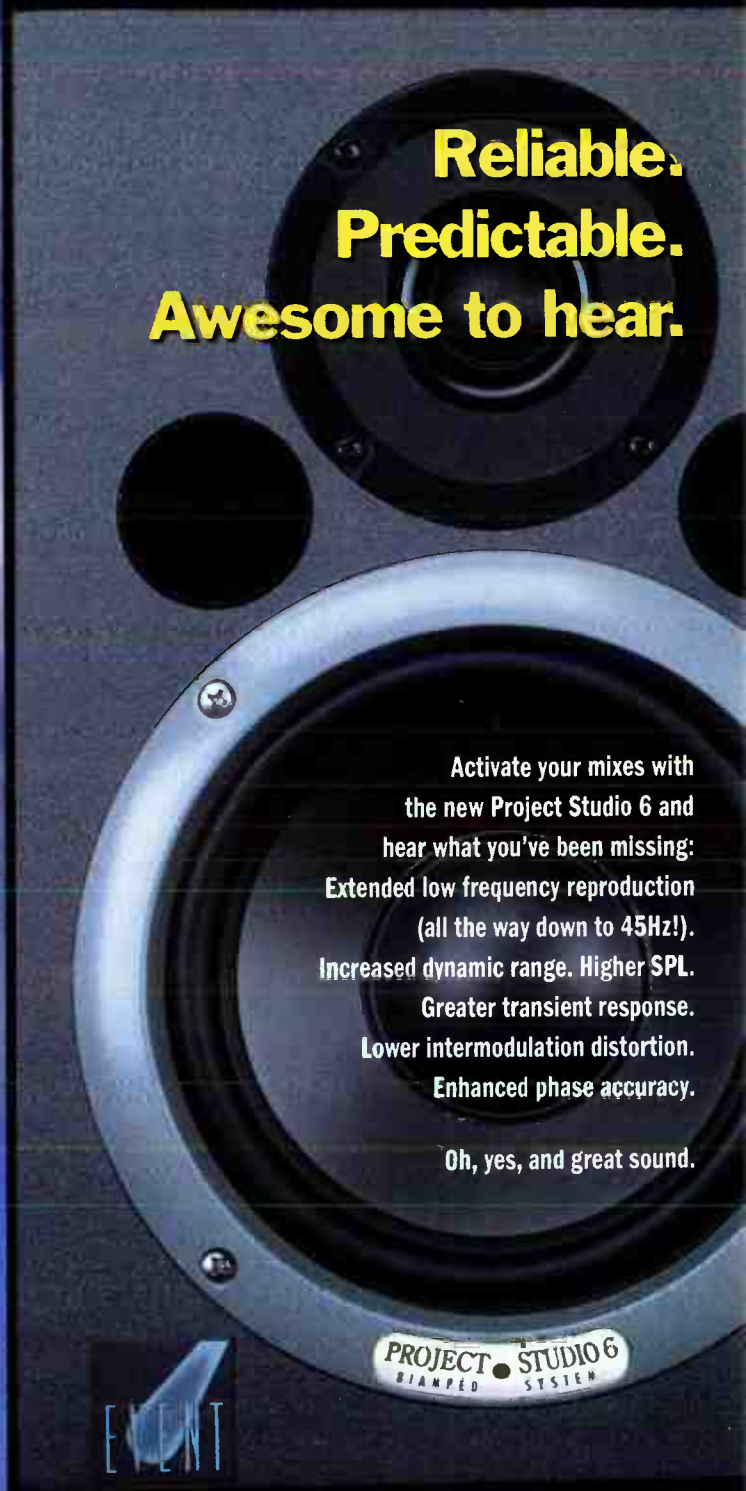

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Jensen JW300

and the included LecNet software allows for remote computer control of the receiver.

Available in bodypack, lavalier and handheld formats, **Nady Systems'** new UHF 760 System ($1,150 for the handheld system, bodypack and lavalier models are $1,030 each) is a 160-channel UHF wireless system that features user-switchable UHF channels between 746 and 952 MHz and true diversity operation. The 760 boasts 120dB dynamic range, balanced mic/line selectable XLR and ¼-inch unbalanced connectors, and easy-to-read, two-color, five-segment LED meters for monitoring audio levels and group/channel settings. Nady claims an operational range of up to 500 feet in line of sight, and the half-rack receiver can be easily rackmounted.

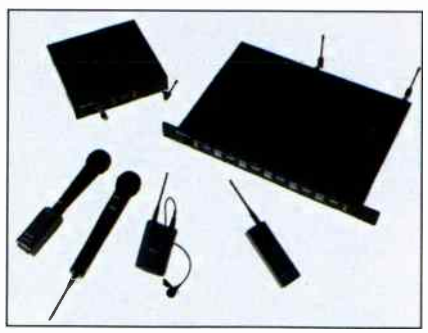
As we were going to press, we heard that **Peavey** was planning to launch a line of wireless products at this month's NAMM show. No details were available in advance—look for more information in future issues.

The True Mobility Wireless Microphone System ($949 handheld or lavalier, $969 headset) from **Sabine** includes a 30-channel diversity receiver with a NiMH-rechargeable battery charger built in the receiver's front panel. The system is available in both UHF (30-channel) and VHF (16-channel) formats. A range of optional microphones, antennae, and mic and transmitter accessories are available for the single-rackspace system, and True Mobility systems incorporate Sabine's popular FBX Feedback Exterminator circuitry for live feedback control. Auto de-esser and compressor/limiters are standard equipment, as is dual-squelch circuitry.

The **Samson** UHF Synth Series Six Wireless System ($2,199 dual receiver plus beltpack, handheld, and distribution amp options) operates as many as 101 simultaneous channels, can be remotely controlled via PC with Samson's Wireless System Manager software and features an RF spectrum analyzer, dbx noise reduction, frequency selector and squelch control. The Synth Six's automatic voltage-sensing power supply works without adapters anywhere in the world, and a wide number of popular handheld, lavalier and headset microphones are available.

Sennheiser's flagship 5000 Series EM1046 Wireless System ($89,580) is a multichannel wireless system that features eight microprocessor-controlled diversity receiver channels in a single mainframe. The four-rackspace 1046 receiver, which operates on both UHF and VHF channels, can be daisy-chained for easy expansion and offers an optional computer connection kit for remote operation and monitoring. Also included is HiDyn Plus noise reduction with 112dB signal-to-noise ratio on each channel and both LED and alphanumeric displays. Transmitters include the SKM 5000 supercardioid condenser handheld with interchangeable mic heads and the SK 50 bodypack with Lemo connector for lavalier, headset or hair-worn mics.

Shure's U24/58 Wireless System ($3,980 dual channel, $2,390 single) is a UHF-based wireless solution that features a hefty 191 user-programmable frequencies to choose from (international versions may vary). The system offers programmable LCD displays on both receivers and transmitters to indicate group/channel settings and transmitter battery status. Four Shure mics are available for the handheld version (SM58, SM87A, Beta 58A, and Beta 87A) and several Shure mini-lavalier and head-worn mic options will work with the bodypack version of the system. Via the receiver's screen interface, users can display and control frequency settings, enter performer's names and modify squelch settings. Transmitters and receivers offer a programmable lock feature to guard against accidental changes and two independent RF sections increase sensitivity and reception while reducing transmission dropouts. Finally, the system is also offered with an optional UA888 accessory that allows users to remotely monitor and control system parameters via a computer interface.



Sony WRT-807A system

Three new UHF wireless microphone products make up Sony's latest system offering. The WRT-807A Handheld Microphone ($780) is a dynamic UHF mic designed specifically for the touring pro. Compatible with all 800 MHz-range Sony wireless receivers, the WRT-807A features 94 PLL-synthesized UHF frequencies, an LCD and locking on/off switch. The $930 MB-806A is a single-rackspace modular UHF tuner frame (with built-in antenna divider) that houses as many as six UHF diversity tuner modules, giving each an individual XLR and mix output. The MB-806A features a global mic/line switch for all outputs and an antenna gain switch to compensate for distance and RF conditions. The matching WRU-806A Diversity Tuner ($490) allows automatic setting of all channel modules loaded into the frame to the correct coordinated group-plan frequency when used in conjunction with the MB-806A. AF and RF level indicators are included, and the use of a converter circuit reduces battery ramped-down performance.

Telex USR-100

Finally, the USR-100 UHF Wireless Microphone System ($540 to $1,600) from **Telex**, is available with beltpack or handheld mic options packed with its SH-100 Posi-Phase™ II receiver. The microprocessor-controlled USR-100 system offers 100 channel frequencies to choose from on TV channels 47, 48, 58 and 59—frequencies that Telex claims to be the least used television channels. The receiver's Programmable Integrated Circuit controls all VCO, RF stage tuning elements, RF signal strength, audio level metering, diversity phase relationship, channel selection, and Telex's smart-diversity circuitry for precise control and automatic self-tuning. ■

Randy Alberts is a musician and writer who's previously been on staff with Mix *and* Electronic Musician.

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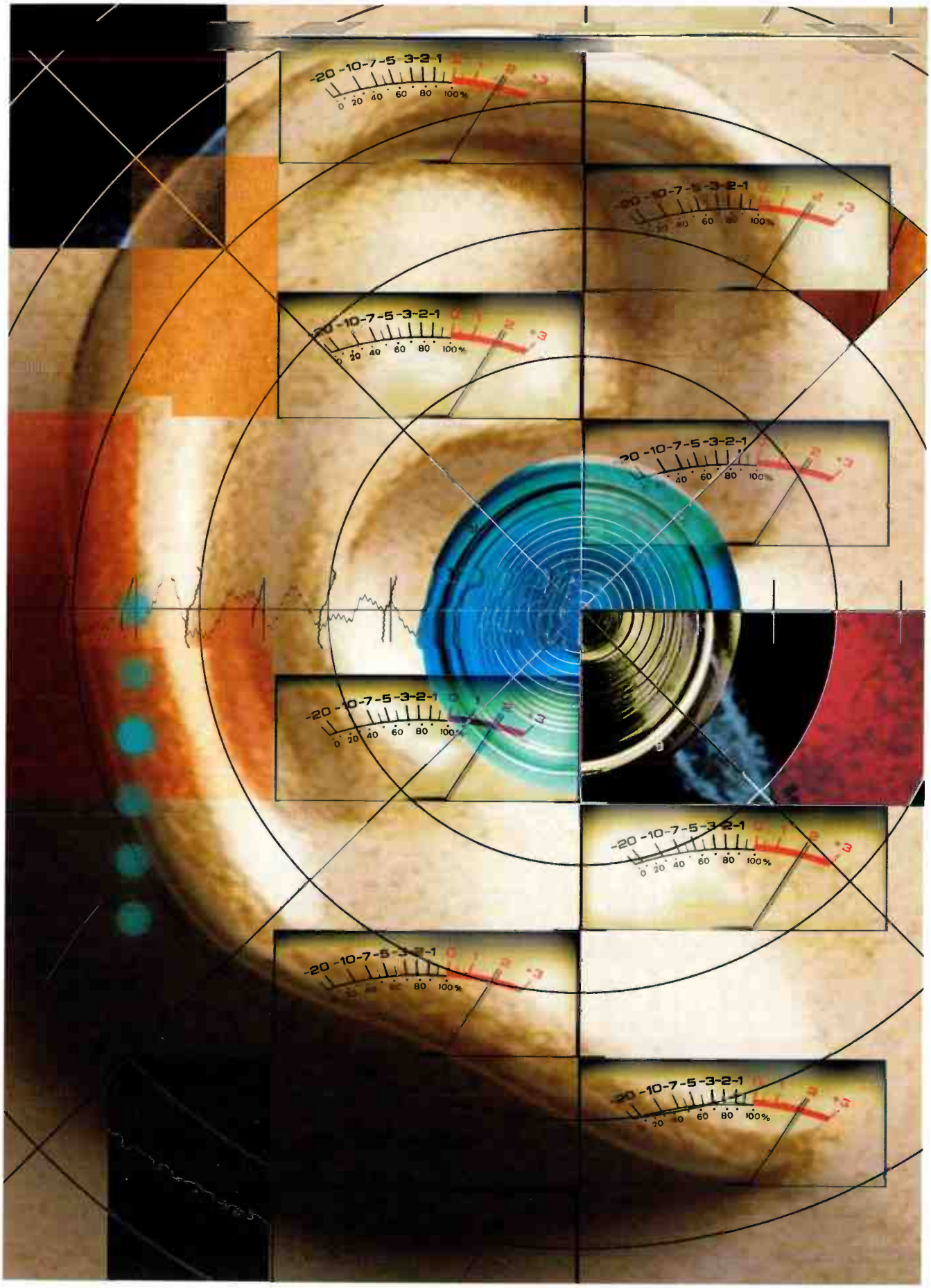

TIPS AND TECHNIQUES FOR GETTING THE MOST OUT OF IN-EAR MONITORS

BY MARK FRINK

In-Ear Monitors (IEMs) offer significant benefits for the performing musician, but they also place higher requirements on users, operators and their equipment. Compared to traditional monitor setups, IEMs require more output mixes, more inputs, more outboard gear and, of course, an individual set of IEMs for each musician and monitor engineer. In order to develop the skills and techniques that provide gratifying results on IEMs, monitor engineers must thoroughly understand the technology and must invest in equipment far more complex and expensive than wedge-based monitoring requires. The payoff is that performers who become comfortable with IEMs may never again be satisfied with wedges.

IN-EAR MONITORS

I've been fortunate to learn from some the best IEM engineers and have done a little exploring on my own. I don't pretend there's any single best solution to the challenges of this evolving field, but I'd like to share some thoughts with readers who will be using this exciting, new technology.

ONE SIZE FITS ALL...NOT!

Different models of earphones are pleasing to different individuals. There's no guarantee that any one model will make everyone in a band happy, but for consistency, it is always preferable to use the same model. Also, a close match between the performers' and engineer's ear molds is necessary, and the match must be much closer than that between a cue wedge and the floor monitors. Although varying types of monitors can be compensated for, and different sonic characteristics may even be preferable in some situations, the only way to get a good idea of how a performer's ear mix sounds is to use the same model of earphones. This is not to say that different performers in the same band will be happy with the same response. Not only will tastes differ, but different players' hearing abilities will vary. (See sidebar on "Healthy Hearing With In-Ear Monitors.")

Custom molds are more expensive but provide the most comfort and higher isolation. Isolation is important because when the IEMs compete with background sounds, they must be listened to at higher levels. So isolation and hearing conservation go hand in hand. The best earpieces block out ambient sound so that the direct sound can be heard more easily. It is worth repeating that there are no shortcuts to quality. With ear molds, as with most other equipment onstage, you tend to get what you pay for.

ROLL YOUR OWN

One way to "personalize" the response of any given model of IEM is with EQ. In order to equalize IEMs effectively, the engineer needs to become familiar with the response of the product and the hearing of the performers. One way to EQ an IEM mix efficiently is to put the output equalizer controls in the hands of the performer listening to them. Many musicians have a working knowledge of EQ and can quickly make their own adjustments to provide a satisfying mix.

Some headphone enthusiasts recommend what they call "Biphonic EQ," which amounts to boosts of about 6 dB at 30 Hz, 2.5 kHz and 20 kHz to promote a more natural listening experience. The transducers in many earphones already have a similar boost in the midrange. We've seen a simple high-frequency boost available on some IEM products, and it's conceivable that one of the next features to appear will be the loudness contouring switches that are commonly found on consumer stereos.

THE SILLY-PUTTY METHOD

Many engineers use the SIA Smaart Pro computer-based analysis system for sound-system measurements. I've also found this to be a useful tool for comparing the response of IEMs. One standard device is an aluminum 10cc coupler that fits a measurement microphone to a transducer with a chamber that approximates the volume of the ear canal. I've discovered that inexpensive couplers can be made from plastic 35mm film canisters (Fuji's works better than Kodak's) by drilling a hole in the bottom for a snug fit with the tip of the measurement mic. Lining the inside of the film canister with half-inch foam reduces the size of the chamber to imitate the size and shape of an ear canal, while at the same time reducing reflections. Simply drill a hole in the top of the film container for the tip of the earmold and use a 1-inch doughnut of art clay (or Silly Putty) to seal the ear mold—an airtight seal at both ends is important for accurate readings. You can then measure several molds as quickly as you can switch the tops. This may appear to be a crude measurement method because it doesn't yield the precise response of the transducer (which varies for different molds and for different ears). It does, however, offer a repeatable means of comparison among different makes, between several units of the same make and, most importantly, for verifying the performance of the same unit over time. I keep several predrilled canisters, each drilled out for a different measurement mic, along with a half-dozen tops, all sealed in a plastic bag so the putty doesn't dry out.

MICS AND GATES

Due to the isolation provided by good ear molds, the ambience of the performance space must be added back to the mix in a controlled fashion for a realistic mix. Conversely, too many open mics in the mix will tend to muddy the sound, and any set-and-forget reverbs on those inputs will mush up the mix even further. For example, a guitar amp pointed at an open vocal mic will wind up in that vocal mic mix, messing up the sound of the guitar in both the monitor and FOH mix. One way to reduce the

HEALTHY HEARING WITH IN-EAR MONITORS

Differences in personal ear geometry and varying degrees of hearing ability resulting from the occupational hazards of live sound are factors to consider when selecting in-ear monitors. Consequently, it is strongly recommended that both musicians and engineers get their hearing checked annually.

A hearing test should always be included when impressions are made for ear molds, and both procedures should be performed by a certified and IEM-knowledgeable audiologist. Of course, hearing loss is a sensitive subject among musicians and other audio professionals, and each musician must decide whether to share the results of a hearing screening with the sound engineer. But in the course of learning what different performers want in their monitors, astute engineers will eventually acquire an intimate knowledge of the performers' hearing anyway. Why not save time? An informed, confidential discussion with your monitor engineer can help conserve your hearing and make it easier for him or her to tailor the mix for your specific needs. ■


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IN-EAR MONITORS

amount of stage wash getting into open, unused vocal mics is with gates, and one recommended device is the PureSound Mic-Mute, a pager-sized gate that sits on the mic stand and uses infrared light to detect when someone is in front of the microphone. The newest models have adjustable proximity, run on phantom power and offer adjustable attenuation. The traditional Mic-Mute mounts on the back of the vocal mic, but the new MM-4 has an XLR pass-through, allowing it to be mounted lower on the mic stand. The greatest benefit is that the monitor mixer no longer has to spend half the set ducking unused vocal channels, freeing hands for the more important fader moves that IEM mixing demands.

A few extra mics placed in strategic spots around the stage can make it easy for a performer to talk privately to some or all of the band or just the engineer. A gate or Mic-Mute can take the place of a push-to-talk (PTT) switch, making talkback hands-free. In fact, with IEMs, a variety of elaborate communications arrangements can be created, allowing for all kinds of subtle interaction during the show. One example is a simple footswitch that can redirect a vocal mic into a talkback channel. Similarly, the monitor engineer should set up a system for talking to the performers; a PTT is the traditional tool, but a Mic-Mute can free both hands to make adjustments, as the mic will turn itself off when you lean away.

Overhead mics, which were almost never used in traditional stage monitor mixes, now play a significant role in IEM mixes. However, because the sonic image must sit right between the ears, traditional overhead mic placements may not sound quite right for IEMs. Often a single mic over the drummer's head, a stereo mic or an X-Y pair will provide a better representation of the entire drum kit than the usual split pair of overheads. For downstage audience mics, pencil condensers are generally the most suitable and a stereo mic—such as a Crown SASS or a Shure VP-88—placed downstage center can provide extra realism and imaging that help the artist relate to the audience response.

As an IEM convert, I rarely use a cue wedge anymore, even when an entire band is on wedges, other than during the first half-hour when I'm checking out the rig. I now find that a cue wedge seems to draw posers and hangers-on over to monitor beach, where they interfere with the ability to make meaningful eye-contact with performers. I find it much easier to pick out a speaker mix on the verge of feedback using IEMs, and they can be turned down to a more comfortable level than a cue wedge.

When working as the monitor tech for the artist's monitor engineer or as the "third guy," I'll take the cue out of the console as one input to my wireless IEM transmitter and plug the intercom into the other. This allows me to listen to what the monitor engineer is cueing

—CONTINUED ON PAGE 214

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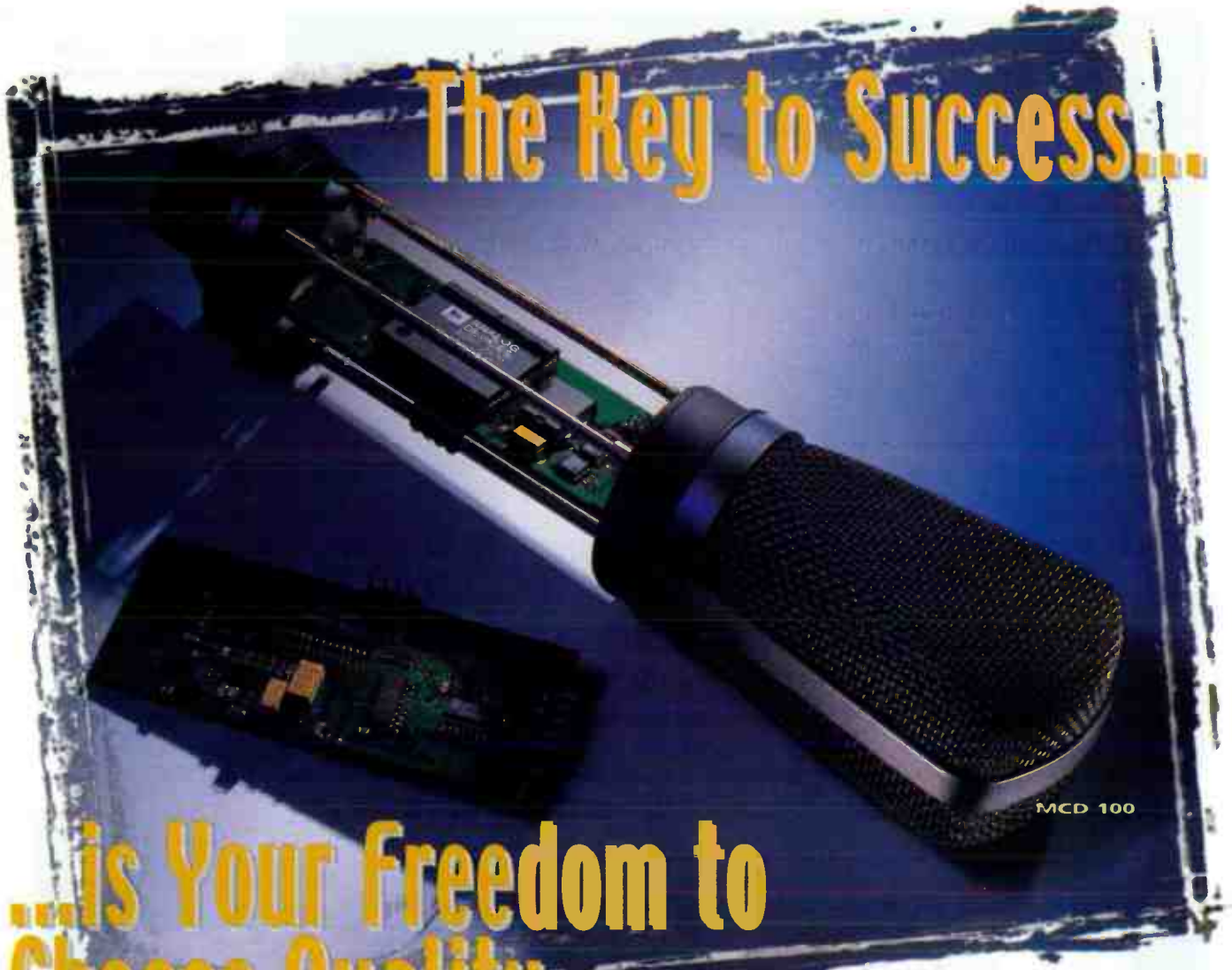

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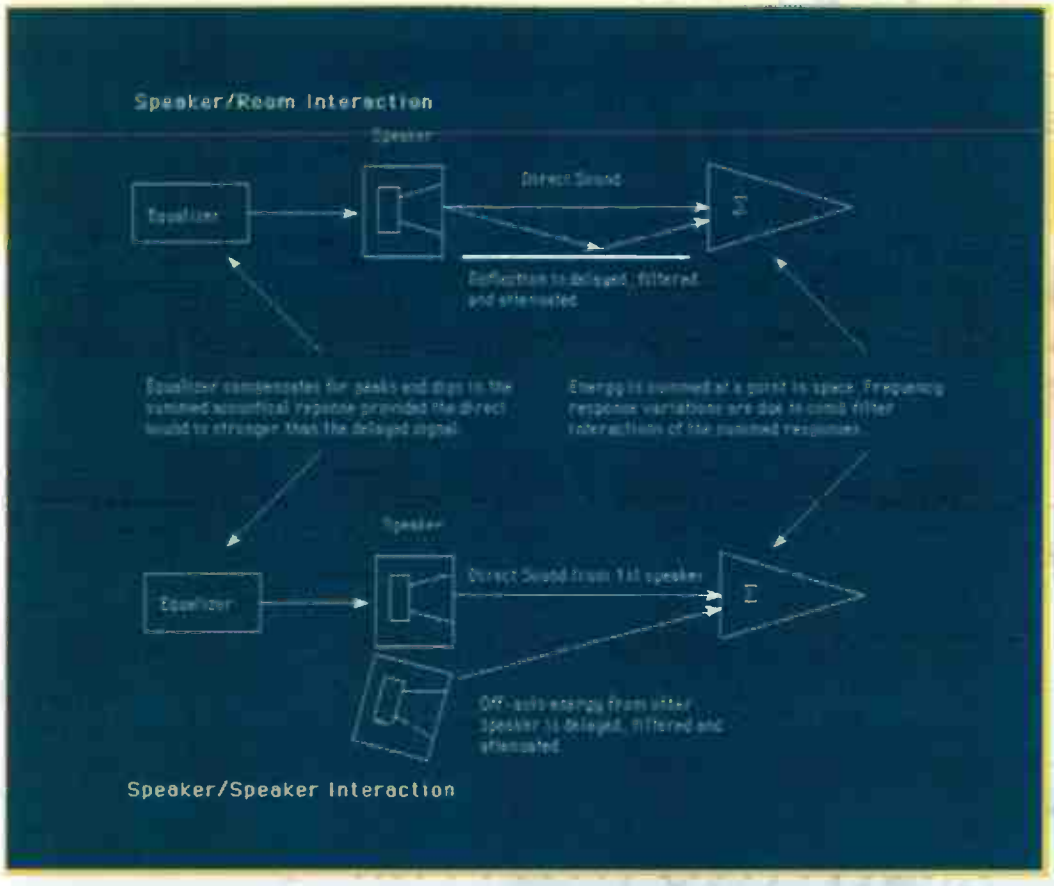
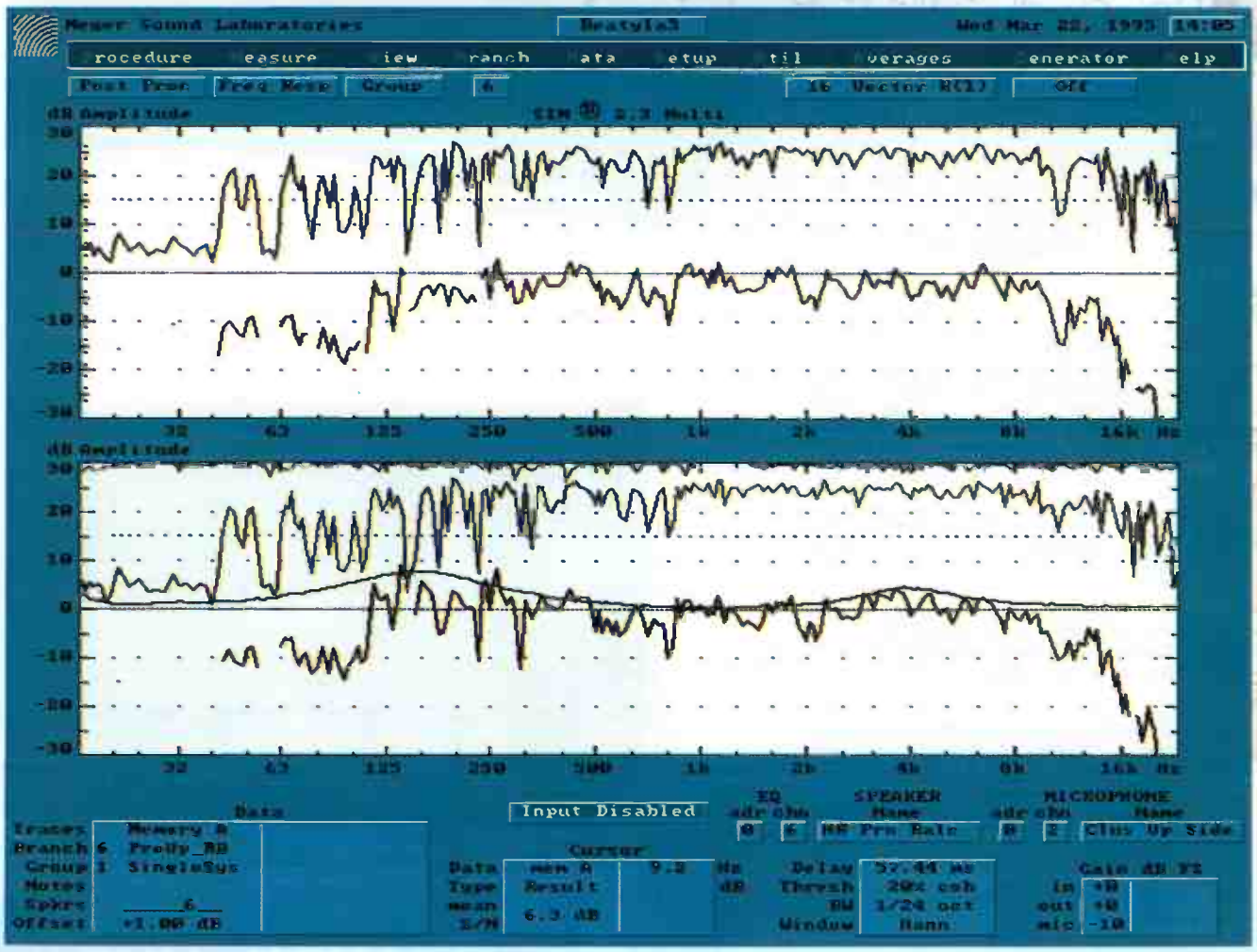


Left: Figure 1

Comparison of speaker and room interaction. Notice that both can be compensated by equalization provided that the direct sound is louder than the secondary source.

Below: Figure 2

Equalizing for speaker interaction. The lower screen shows the original response and the equalization curve that was applied to compensate for speaker/room interaction. The equalizer curve is shown inverted. The upper screen shows the effectiveness of the equalization to bring the response closer to its free-field state. Notice that no attempt is made to correct the narrow dips in the response. Equalization instead compensates for the broad characteristics of the speaker/room interaction.



EQUALIZING THE ROOM

BY BOB McCARTHY

"I am going to equalize the room."

We've all heard that statement so many times that we scarcely think about what it literally means. We know that in practical terms it means adjusting an equalizer to suit your taste. It may be done with the latest high-technology analysis equipment, voodoo magic or simply by tweaking away "until it sounds right." In any case, are we really "equalizing the room?" What

Refinements in sound-analyzing technologies are beginning to shed some light on both the capabilities and the limitations of equalization.

exactly are we doing? There are lots of disagreements on this topic, but all agree on one thing: You cannot change the architecture of a room with an equalizer. You can, however, equalize the response of the speaker system. Where the room fits into all this is a matter of debate; it is much more than semantics and has very real practical consequences on our approach to sound-system alignment.

EQUALIZING THE ROOM

WHAT DO EQUALIZERS "EQUALIZE" ANYWAY?

Let's assume that we have a speaker system with a flat (or otherwise desirable) free-field frequency response. That is to say, it requires no further equalization. There are three categories of interaction that will cause the frequency response to change, to become, for lack of a better word, "unequalized."

The first of these interactions is between speakers. When a second speaker is added, the combination results in a modified frequency response at virtually all locations. This is true of all speaker models and all array configurations, regardless of any claims to the contrary. The summation of the two responses varies the frequency response at each position, depending upon the relative time arrival and level between the two speakers. As additional speakers are added, the variations in response increase proportionally.

The second category is the interaction of the speaker(s) with the room. This is generally termed coupling, reflections or echoes. The mechanism is similar to the speaker interaction above. The response varies from position to position, depending upon the relative time arrival and level between the direct and reflected sound. Both of the above effects are the result of a summation in the acoustical space of multiple sources, either speaker and speaker, or speaker and reflection. Therefore, the solutions for these interactions are very closely related.

The third interaction is caused by the effects of dynamic conditions of temperature, humidity and changing absorption coefficient. However, the effects of these interactions are small by comparison with the other two, so we will not touch on them further here.

Are any of these problems solvable with an equalizer? The answer is a qualified "Yes." The magnitude of these problems can be reduced by equalization, and substantial progress can be made to restore the original desirable frequency response. If equalizers were totally ineffective, then why have we been loading these things into our racks for the past 35 years? However, in a practical sense, the equalizer can only provide complete success in equalizing the response when applied in conjunction with other techniques such as architectural modification, precise speaker positioning, delay and level setting.

To what extent is the speaker/room interaction equalizable? This has been a matter of debate for more than 15 years. In particular, the advocates of various acoustical measurement systems have come down hard on these issues. What we are doing is equalizing, among other things, the effects of the room on the speaker system. Why is this controversial? It stems from the historical relationship of equalizers and analyzers. Let's turn on the Way-back machine and take a look.

EARLY ANALYSIS

In ancient times (the 1970s), the alignment of sound systems centered around a crude tool known as the Real-Time Analyzer (RTA) and a companion solution device, the graphic equalizer. The analyzer displayed the amplitude response over frequency in ⅓-octave resolution, and the equalizer could be adjusted until an inverse response was created, yielding a flat combined response. It takes a negligible skill level to learn to fiddle with the graphic EQ knobs until all the LEDs line up on the RTA. It is so simple that a monkey could do it, and the results often sounded like it. Although these tools were the standard of the day, they have severe limitations, and these limitations can lead to gross misunderstanding of the interaction of the speakers to each other and the room, resulting in poor alignment choices.

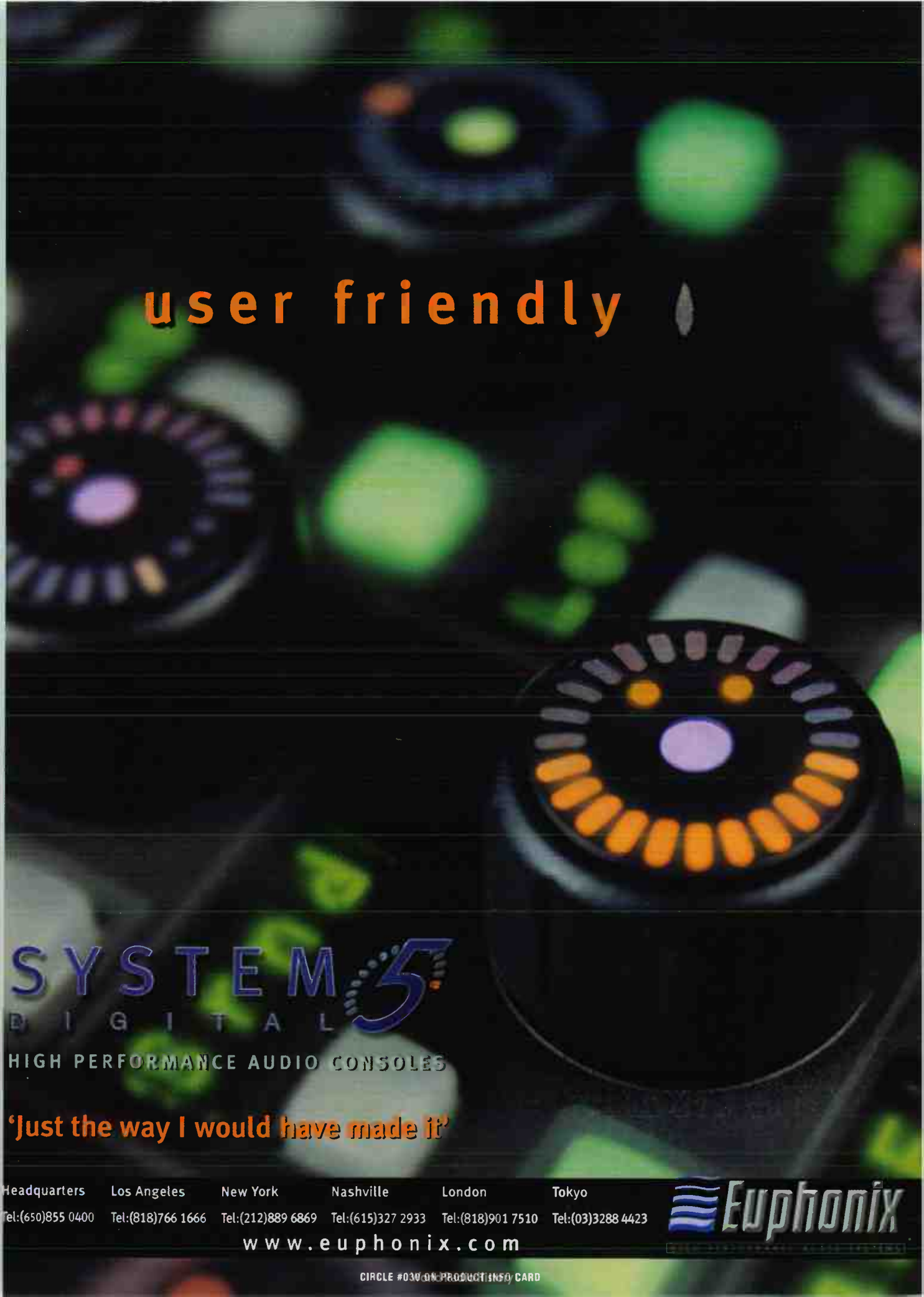
The equalizer can only provide complete success in equalizing the response when applied in conjunction with other techniques such as architectural modification, precise speaker positioning, delay and level setting.

One such limitation is the fact that the RTA lacks information regarding the temporal aspects of the system response. There is no phase information nor any indication as to the arrival order of energy at the mic. The RTA cannot discern direct from reverberant sound, nor does it indicate whether the response variations are due to speaker interaction alone or speaker/room interaction. Therefore, the RTA provides no help in terms of critical speaker positioning, delay setting or architectural acoustics.

Second, the RTA gives no indication as to whether the response at the mic is in any way related to the signal entering the loudspeakers. The RTA gives a status report of the acoustical energy at the microphone, with no frame of reference as to the probable causes of response peaks and dips. These peaks and dips could be due to early room reflections or speaker interactions, which can respond favorably to equalization. However, the irregularities in response could be from late reflections, noise from a forklift engine or reflections from a steel beam in front of the speaker. The equalizer will be ineffective as a forklift or steel beam remover, but the RTA will give you no reason to suspect these problems. A system that is completely unintelligible could look the same on the RTA display as one that is clear as a bell.

Third, the fact is that ⅓-octave frequency resolution is totally insufficient for critical alignment decisions. In addition, there is a misconception that a matched analyzer/filter set system is desired. It is not. The analyzer should have three times the resolution of the filter set in order to be able to provide the visible data needed to detect center frequency, bandwidth and magnitude of the response aberrations. A ⅓-octave RTA is only able to reliably determine bandwidths of an octave or more. What appears on the RTA as a ⅓-octave peak may be much narrower. What appears as a broad ⅔-octave peak may actually be a high narrow peak placed between the ⅓-octave points. What will your graphic equalizer do with this?

Unfortunately, the absence of this critical information has often lulled users into a sense of complacency, predicated on the belief that equalization was the only critical parameter for system alignment. In countless cases, equalizers have been used to correct problems they had no possibility of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EQUALIZING THE ROOM

solving and could only make worse. Graphic equalizers have no possibility of creating the inverse of the interactive response of the speakers with the room. Simply put: "You can't get there from here." (For further discussion, see "Equalizer Inequality" in the June '99 issue of *Mix*.)

The audible results of all this tended to create a generally negative view of audio analyzers. Many engineers concluded that their ears, coupled with common sense, could provide better results than the blindly followed analyzer. As a result, though RTAs were often required on riders, they only received cursory attention on show day.

MODERN ANALYSIS

Technological progress led to the development and acceptance of two analysis techniques in the early '80s: Time Delay Spectrometry (TDS) and dual-channel FFT analysis. Both of these systems brought to the table whole new capabilities, such as phase response measurement, the ability to identify echoes and high-resolution frequency response. No longer could an unintelligible pile of junk look the same as the real McCoy on an analyzer. The complexity of these analyzers required a well-trained, highly skilled practitioner in order to realize the true benefits. Advocates of both systems stressed the need for engineers to utilize all tools in their system, not equalizers alone, to remedy response anomalies. Delay lines, speaker positioning, crossover optimization and architectural solutions were to be employed whenever possible. And now the tools were capable of identifying the different interactions.

But on the issue of "equalizing the room," a division arose. All parties agreed that speaker/speaker interaction is somewhat equalizable. The critical disagreement was over the extent to which the speaker/room interaction could be compensated for by equalization. The TDS camp advocated that speaker/room interaction was not at all equalizable, and therefore, the measurement system should screen out the speaker/room interaction, leaving only the equalizable portion of the speaker system on the analyzer screen. Then the inverse of the response is applied via the equalizer, and that was as far as one should go. The TDS system was designed to screen out the frequency response effects of reflections from its measurements via a sine frequency sweep and a delayed tracking filter mechanism, thereby displaying a simulated anechoic response. The measurements are able to show the speaker/speaker interaction of a cluster and provide useful data for optimization.

Such an approach can be effective in the mid and upper frequency ranges where the frequency resolution can remain high even with fast sweeps, but it is less effective at low frequencies. Low frequencies have such long periods that it is impossible to get high-resolution data without taking long time records, thereby allowing the room into the measurement. For example, to achieve ½-octave resolution, the equivalent to the Western Tempered Scale, one must have a time record 12 times longer than the period of the frequency in question. For 30 Hz, you will need a 360ms (12x30ms) time record. If fast sweeps are made to remove echoes from the measurement, the low-frequency data has insufficient resolution to be of practical use.

Dual-channel FFT analyzers utilize varying time record lengths. In the HF range, where the period is short, the time record is short. As the frequency decreases, the time record length increases, creating an approximately constant frequency resolution. The measurements reveal a constant proportion of direct sound and early reflections, the most critical area in terms of perceived tonal quality of a speaker system. The most popular FFT systems utilize ¼-octave resolution, which means that the measurements are confined to the direct sound and the reflections inside a 24-wavelengths time period across the board. This is a good practical level of resolution, allowing us to accurately equalize at around the ⅛-octave level.

With the FFT approach, more and more of the room enters the response as frequency decreases. This is appropriate because at low frequencies the room/speaker interaction is still inside the practical corrective equalization window. For example, an arena scoreboard might create a reflection that arrives at the mix position 150 ms later than the direct signal. At 10 kHz, the peaks and dips from this reflection will be spaced 1/500 of an octave apart. At 30

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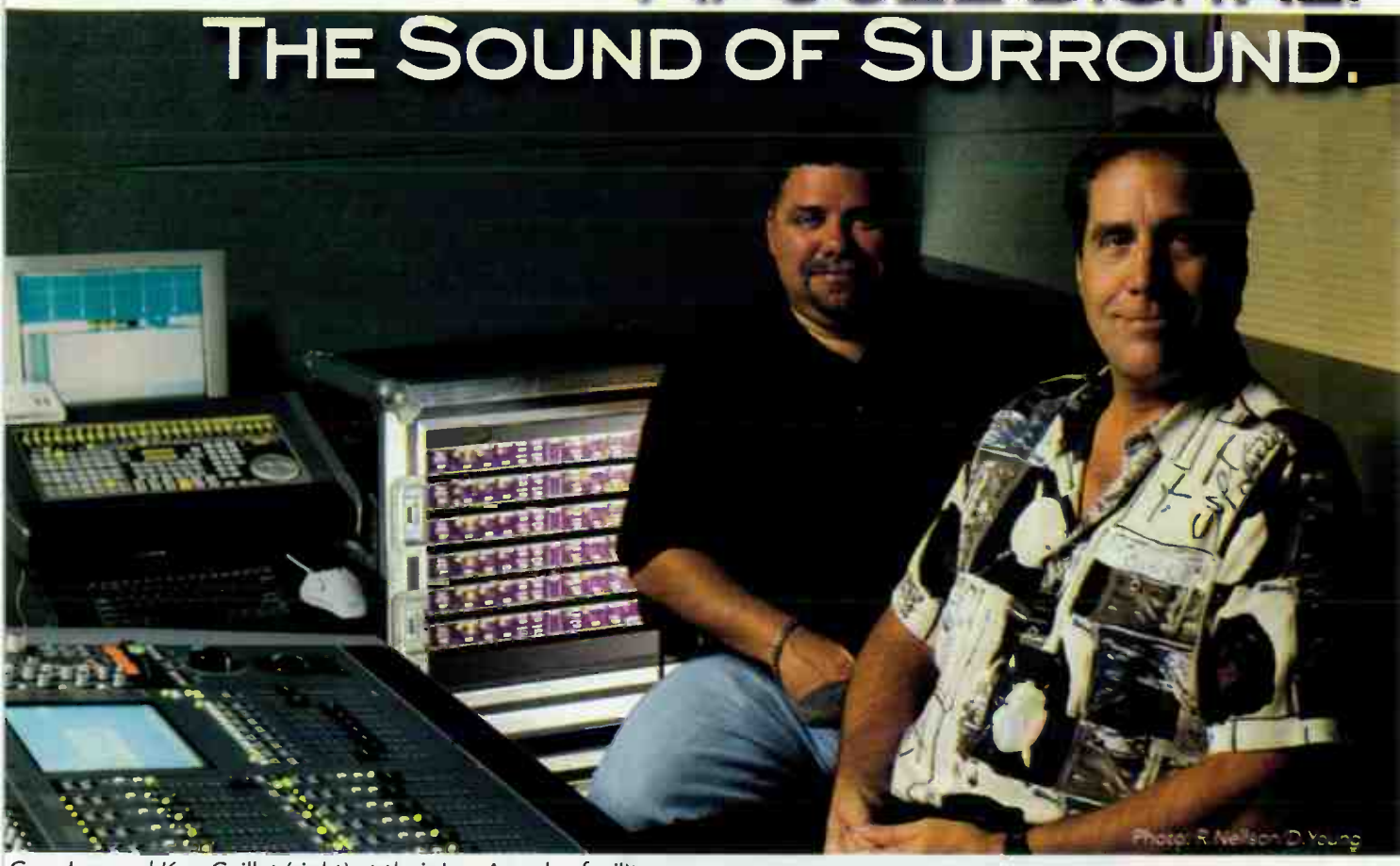

Gary Lux and Ken Caillat (right) at their Los Angeles facility.

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EQUALIZING THE ROOM

Hz, they will be only ⅓ octave apart. Thus the scoreboard is in the distant field relative to the tweeters, and applying equalization to counter its effects will be totally impractical. An architectural solution such as a curtain would be effective. But for the subwoofers, the scoreboard is a near-field boundary and will yield to filters much more practically than the 50 tons of absorptive material required to suppress it acoustically.

Many years ago, the FFT camp boldly stated that the echoes in the room could be suppressed through equalization. Unfortunately, these statements were made in absolute terms without qualifying parameters, leaving the impression that the FFT advocates thought it was desirable or practical to remove all of the effects of reverberation in a space through equalization. While it can be proven from a theoretical standpoint that the frequency response effects of a single echo can be fully compensated for, that does not mean it is either practical or desirable. The suppression can only be accomplished if the relative level of the echo does not equal or exceed that of the direct and there are no other special circumstances that cause excess delay. (Excess delay causes a "non-minimum phase" aberration and is outside the scope of this article.) If the direct level and echo level are equal, the cancellation dip becomes infinitely deep and the corresponding filter required to equalize it is an infinite peak. As we know from sci-fi movies, bad things happen when positive and negative infinity meet up. Compensating for the response requires adjustable bandwidth filters capable of creating an inverse to each comb-filter peak and dip in the response. As the echo increases, you will need increasing numbers of ever narrowing filters. A 1ms echo corrected to 20 kHz will require some 40 filters because there are 20 peaks and 20 dips varying in bandwidth from 1 to .025 octave. A 10ms echo would need 400 filters with bandwidths down to 1/400 octave. Obviously, it would be insane to attempt to remove all of the interaction at even a single point in the hall. In the practical world, we have no intention of attacking every minuscule peak and dip but instead will go after the biggest repeat offenders. The narrower the filters are, the less practical value they have, because the response changes over position.

PRACTICAL IMPLICATIONS

It is indeed possible and practical to suppress some of the effects of speaker/room interaction. If this was not possible, it would be standard practice to equalize your rig in the shop, put a steel case around the EQ rack and hit the road. The practical side of this is that we must be realistic about what is attainable and the best means of getting there.

The variations in frequency response due to both speaker/speaker interaction and speaker/room interaction will always change with position. Once you have seen high-resolution data at multiple positions, you can never go back to thinking that your equalization will solve problems globally. A system that has the minimal amount of the above interactions will have the greatest uniformity throughout the listening environment and, therefore, stands to gain the most practical benefit from equalization. If it sounds totally different at every seat, let's just tweak the mix posi-

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EQUALIZING THE ROOM

tion and head to catering. To minimize the speaker/speaker interactions requires directional components, careful placement and precise arraying. In areas where the speakers overlap, time delays and level controls will minimize the damage in the shared area. To minimize speaker/room interaction, the global solutions lie in architectural modification (it's curtain time), the selection of directionally controlled elements and precise placement.

Finally, you are left with equalization. For each subsystem with an equalizer, map out the response in the area by placing a mic in as many spots as you can and see what the trends are. In particular, measure around the central coverage area of the speaker. Stay away from areas of high interaction, where the response will vary dramatically every inch. Examples of this include the seam between two cabinets in an array or very close to a wall. Each position will be unique, but if you place filters on the top four to six repeat offenders, you will have effectively neutralized the response in that area.

CONCLUSION

Modern analyzers are capable of displaying a dizzying array of spectral data. But little practical benefit will come to us if we continue with the antiquated approach of the RTA era. To take full advantage of the benefits of equalization, we must fully comprehend how to identify the mechanisms that "unequalize" the system. With modern tools, it becomes possible to analyze the response such that the interactive factors of speaker systems can be distilled and viewed separately. This allows the alignment engineer to prepare the way for successful equalization by using other techniques that reduce interaction and maximize uniformity in the system. "Equalizing the room" will remain in the domain of architectural acousticians, but with advanced tools and techniques, we can proceed forward to better equalize the speaker system in the room. ■

Bob McCarthy specializes in sound system design and alignment and can be reached at bobmcc@primary.net.

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MIXING MONITORS

AN ENGINEERS' ROUNDTABLE

ILLUSTRATION: CHARLES STUBBS

In this special live sound issue of *Mix*, readers will find plenty of useful information on audio products designed for live sound applications. But none of this cutting-edge technology gear runs itself (yet), so we decided to balance the product coverage with some stories from the trenches. Four experienced monitor engineers—Robert Kosloskie, Paul Owen, Rene Spooner and Vish Wadi—were kind enough to reveal some of the tips and tools they use in their craft. (For some background, see "Our Panel of Experts," page 82.)

Perhaps not surprisingly, each engineer's equipment choices tended to reflect his working style. For example, asked if he prefers any particular type of high-frequency driver for wedge monitors, Wadi replies "No, as long as it sounds good. I'm not one of those guys who go by [model] numbers and say, 'This is what I want.' I'm very open-minded to try new things, and if I don't like it, I go back to what I know. I'm also from the old school—I still love [Sennheiser] 421s for drums. At the same time, I don't mind trying new things out."

Owen notes that his selection of high-frequency driver typically depends on the application. "I've gone through so many different drivers and diaphragms, everything from Electro-Voice DH2As to JBL 2445s. I still think the JBL is a nicer-sounding, high-frequency unit, and it's much more robust, especially for drum monitors. I had some 212 [monitor cabinets] I used for Lars [Ulrich of Metallica] in his huge drum monitor setup, but the DH2As just wouldn't take the beating, so I ended up putting some JBLs in there, some 2445s, and I've never lost one. I was losing one every other show, before."

BY CHRIS MICHIE

When choosing amplifiers, however, Owen is much less critical. "There are so many high-quality amps out there, from Crest and Crown, for instance, that I don't have a preference, to tell you the truth," he says. "As long as it makes the wedge work, I don't really care."

On the subject of monitors, both Owen and Wadi agree on the deserved success of the Clair Bros. 12AM wedge monitor. "I like 12-inch [wedge monitors] because I like a nice tight stage and smaller wedges," says Wadi. "I love the way the 12AM sounds. Fifteens, for some reason, I'm not really fond of. I can't get that nice, tight sound. I have, but not the way I like it."

"Clair Brothers always had an amazing reputation for their monitors," says Owen. "The 12AMs have been used constantly, by everybody. I was always prone to using DMLs,

—CONTINUED ON PAGE 76

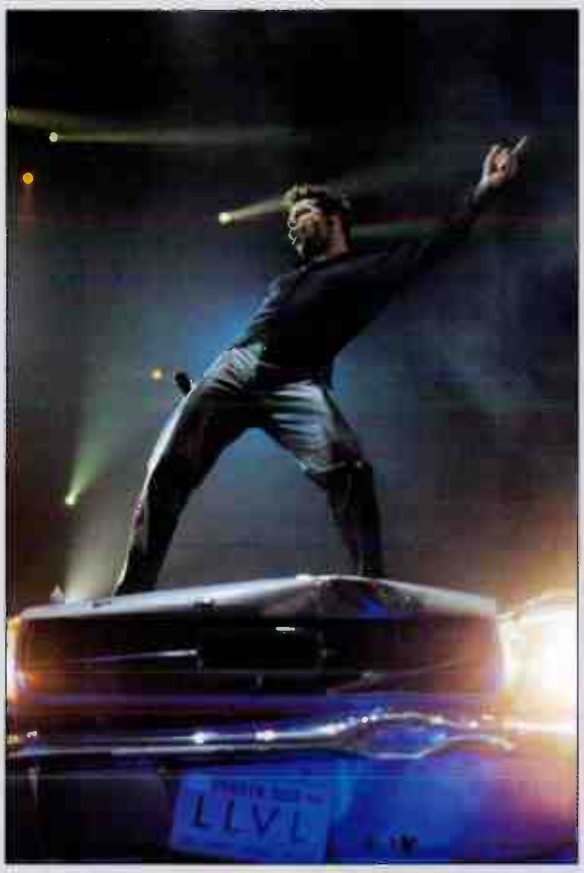
TOUR PROFILE

RICKY MARTIN

Stagin' "La Vida Loca"

Ricky Martin has been called the Latino Elvis, but on the weekend before Thanksgiving at the San Jose Arena, it probably would have been more accurate to compare him to the lads from Liverpool. The screaming was as deafening as it gets in the San Francisco Bay Area, this side of The Beatles' '65 Candlestick Park show.

"It's girls and women screaming, and they scream at a very high pitch. Sometimes they're screaming so loud I put my headphones on—more for ear protection than anything else," says FOH engineer Steve Guest, a veteran of tours with David Bowie, David Sanborn and Janet Jackson. "My biggest challenge with this show is the crowd, which is generally a lot louder than I am, or louder than I want to be. I don't want to mix the show so loud that it's painful. But at the same time, I have to keep in the game so the crowd doesn't wipe me out completely."



PHOTOS: STEVE JENNINGS

Guest says the crowd at the first of two nights at the approximately 18,000-seat arena was one of the loudest on the tour, which ran from October 20 to December 7. The SPL meter mounted on his console hit 113 dB (A-weighted). "And that's just a slow average from a cheap analog SPL meter," Guest adds. "I don't know what the actual real peak SPL is, but it's painful when they get that loud."

The second night was a little more sedate. The crowd started screaming as the show opened with a video of a day in the life of Martin, complete with a *Hard Day's Night*-style dash from the press rather than fans. They waved Puerto Rican flags, held up signs, including one that read "Show Us Your Bon-Bons," and yelled even louder each time Martin turned around to execute his trademark hip swivel.

"I think a crowd wants to be able to do that to an extent," Guest explains. "They're expressing their enthusiasm so much that they drown the show out for a moment. I guess it's exciting—a feeling of power for them. I have the horsepower to get it over them, but I feel they should be able to do that to a certain degree, so I'm walking the line between being too loud and loud enough to have intelligibility in the show with the crowd noise. Everyone wants to hear the show."

In addition to wearing molded custom earplugs, the ATK/Audiotek and Firehouse Productions crew found another way of coping with the intense crowd noise. "Recently we've started making little bets at the front of the house on what the crowd noise is going to peak at," Guest jokes.

L to R: Systems tech John Protzko, FOH engineer Steve Guest and assistant FOH engineer/ systems engineer/crew chief John Tripeny

"LA VIDA LOCA" ONSTAGE

The elaborate production design proved to be another big challenge for the crew. Artistic director Jamie King utilized every part of the stage in a show designed for an MTV-weaned audience: The theatrical performance includes a variety of set and costume changes, tasteful video backdrops and lighting design, and thoughtful choreography. Martin gyrates on the hood of a car that rises up on a hydraulic lift for the opening number, "Livin' La Vida Loca," surrounded by go-go dancing couples. He later comes up on the same lift, lounging on a couch, accompanied by sitar and tabla players on "She's All I Ever Had." For "Private Emotion," he descends from a small catwalk on a pole-like elevator, dueting with backup vocalist Madeline

—CONTINUED ON PAGE 84

BY KIMBERLY CHUN

TOUR PROFILE

MELISSA ETHERIDGE

Arena Rock Hits the Theater Circuit

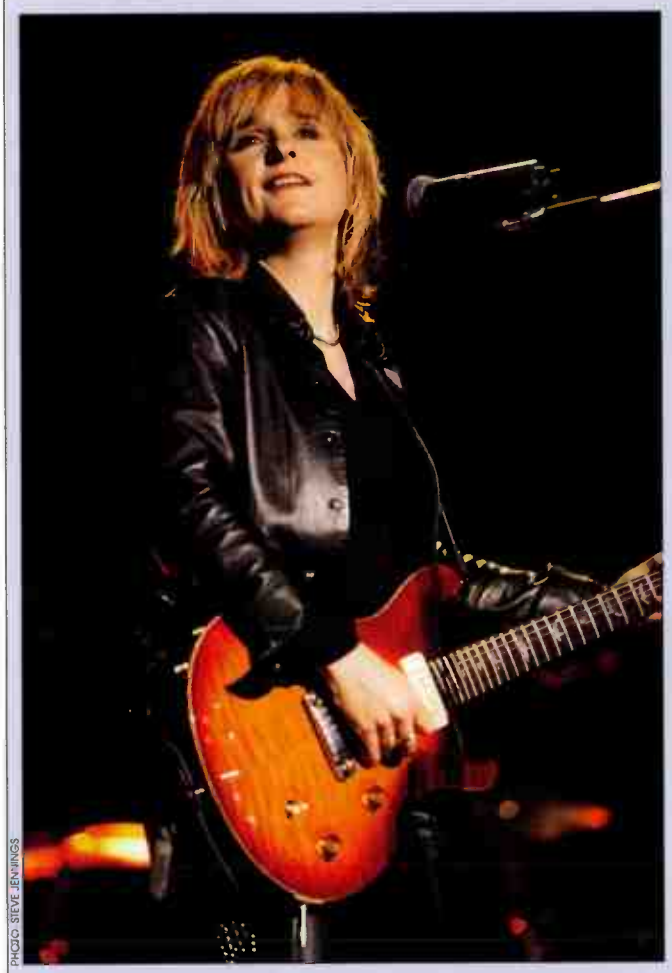


PHOTO: STEVE JENNINGS

Absent from the touring scene for some two-and-a-half years before the release of her latest album, *Breakdown*, Melissa Etheridge took to the road in late September to promote the new disc. And, like other arena veterans such as John Mellencamp and Sting, Etheridge decided to open her new touring season with a string of dates in theaters, offering fans the opportunity to catch their favorite act in an intimate environment. Etheridge's first major theater show occurred October 7 at the New Jersey Performing Arts Center in Newark, N.J., and the 1999 leg of the tour concluded December 18 at the Star of the Desert Arena in Primm, Nev.

Etheridge again teamed up with Escondido, Calif.-based sound company Sound Image. Jon Schimke has overall production management chores, overseeing both sound and lighting rigs. Huey Lewis veteran Jim Moran is handling monitors, and the FOH mix engineer is Steve Folsom, who has worked on Etheridge tours since June 1989.

"Melissa and I have talked about our long-term professional association at length," says Folsom. "We think it's because we both came from non-industry places—she's from Kansas, I'm from Maine—and we both slugged it out in the clubs for a lot of years, chasing a dream in a place where not many people achieve that dream. As fate would have it, we both made our respective visions come true at the same time. There's been a bond between us ever since."

EVERY SONG A ROCK ANTHEM

Folsom's task is to bring aural harmony to a set list of 23 songs, a half-dozen of which are performed in an acoustic set midway through the three-hour show. In addition to Etheridge (vocals and guitar), the band includes John Shanks (guitar), Mark Browne (bass), Kenny Aronoff ("the world's loudest drummer," according to Folsom) and Patrick Warren (keyboards).

"There was a time in the beginning," Folsom recalls, "when we used to be a nice, 104dB kind of theater act. But then we started playing arenas. We got bigger and louder. Melissa loved it. This band loves it. The crowd loves it. Every song is a rock anthem. We've measured guitarist John Shanks in front of his rig onstage at 113 dB. Kenny [Aronoff] came in at 110 dB at the front of one of his snares. At the outset of this tour, I realized that there was no turning back. Everyone was demanding a big, powerful arena sound, even though we were going to be playing theaters. Creating that sound was my challenge. I had to effectively gear down from arenas in size and scope, yet still maintain the volume and presence that was expected."

PHOTO: KAREN HOYT

L to R: FOH mix engineer Steve Folsom, sound technician Jon Schimke and monitor engineer Jim Moran

Folsom's approach calls for optimizing the efficient use of both space and power. For the P.A., Sound Image supplies a dozen carbon-fiber G-5

BY GREGORY A. DETOGNE

—CONTINUED ON PAGE 70

PHOTOS AND TEXT BY STEVE JENNINGS

Pictured at the monitor board, from left to right: MSI system engineer Ishai Ratz, assistant engineer Bryan Laffin, monitor engineer Doug Deems, and David Bernas, who mixes monitors for support act Powerman 5000.

Ratz has been with sound system supplier Maryland Sound Industries for ten years. On this tour, Ratz not only flies, arrays and tunes the P.A. but also sets up the FOH position for Dave Licursi. "I get everything going as close to a starting point as I can for Dave," he comments. "He wears more than one hat on this tour."

The EAW 750 P.A. is new to MSI, and Ratz is using Crown amplifiers with the newer generation IQ PIP cards for crossover and system control. All of the amp cards are controlled via a computer at FOH, which also displays the entire system status. "It allows you to zone the P.A. in a very effective way and compensate for various distances and throws and irregularities in the venue," says Ratz of the IQ system. "It's all at your fingertips."

Deems is using a "brand new" Midas Heritage 3000. He has 48 inputs and is using all of the 24 mix outputs in stereo and mono configurations, plus eight matrix outs. Deems' rack includes Klark Teknik DN3600s "with the remote head" for EQs and a Lexicon PCM70 and a Yamaha SPX990 "to fatten up the background vocals." For inserts, Deems is using dbx 160 compressors and a BSS 901. "It's a little unusual, but I'm getting to the point where I won't mix without one of those," he notes of the 901.

Deems creates individual mixes for all of the musicians and has a total of 15 wedges onstage, mainly double 12-inch models with a few single 12s, plus flown sidefills. Drummer Stefanie Eulinberg is using a set of in-ear monitors for a click track. "We're exploring that now," Deems says. "I'd like to get a couple of people on the in-ears."

Kid Rock sings into a Shure 58 (not a Beta). Other mic choices include Shure 57s and Sennheiser MD-409s on guitars, Beyer 88s and an SM91 on the two kick drums, SM57s for snare, Sennheiser 504s on toms and pair of Earthworks SR71s for overheads.

Left: Scott Krause (whose brother Jason plays guitar in the band) acts as guitar/drums/bass/keyboards tech and also looks out for DJ Kracker. Guitar tech Matt Hartman takes care of guitarist Kenny Olsen.

Keyboard player Jimmy Bones has an old Wurlitzer XPX-2 organ and "a nice analog synth," the JP 8000. Guitarist Jason Krause plays through Marshall JM2000s with two Boss pedals, a 6-band EQ and a noise suppresser. Bassist Mike Bradford is playing through a Line 6 Pod into two SWR cabinets. Drummer Eulinberg plays Pearl drums, augmented with SPD 11 and V-Drum electronic drum systems.

Kid Rock has been out on tour since last fall, successfully promoting his *Devil Without a Cause* CD, which has sold more than 5 million copies and counting. Fronting a hyperactive show, which he describes as "Aerosmith, Run-D.M.C. and Lynyrd Skynyrd in a blender," Kid Rock also has found time to produce DJ Kracker, using his tour bus as a studio. After playing some opening dates with Metallica, the rapper moved on to Australia this month. *Mix* caught his "Between the Legs" tour at the San Jose Event Center in San Jose, Calif.

FOH engineer David Licursi spent "about six years" tour managing for Hall & Oates and is now acting as tour manager, road manager and tour accountant for Kid Rock, a factor that influenced his choice of mixing console. "The reason I chose the Yamaha PM4000 board is it's something I'm familiar with. It's reliable, and it makes me feel at home, at ease. After being in the production office all day, I can run out there and dial it in quick."

Licursi's outboard effects rack contains two Roland SB-330s for delays, a Lexicon 90 and 70, and a pair of Yamaha SPX990s. "I don't have anything tricky," he says. "I have about 42 inputs, and there's a lot going on out there, but it's pretty simple and straightforward. About the only new thing we brought on this tour is the Antares ATR-1, the rackmount version of the Pro Tools plug-in." The ATR-1 is used on one song, Kid Rock's current single "Only God Knows Why," explains Licursi. "We're not in studio conditions, but this works just as well."

PHOTOS AND TEXT BY STEVE JENNINGS

Chris Cornell,

formerly of Soundgarden, is on tour to support his new CD, *Euphoria Morning*. The tour started in November, took a break during the holidays, and will continue throughout the world for most of the year 2000, says tour manager Judd White. *Mix* caught up with Cornell and his four-piece band at the Berkeley Community Theater in Berkeley, Calif., in November 1999.

Onstage, microphone models are almost all from Shure: Beta 52s for kick drum, Beta 56 for snare, SM94s for hi-hat, ride cymbal and snare bottom, SM98s for toms, a Beta 52 for percussion bottom, and KSM32s on percussion top and overheads. The bass mic is a Shure Beta 52, and the two backup vocals are on Beta 87s with cables. Cornell sings into a Shure UHF system with a Beta 87 cardioid capsule. "It's the new one Shure is experimenting with at the moment," notes Paterson. The only non-Shure inputs are the keyboard DIs and Groove Tubes MD1s on guitar.

Monitor engineer James Bump, who works for Showco, is using a Harrison SM5. "I have 26 inputs and create stereo mixes for five people," says Bump. "I use the rest of the inputs and sends for reverbs and delays and Chris' vocal." The whole band is using Shure PSM600 wireless in-ear monitor systems, with earmolds from Future Sonics. In addition, the tour is using the new Shure PSM700 unit. "Chris pretty much hears his own vocal and a little guitar and keyboards," explains Bump. "[Keyboardist] Natasha, [guitarist] Alain and [drummer] Greg [Upchurch] have a full mix of everything, and Ric, the bass player, listens mainly to the drums, himself, the vocals, a little guitar and keyboards."

FOH engineer Gordon "Gungi" Paterson with tour manager Judd White (right)

"For this leg of the tour, the P.A. is all rental—stacks and racks," says veteran independent FOH engineer Gordon "Gungi" Paterson. "We're carrying our own FOH package, snakes, monitor package, mic stands, cables, all that good stuff." At FOH, Paterson has a Midas XL3, and his racks are equipped with an assortment of equipment from Dallas-based Showco, in addition to some of his own equipment. "I own six Distressors, two Lexicon PCM81s, a TC Electronic M5000 and a Roland SDE-3000, and two Audio Logic PA88 Exciters," lists Paterson. "From Showco, I have a Lexicon 480, an Eventide H3000 SE and a Yamaha 990. I'm using TEQ EQs: two on the main system and two on vocal inserts for Chris. I'm also running two dbx 902 de-essers."

"One of the Distressors I'm using has the new British mode on it," Paterson notes. "It emulates an 1176 with all the buttons pushed in. I haven't found a use for it yet, but I'm sure I will," he laughs.

"We have a new amp called the Line 6 2x12 comba," says guitar tech Fozzy. "It's a digital amplifier that guitarist Alain Johannes uses and it has every guitar sound imaginable. And it's all digital, so you can save up to 36 different sounds. You just program the pedal board and the amp, and then you can recall any sound at any time."

Drum/keyboard tech Yogy Garcia takes care of all bass changes for Ric Markmann and guitar changes for Cornell.

Monitor engineer James Bump's racks include Klark Teknik DN360s, which he uses for the stereo mix outputs, and various reverbs. Two Yamaha 1000s are assigned to drums and Chris' vocals, and two Yamaha 990s serve for guitarist Alain Johannes and keyboardist Natasha Shneider. Cornell uses a foot pedal to top in the current song's tempo on a Lexicon MPX-100 delay, which is mainly for his own in-ear mix. Bump uses both an Aphex Compressor and an Aphex Expressor for Cornell's vocals. He has two dbx 160As assigned to keyboards, and he uses two Drawmer 201 gates on drums. "I also have a Klark Teknik 504 quad compressor, which I sometimes use on bass player Ric Markmann," adds Bump.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expensive in-ear rental fees and still carrying a traditional monitor rig anyway, just in case. It wasn't until this tour that we really got it right." To correct the lack of ambience in the in-ear mix, Moran has added crowd and room pickup from Shure SM81 mics placed stage left and right.

MIC CHOICES

At front-and-center, Etheridge uses a handheld Shure U24D/58 UHF system for vocals. The Shure UHF U1 bodypack is mated with Etheridge's headset mic, a much-modified Crown CM-311E. "After we got through with it, it became a 'neckset' mic," Folsom says with a grin. "Being a dynamic singer, what Melissa hated about headset mics was that she couldn't ever get away from them. She couldn't 'play' them properly, in other words. We took the Crown unit apart one day and sort of turned it inside out, adding a hair tie to hold everything together. Then we mounted it around her neck just like you'd do with a harmonica." The result is that Etheridge can turn away from the mic as necessary, adding the dynamic control she can otherwise achieve only with a handheld mic.

Guitarist Shanks plays through four custom, single-12 cabinets, driven by a selection of amp heads located offstage right, including Top Hat, Fender Bassman and Marshall models. Each of the cabinets is tilted backward at roughly a 60° angle on stands built by guitar tech Zachary Saville; this arrangement projects energy into the ceiling, sparing the first ten rows the full ear-bleeding fury of the stadium-size guitar rig. Never quite sure of what goes where in the guitar rig, Folsom has designated the two outside enclosures "wet" (fully effected), and the inside ones "dry" (less effected, usually with delay only). For the wet cabinets, Folsom uses Shure Beta 57As in front of the dry enclosures.

"Some songs start with ethereal sounds coming from the wet cabinets, which are panned hard left and right," Folsom explains. "When you hear them, it's almost as if a second keyboard is coming through. Then, as John's power chords come into the chorus, I bring up the center dry cabinets and punch it through. At that point, it's all him."

DRUMS, DRUMS, DRUMS

Aronoff, who has played on more hit recordings than anyone would care to list, has been playing live with Etheridge since 1995. "When I sat down and thought about how I was going to represent the newer material live, the only way I could think of to do it was to add more pieces to my setup," he explains. "In the past, the set list was pretty much straight-ahead rock 'n' roll. This time, I had drum loops to deal with, plus a sizable amount of different textures and dynamics."

In rehearsals, Aronoff kept adding pieces until he reached a point where he had effectively created two drum kits, covering every square inch of available riser space. At the Chicago date, as the drummer proudly displayed a "Kenny Trackmaster" brass shell, hand-engraved super piccolo Signature Series snare drum from Tama, the star of the show walked by on her way to the front of the stage. "This is insane," Etheridge said, looking as if something from Aronoff's towering rig may break loose at any moment. Ignoring the good-natured jibe, Aronoff continued: "I arranged everything you see before you so that I could properly cover all the bases. And although I have a reputation as being a slammer, this new dynamic

has changed me. Now I'm using brushes, dowels, many more cymbals and a number of other tricks to broaden the dynamic."

Folsom's first reaction to Aronoff's sprawling two-crammed-into-one drum kit was similar to Etheridge's, and he initially came up with a drum mic input list of 18 channels. "From my perspective, it really was insane," he recalls. "There were microphones everywhere: under the bells, under the ride, next to a sizzle cymbal way over to the right, in the kick drums...In some places you could reach out and touch four mics with one hand—that's how close the mounting positions were." To economize, Folsom uses two Shure KSM32 condenser mics as overheads. "I was able to use those two mics to capture a huge part of the kit, not just the overhead sounds. Given their performance characteristics and sensitivity, if Kenny started riding his sizzle cymbal, I found I could pull that sizzle out by simply riding the appropriate KSM32 on my end. I didn't need a dedicated sizzle cymbal mic. The more I experimented, the more I was able to strip away other mics in the same fashion. In my world, less is always more when it comes to miking drum kits."

Eventually, the drum input scheme was reduced to a manageable number. A Beta 52 on kick, SM57s for snare and piccolo snare, an SM81 for hi-hat, and Beta 98s on rack and floor toms. In Chicago, Aronoff also used a ddrum electronic pad as a second kick, but it was replaced later in the tour with a Tama 18-inch Deep Star Classic unit outfitted with a ddrum trigger. "The sounds are the same; it just feels better," Aronoff says.

BOTTOMLESS LESLIE

Keyboardist Warren's setup includes such vintage items as an orange Wurlitzer, a Chamberlin and classic Hammond B-3. Using Countryman DIs for the electronic keys, Folsom originally miked the Hammond's Leslie cabinet in a traditional fashion at top and bottom, using a Beta 52 on the bottom and a Beta 56 on top. New at the helm of a genuine Hammond (he bought his first one just for this tour), Warren likes to reverb up and mix in little percussive sounds, adding a few pop playing techniques along the way. Although he quickly discovered that the rotor switch leading to the Leslie can be fun, he never went for the low-end, dragging growls some players latch onto.

As Folsom tells it, "Jim [Moran] and I were talking one day, and we both agreed we didn't really even need the low mic. Jim had used a Shure single-point stereo VP88 on a Leslie with Huey Lewis, so I brought one out and we tried it on top with nothing on the bottom. It did what 88s do—gave us that natural, perfect blend from left to right."

The VP88 also proves useful for the show's acoustic set in an overhead left- and right-configuration over Aronoff's cocktail kit. The quirky-looking drum set from Remo fuses diverse elements (a snare drum body with a conga head, for example) and can be played with either hands or sticks. In addition to the VP88 overheads, Folsom uses a Beta 56 for kick.

Of the remaining inputs, bass is taken DI, and Etheridge's Matchless guitar amp is stashed offstage right and miked with an SM57. Beta 58A microphones serve for backing vocals, and a Shure SM98 for the accordion completes the input list.

RACK GOODIES

Folsom has a "less is more" philosophy on processing and has neatly tucked everything vital for the *Breakdown* tour into a pair of outboard racks. "Most clubs have more stuff than I do," he says. A Roland SDE-3000 supplies about one-quarter of a second of delay for Etheridge's vocal. "But I don't use it in nice-sounding rooms," Folsom is quick to point out. "In really live rooms, however, I use it to bring a little more dimension to her voice than everything else around her. After I use it, I turn it off. I don't want it perceived as being an effect."

A pair of Yamaha Pro R3 digital reverbs are mainly used on drums. To meet the need for a "lo-fi" section in the show, Folsom uses the filtering effects of a Yamaha SPX990. A Drawmer 1960 tube mic preamp/compressor is assigned to Etheridge's acoustic guitar and bass, and four Aphex 661 Tubessence compressors are patched across the four vocal channels. Six Behringer Intelligates occupy the remaining rackspaces.

To ensure that the rig would fit in theaters, Folsom selected a Yamaha PM-3500-56 console for FOH. And, acting on a tip from a friend at Sound Image, Folsom uses the single-rackspace, 2-channel Midas XL-42 mic preamp/EQ for Etheridge's vocals. "It's a great meeting of cultures," he says. "I now have nice warm English EQ on my Japanese board." ■

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—FROM PAGE 64, MIXING MONITORS

which I used on quite a few tours, the E-V DMLs. And SSE, the company in England we use quite a lot, had a Beta Max, made from the same design, which I think is a great-sounding wedge. I do think that for vocals, the smaller 12 wedges are definitely the way to go."

Kosloskie notes that the needs of the production often dictate equipment choices. Reba McEntire has recently been touring an autobiographical play depicting her experiences in life and music, "a pretty big production," says Kosloskie. Because of the show's format, Kosloskie must mix for three different mic setups: "For the first part of the show, I'm using the Danish Pro Audio 4060 lavalier. It's a little omnidirectional, and it's flesh-colored, so we hide it in her hair, on her forehead," he explains. "Then, on the same wireless system, when she comes to the concert section of the show, I've got the Crown CM-311E headset mic. That's a really good headset mic. I keep trying new headset mics, but I haven't found one yet that beats that one as far as the audio and the rejection. It's just killer. And we also use the Shure UHF handheld system, with a Beta 58 on it, during one song of the show."

Owen notes that he has recently changed Metallica's vocal mics, from the Shure Beta 58 to the Audio-Technica 4054, a cardioid condenser. "I think the pattern's as tight as a 58," says Owen. "It's just got a better sound quality. A 58 is just a great all-round microphone, and you can knock them around and they'll still work. But now, with in-ear monitors, you can actually get a lot more quality in the mix. When whole stages are completely dead—no ambient sound apart from the back line—the selection of microphones is becoming far more critical. Rather than just going with whatever gets the loudest volume with the least amount of feedback, I think people are really looking for quality now."

IEMS ADD CONSISTENCY

A fundamental mark of quality is consistency, and one advantage of in-ear monitors (IEMs) is that they are relatively unaffected by daily changes in performance acoustics. "By having the in-ears, our environment is basically with us everyday," says Kosloskie, referring to the current Reba McEntire production. "All we have to do is adjust to what the room does to us. It's pretty much the same."

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Kosloskie makes extensive use of board automation, both to manage a complex show and to make up for a lack of preparation time. "We've got ten trucks out with us now: set, lights, scenery, props and audio, and it takes all day to load in the production. Audio gets very little time," he notes. "I have a lot of cues in the show, and whenever we don't do our play, they have a repertoire of songs that they just pick out of the hat. We'll get a set list before the show, so I run through all my songs and write down the cue numbers. Then I just scroll up that number, punch it at the end of each song, and we're all set for the next one," he explains.

As Spooner observes, IEMs have democratized the stage—the singer is no longer completely at the mercy of "a bass player with 800 pounds of equipment and a guitar player with his huge stacks. If the production manager/lighting guy goes with a sound company that doesn't have great monitors or a great monitor engineer, the singer never seems to get a fair shake," says Spooner. "But now the singer can walk in with his rig under one arm and have really sterling sound for himself and his vocal and not have to worry about screaming to hear himself—or screaming at the monitor guy for making feedback."

Owen points out that changing a drummer over to IEMs can significantly ease the FOH mixer's job. "He's got no interference with the drum monitor blasting down the front vocals," says Owen. "It's surprising how much it changes things. It's night and day. In outdoor shows, especially, where the drum monitors are blasting away right down the middle, the engineer out front will start balancing his mix around this center sound off the drum monitor. Because it's pointing right at the mix position. [With IEMs] he doesn't have that."

Of course, in-ear monitors come at a price, which includes a significant investment in dynamic control devices. "We use Aphex Dominators on each mix output, before it goes to the amp or the transmitter," says Kosloskie. "Right now, I'm using the dual Summit Audio compressor, the DCL 200s, on Reba's voice."

"I guess I'm from the old school, again," says Wadi. "I love the dbx units. I like 160XS on vocals and the 900 Series for the other stuff. When I'm using an ATI Paragon, I use the compressors on the board for everything except for vocals. The one on the ATI's not fast enough for me."

NEWSFLASHES

The 30-year-old **First Union Spectrum Arena** in Philadelphia recently underwent a four-week sound system renovation. Signal Perfection Limited (Columbia, MD) installed 72 R2-52s, ten R6-Basshorns, eight R2-94s, two R2-77s, and 56 CPL23s, all from Community Professional Loudspeakers. The clusters are driven by 22 Crown K2 amps, and the 56 CPLs are driven by two Crown Com Tech 400 amps. Two BSS Sound Web units provide EQ, delay, compression and crossover functions to the clusters. Under-balcony delays are processed though a Bi-amp Digital Signal Processor. A Rane digital delay processes the existing speakers in the VIP boxes...**Disney's *Lion King*** opened in London's West End at **The Lyceum Theatre** in October 1999. Sound design by 1998 Drama Desk Award-winner **Tony Meola** includes a 89-input Cadac J-Type Live Production console equipped with motorized faders and Sound Automation Manager for Windows® (SAM). Sound equipment was supplied by London's **Autograph Sound Recording**. In other Cadac news, sound hire company **Jason Sound** of Vancouver, BC, has a Cadac J-Type out on tour with Bryan Adams...**Florida State University** has chosen the Telex Communications Inc. RadioCom BTR-600 2-Channel Encrypted Digital Wireless Intercom system for communications among the Seminoles football team's coaching staff...Liverpool-based P.A. company **Adlib Audio** has purchased a new 48-channel Soundcraft FIVE Monitor desk for the latest UK tour by long-term clients **Texas**. The tour also features a Soundcraft Series FIVE front-of-house desk, operated by Adlib principal **Andy Dockerty**, a Martin Audio P.A. and BSS processing equipment...**Seismic Systems Inc.** of Redondo Beach, CA, has acquired the remaining inventory of the AURA 1808 NRT (Neo-Radial Technology) high-excursion 196-cubic-inch displacement drivers. Seismic has the exclusive right to improve, market and manufacture the drivers as the Seismic 8196...The recently opened **Southwest Flame Convention Center** in New Mexico has installed a JBL SR-X Series sound system. Designed by **HB Electronics** of El Paso, TX, the system includes four JBL SR4719X subwoofers and eight SR4733X speakers in the Center's club lounge. JBL Control 28 speakers are used for side- and rear-fill, and in the Center's bar areas. Eight JBL TR105 speakers serve as monitors for live performances...Billed as the world's biggest and most technically ambitious show ever, **Net-Aid** featured live performances in three venues spanning two continents. The biggest of the three shows was staged at London's **Wembley Stadium** and featured **Robbie Williams**, **George Michael**, **David Bowie** and **Bryan Adams**, among others. London's **Canegreen** supplied the audio systems, including a self-powered Meyer system for the main P.A., two Midas XL4s at FOH and two Heritage 3000s for monitors...**Rocky Mountain Sound** of Vancouver is providing sound reinforcement for the Western leg of the **Diana Krall** tour of the U.S. and Canada, using the new EAW KF700 Series speaker enclosure with QSC PLX amplifiers. According to Rocky Mountain Sound's **Eric Laliberte**, the system consists of a top row of two KF755 downward firing cabinets used upside-down to cover the balcony seats, with a middle row of two KF750 cabinets sitting on top of two more KF755 cabinets to cover the floor. Two EAW SB850 subwoofers per side provide low bass, and four EAW JF260 speaker enclosures are used for frontfill. System control electronics include a Midas XL3 mixing console, BSS FDS-388 Omnidrive crossover and a Lexicon 480L reverb...**Eighth Day Sound**, based in Cleveland, is providing the sound system for **Barry Manilow**'s current tour, which features Vegas-style lighting and set design, Manilow's traveling six-piece ensemble and a 30-piece local orchestra. Monitor engineer **Bill Fertig** is using an ATI Paragon II monitor console in part because the only alternative would have been to use two boards. Another key feature of the Paragon is being able to listen to a point in the mix, post-fade or pre-fade, anywhere on the desk, notes Fertig...A November 23, 1999, show featuring **Metallica** and the **New York Symphony Orchestra** at **Madison Square Garden** was reinforced by a NEXO Alpha P.A. system, the result of an international collaboration between **Thunder Audio** of Detroit and **SSE Hire** of Birmingham, England. The rockers-meet-symphony format concert, which will be staged in Europe with the **Berlin Philharmonic**, marked the launch of Metallica's new album and

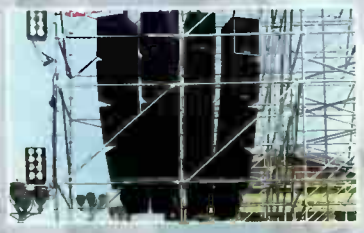
—CONTINUED ON PAGE 80

One Thing These Competing Sound Companies Do Agree on...

ATK's V-DOSC System

SE Systems' JBL HLA System

Carlson Audio's EAW System



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– Cliff Miller, President
SE Systems

"We're constantly running the amps at full power. The overall reliability is great and performance is outstanding. And the fact that the guys aren't worn out from working and stacking the amps is a plus."

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"With the in-ears, bring on as many channels of compression as you can get," says Spooner. "Let's compress everything. Let's make everything really fit into its space in the headphone mix."

By contrast, for wedge monitor mixes Spooner's philosophy on EQ is "less is more:" "I like to go with as little EQ as possible. Let's turn it on, turn it up to the desired volume and see where we are. With the EAW wedges, you turn them on, they sound good, [and] you have to do minimal EQ; you don't have to make a bunch of compensations. Someone else has done that—they spent a bunch of money on R&D. But we've got some other wedges, double 12s with a 2-inch, and there are some characteristics you should take into account before even turning them on. Some low mid that you just have to get rid of."

Simplicity also figures in Wadi's setup. "I like getting all the mixes sounding the same, whether they're wedges or ear monitors. And I stop there. Unless somebody wants something way different," says Wadi. "But almost everybody I've worked with so far, it's been all right, having kind of a flat sound. If you start from a flat sound, then when you EQ a kick drum, no matter where you put it, it sounds the same. But let's say somebody wants it really bright, and it's the only thing in that mix, then I'll make the mix brighter."

THE CONSOLE

On monitor console preferences, there was a general consensus that today's better mixing consoles are more than adequate for the job. "Out of personal preference, I don't think there's a desk on the market as good as the [Midas] XL4, regarding EQ," says Owen. "But at the same time, I don't mind using the [Yamaha] PM4000, but I just don't think the facilities are as good. It's a nice-sounding board for in-ears, but I don't think it's a real good hard-driving board as regards wedge monitors."

Wadi is currently using a Paragon II with Sting. "When I first started, the Soundcraft 400B was the only board," he recalls. "We've come a long way. The Ramsa [840] was a good board, and I love the way the [Midas] XL3 sounds. And the [Midas] Heritage 3000 is a good-sounding board. I must say that."

Wadi is less enthusiastic about Midas' flagship mixer, the XL4. "The XL4 is a good-sounding board, but I don't trust it. It went down on me twice, and sometimes that's all it takes," says Wadi. "I'd rather have stuff without programs—they're called programs—because in the XL4, if I lose programs, I lose all my mixes. The ATI is a good board, but I wish it had a little bit more punch, like the XL3. But I'm coming around to it and I'm beginning to find the sweet spot in it."

UNDER PRESSURE

Asked to name one factor essential to success as a monitor engineer, all those interviewed picked artist communications. "The whole thing of monitors is, 50 percent of it's technical ability—being able to do the job—and 50 percent of it is definitely artist relationships," says Owen. "There's so many monitor engineers out there who are just getting through the technical side of the gig, but because their face fits and they get on well with the band, they get through it. It depends how you deal with the pressure."

Wadi is by no means short of technical chops—he holds a bachelor's degree in electrical engineering—but he insists on a close working relationship with the artists he works for. "They've all been pretty good. If they don't [communicate], I just have to tell them, 'Look, we need to have some kind of communication thing going,'" says Wadi. "I've been lucky, being able to read people. I've been working for Sting for long enough, I can look at his facial expression and know something is wrong. And he'll tell you."

Spooner holds that being open and honest counts. "I've always been one to just jump right out onstage with them as soon as they start playing, and that a lot of times, will help them communicate with you, if you go and stand right next to somebody as opposed to staying at the console," he says. "I make a point of having a private conversation with the artist, letting them know that I'm there

—FROM PAGE 78, NEWSFLASHES

featured music composed and conducted by **Michael Kamen**. SSE and Thunder Audio are now the largest NEXO proprietors in the UK and USA, respectively, and SSE has provided Metallica with NEXO P.A. systems on several world tours. NEXO recently announced its largest single order, the sale of 192 cabinets of Alpha System to Hibino P.A., Japan...The first annual **Sacramento Jazz Festival** was held late last year on the grassy lawns of the Cal Expo Center in Sacramento, CA. The two-day festival, featuring such jazz luminaries as **Lee Ritenour**, **Spyro Gyra** and **Joe Sample**, attracted 8,000 fans. Nelson Sound of Burbank, CA, supplied the sound reinforcement system, which included EAW KF850s positioned on the stage supplemented by additional KF850 delay towers. QSC and Crest amplifiers powered the entire system...Level Control Systems' SuperNova matrix mixing system, with Wild Tracks hard disk playback, is at the core of all sound control and audio playback for "Poseidon's Fury," one of two new attractions at **Universal Studios' "Islands of Adventure."** The audio/visual and show control systems were designed by **Thomas Gregor Associates** of El Segundo, CA. "Poseidon's Fury" combines live and projected characters, hydraulic and pyrotechnic effects, water and mist projection screens, and 3-D sound effects and music in a walk-through environment with four separate spaces. Wild Tracks provides 32 tracks of playback, ranging from continuously looping soundscapes, to explosive sound effects, to music and dialog tracks... **ProMix's** branch office in Orlando, FL, recently purchased an Otari Lightwinder LW-50 Colosseum Series fiber-optic system and has used the LW-50 on a variety of corporate and industrial productions...**Britannia Row Productions** has supplemented its existing stock of Turbosound Flashlight speaker systems with another 48 stacks. There are 2,000 Flashlight boxes in service worldwide. Turbosound is distributed by Audio Independence in Middleton, WI...**The Outer Limit**, Nashville's multiroom dance club, is entirely equipped with Electro-Voice loudspeaker systems. Twenty-two E-V Sx80 compact fill speakers are distributed in and around the club, and the four separate rooms are specifically equipped for the types of music they feature. "Coconuts" has two T55 top boxes and two Sb180 subs; "Hysteria" has four MTL-1 dual 18-inch subs, four MTH-1 top boxes and four Sx500s; "Lava Lair" has six MTL-1s and six Sx500s; "Neptune" has four MTL-1s and four Sx500s. All rooms are outfitted with E-V's R Series wireless systems...**Harry Donovan** and **Jay Glerum** are presenting a series of three- and four-day seminars on the principles and practices of arena and stage rigging. Dates include March 3-5 in Anaheim, CA; April 2-4 in Atlanta; and May 21-24 in Denver. Call 812/278-3123 or visit www.riggingseminars.com for further details. ■

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to help them. Communication with the artist has always been the most important thing to me. That's always the biggest thrill of my job, as having the one-on-one communication with the artist during the show. Right there, standing right there, he looks right over at me, and we've got our signals worked out, and he gives me the little signal, I make it better for him, and the show is better. That's where it's at, and if that's not happening, if you don't have that communication, then it's no fun for anybody."

On the McEntire show, Kosloskie uses the IEM system as a personal communications channel to the artist. "If she gets stuck on a line, boom, I can ram them out to her on the talk back mic, and just her, nobody else, hears it," he explains. "And when she goes for her clothing changes, I can solo her microphone and listen in on my ear monitors, and I can talk back to her. I can talk to her, she can talk to me, and we can fix any problems. If it's real muddy, or if it's too boomy, or if the high end's frying on her, she can describe that situation to me and I can try and fix it."

Owen notes that verbal communication over IEMs between artists and production crew becomes essential when the monitor engineer is out of sight. "I've been so many times on cameras now, it's unreal," he says. "With the in-ears, it's not as critical—you don't have to watch for mics getting thrown in front of wedges. Plus, it makes it easier from a psychological point of view. When bands see monitor engineers on the side of the stage, they're always a good scapegoat to go and scream at when they want something, if things don't go right. [Metallica] did 17 months in the round, and they never saw me all night and very rarely asked for anything, because they probably looked a bit stupid talking into a camera, waiting for a light to flash to acknowledge their signal. And all of a sudden, when we went into stadiums and I'm back on the side of the stage, it was 'up, down, up, down.' Just because they see you, they ask you for it."

Though Owen's jibes about Metallica's monitoring demands are affectionate and tongue-in-cheek, he points out that monitor engineers must often deal with unreasonable requests and/or abuse. "Look at the guy who is doing Marilyn Manson, who throws mics at him and talks shit at him," says Owen. "Marilyn Manson even ran over our monitor desk in Europe to get to his monitor engineer. Across our desk, which caused complete havoc. He could have ruined that whole show. And when you look at people like Axl Rose [Guns N' Roses], were bar-coding engineers, because they were going through them so regularly. There's some horror stories out there, I know that. Some real horror stories." ■

Chris Michie has never been asked to mix monitors and considers himself very fortunate.

OUR PANEL OF EXPERTS

Robert Kosloskie started out with Electric Air Productions in Lubbock, Texas, and first worked with Reba McEntire at a rodeo show. When McEntire moved on to Dallas-based Showco, Kosloskie went with the account and has now been on McEntire's payroll more than a dozen years.

Paul Owen, originally from Birmingham, England, started his own company when he was 18 and mixed front-of-house for Keith Relf's Renaissance and Roy Wood's Electric Light Orchestra. After tours and one-offs with Slade, James Brown and Wet, Wet, Wet, among others, Owen started doing monitors for Metallica about 14 years ago. Owen's other credits include AC/DC, Queensrÿche and Aerosmith, and he recently took over management of Thunder Audio's office in Grand Rapids, Mich.

Rene Spooner, a Canadian, has been touring throughout North America and the world for more than 20 years and has toured with the Tragically Hip and k.d. lang. Spooner is an independent, though he is primarily affiliated with Rocky Mountain Sound, Vancouver, B.C., and most recently mixed monitors for Colin James.

Vish Wadi got his start as a sound engineer in Jamaica, when he was asked to fix one of Bob Marley's amplifiers and first went on tour with Third World. Acknowledged by his peers as one of the most skilled and personable monitor engineers in the business, Wadi has since worked with George Michael, Mariah Carey, Debbie Gibson, R.E.M. and U2. At present, Wadi is on tour with Sting (see December's "All Access"). ■

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—FROM PAGE 65, RICKY MARTIN

Rosado as she ascends on a parallel elevator, and he cheers on the crowd in the World Cup song, "The Cup of Life," as dancers do somersaults from bungee cords and walk up the video screen backdrops. The tour includes 77 crew members (150 with band members, dancers and managers), 14 buses, 19 working trucks and two alternating pre-rig trucks, each containing a set of rigging.

The massive show played a major part in Guest's choice of L-Acoustic's V-DOSC system. "The set and lighting/video rig on this tour is extensive, and the V-DOSC system's small footprint is relatively low in its weight and space requirements by comparison—both in the air and in the trucks," he explains. "I knew the crowd would be a factor, and the V-DOSC's high intelligibility really pays off."

Invented by French physicist Christian Heil, the V-DOSC has proven to be a very coherent system, especially in large, acoustically hostile spaces such as hockey arenas, Guest says. Each cabinet contains two 15-inch, four 7-inch and two 1.5-inch transducers behind a patented waveguide, all powered by QSC PowerLight amps. Floor-stacked Electro-Voice MTL-4 subwoofers complement the main system. "I like the MTL-4 for low-end punch, but I've found I'm not relying on the subs as much as I normally would. Although I've used V-DOSC quite a few times, I'd never toured with it, and the V-DOSC low end is performing well above my expectations. We started with eight subs per side, and I cut it to six after a few shows," Guest says. "The P.A. is physically aligned according to the physical dimensions of each room. Once that's done, the rest is just EQ'ing the P.A. for the room.

"We're using the XTA 226 crossovers, which have plenty of parametric EQ power built in, and they sound great," Guest continues. "What I'd really like to see XTA do is to add 'linking' capability to the crossover output limiter banks. Each individual crossover output has limiters to protect the system, but they operate independently. Ideally, I want the system crossover to have the capability to link the output limits in the system so that if one output limits, all or selected outputs limit together, and when you start hitting the limits of the system, the system limits evenly and predictably. Bob Stern, who founded Northwest Sound, got me hooked on that concept a very long time ago. Otherwise, say if just the high end limits, suddenly it seems the midrange is jumping out at you, and the system sounds like the tuning is changing, which is very, very distracting when you're mixing. Suddenly, you think, 'I've got too much midrange' or 'I haven't tuned the system right.' You get very preoccupied in the middle of the show with what's happening with the system. Otherwise, it's a great crossover."

Assistant FOH engineer, systems engineer and crew chief John Tripeny measures each room and inputs the dimensions into his laptop's special spreadsheet program for the V-DOSC calculations. "We're very careful not to be shooting the P.A. system into large flat spaces," he says. "If we've got a concrete wall that runs all the way around the arena, we'll put a break in the system so we're shooting above and below, but we try to avoid those ugly, reflective surfaces, have the arenas lift the scoreboards up out of the way [and] open the glass on the luxury boxes—anything they can do to minimize the reflective surfaces of the room."

PHOTO: STEVE JENNINGS

Monitor engineer Rafael Alkins

"The system is very definable in the vertical domain, and when you keep the sound out of the roof, you really have done something," Guest adds. "You don't hear all the stuff coming, washing back out of the roof, so the sound becomes more coherent. You're hearing more direct vs. reflective sound."

UP FRONT ON THE MIDAS XL4

Guest mixes from a Midas XL4 console with full automation and motorized faders. The FOH and monitor equipment was provided by ATK/Audiotek of Burbank, Calif., and Firehouse Productions of Red Hook, N.Y., with ATK, supplying the V-DOSC system, amplification and AC distribution. Although Guest mainly had toured with XL3s and Yamaha PM4000s in the past, he had used the XL4 a few times. "This is a great singer and a great band, and I wanted to do the tour with an XL4 because I think it's very musical. Mike Stahl from Audiotek offered me a fully automated XL4, and the automation package was a very attractive bonus," he explains. "I had never used automation live before, and it took me a few days to get adjusted to it, but now I really like it. The show is entirely live with no sequencing or digital tapes so the automation helps out a lot with muting the unused live mics."

Tripeny throws in praise for the console's versatility: "It's very nice because it sends MIDI program changes, it snapshots your song, snapshots all your balances, all your mutes, everything."

Guest can also drive effects cues from the desk. The Eventide H3000 DSE, Lexicon PCM91 digital reverb, three Yamaha SPX990 multi-effects and Roland SDE-330 digital delay all return to a small Yamaha 01V automated mixer, Guest says. The entire effects chain is keyed off of the MIDI program change issued by the XL4 automation, when he changes cues from one song to the next. Guest also connected an old Roland MIDI program changer keypad to the MIDI input to the XL4, which, he says, is "good for quick random access to program changes when you don't want to have to step through or scroll to cues on the XL4."

Other inserts include Drawmer 241 dual compressors, dbx 160SL dual compressors and Aphex 612 gates. "I use the Aphex 612 because the external trigger inputs accept lower-level inputs than the newer 622," Guest says.

Otherwise, Guest has a pretty fundamental outlook on mixing. "My basic mixing philosophy is 'find the magic and get everything else out of the way,'" he says with a chuckle.

MARTIN IS VOCAL ABOUT MIKING

Martin is very particular about the microphone he uses. He prefers the Sony WRT-810A that has a handy mute switch but agreed for a few shows to try a Sennheiser (the same unit his backup group and band members use). "Earlier this year [monitor engineer Rafael Alkins] and I discussed going to a good Sennheiser wireless, and Ricky agreed to try it out," Guest says. "He later returned to the Sony after it was rebuilt. He's really comfortable with that one, plus it suited his voice. It just cuts through everything very easily."

Alkins agrees that it seems to suit his vocals. "Every artist has different ranges

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in their voices, and somehow that microphone projected that range we were looking for," he adds. "That [mute switch on the Sony] was the magic switch that he really enjoyed having."

Martin likes to have control of the mic: He might start singing up in his dressing room or mute it when he talks to others backstage or shut it off while he dances in strategic spots. "Normally, if an artist ran out in front of the speaker stacks unexpectedly, it could take off in feedback," Guest says. "I can avoid that by panning him to the other side, so that, when he's speaking, it comes out the other side, but he just doesn't worry about it. As soon as he goes out front, he just kills the microphone so he can dance and the crowd can participate in the show, and when he comes back onstage, he turns the mic back on."

"He's great with that switch," Guest continues. "Once he was doing a duet with a special guest vocalist who was using his identical spare mic. He was singing, she came in for the duet, and her mic was off. He ran upstage and went right for the switch and turned it on for her before any of the stage crew could even react."

For Martin's vocal processing, Guest relies on a Focusrite Red dual mic preamp, a Meyer CP-10 dual parametric EQ and a Drawmer 1960 dual tube limiter, with Klark Teknik DN-360 dual graphic EQs as a sidechain for the 1960s. The dual-channel setup allowed Martin's main and spare mic to have identical processing, and the spare channel could be used for announcements and line checks, Guest notes. "The signal from Ricky's wireless receiver runs directly to the mic pre. The output of the vocal processing rack returns to the line-level insert return patch points on the XL4 console, bypassing the input preamp and EQ stages," he says. "The added benefit of this system is that this rack can accompany Ricky on any gig, live or TV, giving a high degree of sonic consistency for his vocal in any audio situation."

MOVING THE BAND

The new sets and choreography demanded more movement from the musicians, who played live, without backing tapes and with no sequencers or computers onstage. "The guys were used to the band basically standing and playing a show, and suddenly the band was walking, dancing, moving, changing clothes," Tripeny says. "At first, until everyone was familiar with it, it was kind of difficult to segue. The band had to think about so much that they weren't as focused on the playing, and it made it a little difficult on our ends. Now it's fine, but it took us four or five shows to really nail it and get it right."

Fortunately Guest and Alkins had joined the tour before the new staging and larger set, during the "Vuelve" world tour in October 1998. They worked eight weeks with only one week of rehearsal. Now, Guest says: "The guitar players wear headset mics because there's a lot of dancing and movement. Everything's wireless because everyone's moving. The only things that aren't wireless are the drums, percussion and keyboards. They have their in-ears, but everyone moving onstage has to have ear monitors and a wireless. We're using 34 wireless frequencies so the show is complicated in that regard, especially for Raffie [Alkins]." There are no wedges on stage, only sidefills for the dancers.

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stage action from a 72-input (with eight stereo inputs) ATI Paragon II. It's capable of as many as 20 stereo monitor mixes and includes four bands of parametric EQ, the patented ATI compressor and parametric noise gate. "This is one of the first consoles they put out," says Tripeny. "It's a beautiful board, and it sounds great. We're using all 40 outputs on it now." Compression comes from an Aphex 720 Dominator, which Alkins praises. "It's not a hard compression that you normally find. Very supple." His effects rack also includes a TC Electronic 3000, two 2000s and two Yamaha REV500s, as well as a BSS 901 vocal processor for Martin.

For the tour, Alkins chose a Future Sonics in-ear monitoring system, which Martin now owns. "[Future Sonics] made alterations to suit our needs, such as the switching system they installed for me," Alkins says. "The system is all stereo, and we have 15 stereo mixes onstage. We have a full stereo return, and they were very instrumental in doing that. They had one-week turnaround time to do it, so they did a great job.

"It's a whole lot easier noise-wise," Alkins says of the system. "So all we have to deal with is the main quality. We don't have to fight with the stage levels, but again it can also be dangerous [with the loud levels]."

"In general, it's difficult if someone is singing and the monitor engineer gives them too much of themselves in their ear monitors," Guest adds. "Then they start backing off the microphone or singing too soft, and I get the room sound swirling in. So it's a delicate and tricky balance that he and the singers have to strike between giving them enough to keep them properly on the microphone and enough for them to be happy and hear themselves with some degree of dynamic reality."

ORGANIZED ROAD WARRIORS

Otherwise, the tour is a model of organization, Tripeny says. The entire show, as large as it is, takes eight hours to set up and three to take down. The audio equipment takes three hours to set up and an hour and a half to break down. "We do a pre-rig every day," says Tripeny, who puts the P.A. up with systems tech John Protzko (filling in for Greg Lopez on part of the tour). Firehouse monitor technician Mark Weglinski handled the stage inputs and technicals. "We have a double set of motors and steel, so when we walk in the room, [it's] already rigged with all the motors, and then we build the rest of it. We have the grid up here, the superstructure," he explains, pointing out the steel frame of the set above the stage.

"Then the lights and curtains and video walls go up over that," he continues. "Once that and the audio is up, the stage rolls underneath everything. The stage actually gets built out on the floor out there," he gestures to the area in front of the stage. As a testament to the crew's teamwork, Guest drives the motors at night when they're bringing the P.A. out, and even the "pyro guy," Frankie Loffredo of Zambelli Fireworks, helps the rest of the crew load out.

Guest and Alkins believe teamwork and trust have been essential in this multidimensional show, which is scheduled to begin again on February 11 in Puerto Rico and end July 7 in Los Angeles. "[Martin] is very flexible for us," Alkins says. "He allows us to do what we need to do, in his best interest, and he trusts us, and that makes for a good relationship. A lot of the artists that I've worked with in the past will not just allow you very much latitude." ■

Kimberly Chun is Mix*'s copy editor.*

New Sound Reinforcement Products

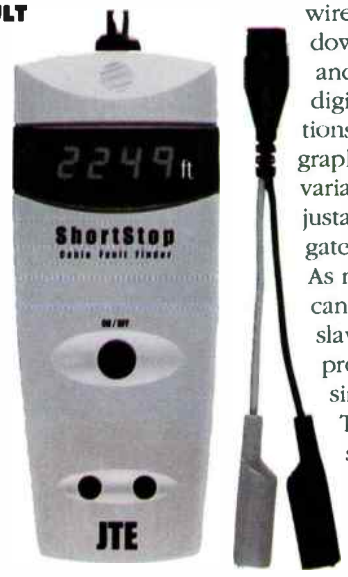
QSC RMX SERIES AMPS ▲

Unveiled at this month's NAMM show in Los Angeles is the RMX Series from QSC (Costa Mesa, CA), a line of 2-channel, two-rackspace amplifiers delivering 830, 1,000 and 2,400 watts (4-ohm, bridged). Features include high-current torroidal transformers, three-way (bypass, 30Hz and 50Hz) highpass filters, defeatable internal clip limiters, front-mount gain controls and LED indicators, balanced (¼-inch, XLR and barrier-strip) inputs, Neutrik Speakon and binding-post outputs, variable-speed cooling and onboard DC, and thermal overload protection. Retail: RMX 850, $549; RMX 1450, $649; RMX 2450, $899.

Circle 314 on Product Info Card

JENSEN CABLE FAULT FINDER ▶

Jensen Tools (Phoenix) offers the ShortStop Cable Fault Finder, a handheld, battery-powered device that tests for opens and shorts in all kinds of wire, including co-ax, two-wire shielded, twisted multipair and AC wire. The unit will measure cable length on spools, in the wall and underground. Water-resistant and input-protected to 250 VAC, the ShortStop can inject a tone onto the line for cable tracing and gives an audible indication of shorted wires and hazardous AC voltages. Price is $299, including four AA batteries and a clip lead adapter.



Circle 315 on Product Info Card

LA AUDIO DIGEQ

LA Audio's digEQ (distributed by Pro Sound International, Tullytown, PA) is a 24-bit digital, programmable EQ and dynamics processor, offering simultaneous dual-channel operation of graphic, parametric and shelving EQ, filters, compressor/limiter and gate. Designed for live sound reinforcement applications, the digEQ offers a highly intuitive user interface and instant access to function parameters. Options include a wired or wireless remote control, Windows control software, RTA and digital delay modes, and digital I/O. Processing functions include 31-band, ⅓-octave graphic EQ, 3-band parametric, variable LP/HP filters with adjustable slopes, expander/noise gate and compressor/limiter. As many as 98 system settings can be saved. Master and slave units are networkable to provide up to 32 channels of simultaneous processing. The digEQ network control software permits system management locally from the master unit or from the remote, PC or other MIDI controller.

Circle 316 on Product Info Card

RANE 12X4 ROTARY MIXER ▼

Rane Corporation's (Mukilteo, WA) MP 2016 Rotary Mixer is a three-rackspace unit for DJ, club and A/V applications. Six stereo inputs with rotary faders feed Master and Booth output buses. Four input channels have stereo line/RIAA phono connectors; the other two offer mono mic/stereo line inputs with rear-panel 2-band EQ and mic gain trim pots. Master outs are balanced (XLR) and unbalanced (TRS); Booth outputs are unbalanced. Other features include 3-band output EQ, headphone select, volume control, Cue/Master switch for the Booth output, tape recorder outputs and effects loop insert. An optional XP 2106 external processor adds 3-band EQ for all six input buses, L/R LED output meters, plus an A/B "crossfader" with adjustable crossfade contour. The MP 2016 is $1,499; the XP 2106 is $749.

Circle 317 on Product Info Card

EV DEBUTS FORCE SUB

Electro-Voice (Buchanan, MI) introduces the Force® Sub, a dual 15-inch subwoofer that complements the Force two-way system. Featuring a compact 23.5x20.5x23.5-inch cabinet with a steel grille and corner protectors, the Force Sub includes a pole-mount socket and a 30-inch pole for mounting EV full-range systems. Built-in lowpass electronic filtering allows the Force Sub to be paralleled with a full-range

system on a single amplifier channel. Capable of handling 1,200-watt peaks, the system is rated at 300 watts continuous. Price: $498.

Circle 318 on Product Info Card

DBX 12-SERIES GRAPHIC EQS ▲

dbx (Sandy, UT) introduces the 1215 and 1231 dual-channel graphic equalizers, the first models in the company's new 12 Series of graphic EQs. The 2U 1215 ($449.95) features 15 ⅔-octave bands per side, and the 3U 1231 ($549.95) offers 31 bands of ⅓-octave EQ per side. Both units offer ±12 dB of input gain range, ISO frequency centers, and switchable 18dB/octave 40Hz Bessel low-cut filters. Additional features include 45mm faders, selectable ±6 or ±15dB boost/cut ranges for precise gain adjustment, and internal power supplies. I/Os are balanced, and users may choose among XLR, barrier-strip and ¼-inch connectors.

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HAFLER C-SERIES AMPS ▼

Hafler (Tempe, AZ) intros its C-Series 2-channel amps for live-sound and cinema-install applications. The two-rackspace, 300- and 600-watts/ch. C-Series

models are based on Hafler's patented Trans•nova platform and Class G circuitry. Reportedly capable of constant power output and consistent thermal performance into any impedance, the units are fan-cooled, use switching power supplies, feature surface-mount and MOSFET technology, and will operate at 110/220 volts. Both live sound and fixed install versions may be ordered with crossovers, and digital amplifier control is in development.

Circle 320 on Product Info Card

IASYS RT-60 SOFTWARE ▼

The Iasys® system setup tool from AudioControl Industrial (Mountlake Terrace, WA) now includes a reverberation time (RT-60) measurement facility. Version 3.0 software for the self-contained unit also includes a memory copy function and a real-time SPL display. To measure RT-60, the operator simply selects a ⅓-octave frequency band between 63.5 and 4k Hz and presses the test button. Iasys automatically runs the

test procedure and measures decay time automatically over at least seven test passes. A new memory copy function lets operators run multiple tests quickly; the real-time SPL function features a numerical display with 1.25-inch numerals.

Circle 321 on Product Info Card

POLYSONICS PRO LOUDSPEAKERS

Polysonics (Eureka, CA) enters the pro audio market with its Microsonics™ Loudspeaker line. Flagship of the system is the FR-12 Hornet,™ a full-range, two-way system featuring a single 12-inch woofer and HF driver on a 60°x90° horn. Frequency range is 44 to 18k Hz. The FR-8 Mosquito™ is a compact two-way system that includes an 8-inch coaxial woofer with a 1-inch HF compression driver in a rectangular cabinet (17x10.5x13 inches, 45 lbs.). Frequency range is 75 to 20k Hz. Other Microsonics Series products include a similarly loaded stage monitor (the M-8 Cricket™) and the SW-15 Mantis,™ a single 15-inch subwoofer that can be used as the basis for a three-way system with the MR-8 Drone™ midrange unit and HF-1 Scorpion™ HF unit.

Circle 322 on Product Info Card

TSUNAMI TECHNOLOGIES AMPS ▼

Tsunami Technologies' (San Francisco) HQS Series of lightweight, high-power amps are two-rackspace units with advanced Class-H switching power supply circuitry. The four HQS models range from the HQ702S (380 watts/ch. into 4 ohms; 850 watts bridged mono) to the 27.5-lb. HQ2002S, which delivers 980 watts/ch. into 4 ohms or 2,000 watts bridged. Other features include variable-speed cooling, detented 21-step attenuators, the ability to drive 2-ohm loads and a bandwidth extending to 55 kHz. Tsunami also offers a line of powered mixers based on the same Class-H amp designs.

Circle 323 on Product Info Card

UK Music Recording

STUDIOS ADAPT AS MARKETS CHANGE

Napoleon once disparaged the English as "a nation of shopkeepers," and the London studio industry is increasingly a business of small boutiques, often allied with larger established facilities. The renaissance that London studios have enjoyed in the past five years, as bands like Blur and Oasis have rejuvenated the big-sound rock record sector in music, is drawing to a close. Now, the focus is shifting to project studios, and the observations of commercial studio managers and owners show that many are feeling the pinch.

"It's been up and down lately, the last year-and-a-half," says Ian Davidson, director of Virgin Studios, which includes London's Olympic Studios and The Town House facilities. "The fortunes of big studios like these follow the course of the music business, and the band thing has been giving way a bit to more techno-pop from Europe, which doesn't have the same needs for big rooms as rock music does. Ultimately, that affects the studios' bottom line."

Stanley House features seven programming rooms in addition to this main SSL 9000 J-equipped studio.

Managing three music rooms at Olympic and four at The Town House (which also has five audio post-production suites), Davidson has found that he's been unable to raise rates, which average £1,100 per 12-hour day (about $1,760 U.S.), despite having upgraded each of the facilities with an SSL 9000 J console. Olympic and The Town House are able to add to their margins by strictly enforcing 12-hour days and charging higher rates for overtime, and by charging separately for certain key pieces of digital equipment, such as Sony 3348 digital multitrack recorders. The three trucks of the company's mobile recording company, Manor Mobile, are also high-margin revenue generators; with only four people assigned specifically to the division, the trucks have a lower overhead than the studio and can often charge higher rates.

CTS is a venerable commercial facility that has made a commitment to digital consoles. Pictured is Studio 2 with its AMS Neve Capricorn, Dolby Surround and custom ATC LRC monitoring.

As techno music makes a comeback, productions move into smaller, more private spaces. But veterans like Davidson have been around long enough to know that this process is cyclical, and that bands and the need for large recording spaces will return at some point, which makes it worthwhile to keep facilities as close to the technological edge as is affordable.

Olympic and The Town House might seem to have the resources of Virgin founder Richard Branson as a cushion, but Davidson stresses that "the studios are expected to make their own way financially." One of the creative solutions Davidson has developed to keep these studios successful is to rent parts of the facilities, of various sizes, to engineers and producers. The studios benefit both from the rental income and the proximity to tenants' larger budget projects. The Town House has five such tenants, Olympic another four, each renting the equivalent of a small (12x12-foot) office for the equivalent of nearly $20,000 per

BY DAN DALEY

—CONTINUED ON PAGE 96

STUDIOS 301 REOPENS IN SYDNEY

You could say that evolution and history combine in the reopening of Studios 301 in Sydney, Australia. Behind the studio's brand-spanking-new facade is the legacy of what may be the oldest continuously operated recording facility in the world. The most recent incarnation of Studios 301—which opened to much fanfare on the evening of November 19, 1999, with a party that brought out much of Australia's media elite, including Rupert Murdoch—resides in a former bank and bank records warehouse in the Sydney suburb of Alexandria, a couple of miles from the city center. It's a multi-ethnic, bohemian residential area that is attracting many of Sydney's music business heavies.

The recording room and control room (below) of Studios 301's renovated Studio 1, also known as the Blue Room

301's new owner is Tom Misner, the founder of School of Audio Engineering, who began his audio career in Sydney more than 30 years ago. In addition to the facility, Misner has purchased about 30 properties within a few blocks of it, some of which are being converted to satellite offices for things like studio management and technical support; others are purely for investment purposes. But it's plain that the studio building itself is the focus of this venture. Valued at $6.5 million including equipment, the renovation took the better part of a year and neatly nestles five studios into a 12,000-square-foot edifice, complete with a garden patio and a three-bedroom apartment.

The link to the facility's past is not immediately apparent in the impressive new construction. But when Misner bought 301's assets, he also acquired much of the audio heritage of Australia, whose industry was largely colonized, like the country itself, by the UK. The original facility was started in 1926—pretty much concurrent with the beginning of pro audio itself—as the Columbia Graphaphone Studios, making it the world's second-oldest studio. It later became EMI, which continued to bring over new technologies. Studios 301, named for its street address on Castlereagh Street, was bought out by its management in 1996, and Misner bought it in February 1999.

That location's recording facilities have been gutted, but it remains operative as a mastering facility, one of the leading ones in Australia, and several staffers remain there, although there is much shuttling going on between the two locations. The intent, says Misner, is to leave mastering at the original location, although that may change at some future point, understandable considering the amount of properties he has acquired around the new location.

THE LEGACY

In its heyday, 301 was constantly busy as the EMI facility for most of Asia. Hit records for recording artists such as the Little River Band, Split Enz and Crowded House were done there. But if there was a jewel in this crown, it probably belongs to Slim Dusty, Australia's most famous country singer, who in 1957 recorded "The Pub With No Beer" at 301. The record went on to become the single biggest-selling recording in Australian history and produced the first—and only—Gold record award for a 78-rpm disc.

Martin Benge went to work at 301 in 1971 as a staff engineer and went on to manage the facility for nine years. After going freelance, he returned to the studio last year to work as a consultant for its new edition. He recalls that through the 1970s, the consoles at 301 were of EMI design and manufacture, vintage mid-1950s. "But they did have one of the first transistorized recording desks ever made, and it was locally built," he says. "Otherwise, it was all valve consoles with four channels and large rotary pots. Later on, when I came here, there were two transistor consoles and one valve desk. In

BY DAN DALEY

1973, we put in one of the Abbey Road TG Series consoles built in the UK, and that lasted right through 1978, when the studio was renovated and we installed three Neve 8078 consoles, one with Necam automation for mixing and the other two without. In 1986, we put in the first SSL console." Benge says the local market was happy for a long time with the more vintage technology. "But once the Australian music market heated up in the 1980s, and we had bigger bands passing through, they started demanding more automation and channels," he explains. "Also, our closest competitor, Rhinoceros, had already put in its first SSL. So it was very much a market-driven decision, [as] much as we and lot of other people loved the old valve desks."

GOING TO THE BANK

The exterior of the new facility is plain, almost dowdy, part of the strategy to keep the facility and its clients as anonymous as possible. Inside, however, the implementation is first-class and was designed by Misner, with architectural and acoustical consulting from Roger Darcy and Nick Whittaker of London-based Recording Architecture.

Studio 1 is centered on a 3,800-square-foot recording space that can hold as many as 70 musicians for tracking, scoring and string overdub sessions. Here, as in the other studios in the complex, all floor and wall surfaces are made of solid concrete and completely floated. Misner chose concrete to minimize resonance and create a more predictable acoustical response, using trapping and diffusion to tune the spaces. Broad-band low-frequency trapping is used extensively throughout the two main ground-floor studios, with curved wooden perforated ceiling diffusors and square-holed back wall diffusors in the control rooms. "Concrete is not unusual for studio floors, but most people use layers of plasterboard for walls, and when sound hits it, it gives, and the energy is converted from acoustical into mechanical," Misner explains. "Concrete is more predictable."

Studio 1 has a decay time of 2.2 seconds, and the smaller, more rock-oriented Studio 2 has an RT of 1.2 seconds. Both studios make extensive use of booths, not only to create various isolation areas, but also to affect the resonance of their main spaces. Studio 1 has folding doors along the length of its largest iso booth (which has its own RT of 1.5 seconds and a totally diffused ceiling), which can change the room's response. Misner specified custom air-tight doors from German manufacturer Rehau.

Studio 2's 1,200-square-foot main room uses very hard stone surfaces to create a hard ring for drums; high frequencies are mitigated by the ceiling treatment. The larger Studio 1's ceilings are characterized by pyramidal diffusors, abetted by mid/low-frequency traps, tuned to around 800 Hz, on the walls. Studio 1 has a Neve Legend VR console with 48 inputs and Flying Fader automation; Studio 2 is fitted with a 64-channel SSL G Plus with Ultimation. The consoles, Misner says, are both widely familiar to Sydney's engineering base and are competitive in the overall market. (As yet, Australia has no installed SSL 9000 J or MT, or Neve Capricorn consoles.) Main monitoring is via Genelec speakers, and both Studios 1 and 2 are surround-capable; Studio 1 has 8-channel capability.

Upstairs, three smaller studios are based around mid-market consoles, in-

cluding a Mackie digital and an Amek Langley Big. All the studios share wiring (both network and tielines including an Internet link for Webcasts) and a common central machine room with formats including Sony 3348, Tascam 38, Akai digital dubbers, Digidesign Pro Tools and analog formats.

Although Misner's approach to designing studio classrooms is consistently and spartanly practical, Studios 301's aesthetic outfitting is relatively opulent. Lounges are plush, and the 120-year-old Oregon wood beams that were used to build the bank back in the 1920s are very handsome. Studio 1's control room has a large floor-to-ceiling mirror on the right-hand side that balances the room acoustically and adds the perception of space. "Besides, I like to watch myself mix," adds Misner, who is returning to recording and mixing—the milieu in which he started—with four production projects currently under way. But the efficient pragmatism that characterizes SAE is also evident here, with small but telling details such as the placement of mic panels at waist height, which will endear the studio to assistant engineers about ten hours into a tracking session. In addition, air conditioning outputs are located above the soffitted speakers in the main control rooms instead of venting directly downward onto the mixing position.

Audio-for-video capability is integral to the wiring design and systems choices, with a Motionworker system for sync throughout the facility and two DoReMi hard drive video systems whose outputs are assignable to all rooms.

The new facility comes into being only weeks after the opening of Fox's theme park/film production and post-production venture, also in Sydney. In fact, Misner asserts that Fox purposely left film scoring stages out of its design plans because one of Studios 301's rooms would give Sydney its first world-class scoring stage in decades. And 301's design and intent are in line with what Misner sees as the future of the studio business. He says that, with midsized facilities being further squeezed as home recording—which hit Australia in force in the early 1990s—takes more of the music market, a high-level zone is also created for "superstudios," as Misner refers to them—a few in each major market—to cover the upper-tier, bigger-budget work. "That's the thing about the entertainment industry becoming global," he explains. "There's always going to be local markets for music and other entertainment projects. But the upscale work is going to be able to move easily around the world through studios like 301 here. It's just the way the world is going." ■

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year. Most tenants have converted the rooms into personal studios. (One example is Spike Stent's studio at Olympic. See "The Project Studio," page 118.)

"They get the benefits of a larger facility, such as security, reception and catering," says Davidson of his engineer/producer tenants. In addition, Davidson says the ability to work in a professional environment dovetails nicely with the experience many independent producers and engineers have had in terms of a desire to move out of their residences, for space, family and other reasons. "Many of them have outgrown their personal studio situations," he says.

George Martin's AIR Studios also leases project rooms to producers and

engineers. "The client will provide most of their own equipment but benefits from the studio's 24-hour technical service and other facilities," explains Alison Burton, AIR's sales and operations manager. Those facilities, of course, include AIR's four impressive studios: The breathtaking Lyndhurst Hall with its 72-channel Neve VRP Legend console, the 72-channel custom Neve/Focusrite-equipped Studio 1, Studio 2 with its SSL 8000 G board and the AMS Neve Logic 2 in Studio 3.

"We have found that as the trend for producers and engineers to work with Pro Tools, etc., in small home or project studios grows," Burton continues, "leasing rooms for this purpose creates a symbiotic relationship with our more commercial rooms. Once the client has finished pre-production of a track, the transition into a larger tracking or mix room within the building complex is obviously an attractive prospect." Presently, AIR leases rooms to composer/producer David Arnold, who recently completed recording the score for *The World Is Not Enough*, and to producer/writers John Halliday and Trevor Steele.

Roundhouse Studios lays claim to having pioneered this particular brand of studio/client synergy. Roundhouse added dedicated client rental suites when the 20-year-old facility moved several years ago. The studio effectively redefined itself to match the direction in which music in the UK then appeared to be moving—from a few large studios to a larger number of smaller ones. Maddy Clarke, Roundhouse's studio manager, concedes that there are pitfalls for those who try to anticipate and accommodate shifting trends in the music industry. After designing the new facility with smaller recording spaces but larger control rooms, Clarke says, "It was frustrating, a few years back, when all of a sudden everyone wanted big recording spaces again. But we've done well at attracting MIDI and mixing clients with the arrangements we have."

Roundhouse also continues to let out seven programming suites to production tenants, though that market has become more competitive as more programming suites have opened in London. "When we first did it, it was a clever way to boost revenues to the studio," says Clarke. "It wasn't a cheap investment—we built the rooms to very high standards, with lounges and overdub spaces. We spent about £300,000 at the time. But once it was recouped, it was a very good source of income. But now every Tom, Dick and Harry has done this, and there's a lot of rooms on the market. When two of our clients left—one to go on tour and the other moving to the States—where once we had a waiting list to get in now we found we had to shop the rooms around." Despite an increasing inventory of available rooms, Clarke and other studio managers indicate that there are now more potential renters than before, an illustration of how deep the pool of independent producers and engineers has become.

Olympic Studios upgraded its Studio 1 to an SSL 9000 J console a few years ago.

Over at Abbey Road, the famous facility has just entered into its first relationship of this sort, having just leased a programming room to a producer. However, the studio's director of operations, Chris Buchanan, says that this facility is the exception that proves the rule that band recording has waned. "Abbey Road is known for its large acoustic rooms, and those are still busy," he says. "But Abbey Road isn't typical, of course, as we work with such a wide range of projects, such as film scoring, musicals, classical and pop bands, plus mastering, remastering and, more recently, multimedia. I think to survive in the future, studios will need to be pretty flexible and make the most of all their assets."

Stanley House, a two-year-old, $2 million independent music facility in the Stanley Gardens district of London, was also designed to address the same market opportunity. Co-owner Andy Morris (who, with his partner Ian Devaney had helped guide Lisa Stansfield's first two albums to sales of 10 million copies) had his seven programming rooms open before the main SSL 9000 J-outfitted studio came online last year. Most of the programming rooms are now rented to producers and engineers, with minimum six-month leases, and tenants include producer Jon Douglas (George Michael, All Saints) and remixers the Dirty Rotten Scoundrels. Morris says his tenants have drawn such artists as George Michael, Björk and Connor Reeves into the studio for sessions.

In addition to proximity to the main studio, the programming rooms also share the 7,000-square-foot building's other amenities, which include a private pub on the fourth floor. At a time when conventional studios are having a hard time competing with personal facilities, the advantage of being able to order a pint of lager after the horrifically early official 11 p.m. closing time of most London pubs was one that Morris latched onto early in his business plan. "It's as much a social thing as it is professional," Morris explains. "People naturally want to be around other people who do what they do, and that works in our favor in terms of providing that as a service to producers and engineers."

But even beer sales contribute to the bottom line these days. Morris concedes that the relatively new main room has been slow getting off the ground, and he has had to reduce rates once since it opened. He's also noticed that the mix of artists has moved toward dance, R&B and techno, which helps explain why, though the main studio has a mid-sized tracking space, most of the calls he gets for it are for mix projects. When all of his revenue sources are factored in, Morris says business is "decent," but a long-planned second studio remains on the drawing board, and he is more inclined at present to consider adding more rentable suites to the facility. He has, however, added a new Pro Tools system, which has become the most common interface between the increasingly distinct camps of conventional and personal studios in London.

ARTISTS IN RESIDENCE

London has always had a fairly robust fringe of studios on its outskirts, and at Ridge Farm Studio in Surrey, an hour west of London, owner Frank Andrews is hoping that he can change with the times, despite the studio's location on a 350-year-old farm. Like many of his American counterparts, Andrews points to the impact on recording budgets and studio choices that has resulted from

corporate downsizing in the UK entertainment industry. "I see more projects going back to direct recording as opposed to acoustical spaces, and most of what we do here on analog eventually ends up on hard disk anyway," Andrews observes.

During the past two years, under the supervision of studio manager Ann Needam, the studio has begun managing several producers and engineers as a way to both derive revenues from commissions and to build alliances between people and the facility. That effort is still secondary to Ridge Farm's core business, but Andrews says it's too early to tell if that will remain the case several years hence. Meanwhile, he's also hedging his bets with a line of esoteric analog signal processing units, and he expects to double the line from two to four products by the beginning of the year.

All of this is necessary to supplement the studio's revenues, says Andrews. In an interview two years ago, he commented that the resurgence of bands and the upturn in UK record sales, which had increased 14% in 1996, had prompted a round of upgrades throughout London's studio community. Ridge Farm installed an SSL 9000 J and other gear during that period of optimism. As Andrews said at the time, in a verbal snapshot that contrasts with the current climate, "There's a level of confidence out there in the music industry that hasn't been seen since before the recession a few years ago. [Record companies] are investing in music again." Andrews is a veteran and has seen this cycle repeat itself several times, and he fully expects it will again. "But in the meantime, you can't wait for it," he says. "Things will change, but they never revert to whence they came. So we have to change our focus to accommodate that."

OTHER APPROACHES

Although the music scene is in continual flux, there are a few studios that haven't had to deviate from their traditional mode of studio operations. Angel Recording's two very large rooms have found a strong and steady niche in London's orchestral market, which has lately been on an upswing driven by several factors: growth in classical music CD sales, more film and television scoring, cast albums from London's robust theater scene and a demand for more lush string parts on pop records. Studio manager Gloria Luck says while Angel has not been able to increase its rate of £1,350 per day for its rooms, it hasn't had to retreat on them either, and she hopes to be able to increase rates sometime this year. "It's been strong even while the record companies have been cutting back a bit on pop records," says Luck.

Metropolis is one of the largest facilities in London, with five main recording studios and several mastering suites. Managing director Laura Traill concedes that revenues from music bookings are harder to predict now than two years ago, and she has taken a more proactive approach. Metropolis has installed a dedicated 5.1 mixing studio fitted with an SSL 9000 J console. Traill markets it to record labels as part of a new division, Metropolis DVD, which is headed up by David Anthony, founder of New York authoring studio Zuma Digital.

"I certainly wouldn't say we're overbooked in that room as yet," Traill says. "But what we are doing is approaching the record labels and suggesting that they give us the stereo mixes of some of their larger artists and letting us show them what we can do with it. We need to show this client base the potential of the format. We're trying to grow that market instead of waiting for it to come to us."

Metropolis has also created a central booking system for all of its operations. The company expanded its mastering operation dramatically in 1998 when Metropolis acquired U.S. mastering facility Sterling Sound in New York, creating a trans-Atlantic joint venture. (Traill also acknowledged that Metropolis is still actively looking for other possible acquisitions which would, says Traill, "complement our core businesses.") As part of that reorganization, Metropolis has been presenting its clients with various rate and operational formulae that encourage them to use more of the facility's capabilities, from preproduction in two programming suites, through mixing, mastering and postproduction services. Following the model that's been in place at certain large U.S. facilities for about a year, clients can get lower overall rates the more Metropolis services they use. "What it comes down to is that studios simply have to be more creative in how they package themselves and their services to their clients," says Traill.

Another company following the mergers and acquisitions model is Sanctuary Group. A multifaceted, publicly traded company, Sanctuary derives about a third of its annual £22 million

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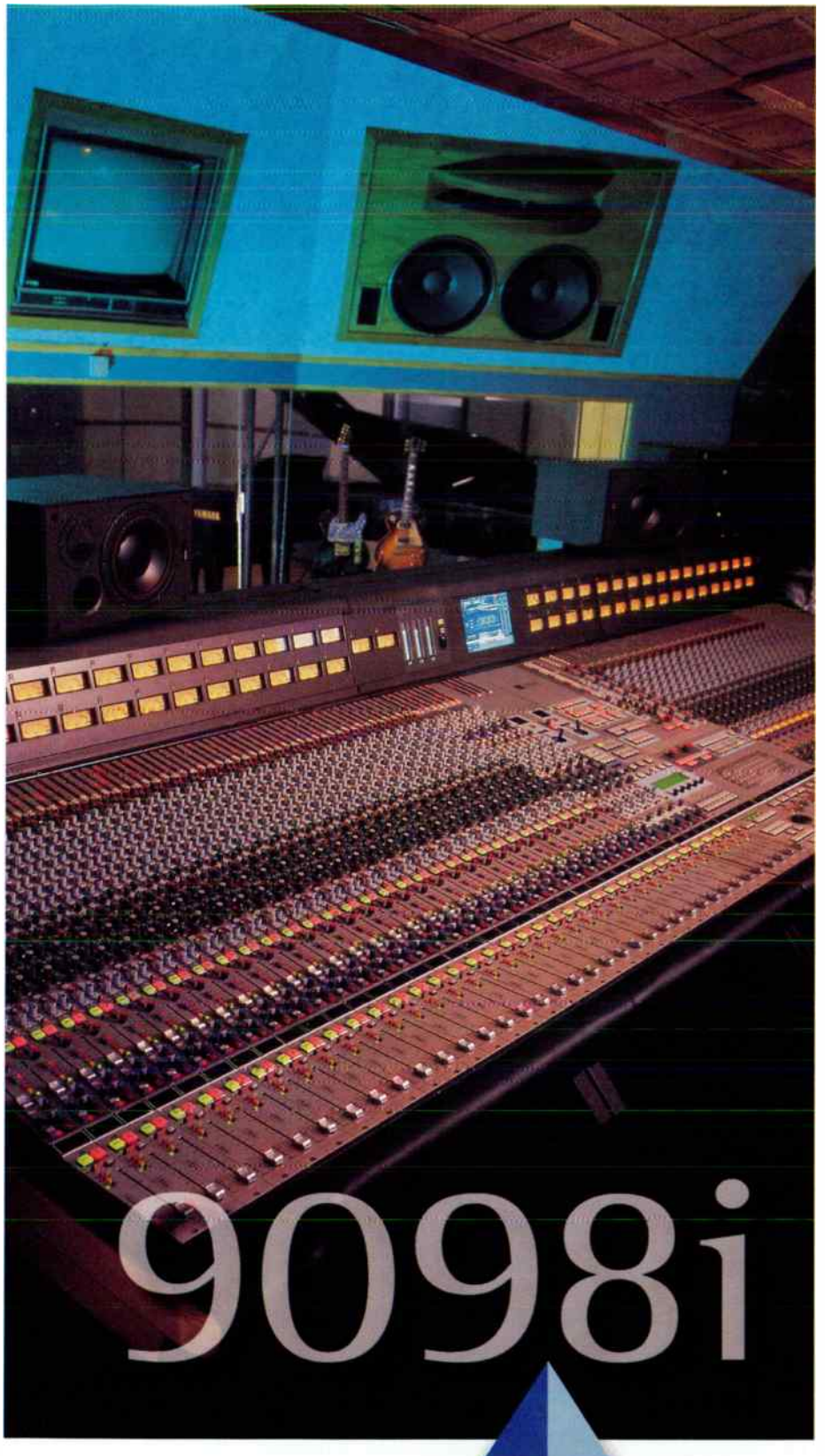

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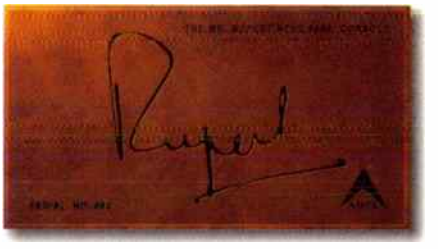

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MIX BUSINESS

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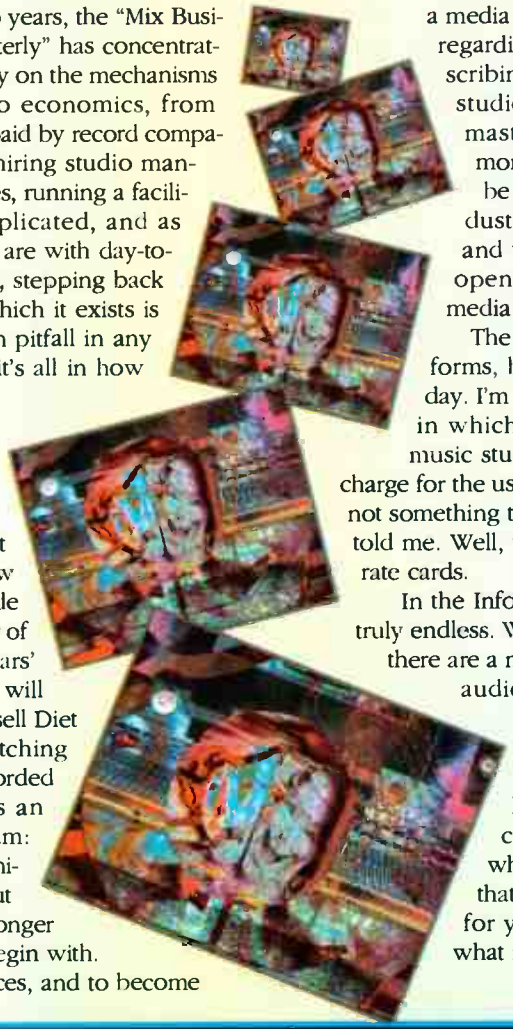
There's No Business Like Show Business

Over the last two years, the "Mix Business Quarterly" has concentrated heavily on the mechanisms of studio economics, from getting paid by record companies to hiring studio managers. Yes, running a facility is complicated, and as busy as you are with day-to-day operations, stepping back and looking at the landscape in which it exists is critical. Tunnel vision is a common pitfall in any business, and it's often fatal. See, it's all in how you look at things.



The recording studio is one cog in what has become a huge and surprisingly well-oiled machine called the media industry, a somewhat lofty euphemism for what is essentially show business. In a few weeks, the Super Bowl will provide the perfect illustration of the merger of art and commerce. Millions of dollars' worth of technology and creativity will be poured into 30-second spots to sell Diet Coke and motor oil. Some ear-catching music will have been brilliantly recorded to sell Corn Flakes. Now there's an equation for the new millennium: $CF=O^x$ (Corn Flake equals Opportunity exponential). Not quite $E=MC^2$, but it encapsulates the reality—it's no longer about the music, if it ever was to begin with.

It's about providing media services, and to become a media service provider you have to start regarding yourself as such. So stop describing your business as a recording studio or post-production facility or mastering house, et cetera. Those monikers will linger and will always be useful code words within the industry. But by reinventing yourself and your business perceptually, you open up to an increasingly diverse media business.

The shock of the new comes in many forms, but confronts us each and every day. I'm reminded of a story I did last year in which the manager for a Manhattan music studio was confounded by what to charge for the use of the studio for a Webcast. "It's not something that we had on the rate card," she told me. Well, the future's not on most people's rate cards.

In the Information Age, the possibilities are truly endless. Webcasts are a growing niche, but there are a million new media applications for audio. Archiving and retrieval. MP3 mastering (someone's going to make some serious money on this one). Audio for kiosks. The list is endless, but the goal is to change the way you think about what you and your facility do. To do that you have to find another context for yourself in the bigger picture of what media is all about. Say it out loud

—CONTINUED ON PAGE 102

Now there's an equation for the new millennium: $CF=O^x$ (Corn Flake equals Opportunity exponential). Not quite $E=MC^2$, but it encapsulates the reality—it's no longer about the music, if it ever was.

QUARTERLY

ALL TEXT BY DAN DALEY

CONSOLIDATION

New Faces, Same Places in The Changing Studio Business

IT'S BECOME A MULTIBILLION-DOLLAR SPORT ON WALL STREET to watch American Airlines swallow Reno Air, or Exxon buy Mobil, or any of the dot-coms snatching up the other dot-coms. Closer to home, Disney bought ABC/Capital Cities, Seagram's purchased PolyGram less than two years after acquiring Universal, and real estate/radio network speculator SFX now basically owns the concert touring industry after a spate of bold and costly acquisitions.

The world is getting smaller by the minute, and so is the studio business.

But you don't need a skybox at the New York Stock Exchange or a power table at Le Dome to watch consolidation roar through show business. There's been plenty of it going on in the studio community's backyard. Much of the activity has been across state lines and occasionally across oceans. In the past year and a half, London's Metropolis bought Sterling Mastering in New York; The Hit Factory purchased Miami's Criteria Recording; Quad Recording in Manhattan bought Quad Recording in Nashville (with names like that, it seems like a match determined by fate, not number crunching); and Todd-AO, the world's largest independent provider of sound services for the entertainment industry, purchased Sound One Corporation, New York's leading sound-for-picture facility. Before the ink was dry on that deal, Liberty Media Group, a division of AT&T, signed a letter of intent to acquire control of both Todd-AO and L.A.-based Soundelux Entertainment Group. Then in November, only a month later, Liberty announced a stock-swap purchase of Four Media Company of Burbank, Calif., making the Colorado company the largest provider of soundstages in the world.

The studio business is not unique, and the reasons behind the recent consolidations are much the same as those in other industries undergoing buyouts and mergers. Many who track entertainment-industry stocks will point to Sony's acquisition of Columbia Records and later Columbia Pictures in the late 1980s as the flash point for consolidation. Sony's intention, it seems quite clear in retrospect, was vertical integration. If you manufacture home stereos, Walkmans, television sets and VCRs and you make professional audio and video equipment, it makes sense that you would also want to provide the content that they channel.

When companies like Sony and Disney acquire film studios, networks or record labels, they are also often acquiring copyrighted intellectual property, ranging from songs to television shows to movie catalogs to record master archives. Known by entertainment accountants as "the gift that keeps on giving," content is often the reason that companies acquire other companies. Other aspects of acquired businesses may be shucked and shed, and if there is a painful side to this phenomenon, it's in that reduction process. When

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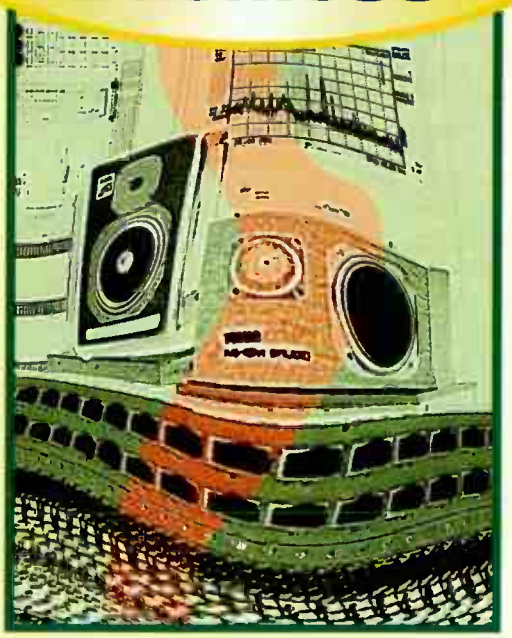

—FROM PAGE 100, MEMORANDUM

a few times; chant it like a mantra: This is not a recording studio; it is a media facility. I am not a recording engineer; I am a media specialist. I am not a record producer; I am a media director.

As a media facility, your potential range of clients increases exponentially. Banks need audio for Web sites and training programs. The meeting and convention business is booming right now, and as it becomes more competitive it will need better sound. As theme parks move closer to virtual reality experiences, they'll need multichannel audio to replace the sound of roller coaster wheels. Go see any museum exhibit, where "immersion experiences" now rule the day, and they all need audio. Sometimes all it takes is someone to point it out to them. That someone could be you.

Granted, not everyone can do this. There are many people and facilities who, for whatever reasons, need to stay on the traditional course. That's fine; there's so much business around that it will leave fewer facilities to service the traditional music dates and will—in theory, at least—allow those that stay in the game to raise their rates.

There are plenty of articles in *Mix* that tell you where to put which microphone in the kick drum. For the past two years, the "Mix Business Quarterly" has tried to help you hold on to the place where you keep the kick drum. I want to help you beat a new drum. ■

CONSOLIDATION

—FROM PAGE 101, CONSOLIDATION

Seagram's scion Edgar Bronfman Jr. took over PolyGram in 1999, the first thing he did was require $300 million in cost reductions throughout the company's global empire. Part of that was felt in the pink slips that rained down at record labels and film divisions in the ensuing months, and part of it trickled down to the recording studio level, where A&M Studios was sold to Jim Henson's company and is still in limbo as of press time.

The up side can be dramatic, though. For instance, SFX's stock price rose fourfold after it began its acquisition spree more than a year ago. Stock is the magic word, explaining much of

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the fervor surrounding takeovers. The entertainment industry, like many other industries, has become increasingly beholden to stockholders. The Liberty Media/Todd-AO/Sound One/Soundelux deal, for instance, was essentially a stock deal. According to the proposed arrangement, which was expected to be final by the end of 1999, Liberty Media Group would acquire 50% of Todd-AO's outstanding Class A common stock and 100% of its Class B common stock for the issuance of 2.5 million shares of Liberty Class A common stock. Liberty would end up owning roughly 57% of the equity and 82% of the votes of Todd-AO. Similarly, Liberty would acquire approximately 55% of the equity and 92% of the votes of Soundelux in exchange for the issuance of nearly 1.9 million shares of Liberty Class A common stock. Acquisitions such as these can boost stock prices, if Wall Street approves of the way companies go about it.

The globalization of media parallels the development of globalized industry

BIOGRAPH: MARTIN BENGE

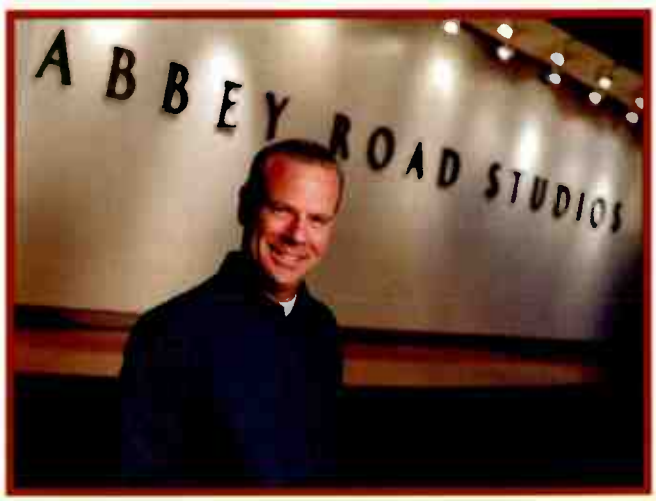
Been There, Done That

The headlines generated by the wave of consolidation that's swept the recording industry in recent years might make it seem as though such turmoil is a recent phenomenon. But the truth is that the business of studios has as much of a history as many of the studios themselves. And former head of EMI/Virgin studio operations Martin Benge not only witnessed it, but has been a big part of it during a career that's spanned 37 years and shows no sign of stopping.

Benge's professional history began in 1962 when he joined EMI in London as an "electronics engineering apprentice," back in the days when such apprenticeships lasted for five years and the recording industry was ruled by intensely serious men in white lab coats. You didn't even get to touch the tape until you'd put in a couple of years of hard labor. Benge was assigned to Abbey Road Studios, then the crown jewel in an empire of dozens of recording facilities in 14 countries. In those days, artists were routinely assigned to staff producers working in recording facilities owned by their labels. And so Benge found himself working with EMI's best-known group, The Beatles, on occasion, as well as many top classical players and conductors, including Jacqueline du Pre, Yehudi Menuhin and Otto Klemperer. "That was it—that was the way the world worked at the time, and no one thought about it much differently," recalls the 55-year-old Benge, who still retains some of the polite formality that was instilled by EMI's rigorous training regimen.

But the studio business was on the verge of upheaval. The rise in the power of the rock artist and the producer gave them more influence over recording venue choices, and by the early 1970s, independent studios had gained the edge in the record-making process. When The Beatles chose Olympic Studios in London to record "Baby You're a Rich Man"—the first Beatles recording outside of an EMI-owned facility—it was the beginning of the end for label-owned studios. Throughout the 1980s, labels such as Columbia and BMG shut down their studios in New York and elsewhere. "By the mid-'80s, it was all over for them," Benge says. "That model was through."

Benge moved to Australia in 1971, going to work at the EMI facility in Sydney, all the while watching the studio industry change focus. "The interesting thing, though, was that even as the major labels were shutting down rooms, Richard Branson's Virgin Records was going the opposite way," he says. "He opened The Manor in Oxford in 1972, and Mike Oldfield's *Tubular Bells* put both the label and the studio on the map, so to speak. As the labels were closing down their studio networks, Branson



was expanding his." Indeed, Branson next opened the Townhouse Studios, then bought The Who's Ramports in Battersea and renamed it Townhouse III, then bought Olympic. "It was curious to watch this whole contrary process," Benge says.

In 1984, after a ten-year independent stint, Benge entered the domain of studio management, taking over the reins of EMI's Sydney facility, which had been renamed Studios 301. But by 1992, even EMI's studio empire was a shadow of its former self, with just a handful of facilities remaining, including Abbey Road, Capitol Studios in Los Angeles, and a joint venture with Toshiba in Tokyo. EMI

—CONTINUED ON PAGE 114

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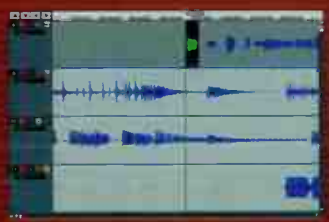

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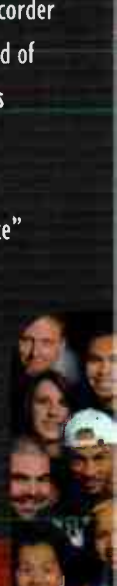

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in general. Firms acquire other companies across state and national boundaries to give them longer reach and access to new markets. When Todd-AO acquired Sound One, Todd-AO was seeking to expand its service offerings into new markets, both in New York and as a gateway to Europe. When Liberty Media bought Todd-AO, Soundelux and, by extension, Sound One, it was seeking to acquire post-production services in-house. For the acquired service providers, the merger, in theory, represents an assured stream of work.

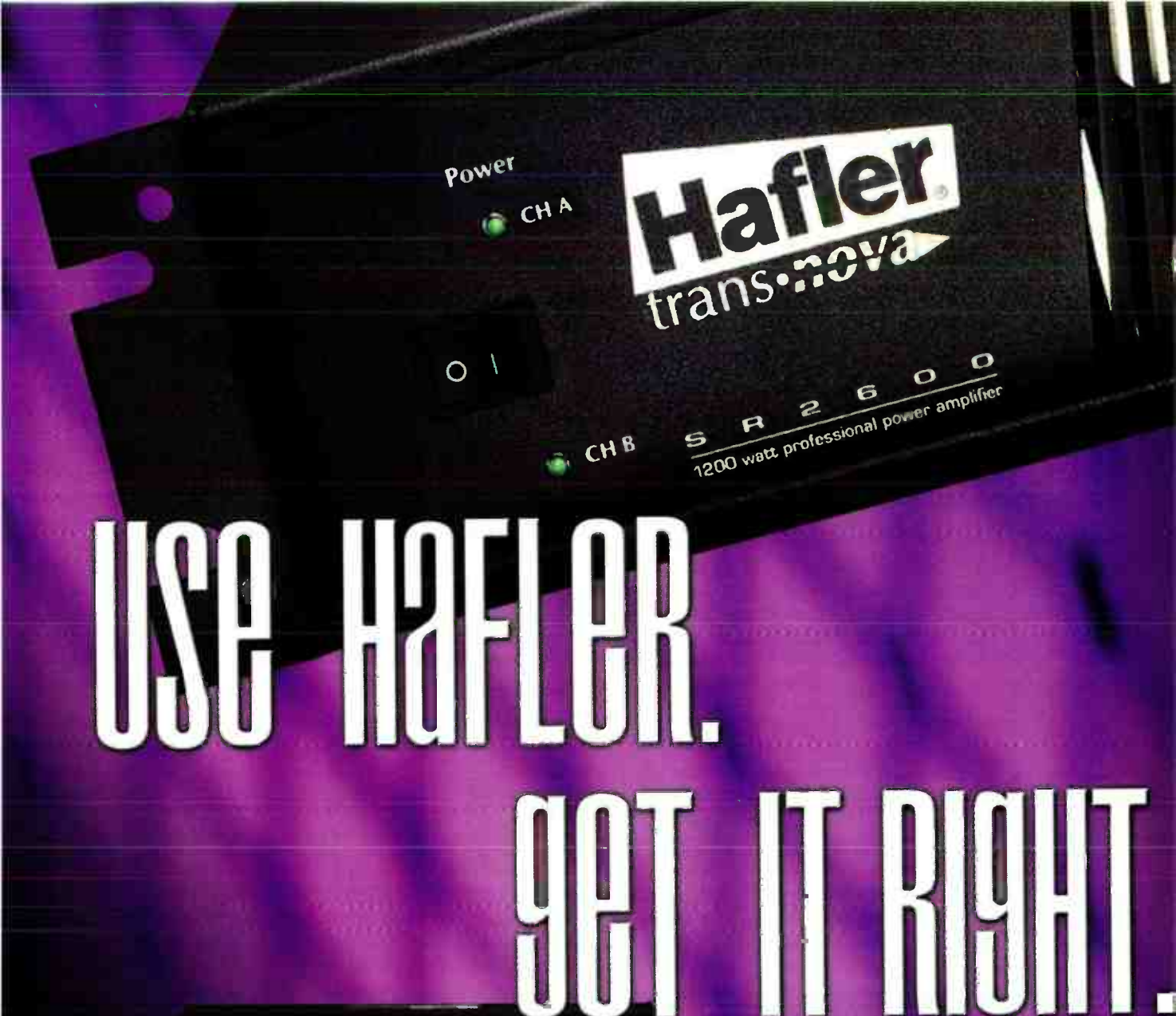
Again, vertical integration. AT&T has huge holdings in cable television (according to reports, Liberty made $5 billion when AT&T purchased Tele-Communications Inc. [TCI cable], giving it the money for the acquisitions). By controlling the means of production along with the pipes into the home, whether cables or phone lines, they assure themselves a consistent stream of content and means of distribution.

But another motive behind acquisitions is equally apparent, though it seems too simple: With the growth of media outlets—from cable channels to multiplex cinemas to the Internet to digital television—comes the need to fill those channels. This is why the History Channel can rerun World War II longer than the war itself, and why *Hogan's Heroes* and *The Brady Bunch* are part of our lives all over again. Quite simply, it costs less to buy previously produced content and pour it through media channels than it does to produce it from scratch.

The entertainment industry, like many other industries, has become increasingly beholden to stockholders.

NASHVILLE—A CONSOLIDATION CASE STUDY

Consolidation is a complex phenomenon, a series of linked events that depend on a number of factors. Its effects on the studio industry are visible most starkly in one particular market. Nashville came into the 1990s with a solid and sizable, if somewhat aged, studio base. At the turn of the decade, area studios had been existing in a sort of comfortable time warp. The impact of project studios virtually missed the



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city in the first half of the decade, thanks largely to the nature of its music business up to that point. Nashville was based around country music, a Machine that has a voracious appetite for songs and low-cost records, producing a landscape in which studios could run a steady stream of projects through their doors and fill in any cracks with the thousands of song demos that the Machine required.

Demos also provided the foundation for the numerous smaller facilities in town. Songwriters—one of the core constituencies of project studios—were simply too busy to become personal studio owners. The highly competitive nature of the publishing business in Nashville demanded high-quality demos, which studios and the city's massive musician base churned out regularly. Country record production was also highly centralized in the hands of a few powerful producers, many of

New Markets for a New Age

FINDING PROFITS IN A WIDER RANGE OF SERVICES

One message has become increasingly clear in the studio business during the past decade: Providing conventional recording services is often not enough.

Many of the standard recording studio applications—particularly overdubbing, mixing and mastering—have migrated to alternative venues, such as project studios. At the same time, certain types of sessions, such as voice-overs, needle drops and original music, are increasingly being brought in-house by companies that acquire low-cost, powerful desktop audio equipment.

But when one door closes, others usually open, and the audio business is rife with new opportunities. These include disc replication, computer graphics and artwork design, post-production services, and Internet-based services (a whole article by itself), to name just a few. These services may seem to pull studios away from their core competencies, but they are, in short, adaptive reactions to a changing business environment.

I was right here watching as a studio [business] became increasingly difficult to maintain. The world changed, and some studios couldn't change with it.
— John Trevethan

MULTIMEDIA? WHAT'S THAT?

Mastering engineer John Trevethan is co-owner, with recording engineer Mike Griffith, of Antarctica, which opened last year in Nashville on the site of the former Sixteenth Avenue Sound on Music Row. "I was right here watching as a studio [business] became increasingly difficult to maintain," Trevethan says. "The world changed, and some studios couldn't change with it."

Antarctica was conceived from the start as serving both music recording and mastering markets. Then Trevethan's wife, Brenda, moved her Mac G3-based graphics design business into the space, putting out, among other projects, mock renderings of CD covers for the independent recording artists that make up much of the studio's clientele.

The arrangement works both ways, Trevethan says: "There's been instances in which her clients have come to the studio for graphics work, and they say, 'Oh, you have a recording studio here, too…" Brenda Trevethan also does basic Web site design, and the studio adds MP3-encoded audio elements. Antarctica has also developed a flexible rate packaging system: The more services clients use, from recording to mastering to graphics, the larger the discount.

Marketing these services can be tricky, though; the danger, says Trevethan, is in losing focus. "We tried selling ourselves as 'Antarctica Media' at one point," he explains. "But it was too nondescript. People need to know what it is you do, and you have to be able to communicate that information to them as quickly and as simply as you can, because there's a lot of competition out there." So, Antarctica incorporated a subtitle into their company name: "Recording, Mastering, Graphics." Simple yet effective.

BURN, BABY, BURN

Tape duplication has traditionally been an alternative revenue source for recording studios. Now it's disc replication. The advent of multi-deck CD-R burner systems, coupled with new compact and equally affordable on-disc printing systems, has made bulk CD replication available to studios. For an investment of less than $10,000, studios can turn out 500 finished discs a day on a multi-disc system from companies such as Otari, Microboards or Rimage. Blank media costs less than $1, therefore this can turn into a significant revenue stream.

But, a note of caution concerning copyrights: While RIAA copyright enforcement has cut into CD piracy and counterfeiting, CD-R pirating has nearly doubled in a year, and both the RIAA and Philips Standards & Licensing—the division of Philips that enforces royalty payments for Philips and its optical disc patent holder partners in CD, CD-R and DVD—are getting much more aggressive—and litigious—in their enforcement efforts. If you do any disc replication for any client, make sure that the client presents you with written assurance that they are the legitimate copyright holders of the material, even if they recorded it in your studio. Both the RIAA and Philips S&L have been suing replicators, and they are aware that studios are offering these services. If you

—CONTINUED ON PAGE 112

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whom were also the heads of the city's record labels, another factor reinforcing the status quo.

Nashville had always been a destination for non-country recording projects, but these tended to be centered on a few specific facilities (like Quad Recording, founded by producer Norbert Putnam, who produced artists such as Jimmy Buffett and Dan Fogelberg there, and The Bennett House, owned by producer Keith Thomas, producer for Vanessa Williams and other pop/R&B artists). Pre-1990s Nashville was almost feudalistic in nature, very much the soap-opera setting that director Robert Altman portrayed in his film *Nashville*. By the end of the decade, it would look more like Oliver Stone's *Wall Street*.

Then along came a rise in country music's market share, from around 12% to over 18% by 1994—this in a growing U.S. record business that approached $12 billion that year. Led by the success of artists like Garth Brooks and Reba McEntire, country became a media darling, and Nashville's cultural stock soared. It became apparent that Nashville studios needed to revamp to meet what looked like a long run as a reinvigorated music capital.

The lag time between this realization and actual execution, however, proved to be long and costly. The first significant move was the opening, in late 1993, of Masterfonics' The Tracking Room, which brought in Nashville's first SSL 9000J console, set in a Tom Hidley-designed studio. With a stated card rate of $2,500 per day—nearly 40% higher than the then-top-of-the-line rate in town—The Tracking Room raised the bar in Nashville and set the stage for a massive expansion of the studio base. Within two years, six more world-class rooms at three facilities would come online: two at the newly constructed Starstruck Studios (including two more SSL 9000J consoles); three at Ocean Way Nashville, a joint venture between L.A.-based Ocean Way and Memphis/L.A.-based House of Blues Studios (née Kiva); and one, another Hidley 9000 combination, at East Iris. Each facility had cost in excess of $3 million to build.

What happened next was, in retrospect, entirely predictable: The bottom fell out of country music. As early as 1995, country began to decline in popularity and market share. By 1997, record labels were beginning to pull up shop in Nashville: A&M closed, as did Imprint, Decca, Almo Sounds and others. Revenues to recording studios, already reeling from a successive round of rate cuts generated by all this new competition, disappeared. It set the stage for progressively more intensive rounds of musical chairs, in which there was one less studio every time the music stopped. The effect on the studio business became clear in 1998, when several stalwarts of the community closed, from Sixteenth Avenue Sound in 1998 to Music Mill the following year. In January of 1998, Masterfonics entered Chapter 11 bankruptcy protection, listing debts of $2.9 million.

Then the consolidation began. Emerald Recording, one of Nashville's stronger players, sat out what had become a pro audio arms race in the middle of the decade and therefore had capital. Emerald bought Masterfonics' assets out of bankruptcy almost a year later. During that time, Seventeen Grand, a relative newcomer to Music Row, acquired Love Shack. Meanwhile, more facilities went on the block. In early 1999, Emerald continued its buying spree, acquiring The Workstation and looking at another studio still under construction. Around the same time, Gary Belz, owner of House of Blues Studios and a

co-owner with Allen Sides of Ocean Way Nashville, stepped in and bought East Iris.

During this period, Nashville's studio base underwent a number of other changes. Both Emerald and Starstruck expanded their broadcast services, and Emerald expanded a post-production joint venture. One of Nashville's leading mastering facilities, MasterMix, moved into a new facility and added DVD authoring to its repertoire. And smaller studios began to inhabit the hulks of some of the departed facilities (for example, two studios took root in the former Sixteenth Avenue Sound). In fact, a number of new small studios and services developed in the later years of the decade, from CD-R replication services to Pro Tools-based tweaking. Nashville's studio infrastructure wasn't crumbling, it was evolving. And if a changing entertainment market was the driving force, then consolidation was the engine.

What's happened in Nashville is far from over. The players there have mixed responses. "There's a kind of maturity that's being forced upon Nashville at the moment," says Brett Blandon, manager of Ocean Way Nashville. "We're in a zone in between the original good ol' boy way of doing things and the cutting edge. Nashville's finally becoming accepting of change, if for no other reason than it has to."

Josef Nuyens, owner of Castle Studios, is less sanguine. "I don't think anything's going to really change in the end," he says. "At least, not as far as studio revenues are concerned. My long-term prediction is that many of the studios that are growing by consolidation now are going to break apart five years down the line because they won't be able to carry the weight that the cost of these new acquisitions brings with them."

Recording Arts owner Carl Tatz encapsulates a lot of unspoken sentiment when he says, "I'm curious about how the ending to all this comes out. But in a way, I want to know but I don't want to know."

Nashville's experience has definite implications for other markets. Most notable among them at the moment is Miami, which in many ways is now where Nashville was in 1992: on the cusp of having its local music culture intersect with mainstream pop. Records from Ricky Martin, Enrique Iglesias and Jennifer Lopez are doing on the Billboard Hot 100 what Billy Ray Cyrus, Clint Black and Reba did six years earlier. The acquisition of Criteria Studios in Miami by The Hit Factory in New York set in motion a continuing series of studio openings and renovations. Two huge post-production and multimedia service facilities, Power Plant and The Hollywood, have either announced their intentions or actually started to build there.

The similarities between the two markets are striking. But so are the differences. Where Nashville's music base was dependent upon the success of country, Miami's Latino music has ready markets throughout the world, and Miami has already evolved into the production and post-production hub for much of that work. (Country tried to project itself globally in the 1990s, but with the exception of a few markets, such as Brazil and Ireland, failed to achieve any notable success.) This doesn't mean smooth sailing for Miami. As Nashville's experience indicates, the lag time is long between realizing that a market is hot and opening the doors to a new facility that will service it, yet a market's time at the top is growing ever shorter. And early entry into a hot market is no guarantee of success, as Masterfonics found out.

The two biggest music recording studio markets, New York and Los Ange-

les, have thus far not felt the impact of consolidation. (The post-production business in Los Angeles has undergone a radical transformation over the past six months that dwarfs recording-studio consolidation in both facilities and dollar amounts.) In a sense, New York underwent that years ago when the record companies headquartered there, such as RCA and Columbia, began entering their global phases and closing their own recording studios. Los Angeles has seen some turnover, but there are no indications that its studio base is about to change. The city seems to be benefiting from the resurgence of rock music sales and airplay, and L.A. has always been the guitar-god mecca.

But that doesn't mean things won't change. Consolidation is an evolutionary business process, one that will likely affect all industries at one time or another. Change is the only constant, and that is something the entertainment industry and the studio business have in spades at the moment. ■

—FROM PAGE 108, NEW MARKETS

want to get into disc replication in a substantial way, call the RIAA (202/775-0101) and ask for their guidelines for disc replicators. Don't take this lightly.

MEDIA MONEY

Another less obvious but equally useful idea comes from Advantage Audio in Burbank, Calif., an audio post house specializing in sound for animation. Nearly two years ago, the facility decided to go all-digital, and, ironically, tape sales helped finance that move. According to co-owner Bill Koepnick, the studio had been billing tape costs to clients, coming in at about $200 to $250 of tape per episode, including 2-inch and MDM formats. Instead of selling tape, which then had to be archived, the company began applying those same costs to the use of hard disks, which enabled them to replace hard drives as they wore out. (Work is archived to Exabyte tape, so no projects are ever discarded.) The real benefit, though, comes from the fact that the cost of hard drives has been coming down, with a 9-Gig hard drive now costing less than $900.

"We typically use about the equivalent of eight hard drives per show," says Koepnick. "But since the cost of the drives is lower, we're not only replacing the used ones but we're also able to buy additional ones, thus increasing the amount of media we have available to use for projects. This has helped finance our transition to digital and increased the amount of digital real estate we have, and it's not costing the client any more than the original analog media was."

ON TO THE INTERNET

The Internet presents so many new revenue ideas that I won't even go into the possibilities here—we'll devote an entire article to the topic on the next go-around. For now, think of your studio as a site for Webcasts, much the same as you did for radio through the '90s. And think about sharing files or talent with studios outside your geographical area. Or just let your imagination run wild.

TROUBLE AHEAD: STUDIO LABELS

We can talk at length about clever ideas to increase the amount of money coming into a studio, but it's worthwhile to consider what *not* to do, as well. There are a lot of ideas that look good on paper, or in a bar at 1 a.m. after a couple of cocktails, but implementing those ideas can be a lot less pleasant.

The most-often-cited secondary revenue source for music recording studios is starting a record label. While there have been a few notable successes over the years, and while the Internet and MP3 promise quick returns, for the most part, studio-based record labels don't make a profit. You may think that you're using studio time that was available anyway, but the consensus among many studio owners who have gone this route

STAT OF THE MONTH

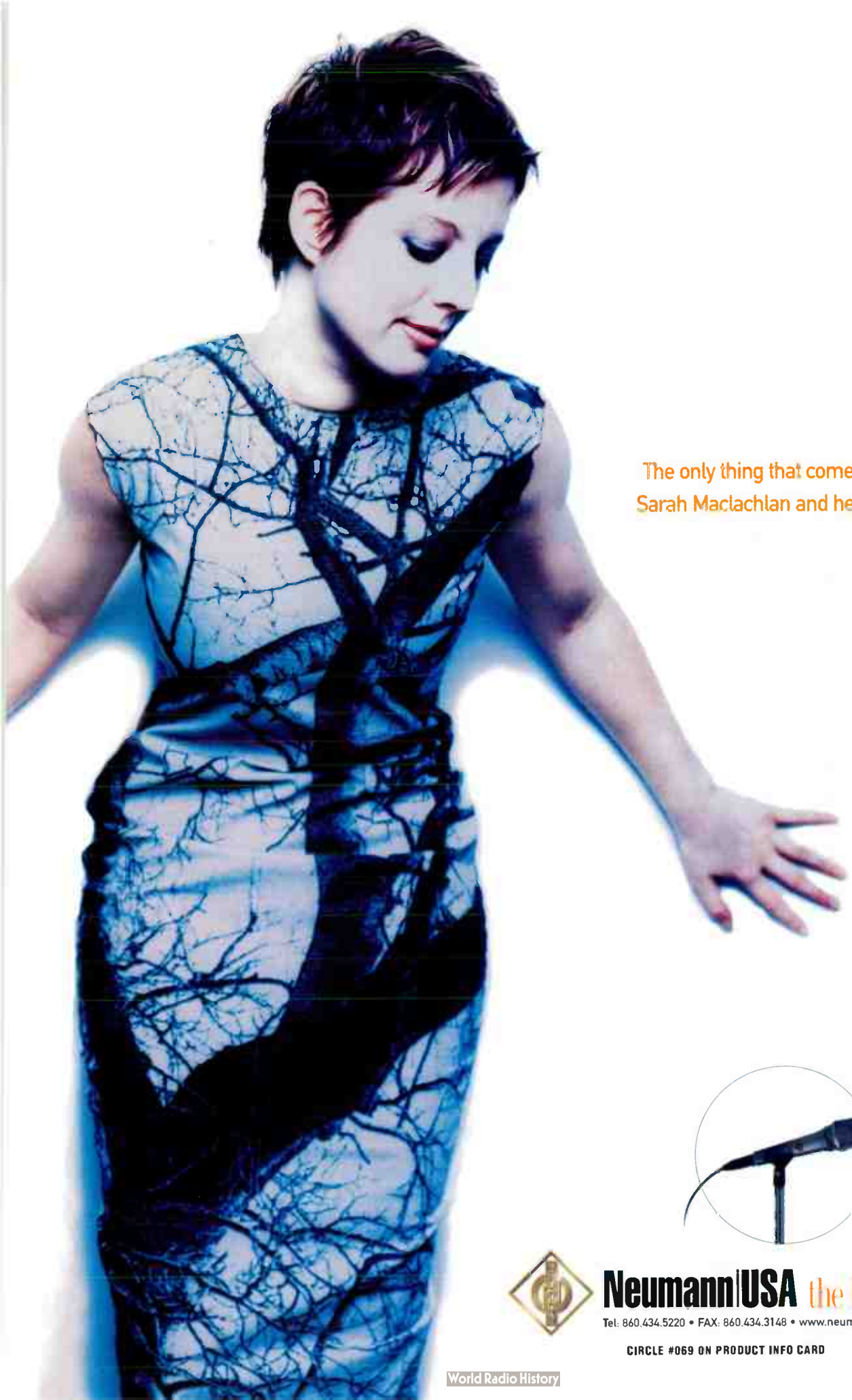
RIAA MID-YEAR PIRACY STATISTICS

The encroachment of piracy, which steals money from everyone associated with professional audio, was arrested somewhat last year thanks in part to actions against CD plants. But CD-R piracy is way up.

COUNTERFEIT/PIRATE SEIZURES	1998 MIDYEAR	1999 MIDYEAR
Cassettes	249,865	61,420
CDs	133,215	70,734
CD-Rs	23,858	155,496
Counterfeit/Pirate/Bootleg Labels	1,010,272	1,460,125

BOOTLEG SEIZURES	1998 MIDYEAR	1999 MIDYEAR
Cassettes	0	1,005
CDs	2,150	1,560
CD-Rs	0	10,485
Videos (music related, includes bootleg, counterfeit and pirate)	1,177	2,587

ACTIONS TAKEN	1998 MIDYEAR	1999 MIDYEAR
Search Warrants/Consent Searches	55	71
Arrests/Indictments	174	438
Sight Seizures (without necessity of a search warrant)	528	501
Guilty Pleas/Convictions	398	492
Civil Suits Filed	4	2
Judgments/Settlements	3	3



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is that projects tend to take on a life of their own and draw producers into using more and more time—billable time. Add in down time costs for electricity and other utilities (ever noticed how much your spec artist spends on the phone?), as well as assistant engineers and runners.

This is not to say that using the studio to pursue personal music ambitions isn't viable. But it's worth considering the actual costs of such ventures vs. the potential for return. Even the major record labels cry about how low their batting average is in terms of how many acts they sign vs. how many ever actually hit and make a profit. (It's an argument they generally trot out whenever anyone points out that the cost of a replicated CD is now less than 30 cents, while the labels are still charging $17.97 for CDs.)

The same jaundiced eye should be brought to bear on spec deals that come from the outside. Trading billable time for a piece of the pie-in-the-sky is questionable business, at best, for all of the foregoing reasons. But if you do decide to participate in a spec deal, get the entire deal on paper (preferably one written by your attorney), don't undervalue the contribution of your studio to the outcome of the project, and lean toward hard compensation vs. percentages of sales or publishing, which can be easily fudged later. ■

—FROM PAGE 104, MARTIN BENGE

then asked its expatriate alumni to guide a new phase in its studio operations when EMI acquired Virgin in June 1992.

"There was already a strategy in place to perceptually decouple the name 'EMI' with the individual studios," Benge says. "To survive, the [EMI] studios had to get business from artists on other labels, and you couldn't have them thinking that they were on one label but recording in studios owned by another."

Benge embraced that strategy, but was also faced with the effects of another fundamental change in the nature of the studio business when home recording began to make its presence felt globally. "So here we were in a situation in which the big record labels had pretty much divested themselves of their own studios, yet EMI now suddenly had a much larger studio collection when Olympic, Townhouse and The Manor came along with the Virgin deal," he recalls. "On top of that, big studios suddenly found themselves losing business

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to home recording. And I was now heading up EMI/Virgin's studio operations and faced with the prospect of having to make a profit when the rest of the industry was moving in the opposite direction. I thought, 'This is a bit of a challenge.'"

Fortunately, Benge was up to the task. In addition to continuing to fade the EMI moniker and build the brand names of studios like Abbey Road, he also spent more than a year reviewing the economics of all of the studios and closed several mid-level rooms that were losing the battle to personal recording. At the same time, he had to reconcile two disparate corporate cultures he was supervising—staid and traditional EMI and the younger, brash Virgin. "I think a large part of why I was hired was because, even though I had started at EMI, I had been away in Australia for all those years and could come back and be more objective," he explains.

After putting together a team composed of employees from both EMI and Virgin, Benge began to significantly upgrade the remaining facilities, making them even more upscale to blunt the effect of personal recording technology and to position them for new markets, including video post. In 1995, he helped start Abbey Road Interactive, the group's new media arm, which went quickly from a staff of three to 15. He closed The Manor—which was located in a huge Victorian country estate that required a tremendous amount of overhead, including gardeners—and dedicated more resources to mobile recording, expanding the operation from one to four trucks. Then he expanded the company's presence in Europe by opening an office in Paris.

But perhaps the most innovative move of Benge's tenure—and one that reflects a much larger business trend—was the creation of a merchandising division that capitalized on a resurgence in Beatles nostalgia, sold Abbey Road T-shirts and coffee mugs, and took the museum-shop approach to profitability in the studio business. Another offshoot of that idea—branded pro-audio products like pop screens for microphones aimed at the home recording market—will take effect sometime this year, although Benge left the EMI/Virgin post in 1998 and is now happily ensconced in Sydney with a new career as a consultant.

"It's all about branding now, isn't it?" he asks rhetorically. "But the business, and the world, has changed quite a bit. And studios simply have to change with it." ■

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THE MIX SUITE

SPIKE STENT FINDS THE BEST OF BOTH WORLDS

Anyone who runs a studio—project or public—soon realizes there's much more to the process than simply buying and installing gear. As your needs grow, maintenance, security and front office personnel can become as important as your outboard racks, especially when you're working with a clientele that includes household names such as Oasis and Madonna. This was precisely the issue facing engineer/producer Mark "Spike" Stent, whose past clients range from Depeche Mode, Spice Girls, Björk and U2 to Beth Orton, Texas and Massive Attack.

We caught up with Stent during a rare lull between gigs; he had just produced *Standing on the Shoulder of Giants* (the new Oasis CD) and was mixing the upcoming Madonna album. With his growing list of projects, Stent needed a full-time workspace of his own. "I had been working at Olympic for more than ten years—it's been my favorite studio," says Stent of the world-class studio complex, located in London's residential district of Barnes. "When Olympic heard I was looking for a place of my own, they approached me with the idea of working together: They built the room, I equipped it and Olympic rents my room out when I'm not using it. I basically built a room that I ultimately would love to work in."

Known as The Mix Suite and operated as a joint venture between Stent and Olympic's parent company EMI, the room's amenities include a 72-input SSL G Series console, Studer A820 multitracks, 48 tracks of Pro Tools and a Sam Toyoshima room design, all in a setting that overlooks a garden.

"I was worried about having enough bottom end, because the control room's quite large," recalls Stent. This concern was addressed with Genelec's flagship 1036A monitors, a three-way double-18 system that goes down to 17.5 Hz. "The Genelecs sound amazing," he notes. For near-fields, Stent uses KRK 9000Bs and NS-10s powered by Bryston.

Outboard gear in heavy use at The Mix Suite includes LA-2As, 480L reverbs, AMS and Roland SDE-3000 delays, an Eventide DSP-4000 Ultra-Harmonizer, and Massenburg and Neve EQs. Stent's favorite new toy is the Filter Factory analog resonant filter from Electrix. "It's a brilliant filter box, and I've had them all—the Sherman, the Mutator, the MIDIWorks," he notes. "Filter Factory is fantastic—creative and well-thought-out. I also use a lot of cheap guitar pedals, either running stuff live into it or putting a loop through it and recording that right into Pro Tools."

When mixing, Stent likes having plenty of options, both analog and digital. "I master to timecode DAT via the Apogee AD-8000 and also run a 24-bit to the DA-98 from that [using the AD-8000's bit-splitting function], along with a ½-inch Ampex ATR-100 using Quantegy GP9, which I've had great results with," he says.

Stent prefers tracking at Olympic, but "for the new Oasis album, we hired Christian Dior's old mansion outside of Cannes and we brought an old Neve desk of mine and an old EMI console," he explains. "I ran drums through the EMI and ran other stuff through the Neve." The project allowed Stent to give his mic collection a workout. "On drums, I used Coles 4038s and my AEA RCA BX-44 reissue—a brilliant ambience mic. I have a batch of Beyer M130 and M160 ribbons, which I used on drum overheads and guitars. We chose RCA BX-77s on electric guitar. I have a pair of Sony C-37s that I love on acoustic guitars and the RØDE Classic mic is really good on acoustics, where you want a bright mic sound. For vocals, you can't go wrong with a valve U47 or Telefunken ELAM 251. I also use a Brauner VM-1, but my choice of vocal mics would be a Sony C-800G—the one with the heat sink—or a beat-up SM58: It depends on the vocalist."

Like most producers, Stent is most relaxed at home. "I like to feel comfortable, and that's why Olympic's perfect for me," he says. "The support staff is great and studio manager Siobhan Paine is amazing. There are probably four or five studios in London at that level, and then it just gets down to personal preference, the vibe of the place or what you like. But I love my place, and I'm very fortunate to have it."

Thanks to TLS Management, London, which represents Spike Stent, for assistance with this article. ■

BY GEORGE PETERSEN

George Petersen is editor of Mix.

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HOT OFF THE SHELF

Rimage is now shipping its Producer 2000 Amigo, a single-drive, fully automated CD-R publishing system. The company has booked $1 million in orders for the Amigo, which features an 8x speed recorder and can burn a full CD in less than ten minutes. Visit www.rimage.com...**Pulizzi Engineering offers a range of power distribution systems** that provide current protection, EMI/RFI filtering, and spike and surge suppression. The T8S series rackmount units offer individual on/off control over eight outlets in a 1U steel chassis. Call 800/870-2248 or visit www.pulizzi.com...The Audio Metrics DA16000.b **analog distribution amplifier from Harris Broadcast Systems** may be configured as a quad 1x4, two 2x8s or one 1x16. The unit offers individual level control of the four inputs and 16 outputs, and each input features a four-LED meter. Phoenix®-style removable connectors speed installation. Call 800/622-0022 or visit www.harris.com/communications...The latest additions to the Marantz Professional **range of CD players from Superscope Technologies are capable of playing CD-RW discs.** Additional features include multifunction cueing facility, a ten-digit keypad for access to up to 99 tracks, 21 preset functions, digital pitch control (±12%) and scrolling CD-TEXT in five languages. Outputs include RCA analog, SPDIF digital co-ax and RC5 remote I/O. XLRs are available on some models. Call 630/820-4800 or visit www.superscope-marantz.com...**JoeMeek has introduced the C2 stereo compressor**, a half-rack unit that retails for $399.99. The company has also cut prices on the VC1 Studio Channel and SC2.2 stereo compressor to $799.99. Call U.S. distributors PMI Audio Group at 877/563-6335 or click on www.pmiaudio.com...**The DAA-50 handheld digital audio analyzer from CRL Systems receives and decodes audio** data according to AES/EBU, IEC958, S/PDIF and EIA-JCP-340 international standards, identifies the format via front-panel LEDs, provides status information and checks for errors. Containing a D-to-A converter that allows the user to monitor the signal via headphones, the DAA-50 can be powered from an AC/DC power supply or rechargeable batteries. Operating sample frequency range is 25-55 kHz; price is $500. Call 800/535-7648...The Multi-Format Monitor Selector from **The Desk Doctor is a stand-alone monitor section** that provides a simple way to switch among various monitoring formats, including 5.1, 7.1 and LCRS. The system, which will interface with any console, consists of a rackmount format selector panel and matching handheld remote unit with volume control and mute switch. Additional features include Pec/Direct switching for film applications, format "Fold Downs" for compatibility checking, MIDI control, and surround processor insert capability. All audio connections are made via DB-25 connectors. Call 818/848-8065 or surf to www.deskdoctor.com...**Argosy Console Inc. offers a range of premanufactured console frames** tailored to the dimensions of small- and medium-format consoles from a variety of manufacturers. Shipped flat, the units may be assembled easily on site—no cutting, drilling or glue required. For a color catalog of console frames, outboard racks, speaker stands and producers' desks, call 800/315-0878 or click on www.argosyconsole.com...**Martinsound has upgraded its software for the MultiMAX multichannel monitor controller**, which may be integrated with any stereo mixing console to add monitoring for 8-channel surround, 7.1, 5.1 and LCRS. New software features allow the user to select any one of five SPL range displays, extends the level range by 30 dB and adds a Wide Inputs Interlock mode that permits all five 8-channel inputs to be selected in any combination, or in an exclusive, interlocking mode. Call 800/582-3555 or visit the Martinsound Web site at www.martinsound.com. ■

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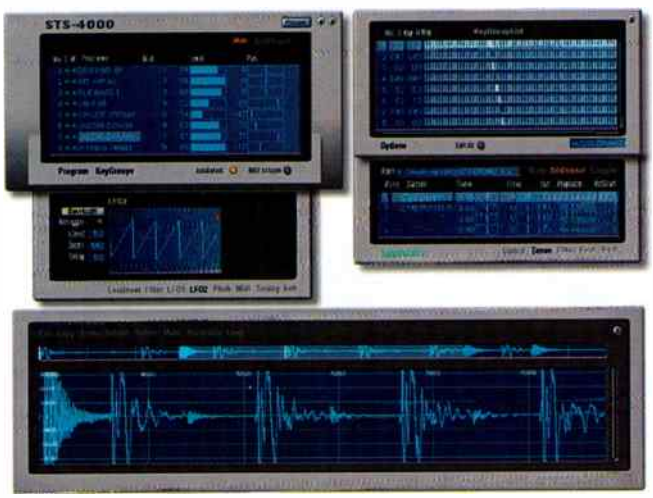

CREAMWARE STS-4000 PULSAR SAMPLER ▲

New from CreamWare (www.creamware.de), the STS-4000 is a software sampler integrating host software with Pulsar's DSP hardware. STS-4000 has a stated latency of only 1-2 ms, and like all of Pulsar's instruments, it can be played just like a "real" instrument (in live applications, for example). The STS-4000 seamlessly integrates with Pulsar, so samples can be routed through Pulsar's DSP effects or modular synths. Features include stereo sampling with up to 24-bit/96kHz resolution; import and export of Soundfont, .WAV, AIFF and Akai S1000 and S3000 files, sample-accurate editing, keygroup editing, velocity-switch, and velocity-crossfade filter with resonance. Other offerings: a Multi mode with 16 programs, stereo out and 16 individual outputs. Polyphony is dependent on host CPU (more than 20 stereo voices with PII 400). Retail price: $398.

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SWISSONIC USB STUDIO D FOR PCS AND MACS ▼

The USB Studio D from Swissonic America (www.swissonic.com) connects directly to the USB port in a PC or Macintosh computer and provides two microphone inputs (with phantom power, polarity reverse and insert points), two Hi-Z instrument inputs, four stereo line inputs, tape/phono I/O and S/PDIF I/O. The desktop unit allows each input to be mixed with any other input via individual level controls and sent directly to the computer as a stereo digital signal, at 44.1 or 48kHz sampling rates. Additional features include stereo analog master outputs, plus monitoring and stereo headphone outputs. The USB Studio D offers 20-bit conversion, features digital I/O at 32, 44.1 and 48 kHz (±4%) and supports all standard USB sampling rates between 8 and 48 kHz. Co-ax and Toslink optical interfaces are optional. Price is $849.

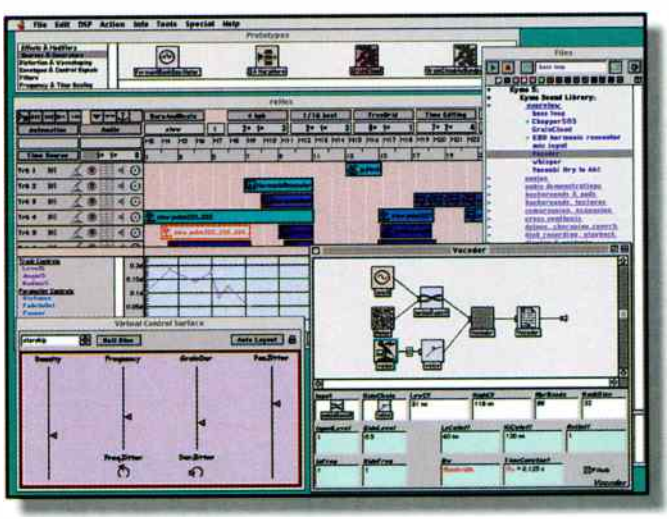
Circle 339 on Product Info Card

PANASONIC 8X CD-R

Panasonic Industrial Company (www.panasonic.com) has announced the CW-7503-B 8x CD-R drive, a new high-speed recorder that can create a 74-minute compact disc or store 650 MB of data in less than ten minutes. The CW-7503-B drive offers a 20x CD-ROM read speed (3 MB of data per second) and a 175ms average seek time. Easily configured into single or multidrive systems, the CW-7503-B features a durable tray mechanism and an MTBF of 125,000 POH (power on hours). The duplication-grade drive is designed to meet the requirements of autoloader systems and provides both UPC and ISRC sub-index support for full compliance with Red Book CD-Audio standards. The drive supports a wide range of media and has been tested with a variety of 8x-certified media. For maximum flexibility, the drive also writes at 1x, 4x and 8x speeds.

SYMBOLIC SOUND KYMA.5 ▼

Symbolic Sound (www.symbolicsound.com) recently released Kyma.5, the latest release of its Kyma modular sound-design software. New in Kyma.5: an easier-to-use graphical interface, a Virtual Control Surface that allows design of custom virtual surfaces using graphical representation, and a Hardware Control Surface that makes use of CM Automation's Motor Mix work surface via MIDI. Other new features include a Hot Sound Library with 400 examples, preset lists, drag-and-drop effects, multichannel panning and a Rolling The Dice feature that steps through random parameter settings.



Circle 341 on Product Info Card

ECHO MONA ▲
Echo Corporation (www.echoaudio.com), maker of Darla and Gina, introduces little sister Mona, 24-bit/96kHz, multichannel digital audio recording hardware for PC or Macintosh. (A BeOS version is on the way.) Mona, a rackmount unit, has four analog inputs with mic preamps—each has XLR and ¼-inch balanced jacks—switchable between line level and guitar. Six analog outputs feature balanced +4 dBu (XLR) and unbalanced -10 dBV (RCA) connectors. In addition, digital audio is provided via S/PDIF and ADAT optical I/O. Sync is to either digital input or external word clock. Dynamic range is said to be better than 115 dB. Mona's multiclient software drivers support most popular program interfaces and allow Mona to be used by multiple programs simultaneously. Echo's included console software provides monitor mixing capability and I/O metering.
Circle 342 on Product Info Card

STEINBERG TIMEFACTORY
Steinberg (www.steinberg.net) announces the release of the Prosoniq TimeFactory time- and pitch-scaling application for Macintosh and Windows platforms. TimeFactory is said to time-stretch up to 133% (or pitch scaling of up to five semitones) without audible loss in quality. The application accepts sound files in AIFF, SDII (Mac) and .WAV file formats of any word length and sample rate, even 24-bit/96kHz or split stereo files. TimeFactory is based on Prosoniq's proprietary MPEX (Minimum Perceived Loss Time Compression/Expansion) algorithm. Price: $499.
Circle 343 on Product Info Card

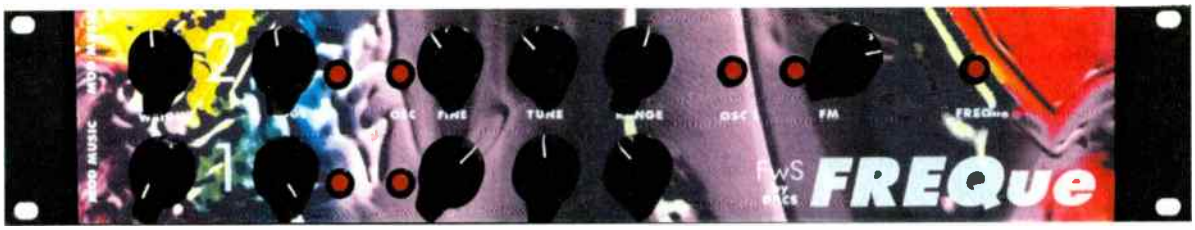
MEDIAFORM NETWORK DISC-ON-DEMAND CDDIRECTOR
MediaFORM (www.mediaform.com) introduces the Network Disc-On-Demand cdDirector automated CD printing and duplication system. The unit is a self-contained automation unit, integrated with a Windows NT workstation; features include six 8x CD-R drives, 200-disc input, in-line printing and multiple SCSI hard drives. Jobs can be started from the server or network client, and unlimited clients are permitted. (No additional licenses are required.) The system's open architecture allows for integration into other software applications. Full production logging and user profiles allow custom control.
Circle 344 on Product Info Card

LEXICON MP-100 OPTION FOR CORE2
The MP-100, the newest option for Lexicon's (www.lexicon.com) Core2 Desktop Audio System, provides true stereo dual-channel processing with hundreds of presets with classic reverb programs such as Ambience, Plate, Chamber and Inverse, as well as Tremolo, Rotary, Chorus, Flange, Pitch, Detune, 5.7 second Delay and Echo. Dual-channel processing allows for combining two effects in various configurations of Dual Stereo (Parallel), Cascade, Mono Split and Dual Mono. Price is $149.
Circle 345 on Product Info Card

UPGRADES AND UPDATES

Steinberg (www.steinberg.net) announced that it has **stopped development** of the **Cubase Audio TDM version**, in order to concentrate on native processing. In other Steinberg news, the company launched **www.cubase.net**, a site aimed at building a **community of Cubase users** and potential customers...**Syntrillium Software** (www.syntrillium.com) introduces **Cool Edit Pro 2000**; new features include full MP3 import/export capability, 24-bit/96kHz support, improved processing speed and quality and more...**SynchroArts** (www.synchroarts.co.uk) has released VocALign AS, **an AudioSuite version of its VocALign software** for aligning double-tracks and replacement dialog...Digidesign (www.digidesign.com) and Lexicon (www.lexicon.com) announce a joint agreement that enables **Digidesign to distribute the LexiVerb TDM plug-in**...**Kind Of Loud** added a **volume linking feature to the SmartPan Pro 5.1 panning plug-in** for Pro Tools; a free Version 1.2 upgrade is available, or you can buy the application for $995. For more information, visit www.kindofloud.com...New from **CreamWare** is **Pulsar for the Macintosh** platform. Visit www.creamware.de for details...**Rimage** (www.rimage.com) announces a **new single-drive CD-R duplication system**: The Amigo features an 8x recorder, Rimage's Prism CD printer and control software that manages and automates recording and printing...**Sseyo's Koan Pro** generative music application **now supports MP3 samples** in its Mac version; visit www.sseyo.com ...**QDesign** (www.qdesign.com) released **Version 1.1 of the MVP digital music system**, which has greater flexibility in MP3 coding and many new features. ■

SNAPSHOT PRODUCT REVIEWS



DACS FREQUE ▲

Ring Modulator/Frequency Shifter

One of the FwS Series of analog effects made in England by DACS, FREQue (pronounced "freak") is a dual ring modulator and frequency shifter, with two built-in oscillators, priced at $1,295. The two ring modulators can be used separately, each with its own oscillator and set of music program tone controls called Weight and Edge.

Two rings are useful for modulating the same mono source and panning the two processed outputs left and right. You can also route the second modulator's oscillator to frequency modulate (FM) the first oscillator. This produces a more complex and quirky effect that's especially wacky on percussion instruments. Perhaps one of the unit's most useful processes is frequency shifting. When the FREQue button is engaged, the two ring modulators' outputs become frequency shifter outputs: The first ring shifts up, and the second ring modulator shifts down. The amount of shift is determined by the frequency of the oscillator, which ranges from 0.2 to 16k Hz. This is not like using a Harmonizer: You can shift all the frequencies of a kick drum down to the subsonic, where only elephants, whales and submarines will hear it.

Some of this unit's other effects that I recommend are: auto panning and intense tremolos, FM generation of complex waveforms, modification of harmonic structures and filter-type sweeps that I use to trick up boring synth pads. I liked the unit's FREQue mode for frequency shifting the pitch of live percussion instrument recordings. And as a ring modulator, the FREQue is the best, cleanest and most versatile I have used, with less leakage of the modulator signal at the output.

DACS, distributed by Independent Audio: 207/773-2424; www.independentaudio.com.

—Barry Rudolph

SOUND CONSTRUCTION AND SUPPLY ▼

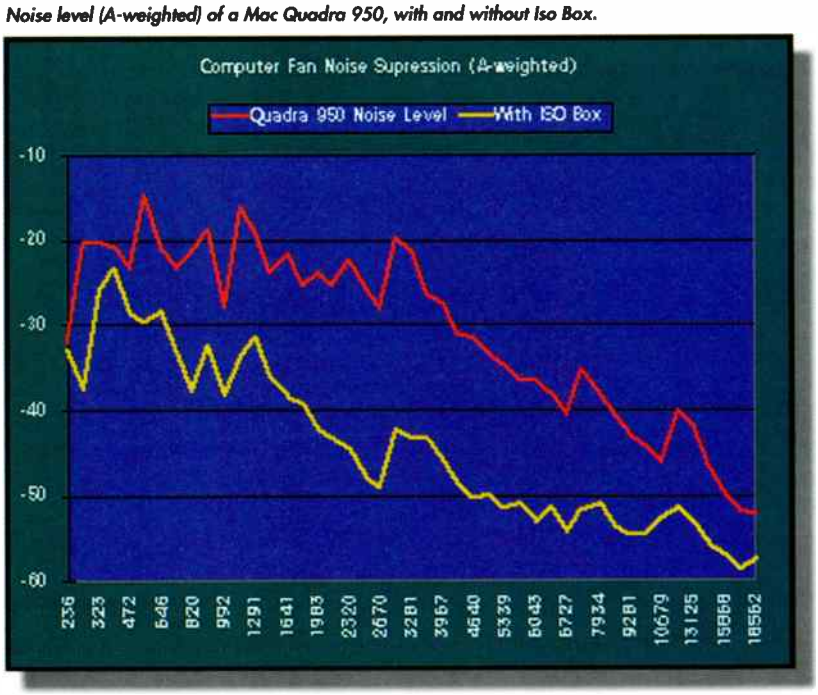
Iso Box

Computers have added a great deal to my studio: creative control, new capabilities and copious quantities of...fan noise. Thanks to the Iso Box from Nashville's Sound Construction and Supply, the turbine whine of hard drive and cooling fans can be a thing of the past.

The Iso Box is a large, acoustically isolated equipment rack available in 12/16/20-space sizes, priced at $1,000, $1,100 and $1,200. Put your noisy gear inside, latch the double-paned glass door shut and enjoy the quiet. Finished in glossy black with maple trim, our review unit had good cosmetic features, aside from a few rough spots. Heat within the foam-lined enclosure is dissipated by a pair of fans mounted on the rear access door. Just don't plan on putting your power amps inside—there is a limit to how much heat they can handle. A thermostat regulates fan speed while a two-digit LED thermometer glows reassuringly behind the glass.

Although the Iso Box is not completely silent, the remaining noise is a muted murmur. The graph below shows an A-weighted curve of a Mac Quadra 950 with and without the Iso Box. With more than 20 dB of attenuation at 3 kHz, I can now be distracted by

Noise level (A-weighted) of a Mac Quadra 950, with and without Iso Box.



the gentle rustling of leaves outside my open window rather than the hurricane gale of fans and the incessant screeching of HDs.

Sound Construction and Supply: 615/313-7164; www.customconsoles.com. —*Rudy Trubitt*

GRACE DESIGN LUNATEC V2 ▼

Microphone Preamplifier

With a sterling reputation for its Model 201 and 801 mic preamps, Grace Design has delivered a portable option based on the same transimpedance amplifier design. Housed in a small, sleek chassis built to withstand generous thermonuclear abuse, the LunaTEC V2 ($1,495) offers some serious features, including a two-position highpass filter (with 6 or 12dB/octave slope), MS decoding, balanced transformerless inputs, balanced and unbalanced outputs, and +48V phantom power. (For those who need it, you can special order units with +12V parallel power.)

Gain controls take 5dB steps through 11 positions and are paired with a 10dB output trim control. All controls are recessed to avoid accidents while jostling gear. To keep a handle on levels, a signal peak indicator LED gives fair warning, shining green to red.

Since the V2 is designed for field recording, there's a low-battery LED as well. However, if you pair this unit with a fully charged Eco-Charge Beta Plus System battery ($190), you've got a healthy ten hours of recording time. Also, if you use the 4-pin power supply, the V2's performance won't suffer at all.

I put the V2 through its paces, individually recording piano, classical guitar and hand percussion with a Neumann U87a and a Hebden CM1050C condenser. Recordings were made through a Symetrix 620 20-bit A/D converter linked to a Panasonic 3700 DAT deck. The preamp translated the low end of the piano beautifully, supporting the warm, round characteristics of the U87a. With CM1050C, the V2 allowed for crisp sound without any brittleness in the high registers. On percussion and guitar, there was increased depth to the sound. In general, there was spacious presence to all the recordings I made. So, whether your job is to capture the quirky mating call of the yellow-breasted bunting or a local band playing Suicide covers, you may never want to go back to your portable DAT preamps if you give the V2 a listen. Sure, the price may seem a tad steep, but you'll hear every single penny you spent on it.

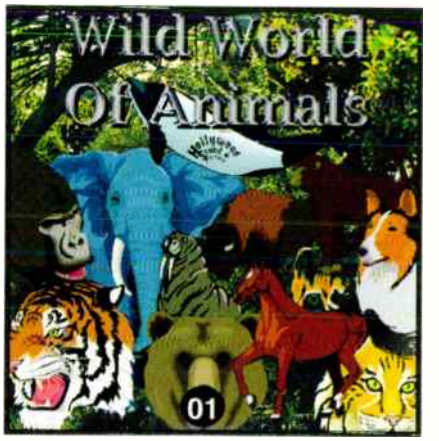
Grace Design: 303/443-7454; www.gracedesign.com. —*Alex Artaud*

HOLLYWOOD SOUND FACTORY WILD WORLD OF ANIMALS ▲

Sound Effects Library

Founded by former Hollywood Edge head Scott Whitney a year ago, Hollywood Sound Factory was created to provide high-quality sound effects and production music libraries. The company's first release, Wild World of Animals, is a ten-CD collection of elusive sounds such as wild animals eating, mating, fighting and running, captured in their natural habitats. Domesticated animals—cats, dogs, goats, cows and horses—are also well represented. In fact, there's an entire disc devoted to horses, offering trots, gallops, walks and canters on dirt, grass, pavement, rocks, sand and cobblestones. Nearly all the horse tracks are single riders, although creating the illusion of an entire posse or battalion is fairly simple by layering different tracks (or offsetting the same track) on a DAW.

Among the other 850 effects in the library are five varieties of whales, narwhals, seals, sharks, walrus, dolphins, rhinos, wildebeest, leopards, bobcat,



wolves, insects, snakes, gators, elephants, birds of every sort (usual and unusual), along with lions, tigers and bears—oh my! Besides the more unusual tracks of "bull footstep Foley" and "Arcadian Flycatcher," the set includes jungle, swamp, ocean, marsh, meadow, desert, park and night (distant insect) ambiences. My rottweiler thought the "rottweiler barks" track was spot-on. I could feel my skin crawl as thousands of bats flew overhead, and listening to the flies and mosquito tracks is NOT for the faint of heart. At $495, here's an excellent animal collection that will either expand your existing sounds, or add some outer-worldly starting points for creative sound design. Yeah!

Hollywood Sound Factory: 626/576-8634; www.hollywoodsoundfactory.com. —*George Petersen*

TC ELECTRONIC M-ONE AND D-TWO ▼

Dual Effects and Multi-Tap Rhythm Delay Processors

Priced at $699 each, the M-One Dual Effects Processor and D-Two Multi-Tap Rhythm Delay Processor use full 24-bit A/D and D/A converters with internal processor chip sets performing 100 million instructions per second. All this microprocessor power is accessible by way of a simple user interface and housed in single-rackspace enclosures.

The M-One is a "Danish Army knife" of a dual-engine processor that runs some of TC Electronic's best algorithms. Effects such as delay, dynamics, reverb, pitch changing, chorus and tremolo are all possible by using any one of the 25

different algorithms. The M-One and D-Two feature 128 ROM factory presets, and 128 RAM user memory locations. Quarter-inch analog I/O connectors are provided for fast and simple connections. Additionally, an S/PDIF digital I/O is included for a pure all-digital, 24-bit signal path supporting both 48 and 44.1kHz sample rates.

The D-Two Multi-Tap Rhythm Delay Processor has a musically oriented rhythm tap system that features up to ten seconds of delay with six add-on qualities including: Spatial, Ping-Pong, Reverse, Dynamic Delay, Chorus and Filter. The Rhythm Tap can easily be applied for live sound and recording applications, as well as in post-production, broadcast, installed sound and other situations where a creative and intuitive delay can be used.

I like dedicated reverb and delay units, as I always require both in mixing. With the M-One and D-Two, TC Electronic now offers two affordable processors that excel at each job better than some of the "all-in-one" boxes that—in the quest for more presets—often compromise parameters and features.

TC Electronic: 805/373-1828; www.tcelectronic.com. *—Barry Rudolph*

RAVEN LABS APD-1 ▼

Active/Passive Direct Box

The APD-1 Active/Passive Direct Box ($349 retail) from Raven Labs is a battery-powered unit that runs for 100 hours, making it perfect for remote recording. There are two independent instrument inputs each with its own mute switch as well as a master output mute button and LED indicator. An unusual feature for a DI box, the APD-1 has a sidechain effects loop with blend control. You can record "dry" but hear

yourself with effects, as the effect/dry mix can be switched solely to the ¼-inch amp out jack. There is also an XLR pad with -20dB, -10dB, 0dB and +6dB positions, a ground lift switch, isolated tuner send jack, effect send and receive jacks, and a dual 9-volt battery holder compartment. The unit runs on + and - 9 volt rails or from the included wall wart, although there is no provision for phantom power.

The APD-1's electronics are augmented by a multiple arrayed geometric inductive coupled balanced output transformer that is Trifiler wound with oxygen-free copper magnet wire. Input impedance is 10 megohms for negligible loading of your guitar's pickups, and the maximum output level is a hefty 6 volts RMS (into 1k ohms). Specs include a 10 to 60k Hz frequency response, THD of 0.004% and signal-to-noise ratio said to be greater than 95 dB unweighted. I used the unit for recording a bass guitar with a passive pickup, as I prefer an active DI in that application. With so little insertion loss, the APD-1 offers a hot output signal with full isolation. Its sturdy steel box and construction is a good bet for the studio or stage, as the unit was (accidentally) kicked across the floor during a take with no sonic change...the tape playback proved it!

Raven Labs: 818/368-2400; www.raven-labs.com. *—Barry Rudolph*

SOUND IDEAS OPEN & CLOSE AND AUDIENCE REACTIONS ▲

Sound-Effects Libraries

Over the years, Sound Ideas has established itself as a leading provider of sound effects, with an impressive number of "firsts." Its Series 1000—still going strong after 15 years—was the first sound-effects library released on CD and the Series 2000 was the first all-digitally recorded library.

One recent library from Sound Ideas is the Series 9000 Open & Close, a 12-CD set priced at $595 featuring ordinary and unusual objects being manipulated, opened and shut.

The completeness of Open & Close is exhaustive, to say the least: Not only does it offer 1,000-plus residential—and 368 metal—doors, windows (159), latches, lockers and bottles, but also

anything else you could imagine opening—barbecues, lipsticks, air locks, boxes, lenscaps, fans, freezer doors (both residential and morgue!), 152 key locks (and four canal-style locks!), prison cells, ovens (microwave and conventional), clasps, sewer grates, stereos, blinds, toilet seats and tanks, handcuffs, safes, luggage and cabinets of every conceivable variety. And the always-useful vehicle doors/windows are in force, with hundreds of effects from trains, planes, cars, buses and ships. I should also mention that the audio is impeccable throughout.

On a slightly smaller scale is Audience Reactions, a two-CD set of applause, cheers, whistles, laughs, guffaws, boos, jeers, "oohs," "aahs" and more from small crowds to much larger gatherings such as the Toronto Skydome arena and Buffalo Bills football games. This collection offers more than 500 sound clips of adults' and children's reactions. The tracks recorded in the larger venues are suitable for use right out of the box and offer a wide range of selections and variety. However, I found that effects recorded in the small theater don't hold up well when used alone; but, when blended with an existing ambience track, these provide a bit of front-row realism for "enhancing" a crowd reaction, and here these sounded perfectly natural. These small-group reactions are ideal for use as individual sound elements or for creating custom tableaus by combining a number of elements in any desired combination. At $249, it's a handy item for anyone's sound-design toolkit.

Sound Ideas: 905/886-5000; www.sound-ideas.com. *—George Petersen*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SHURE E5

PERSONAL MONITOR EARPHONE

As the first two-way, universal-fit earphone for in-ear monitoring applications, Shure's second-generation E5 earphone—priced at an affordable $590—may change the way users feel about in-ear monitors. The E5 was developed in conjunction with Westone Labs and Ultimate Ears. Each of the E5's ear-buds is a true two-way design, equipped with dual balanced armature or "ribbon" drivers and offering greater fidelity than single-driver transducers.

FEATURES

Everything about the E5 invites comparison to its less expensive sibling, Shure's $190 E1. Whereas the E1 felt flimsy, the E5 is ruggedly finished. A durable, clear cable replaces the E1's twisted beige wire, and the entire product is translucent, giving it an "iMac" feel down to its ⅛-inch headphone jack. Like the E1, the E5's generous 5-foot wires are permanently attached to the transducers. The hardest adjustment is getting used to the stiffness of the rugged cable after the suppleness of the less substantial wires found on most other IEM products.

Supplied accessories include two fitting options. Most familiar are the disposable foam tips that look like yellow earplugs, which offer a degree of isolation that's good enough for many users. There are also three sizes of reusable PVC flanges which, while not comfortable to me, offer the benefit of one-handed insertion and are more easily kept clean.

As with the E1, custom sleeves (#58) of clear silicone offer the best fit and are available for an extra $100 from Westone in Colorado Springs, Colo. (800/364-9115). Molded from ear impressions made by a Westone-affiliated audiologist (included in the $100 price), these slip over the tip of each earphone. The improvement in comfort and the ease with which they can be fitted or removed from one's ears make these a necessity for any serious user. The sleeves also help protect the tiny filters inside the E1's or E5's sound ports. But the best argument for custom sleeves is that they provide slightly better isolation, allowing for lower monitoring levels than with the generic tips.

THE SOUND

Across its full frequency range, the E5 is about 5 dB hotter than the E1, with a smoother response. The E5 has extended highs and lows, while the midrange presence peak found in most armature transducers is wider here, offering a balanced yet aggressive sound. Did I mention that they're loud? With this kind of output potential, there's enough horsepower for anyone.

I also compared the E5s to Westone's top-of-the-line Ultimate Ear UE5, which is one of my favorites and costs a couple hundred dollars more. Both were produced with much input from IEM engineer and designer Jerry Harvey. The new E5 has more high-mids, is brighter and a bit louder than the contoured sound of the Ultimate Ear. Though the UE5 is gentler and smoother to my ear, others may prefer the E5's tilt toward the highs.

Users will find that even rudimentary EQ used as tone control can tailor the E5's response to suit a variety of tastes. The E5's greatest hidden feature might be that its robust response will make it favorable to skilled operators who can tailor EQ adjustments to each listener. You wouldn't use a wedge or sidefill without tweaking the graphic, and the next frontier for IEMs is the use of mastering EQ to create a custom fit to each user's hearing and preferences.

Who will like the E5? I would compare its sound to that of a KF-850 and imagine that artists will earn a similar level of acceptance to what is required with that unit. Some musicians are never content with IEMs until they are supplemented with a "thumper" or subwoofer, but anyone using single-driver earphones should give the E5s a try. First-time users can audition the E5 without having to invest in a custom product. Once you add in the price of the custom sleeves, the E5s are not much less expensive than other high-quality two-way ear molds, but for artists who play rough onstage, these earphones are built to take it.

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

BY MARK FRINK

VA4 technology

KF700 SERIES

Total Acceptance

Whitney Houston tour 1999 (Maryland Sound custom KF750 System)

VH1 New Year's Eve 1998/99, NYC (Special Event Services)

River Stages 1999, Nashville (Special Event Services)

Additionally, KF700 Series loudspeakers have been used on the Placebo, The J. Geils Band Reunion and Hootie & the Blowfish tours, and at the 1999 Women's World Cup Soccer Championship Game. They have also been used in installs including the Sands Casino (Michigan), The Gorge (Seattle), The Hampton Beach Casino (New Hampshire), the Calvary Church (Michigan), and the Breslin Student Events Center at Michigan State University.

Never before has the audio industry so rapidly or so unanimously accepted a new product as they have the KF700 Series. In the 6 months since it's introduction an astounding 1,600 units have been sold, putting it on track to become one of the best-selling loudspeakers of all time.

Designers, installers, consultants and engineers from all facets of the industry have enthusiastically embraced the unique features of the KF700 Series. These compact, lightweight cabinets provide exceptional sound quality, phenomenal arrayability and unbelievable SPL for their size, while fast, efficient rigging and truckpack save time and money. Every application, from tours to installations to special events, will benefit from the cutting-edge technology and problem-solving capabilities engineered into the KF700 Series.

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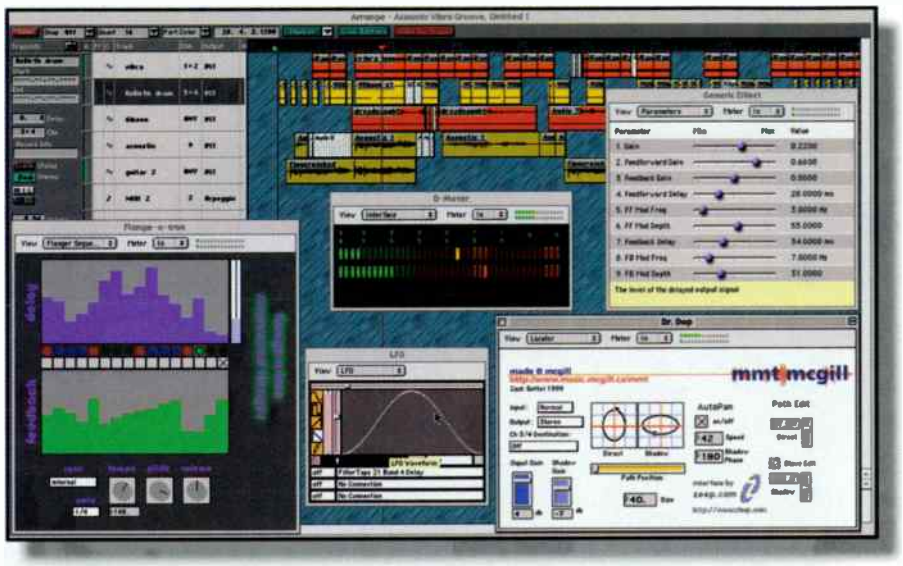
CYCLING '74 PLUGGO

PLUG-IN SUITE AND DEVELOPMENT TOOLS

Cycling '74's retro bike seat logo is a throwback to its namesake decade and quite apropos for their $74 Pluggo plug-in suite: For the price of a Stingray banana seat and a cool wheelie bar you get 74 VST-compatible plug-ins and an open-ended platform designed for downloading free ones and creating your own.

Primarily for use with Steinberg's Cubase and Opcode's Vision applications, but now also supporting MOTU's MAS plug-in format, Pluggo is one of the least expensive and most expressive audio processing tools to come along since, well, 1974. By no means an all-in-one audio processing lunchbox, Pluggo's esoteric leanings nonetheless leave useful delays, dynamics, panners, phasers, filters and the like in its lengthy plug-in menu. The reverb is warm and you'll not likely find a more bendable chorus, but marrying a 16-step sequencer to a complex multi-tapped lowpass filter is more the type of plug-in that makes this tricked-out Stingray really fly. With the retro look and a manual that reads "we hope at least one of these plug-in presets makes you laugh," these people are obviously having way too much fun in redefining how we use audio plug-ins and what we pay for them. At just $1 per plug-in, Pluggo is a must-have for any engineer, sound designer or musician interested in something completely different.

Cycling '74's Pluggo vision includes an open-ended plug-in platform community that doesn't leave existing VST plug-ins behind. Pluggo can host, modulate, randomize and automate any VST plug-in, and their fledgling Pluggo-the-Month Web site (www.pluggo.com) is a treasure trove of developer forums, user feedback and tutorials on making your own Pluggo plug-ins. One free plug-in each month is available for registered users.



A Cubase track screen with Flange-O-Tron, D-Meter, LFO, Dr. Dop and Generic Effect plug-ins

NEVER-ENDING PLUGGO

Pluggo is a run-time extension of Cycling '74's MSP (Max Signal Processing), a set of audio extensions for Opcode's Mac-based graphical programming environment, Max. Originally developed as the ultimate MIDI control software, thanks to the processing speeds of today's Power PCs and G 3/4s, Pluggo has evolved to offer real-time, 32-bit floating-point signal resolution audio processing. MSP and a demo version of Max are included with Pluggo, although you'll need to buy Max in order to create and save your own Pluggo plug-ins.

Categorizing these effects is difficult: Plug-ins can be grouped into synchronization, delays, dynamics, filters, filter/delay combinations, reverb, chorus, flange, phase, pitch, distortion, granular synthesis, spectral modification, visual display, meta plug-in, audio routing, sampling and synthesis, sound localization, auto-panning and parameter modulators. Whew. To tap into all the above, you'll need a Macintosh host digital audio application that sees VST plug-ins, a Power PC 604 or G-Series processor running at 150 MHz or faster, System 7.5.3 or later, and at least 32MB RAM and 20MB hard disk space.

Pluggo can now host sync any VST plug-in to apply modulators to its parameters. The platform was created with Mac-based VST, Vision DSP and StudioVision Pro in mind (Windows-based VST users don't have long to wait), but there are several holes remaining as Cycling '74 tries to bring Logic users up to speed. The manual states that Pluggo "appears" to work with Logic Audio 3.7, but there are some inconveniences: There's nothing in the printed "getting started" manual about configuring Pluggo with Logic, some Pluggo windows are too narrow in Logic to display all the available Logic buttons and you'll need 64 MB of RAM, not the minimum of 32 MB stated on the box. Also, you can only access the first preset for each plug-in because Logic can't switch plug-in presets. A kludgy workaround accesses all the presets by copying and pasting. With such a new platform, it's likely the support of Logic and other VST- or MAS-savvy host programs will improve with each revision.

BY RANDY ALBERTS

Picks up what other mics leave behind.

- Large 1.10 inch, hand-dampened, 24K gold-infused, Optema™ capsules are among the most precise and sensitive ever made.
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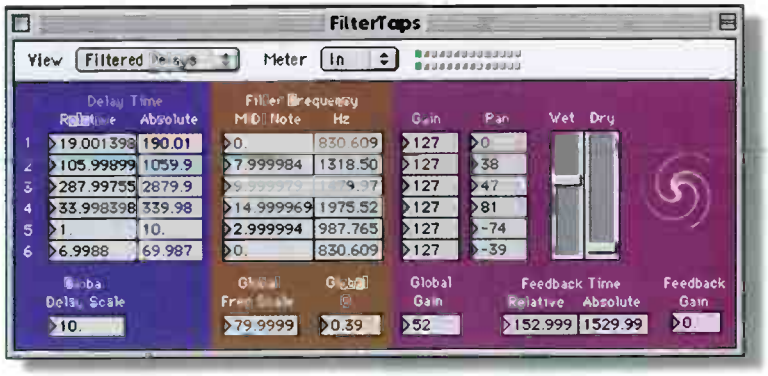

The FilterTaps plug-in provides a six-tap delay line, with an independent bandpass filter on each tap.

INTERFACE ME

Pluggo's graphical user interfaces range from barren sliders to displays that would complement any holodeck. I found some of the plug-ins' simple horizontal parameter faders utilitarian, if not dull, but the majority of plug-in interfaces will either shock or amaze you—or both. The McGill University-contributed Dr. Dop plug-in sports a 2-channel audio position display that shows both source and shadow audio signals chasing each other in 3-D positional space. There's X-Y axis mouse control over any two VST plug-in parameters using the Mouse Mod plug-in, all automatable with VST 2.0, and the aforementioned step sequencer shows up in many plug-ins controlling flange resonances, delay times, filter frequencies and just about anything you can feed into it.

Double-clicking on any parameter slider puts it into fine-resolution mode, and the Parameter Change pop-up menu opens up a beehive of possibilities. Just command-click any plug-in to access a menu that lets you undo edits (only one level), randomize either everything or an individual parameter, or nudge randomize with Evolve. Each plug-in has defeatable input and output meters to save on processing drain, and multiple interface screens can be called up to view parameters, visual displays and precious author notes on how best to use the plug-in. You could be left behind by the terse technical descriptions (or total lack thereof) on the latter, but Pluggo's "set the controls for the heart of the sun" appeal doesn't require knowing exactly what's going on under the hood to create some incredible sounds. With the parameters, I'd like to be able to control the randomize amount below 5% when using the Evolve feature, and the inability to click-and-enter parameter values (because Cubase doesn't recognize plug-in keypresses) often lends itself to excessive mousing around.

There are cool Windows-like pop-up hints, and getting rhythmic effects couldn't be easier in the plug-ins with the step sequencer metaphor. Line or sync up a filter plug-in to a song's tempo and you'll likely lose as much sleep as I have coming up with synth-like beats and textures. I fed a finger-picked acoustic guitar track through the Cyclotron plug-in and ended up with a rhythmic groove that rivals anything I've created with Steinberg's ReBirth.

PluggoSync reads audio from a source track and outputs a trigger sig-

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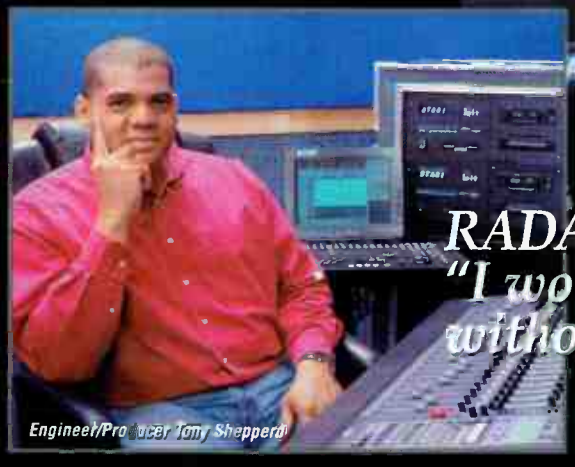

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nal for using Pluggo's LFO and envelope plug-ins to control tempo and beat, and the included Plug-In Manager is a standalone application that works much like Apple's Extension Manager to enable or disable individual plug-ins, a plus considering that the full Pluggo install adds 74 plug-ins to the VST plug-in menu.

PLUG-IN ARCHITECTURE

I reviewed Version 1.07 of Pluggo. Pluggo is bottomless, but you may encounter a few very unmusical and harsh audio spikes with a few of the plug-ins. Sound exploring with Feedback Network, for example, can alternately generate total silence and headphone-crushing frequency spikes from one edit to the next if you're not careful.

Go beyond Pluggo's included plug-ins and program your own using Max's fairly intuitive graphical interface with MSP, though this is not a jaunt for the faint of technology. Cycling '74 and Opcode try with tutorial sessions to simplify using Max and MSP to create plug-ins, but don't try this at home if you're already burned out on technology. I created a very simple phaser with Max in just a few minutes, but let's just say it won't end up as next month's Pluggo-the-Month. Sound designers, especially those already Max-savvy, should go absolutely nuts with MSP and Pluggo. To the Pluggo site's credit, there are helpful dissertations on developing Pluggo-ized VST plug-ins and diving into Max and MSP, but I think I'll just download the free Pluggo plug-ins instead and spend more time as a Pluggo user.

A FEW CHOICE PLUGGOS

Discussing the aural merits of 74 plug-ins in one review is crazy, so I'll end with mentioning a few choice nuggets.

Audio Rate Pan is a very smooth, useful panner that can switch between stereo and mono panning and have its panning frequency modulated by another plug-in. I used Center Channel on a project to subtract some frequencies of a bass part and give it a wide, spatial feel across the stereo field. Chamberverb is a very warm and natural reverb that far exceeds the metallic-sounding Wunderverb plug-in that comes with Cubase VST, and the glide control found in Cyclotron is every bit as expressive as it is on any synthesizer. D-Meter is a bright horizontal VU meter with peak hold that emulates AES/EBU digital metering and was inspired by Dorrough hardware meters, Fragulator's Buffer Size parameter affords a very musical way to tune the effect to an instrument's key, and Filter Taps can really pick up a rhythmically challenged track.

Granular-to-Go's synthesis spits out some incredible sound design fodder, and Phase Scope graphically displays a stereo track's phase alignment, but my symbolic fave has nothing at all to do with changing how an audio track sounds. Light Organ, as the name gives away, is Pluggo's millennial version of everyone's favorite trip-out from 1974—that is, unless you thought strobes and black lights were cooler. Yep, way too much fun.

Cycling '74, 1186 Folsom St., San Francisco, CA 94103; 415/621-5743; fax 415/621-6563; www.cycling74.com or www.pluggo.com. ■

Randy Alberts is a musician, engineer and writer who has been on staff with Mix, Electronic Musician, Keyboard, EQ *and* Radio & Records *before installing Pluggo.*

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TC WORKS SPARK

REAL-TIME DIGITAL AUDIO EDITOR FOR MAC

Spark, the newest software from TC Works, is a 2-track digital audio editor unlike any other, with integration of real-time effects and a unique user interface that set it apart from the mastering and playlist software of yore. I reviewed Version 1.01 (the current release at the time of this writing), which is solid but by no means perfect—no surprise considering it's only Version 1. Despite this early release's faults, Spark breaks significant new ground in power and flexibility, laying down the framework for a program that's sure to be a hit. The updated Spark Version 1.5 should be out by the time you read this, and I'll talk a bit about this major upgrade as well.

The Macintosh-based application has minimum system requirements of a 604 processor running at least 132 MHz, MacOS 8.1 or higher, and no less than 64 MB of RAM. I ran Spark on a G3 desktop, 266 MHz, with 192MB RAM. Though most operations went smoothly (e.g., editing and playlisting) with this configuration, I was surprised to find that the system ran out of DSP when too many real-time effects were active. This ranged from five to eight plug-ins, depending on the effect and routing configuration, and resulted in some nasty-sounding audio dropouts. I later learned from TC that this DSP issue (and others noted below) could be traced back to the Digidesign Direct I/O drivers; TC supplies ASIO drivers that are much more efficient and remedy most of the DSP problems I experienced. Spark is built to handle up to 20 simultaneous real-time effects; my G3 was only able to access a fraction of this palette. The program is best suited for a G4, but if you don't need tons of real-time effects, a less robust system should suffice.

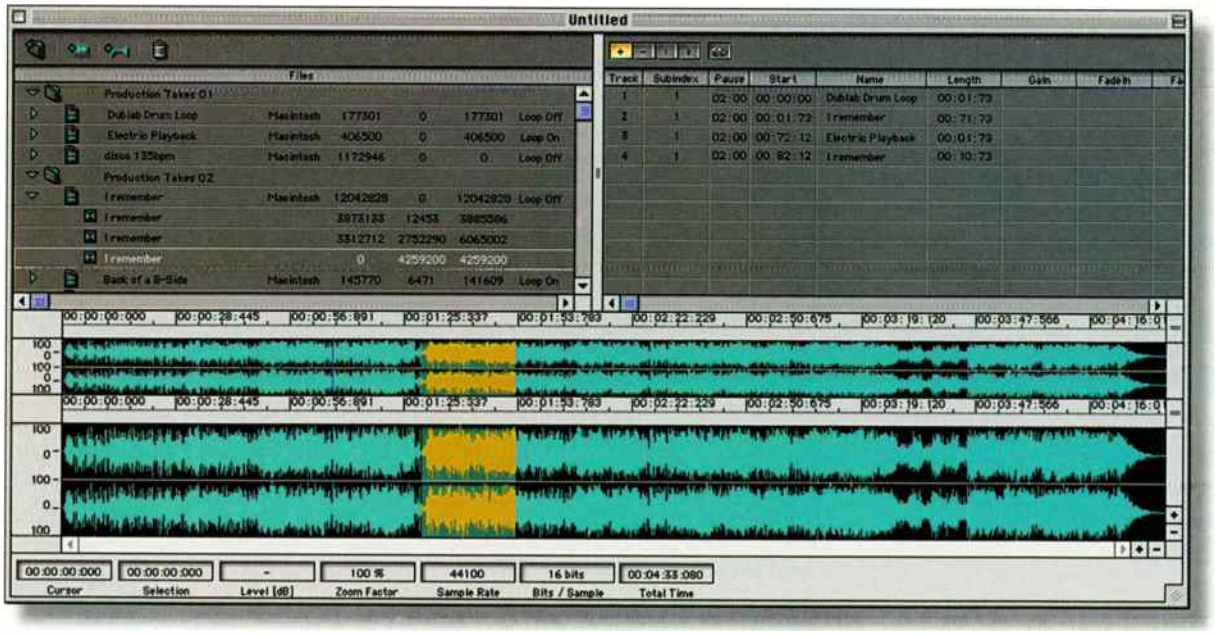
For audio in and out, TC recommends an ASIO-compatible sound card (e.g., Lucid's PCI 24 or MOTU's 2408). Digidesign Direct I/O also works. I have Digidesign's MIX 24 system installed and was able to monitor and record with no major problems. Mac's Sound Manager operates for monitoring but cannot be used for recording. Direct recording from the computer's CD player into Spark's audio file pool makes sampling from audio CDs a breeze. As many as two VST plug-ins can be used during recording, great for tracking with effects like compression. Recording can be set to stereo or mono.

The program reads and writes AIFF, .WAV, SDII and any formats supported by QuickTime 4. Sample rates range from 8 to 96 kHz, and bit depths are 8, 16 and 24. Spark converts any file to match the current project's sample rate and bit depth in real time. If you need to convert quantities of audio files, a built-in batch processor does the job. It's very straightforward, handling all the sample rates, bit resolutions and file formats just mentioned. In addition, DC removal, dither and normalize are available. There are better batch processors, but this one's really convenient because it's built right into the editor.

BY ERIK HAWKINS

TO START A FIRE

Almost all operations are centered around a main editing window, an



Spark's Browser view integrates waveform editing, project file management and playlist.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effects matrix window and a floating transport bar. Navigation within the program is simple as the work environment is well-organized and clutter-free. Most actions are drag-and-drop, from opening files to creating and rearranging playlists.

The main editing window, called the Browser View, comprises three sections: a waveform editor, a file pool and a playlist area. Each section can be sized to taste. Use the waveform editor to slice, dice, loop and create regions. It's very clear-cut. Markers and loop points are easy to create and drag around. A waveform overview helps you keep track of your location within the waveform, handy when zoomed all the way in.

A file pool called File View gives an overview of all the audio files in your current project. This pool is a list, organized in folders that contain audio files and their associated regions. Each folder can have multiple master regions, or parent sound files. The copies, loops and sub-regions derived from each parent file are indented and listed beneath that parent file. Folders and offspring files are nameable, but the master parent file's name is locked. To add a new sound bite to your project, just select a folder and drag a new audio file from your desktop into the folder. I was surprised to find that files cannot be dragged between folders.

In the playlist area, you can organize files and regions in any desired order. It's as easy as dragging a region from the file pool in the playlist area. Once a region is in the playlist, it becomes a playlist file. Playlist files can be arranged and rearranged into different sequences by, you guessed it, dragging and dropping.

Each playlist file has crossfade, gain and pause parameters, with all values accessed by double clicking. Gain is from -12 to +6 dB. Pause times range from 0 to 29 hours. (Now that's a pregnant pause.) There's a selection of preset crossfades: hard cut, linear, equal, overlapping, slow out/slow in, fast out/slow in, slow out/fast in. Crossfade times are fully adjustable up to the length of the audio file, but there's no way to customize curves or draw your own crossfades. This window also provides a space for comments and selecting copy protect on/off and emphasis on/off.

A playlist can be directly exported to Adaptec's Toast or Jam. The latest version of Toast (Version 3.5.6) comes bundled with Spark. Unfortunately, this version can't handle crossfades; you'll need Jam for this (or possibly Toast 4.0, which is about to be released). Toast 3.5.6 is very rudimentary; fine for burning one-offs, but for custom pause times, complex crossfades and a disc-at-once burn (essential for making commercial duplication masters), the $299 Jam is the software of choice.

The Master View effects matrix window should be familiar to anyone who's worked with TC Electronic's FireworX. A grid four rows long by five columns wide lets you insert and route plug-ins in a variety of ways, from parallel to cascades and mults. This matrix flexibility yields an incredibly powerful processing tool. Plug-ins are easily added, removed, mixed, muted and bypassed via controls located at the bottom of the window. Sets of multiple plug-ins, complete with routing configurations, can be saved or loaded. About a dozen presets come with the program and range from simple mastering to bizarre synthesized effects, requiring more DSP than my computer could muster (e.g., the far-out preset Synthesized, which sounded killer when I could hear it between my system's audio dropouts—again, using the ASIO drivers in lieu of the Digi Drivers cleared this problem up). Meters for master L/R output (+6 to -96 dB), L/R phase (for checking mono compatibility) and CPU usage (displayed as a percentage with a clip LED) are located here. Dithering is an option, from 8 to 24 bits. A Create button lets you write the current Master View effects to a selected sound file (I'll explain more about this feature later).

Spark comes packaged with a great complement of native plug-ins, including: Expander, Reverb, Delay, CutFilter, BandPass, OneBandEQ, 3-Band EQ, ResFilter, FuzzStat, Grainalizer and MaxIt (V.1.5). VST based, they can be used with any compatible program, such as Emagic's Logic Audio, or Steinberg's Cubase VST. The plug-ins all sound terrific, ranging from subtle EQ and smooth reverb to radical filters. The Grainalizer plug-in is an underground remixer's dream, combining weird distortion and sick aliasing for an out-of-this-world effect. TC Electronic's long-standing reputation as a manufacturer of great signal processing is continued by its software division. And, if these effects aren't enough, Spark's VST architecture simplifies connecting third-party plug-ins. Assign as many as four

—CONTINUED ON PAGE 216

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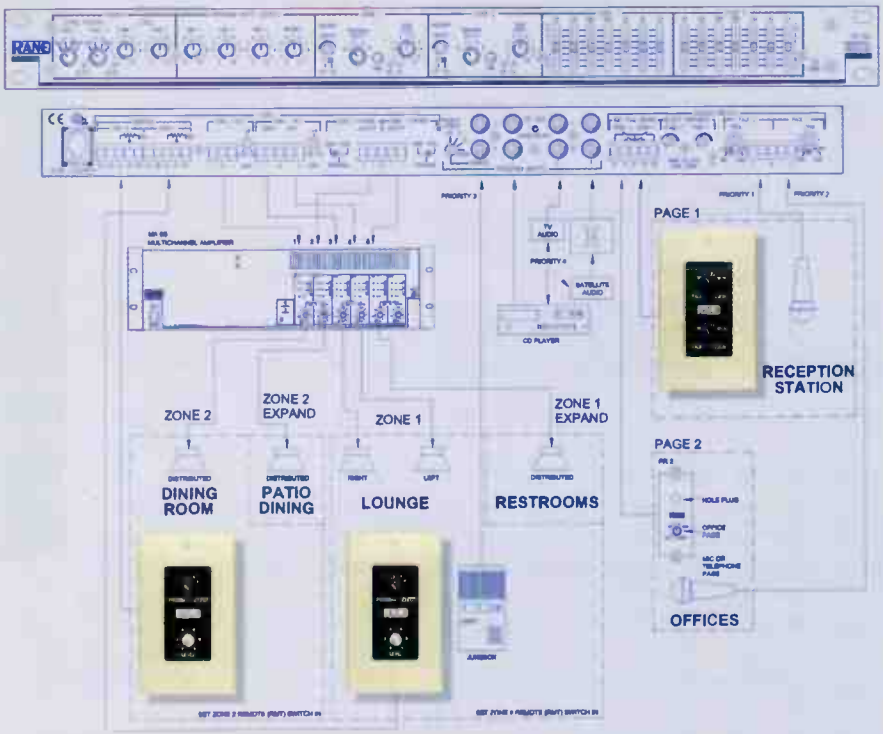

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EARTHWORKS SR71

CARDIOID CONDENSER MIC

Just when you thought you could close the lid on the mic case, satisfied that your inventory is complete, something new comes along to tempt you. The Earthworks SR71 is a phantom-powered, cardioid electret-condenser microphone designed for live sound. The SR71 is another in the line of slender, tapered-profile microphones from Earthworks, a company known for bringing quality omnidirectional measurement/recording mics to new levels of affordability.

Earthworks states that the SR71 exhibits a flat response from 50 to 20k Hz and the ability to handle sound-pressure levels up to 145 dB. The response of this microphone, flat at 6 inches, deviates significantly as the distance from the sound source changes. At 1 meter, lows are rolled off below 150 Hz and down 6 dB below 100 Hz. Similarly, at distances less than 6 inches from the sound source, a pronounced proximity effect is observed, boosting the lows. This effect acts as a natural highpass filter for distant sounds or reflections, a useful feature in some situations.

As stated by the manufacturer, the SR71 microphone is sensitive to vocal plosives and wind noise. This characteristic was confirmed over and over in both live and studio settings where the mic was being used for vocals and acoustic guitar. During one instance while recording acoustic guitar, the normal breathing of the guitar player was so pronounced that a windscreen was required, even though the guitar player was not a vocalist. In another instance, the wind created by a percussionist's hand striking a conga was enough to create a noticeable pop. In fact, a windscreen could be considered essential in most close-miking applications with this microphone. This brings up perhaps the SR71's only noticeable drawback: The windscreen provided was so loose that it fell off many times. Where's my duct tape?

In tests conducted with Mark Heath and the Portland, Ore.-based Pepe & the Bottle Blondes, the SR71 proved effective for many live-sound applications, including cymbals and percussion. The mic performed particularly well on hand percussion, providing a sharp, crisp high-end attack and a rich bass response when placed fairly close. Often, however, the graphic equalizer on the percussion monitor had to be adjusted down a bit above 5 kHz to reduce the potential for feedback. As a drum overhead, the SR71 provided a clear high end, capturing the sizzle of the cymbals. A pair also performed well in stereo on the high end of a Leslie cabinet driven by a Hammond B-3. On grand piano, a pair of SR71s provided a warm, rich sound from the low end while maintaining a bright crisp sound from the higher registers. As audience mics for in-ear monitors, the smooth response and wide pickup pattern were effective. One application where the SR71 did not perform adequately was for vocals on a live stage, where stage volume contributed to monitor feedback and there was significant bleed from drums or other nearby instruments.

EFFECTIVE STUDIO VOCAL MIC

In the studio, the SR71 proved to be an effective vocal microphone, and the proximity effect could be used to great advantage to provide a rich bass response in male vocals. A nylon pop screen is an indispensable accessory in this application. The SR71 compared favorably with a popular, inexpensive, imported tube mic on both vocals and acoustic guitar, exhibiting clarity and warmth from the pronounced proximity effect. Placement and technique with this mic's exaggerated proximity effect offer a variety of ways to experiment. And the smooth off-axis response makes finding a good tracking room a worthwhile effort.

The SR71 also seems fully capable of handling the rigors of road work. During a chance incident, one tumbled from the case, bounced from the truck floor to the back step and onto the concrete, but it suffered only a slight scratch on the matte-black, anodized aluminum finish. At the next gig, it sounded as good as ever.

Overall, the SR71 is a clean, crisp-sounding microphone that, at a list price of $399, is a versatile and economical tool for both live- sound and studio applications. So before you close the lid on the mic case, you might want to consider a couple of Earthworks SR71s to increase the flexibility of your inventory. Just don't forget the windscreens.

Earthworks, Box 517, Wilson, NH 03006; 603/654-6427; fax 603/654-6107; www.earthwks.com. ■

BY MARK FRINK

Mark Frink is Mix's sound-reinforcement editor. Phone or fax him at 503/223-2345 or e-mail mfrink@teleport.com.

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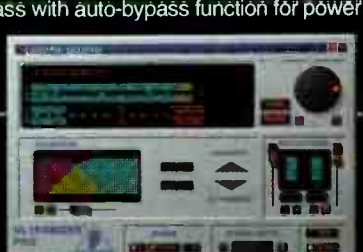

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PRACTICAL ART OF MOTION PICTURE SOUND
By David Lewis Yewdall, M.P.S.E.
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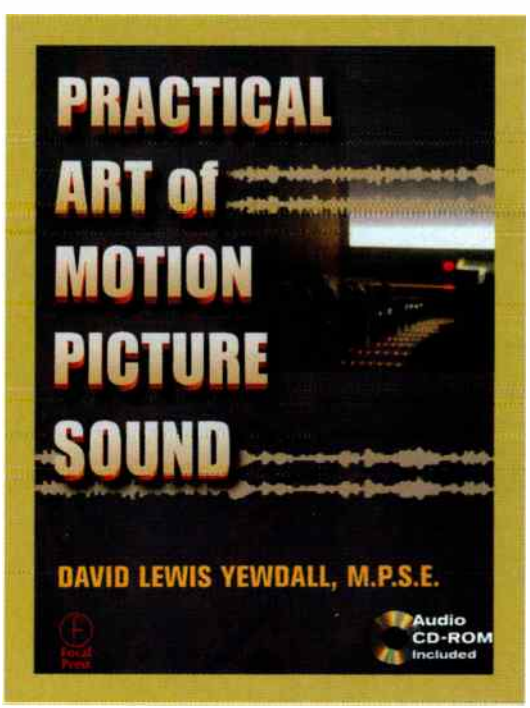
Film sound is not quite a Black Art, but it can feel that way sometimes when you read the magazines or are introduced to terms such as walla, BGs, pull-down and EDL. The level of precision and technical detail is intimidating at first glance, for sure, but at its core, film sound editing is an art. And as with all art, once the details are mastered, the true fun begins.

David Lewis Yewdall, M.P.S.E., has gone a long way toward demystifying the technical aspects of motion picture sound so that the art comes to the forefront in his wonderfully thorough and engaging book *Practical Art of Motion Picture Sound*. Yewdall, a veteran of more than 140 films during the past 25 years, is first and foremost a filmmaker; he just happens to tell his version of the story with sound. His passion for the role audio plays in the filmmaking process is evident in nearly every paragraph, beginning with his description of staying home from junior high with an illness and discovering his father's office ¼-inch tape machine, to his seminal role in the development of soundtracks for such big films as *Escape From New York*, *The Thing* and *The Fifth Element*.



After a brief discussion of the importance sound plays in the storytelling process, Yewdall walks the reader through the production of feature films, from the planning stages, through the shoot, to the edit and finally the re-recording stage—all from a sound perspective. Complex technical processes are broken down into simple frameworks and explanations, and the text is liberally sprinkled with illustrative, and sometimes downright funny, stories from the trenches. Yewdall talked with hundreds of people in all aspects of production and post-production in assembling the book, and many of the interviews are included, from production sound mixers to picture editors to colleagues and peers in the sound-editing community.

Practical Art of Motion Picture Sound is a must-read for all students of sound, whether in film school, recording school or already working in the craft. More than that, it's a must-read for all students of film, and no doubt, a few directors and producers out there would benefit from a read.

The text comes fully illustrated with photos and accompanying diagrams and examples. An audio CD-ROM is included, loaded with examples from the text of everything from 40Hz tones to car-by recordings and Foley effects.

—Tom Kenny

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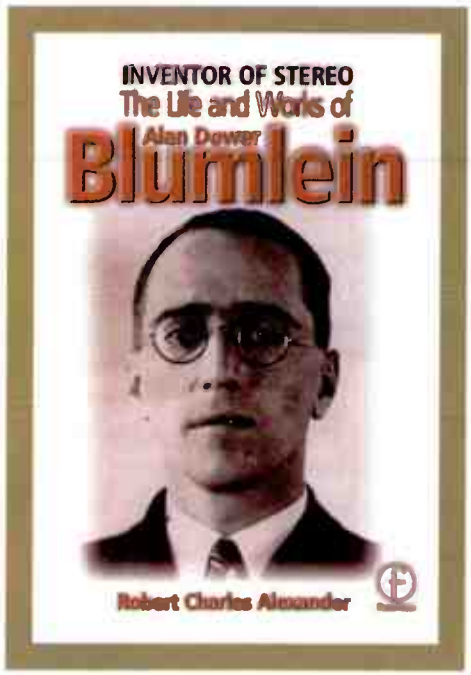

INVENTOR OF STEREO: THE LIFE AND WORKS OF ALAN DOWER BLUMLEIN
By Robert Charles Alexander
Focal Press
781/904-2500
www.bh.com/focalpress

Don't let the title fool you into thinking this is a dry textbook about arcane microphone facts. On the contrary, *Inventor of Stereo: The Life and Works of Alan Dower Blumlein* reads at times like a spy novel, with Blumlein as one of the main characters.

Blumlein is well-known for his pioneering work in binaural recording (he gained a patent for it in 1931 at the age of 28). What makes this book so interesting is that it delves deeper into the life and achievements of Blumlein, from his pioneering work for the Columbia Gramophone Company and EMI, through his pre-war work in early forms of television, to his premature death during the war researching radar systems for the RAF.

In fact, *Inventor of Stereo* includes the first detailed investigation of the events surrounding the crash of Halifax V9977, the plane in which Blumlein and ten others were killed during a secret flight in 1942.

Engaging, enlightening and only slightly nerdy, *Inventor of Stereo* is a fascinating and enjoyable read.

—Gino Robair

THE MIXING ENGINEER'S HANDBOOK
By Bobby Owsinski
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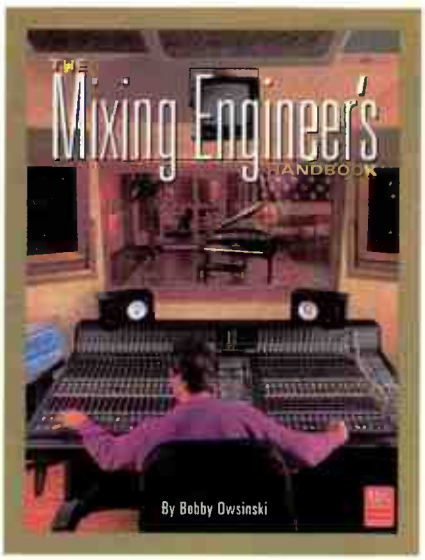
www.mixbooks.com

Throughout his 30 years of experience in studios, Bobby Owsinski interviewed many well-known engineers, from Bruce Swedien to George Massenburg, and the transcripts of the interviews



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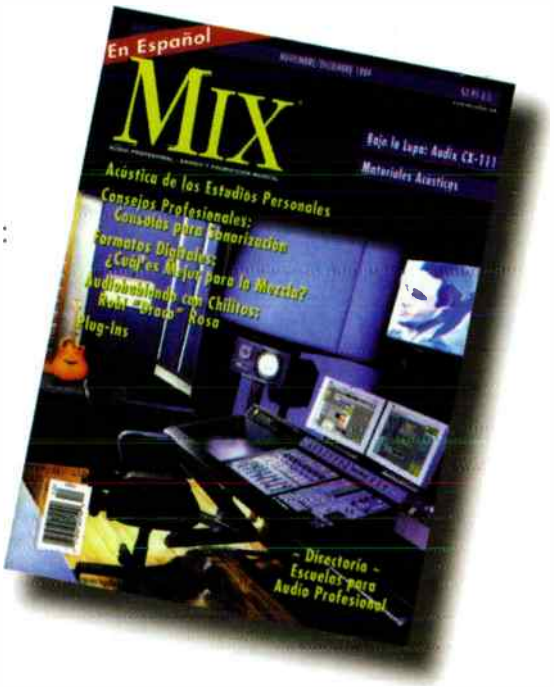

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make up half of this book's 200 pages. The other half details all the aspects of mixing, framed by comments extracted from the interviews. Top-notch organization allows the reader to access engineers' comments by topic or by the name of the engineer.

This well-written handbook should entertain everyone from the rookie engineer to the seasoned professional through chapters on the history of mixing, dynamics, EQ'ing, sound-field placement and effects. With additional chapters on balance, "the key to a great mix," the final mix, and an extensive section on mixing for surround sound, solutions to common conundrums are both detailed and varied. Most refreshing is the candor with which the engineers describe their craft.

This is a very revealing visit into the often mythical realms of mixing, and even established engineers can learn something new from this book.

—David Ogilvy

THE SCORE: INTERVIEWS WITH FILM COMPOSERS
By Michael Schelle
Silman-James Press
323/661-9922

Concert composer Michael Schelle may have never written music for film, but after penning his most recent book, it's safe to say he knows the score.

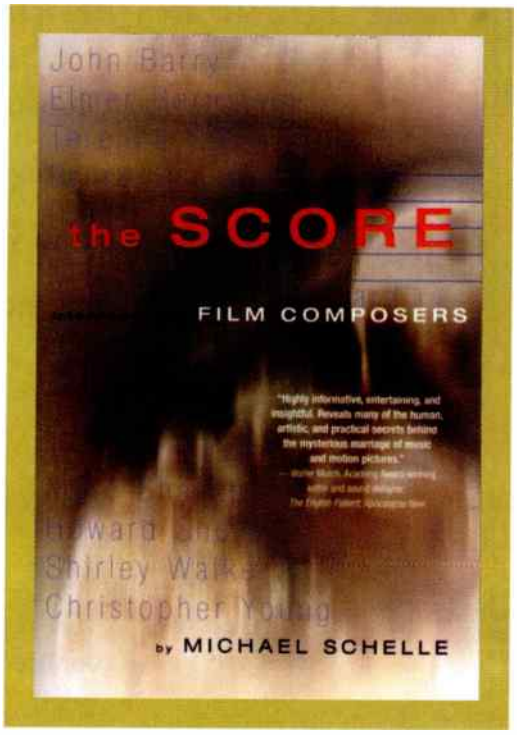
The Score: Interviews With Film Composers covers 15 film composers from a wide array of backgrounds, specializing in a range of musical styles, at various stages in their career. Established composers such as Elmer Bernstein talk about student days spent with Aaron Copland as well as work that runs the gamut, from *The Magnificent Seven* and *To Kill a Mockingbird* to *Animal House* and Martin Scorsese's *Cape Fear*. "What has stayed the same is that the film *always* talks to me," he tells Schelle. Up-and-comers such as jazz trumpeter Terence Blanchard chat about maintaining dual careers and working with spiritual mentor Art Blakey and frequent collaborator Spike Lee.

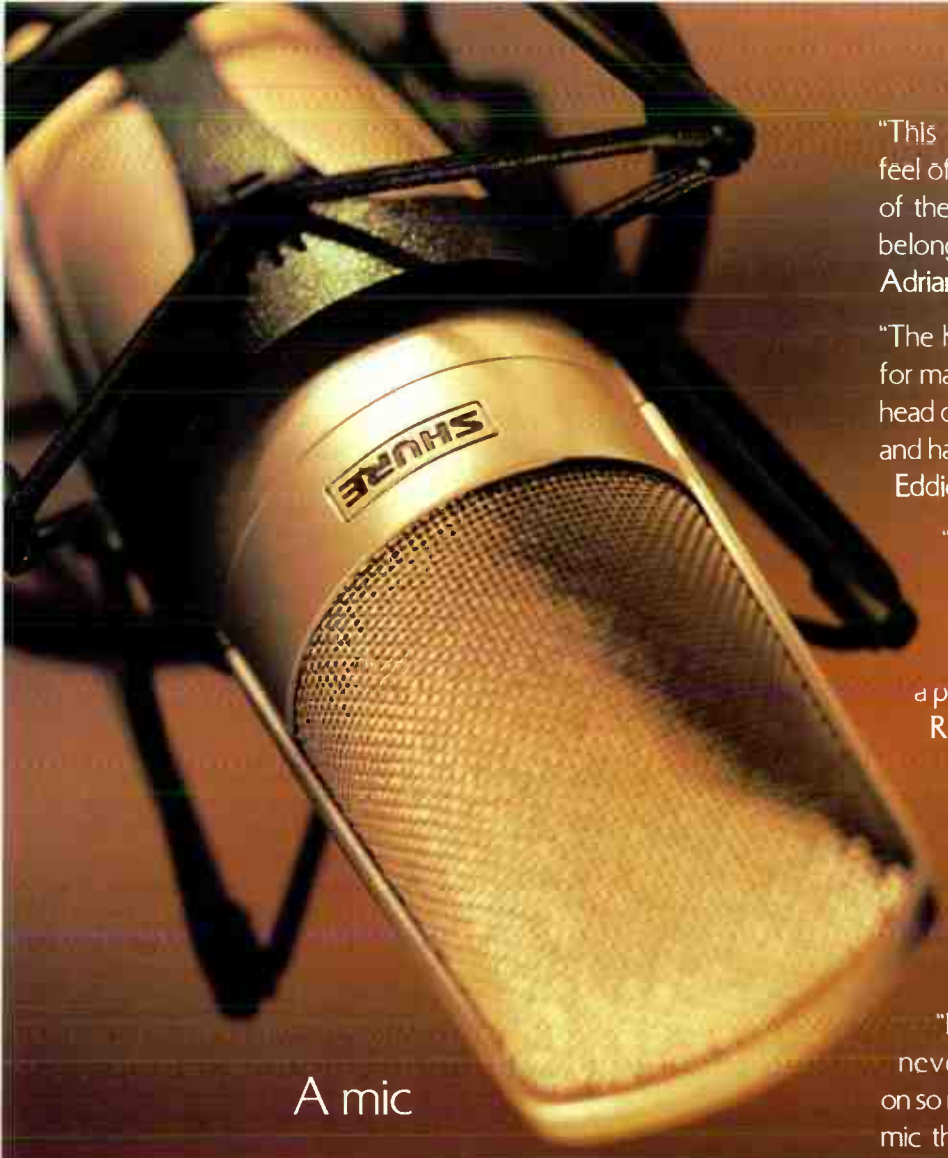
Throughout, Schelle probes into his subjects' tools, techniques and working processes and gets their take on life in the industry. As an NEA and Rockefeller grant-winning composer, he's adept at rooting out musical specifics.

He also elicits some extraordinarily frank comments. John Corigliano (*Altered States*) touches on the loss of prestige composers might face in the concert world when they make the leap to film. Pop songwriter/producer James Newton Howard discloses details about his work on major Hollywood features ("My biggest problem was on *Pretty Woman* where I actually wrote a pretty theme that nobody ever heard...But I try and stay fairly calm about cues disappearing under cars. What are you going to do?"). Horror and action movie composer Christopher Young details the never-ending battle between sound effects and score ("When we were dubbing [*Bat 21*], I thought that the only way it was going to play for more than a week was if the theater owners handed out free painkillers to the audience. It's a really, really noisy film...But that was what the director was looking for.").

It's no surprise Schelle manages to get so many of his subjects to open up. He comes to the interviews well versed in their most renowned and obscure work and armed with a scholarly reputation (his work led to the establishment of a history of film music program at Butler University in Indianapolis). Entertaining, educational and inexpensive at $19.95, *The Score* should make points with the accomplished pro, curious musicologist, budding composer and avid film buff.

—Kimberly Chun





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BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

WHAT'S YOUR RATE?

by Larry Blake

For two consecutive Januarys a few years back, I began my column year with some random musings on that most propellor-heady of topics—correct hygiene of reference tones and sync pops. In that same spirit, there is one technogeek area that continues to amuse, perplex and fluster me: the minutiae of digital audio sample rate and bit depth selection. I pay attention to such matters because I find that getting them straight (and making sure that my crew is on the same page) allows me to waste a minimum amount of time on course correction, thus freeing up the right side of my brain to be all that it can be.

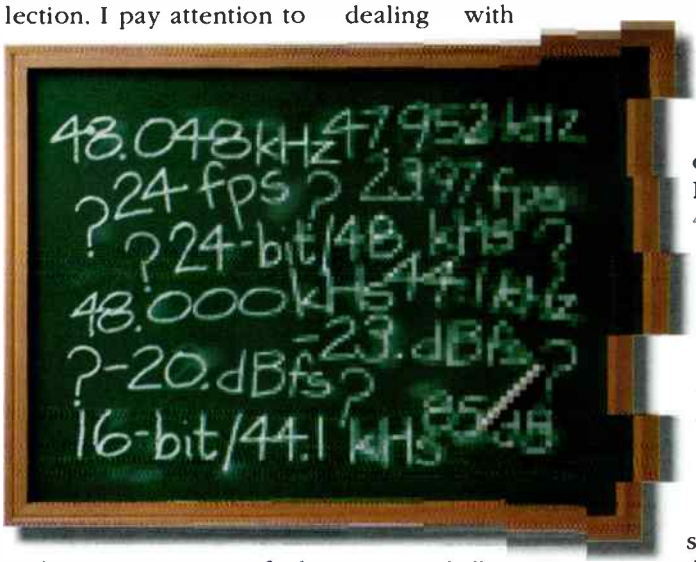


ILLUSTRATION: WENDY SHIRAKI

First, let me come right out and say that I think the only sample rate one should use in film and television post-production is 48.000 kHz when referenced to NTSC video. This is the sample rate "speed" of professional videotape formats (D1, D2, Digital Betacam, etc.). If your project has a "tape finish," this decision is pretty clear and undebatable. It's equally true for feature films, though, because their afterlife on video is much longer and more intricate than their theatrical life (which is usually no longer than six months). After the initial video mastering to high-definition videotape, there are many versions to contend with, including DVD, videocassette and non-curse-word airline versions. Add to this the multitude of foreign-language versions and their respective video releases. Then think about the coming of digital projection, and all that implies.

Therefore, the sooner that a film gets in sync with this standard, the more flexibility you have later on when dealing with any curveball that a version might throw at you. Or, perhaps more importantly, think of the poor person who has to deal with your project after you've retired. You ideally want to have the same sample rate (and bit depth; I'll deal with this later) from the first time audio is digitized during production, through picture editing, Foley and ADR recording, sound editing, premixing, final mixing and versions (domestic printmasters, M&E mixes, etc.).

There is much talk in the industry these days of the speed in which 24-frame high-definition video will overtake 35mm film as the primary source for theatrical features. No question there will be a handful of features shot on hi-def this year, with the numbers increasing rapidly as directors and crews become more comfortable with the process and the look on the screen.

Because the world of hi-def is such an open book at this point, I hope that they will take a long and careful look at the standards they are creating, so that the sync chain can start at the same place where it will end up. Therefore, it's my wish that these 24 fps HD cameras actually shoot at 23.97 fps at a sample rate of...you guessed it, 48.000 kHz.

In this manner, sound recorders on the set would roll at 48 even, and not the 48.048 that they have to roll today when shooting 24 fps film for an eventual (0.1% slower) NTSC "digital speed" of 48.000. Also, should the filmmakers want to mix media, using other video-based formats (from Digital Betacam to consumer DV and everything in between), a single sound master would suffice.

The argument stated against this approach is, "What if we also want to shoot with film cameras at the same time?" It is not difficult to modify professional film cameras to run off of a 59.94Hz time base, thus reducing the effective speed of the camera to 23.97 fps. Video cameras, on the other hand, are not so forgiving of running off-speed; in fact, they're downright intolerant.

In the process of adopting the 48.000 standard, film post-production will have to wave goodbye to two other sample rates: 44.1 kHz and 47.952 kHz. First, let's look at why people run their workstations (and sometimes mixes) at the old CD Red Book 44.1 standard. Of course they want to load music or sound effects from CDs, and possibly for the same reason most of their

—CONTINUED ON PAGE 154

COMPOSER SPOTLIGHT

ANNE DUDLEY

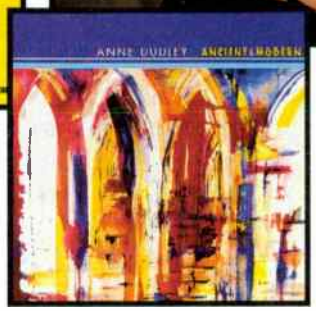
FROM "THE FULL MONTY" TO ART OF NOISE, THE BRITISH COMPOSER ADDS CLASSIC TOUCH TO MODERN SCORES

by Kimberly Chun

Anne Dudley, the Oscar-winning composer of the score for *The Full Monty*, took a cue from the title of the standard English hymnal when she named her new classical music CD *Ancient and Modern*. But in Dudley's case, the words "ancient" and "modern" are resonant in other, meaningful ways: They could be metaphors for the emergence of pop music figures such as Dudley, Danny Elfman and Randy Newman, who create often classically infused instrumental scores for the modern medium of film. And the title could describe the professional life of the London native, who has a grounding in the classics and a reputation as a pop music pioneer with Art of Noise.

Dudley's brilliant career began at 12, when she won her first scholarship to the Royal College of Music. She eventually studied there full time, but the child piano prodigy would still sneak a transistor radio into the bathroom, against her parents' wishes, and listen to the latest tunes from The Beatles and Motown. Dudley got her chance to shape pop music herself when, 18 years ago, she met producer Trevor Horn while playing on the cover-band scene.


PHOTO: GIL GILBERT



Composer Anne Dudley

The meeting led to her keyboard and arrangement contributions on hit songs such as ABC's "Look of Love" and Malcolm McLaren's "Buffalo Gals." She later started Art of Noise with Horn and fellow session players Paul Morley and Gary Langan (later replaced by Lol Creme), scoring Top Ten hits with "Close (to the Edit)," "Peter Gunn"

—*CONTINUED ON PAGE 157*

FACILITY SPOTLIGHT

GOOD MORNING, TIMES SQUARE!

STATE-OF-THE-ART DISNEY FACILITY OPENS IN MIDTOWN

by Gary Eskow

If you were looking to broadcast your morning news show from a location that registers "center of the world" to millions of people around the globe, you might go shopping for a piece of Times Square real estate. That's what the Walt Disney Company did, and the result is Times Square Studios Ltd., the new home of *Good Morning America*, which we recently toured in the company of the studio's manager of engineering and technical operations, Jeffrey C. Hartnett.

Walking around the *Good Morning America* set, past the desks where Charles Gibson and Diane Sawyer sit, over to the bank of windows that rest just a single floor above the jangling sounds of automotive and pedestrian traffic, one is immediately struck by the silence. Each window is made with two pieces of glass, approximately an inch thick. The two panes are separated by an insulating section, and the windows weigh about 4,000 pounds each. The windows on the first floor, which houses The Subway studio, can be rolled back on those days when the crew feels like mingling directly with fans.

At this time, Times Square Studios is being used exclusively for ABC Network projects, including *20/20*, but Hartnett says company strategy includes opening the facility to outside clients as well. "Times Square is the center of the known universe to some and sits at the crossroads of the world," Hartnett says. "Ever since the Dow Jones news wire or electronic ticker was in-

—*CONTINUED ON PAGE 164*


PHOTO: DAVE KING

Jeff Hartnett, manager of engineering and technical operations, Times Square Studios Ltd., in front of the SSL Aysis Air, used for Good Morning America and 20/20.

"BRAZIL" ON DVD

CRITERION REINTRODUCES THE 1985 CULT FAVORITE

by Rick Clark

Big-time recording artists receive the box-set treatment from record labels, but it takes quite a movie to receive the same level of attention. The Criterion Collection, a New York-based company that has a penchant for presenting high-quality editions of off-centered cult flicks, felt that *Brazil* was that kind of movie, one whose fans would search for everything related to the project.

When released in 1985, Terry Gilliam's brutal, darkly humorous epic brought viewers into State employee Sam Lowry's (Jonathan Pryce) desperate, fantastical dreams and pursuit of self-identity in an upside-down Orwellian Bizarro world. Nearly 15 years later, it remains a fixture on the art-house circuit and a favorite in the rental world.

Criterion started work on a five-laserdisc set of the movie in 1993 and then went into a three-year hiatus to work out some studio and rights issues. It finally came out on laserdisc in 1996.

"We thought that we were going to be able to put the disc out, but then MCA put the kibosh on it, and so the movie languished for many years," says Michael Wiese, audio coordinator for the *Brazil* project. "For years, fans of the movie kept calling up, and we could've created a full-time job for someone to do nothing but deflect perturbed potential consumers."

Now, the three-DVD set features the "final final" directorial vision of the movie, as well as a documentary (*The Battle of Brazil*) that showcases the legal battles Gilliam had with Universal at the time. The set also features the "Love Conquers All" syndicated television version, which includes all the edits that Gilliam refused to make. There are also loads of arcane bits that true fans will love.

"One of the things that I think is most extraordinary about this release is its completeness," says Criterion President Peter Becker. "The fact that there was a big story to tell, and that everybody we needed to hear from agreed to be part of the release, was very exciting. It took a long time."

The sound for *Brazil* was mixed from the 35mm Dolby Stereo magnetic tracks. The re-recording mixer on the original release was Paul Carr II, who also did *The Meaning of Life* and *The Fisher King* with Gilliam. Rodney Glenn was credited as sound editor, Bob Doyle as sound recordist; and Rosie Straker was boom operator. Michael Kamen composed the score.

"This is the Director Approved Edition, and Terry was satisfied with the original Lt/Rt, and that is what really matters," says Wiese. "The master for the laserdisc is a D2 videotape. We also use Digi Beta for our DVD masters. They are both very high-quality formats."

In the case of creating the "final" final master, where Gilliam pieced together elements from various versions of the movie, Criterion had to go to some extra effort to find some missing audio.

"When Terry made the original movie, there was a short scene that he decided to lose before the European premiere," says film transfer producer Karen Stetler. "Later, he regretted cutting it out, and he liked it, so we had to dig up the footage for that scene. As it turned out, that scene was still in the camera negative that was in London. So we went out to the lab where the camera negative was stored and looked at the negative, and there it was sitting right there, which was great. The only thing about it was that we didn't have the audio to match it."

After calling around to unearth the matching audio elements to the scene, Gilliam and Stetler found a 1-inch video master someone had made of a version that featured the deleted scene.

Converting *Brazil*'s dynamic audio tracks to 5.1 was never discussed, as the idea of undertaking such a mix would've been almost impossible since the multitracks from the various versions of the film were not all accounted for.

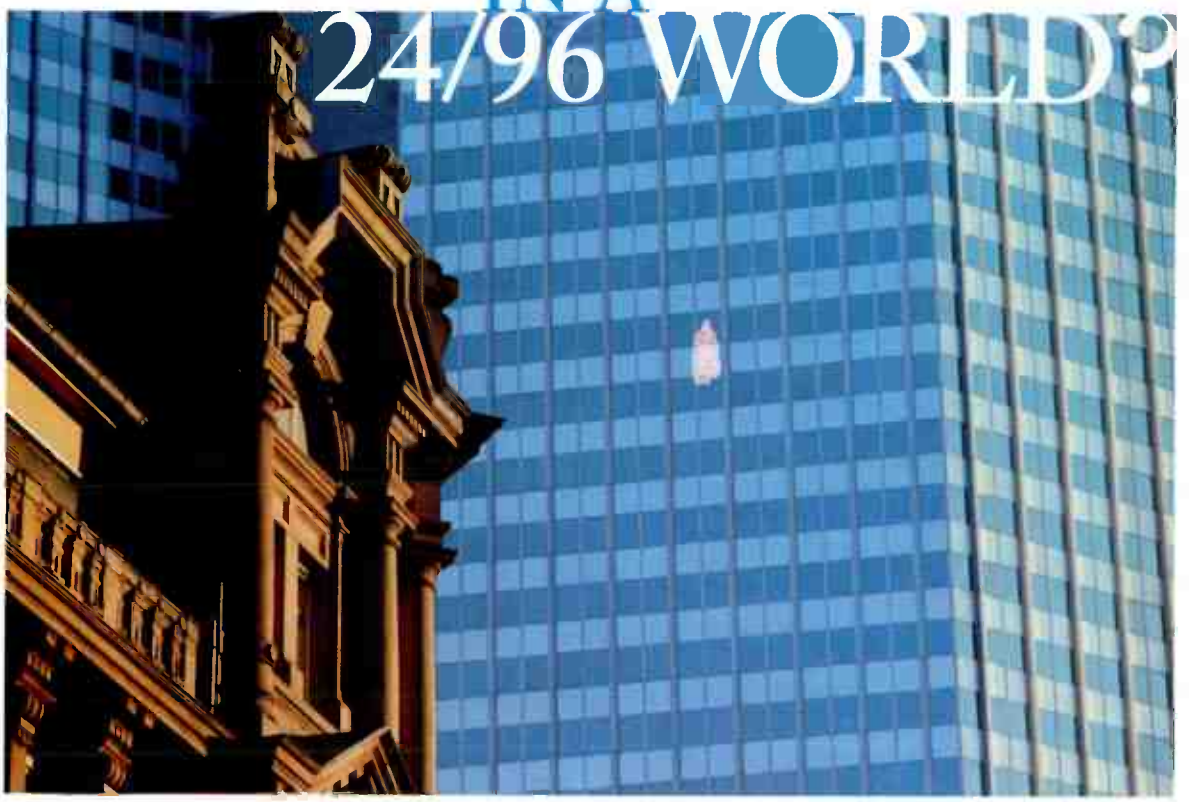
"We wouldn't have been able to cut back and forth between what I would've found for the American and European versions. There are a lot of cuts, and many of them were significant," says Criterion transfer supervisor and DVD quality control guru Maria Palazzola. "We just went Lt/Rt, because we could find the Lt/Rt for the different versions and made it a clean edit in and out of the different versions."

Even if the multitracks had been readily available, keeping the film in sync with the way the director meant to present it at its release is the philosophical position that Criterion follows.

"If you are using the stereo surrounds just for the sake of using the stereo surrounds, it can sound kind of gimmicky," says Wiese. "I don't think that is really going to add to the value of the re-release, unless it is being

—CONTINUED ON PAGE 154

DOLBY SR IN A 24/96 WORLD?



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—FROM PAGE 152, BRAZIL

done for a real reason. We felt that the mixes that existed were very good. [It was mixed by Paul Carr originally]. It is representative of the period, and it shows what mag can do, and that it is still a very viable medium."

Criterion excels at commentary, which is painstakingly assembled through many hours of interviews and subsequent edits. For *Brazil*, Gilliam provides loads of detailed observations on everything from the symbolism of Lowry's dreams to ideas that were attempted and not included.

"Building a commentary is really like doing a crossword puzzle," says Wiese. "You have several comments that are very scene-specific. You know they have to be in there, and you lay those in and really try to fit in all of the other points around them, much like a crossword puzzle. It all has to make a kind of linear sense, and it has to fit into the picture. It is tricky."

The commentary, which was originally recorded for the laserdisc version in the early '90s, was recorded on DAT with cassette backups. As it turned out, there were problems with the DAT, so the cassette commentary was used and dumped into Deck II, which was then directly laid back into the D2 master.

"Deck II was popular right before Pro Tools was getting going. It was a great little program, as long as you didn't need more than a couple of tracks," Wiese laughs.

"When it came time for Criterion to do the DVD edition, all of the laserdisc master elements were loaded into a Pro Tools|24 system, where they were carefully evaluated by Ken Hansen, Will Salas and Heather Shaw," states Wiese. "They went through the audio tracks with a fine-toothed comb, and the necessary adjustments were made at this point, including some very gentle noise reduction and spot fixes in a CEDAR system. The original elements were solid, and the work that we did was very subtle."

"The movie was in great shape," Wiese concludes. "Obviously, you don't want to add artifacting for restoration processes if you don't need to do that. Every restoration is going to introduce its own anomalies and coloration, certainly. So if you don't have to use it, don't for God's sake. The shortest distance between any two points is going to be the cleanest. We don't want to do additional processing, unless we have to. If things can be done right from the get-go at the telecine stage, that saves you a lot of aggravation after the fact. If you can get a nice clean transfer, that is what it is all about." ■

Rick Clark is a freelance writer and producer living in Nashville.

—FROM PAGE 150, WHAT'S YOUR RATE?

sound library was recorded at 44.1.

Yes, it's easy to load CDs digitally in this manner, but tell me, how much difference is there *really* between a music or sound-effects CD that has gone through high-quality sample-rate conversion and one that has gone straight through? The other reason to avoid 44.1 kHz is that not every DAT recorder can record via analog inputs at that rate. Not so with 48.

These historical reasons behind these sources are all well and good, but the fact remains that there is no *destination* medium that is 44.1. Yes, there are the two digital theatrical formats, DTS and SDDS, but printmastering for a film is really a one-time, one-off event. One day on the dub stage and it's over. If you have to sample-rate convert at this one point—if you have a digital console, that is—so be it. In the large scheme of things it's much more important that you have your crucial elements clocked at the "correct" (easy for me to say) speed for all video afterlife eternity.

Okay, so you concede my point on behalf of 48 kHz. Don't get complacent. Even within that speed there is a snake in the grass that is waiting to bite you, and that is the 47.952 sample rate used in the Avid Film Composer.

In doing research for this column, I pulled out all my books on digital audio and workstations, and found one particularly revealing note: The 47.952kHz sample rate is "nonstandard and to be avoided." Nice theory, pal, but virtually impossible to avoid if you're making feature films at the beginning of the 21st century. The Avid Film Composer, which is the standard for picture editing, has certain assumptions that led to this nonstandard rate being its standard.

First, it assumes that audio will be recorded at a 48.000 sample rate during 24 fps film photography. This makes sense, since it allows you to use any old digital recorder during shooting. To match with an NTSC videotape transfer, during which time the film was slowed down 0.1%, you can set the Video Slave Driver to 0.99 to slow down the sample rate by the same amount, thus bringing it to 47.952 kHz.

If you have loaded final-quality audio into your Avid, and can make use of these tracks in final dialog editing via the OMF process, you need to make sure that your workstations are running at that sample rate. If you have Pro Tools, and use a Video Slave Driver, you have to set your session's timecode frame rate to 30 fps and switch the unit to the 0.99 "pulldown" setting. If you're using the latest, greatest Universal Slave Driver, you have to run the session at 29.97 fps, switching "pulldown" in the setup window. Confusing, huh?

One common misconception that picture departments take for granted, I believe, is that all material should be loaded into Avids at "film speed," or with the Video Slave Driver set to 1.0. This is the correct answer if you are loading in from a synchronous source (like a production DAT or ¼-inch tape) that will be playing back at the same speed that it was recording during 24 fps film photography.

However, if you are loading in music from CD to cut against picture, it makes no sense for a very obvious reason: Picture and sound are in sync at exactly 24 fps only one time, during original photography. From that point on, the only time they are together at that 24 fps speed is when film is projected (although it's not exact and is subject to line-frequency variances) or within the picture edit suite, where the Avid will play back at 24 fps.

But everywhere else in the post-production chain—including sound and music editing and virtually all re-recording stages—sync is referenced to NTSC video, which as we know is 0.1% slower than 24 fps/60Hz referenced "film" speed. Therefore, let's say that you are an assistant picture editor and a director walks in one day with a CD that he or she wants you to digitize. You have a cheesy CD player and figure that even if this song is used in the final film, they will have to redigitize it in a quality manner.

To your surprise, it not only ends up in the final film, but a key dance number gets cut to your transfer. When the music editor redigitizes the CD using a

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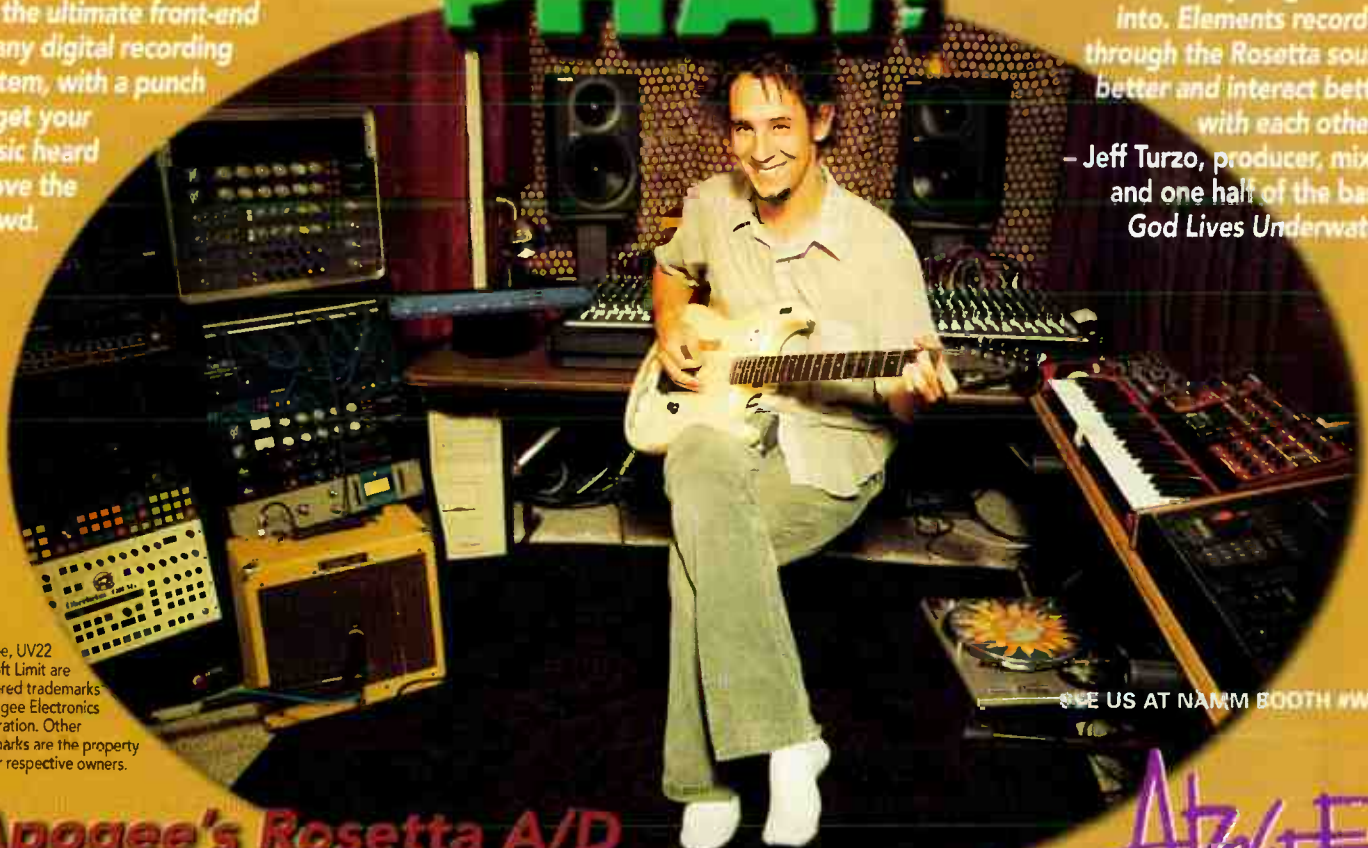

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primo sample rate converter, the sync drifts right from the start at the sickening rate of 1.8 frames per minute. You had recorded it, as had been drilled into your head, at the 1.0/24 fps "film" speed, but the music editor went into record with his system at NTSC speed.

Am I clear here? You should record music (and CDs in general) into your Avid with the Video Slave Driver set to .99 to increase the chance that anything redigitized at a later date will not drift. I qualified that statement ("increase the chance") because sample-rate variations within CD players will cause some slop. The only way to sidestep such problems completely is to do everything the old-fashioned way: transfer the CD to a timecoded medium (such as ¼-inch tape, DAT or DTRS), which can lock to an external sync reference. Thus, no redigitizing.

There are other problems when dealing with Avid Film Composers that I think need addressing. For starters, you cannot digitize audio at 24-bit resolution, which is just plain crazy in the year 2000. Second, when you are using their MediaStation system to digitize audio at telecine, you are handicapped in going into it digitally. The result is that even if you record a DAT in the field, you have to go A/D and D/A at telecine.

I've been skirting around the realm of bit depth and can only state that, excepting Avid OMF files, I don't plan on dealing with 16-bit audio in an edit room ever again. There is no reason to deny yourself the clarity and smoothness that 24-bit recording affords.

I am certainly aware that there are many pieces of digital audio hardware and software designed to help us get around sample-rate and bit-size inconsistencies among digital audio recordings. However, I find that such approaches should be taken only as emergency measures and not as an everyday approach. There is no reason (other than a lack of cooperation on Avid's part) why the sound format on every feature "film"—shot either on film or HD video—can't flow gracefully through production and post-production at the same 48kHz/24-bit standard.

In this column I have often referred to the sample rate as the digital speed, and one of the best investments that you can make is an inexpensive frequency meter. Having a "freq meter" across your word clock (or superclock) output is the best way to avoid being bitten by a switch (hardware or software) rocking your world in the worst way.

One final last bit of nontechnical advice, offered in memory of my friends in transfer bays whose job is to take pieces of sound from point A to point B. Please write down the exact sample rates both of your source material and that of the destination medium. More often than not, the person who hands in a transfer order is assuming too much—including that the transfer person has a certain talents in areas of clairvoyance.

While I have your attention, and while I'm on the subject of proposed standards, there's a hot topic on Hollywood dub stages that needs to be addressed: reference levels. Again I think there is a clear-cut choice: -20 dBfs. This is the reference level of the three digital release formats, Dolby Digital, DTS and SDDS, and is the most common reference found on professional digital videotape mastering.

Yes, I am aware of the arguments for the doubling of headroom offered by the -23 level, and I think they are all misguided at best. There is no way to cheat the fact that the recorded headroom for digital theatrical films can never be more than 20 dB louder (per channel) than your reference level, which is standardized at 85 dB. If you monitor your premixes or final mixes at -23, you will either have to use a limiter during printmastering, or you will simply chop off the top 3 dB of your mix. Either way, you will have been fooling yourself to no benefit.

The given wisdom of those who want to push beyond the -20 barrier is that mag film with Dolby SR offers more headroom, a statement which is absolutely true...for the most part. My qualifier concerns the degree to which analog tape compression has kicked in when you are more than 20 dB above your reference level. Digital recorders, of course, have the opposite approach to distortion and get better and better until they run out of bits. If you want to be pedantic, using a limiter (or even a tape simulator plug-in!), and *not* lowering the recording level, would be the most accurate way to get mag performance from your digital dubber, regardless of reference levels.

The final argument for increased headroom is that we shouldn't reduce the quality of our masters just because that is all today's technology offers us. I don't get this one: A -23 reference level increases only how *loud* the mix can be, not the quality of the recording itself. I am the first to say that mixes should never pay lip service to current,

less-than-ideal, industry distribution standards; your final mix stems should be as good as your budget and patience allow. You should use 24-bit recordings (or, in the case of analog tape, Dolby SR) whenever possible, regardless of having to step down either to low-bit-rate coding schemes or 16-bit resolution for today's printmasters and release formats. For this reason, my habit is to record a 24-bit/48kHz "archival" printmaster at the same time as a 16-bit/44.1kHz "current use" printmaster (in the case of DTS and SDDS).

Last, and certainly not least, I don't think any mixer would ever claim to be creatively limited by 20 dB of headroom! Repeat after me: Movies are (already) too loud!

As always, I can be found at P.O. Box 24609, New Orleans, LA 70184; fax 504/488-5139; or via the Internet: swelltone@aol.com. ■

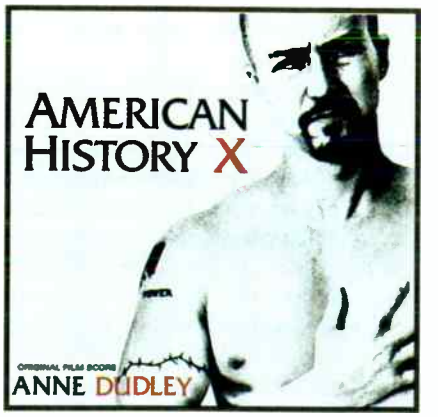
Larry Blake is a sound editor/rerecording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that only about ten people in the city know anything about sample rate and bit depth.

—FROM PAGE 151, ANNE DUDLEY

and "Kiss," and making an impact on techno, dance music and pop with her experiments in sampling and remixing.

In demand as an orchestral arranger and keyboardist, Dudley has collaborated with artists ranging from Paul McCartney, Annie Lennox and the Pet Shop Boys to Queen Latifah, the Spice Girls and Pulp. But possibly her biggest break came when she got an opportunity to compose for British TV programs such as *Jeeves & Wooster* and *Kavanaugh QC*, and then films, including *American History X*, *The Crying Game*, *Buster* and *Pushing Tin*.

Today Dudley composes mostly on piano, mainly in her home project studio, and spends about six weeks on a 40-minute score. Her recording spaces rotate between CTS, Whitfield Street, Angel and AIR studios in London and often involve her favorite music editor—husband Paul Dudley—who has also served as a collaborator, engineer and producer. She talked about her multifaceted past by phone from her UK home a few months ago. She had just returned from a short U.S. tour with Art of Noise in support of their first album in almost a decade, *The Seduction of Claude Debussy*. On that drizzly, autumnal evening, she was looking forward to the release of a few projects: a 20th Century Fox film *Monkey Bones*, which mixes live action and animation, and NBC's *The Tenth Kingdom*.



How did you begin composing for film after working in pop music?

I had actually always wanted to be a film composer, but when I was at college there didn't seem to be any easy route into it—or any route into it at all. I found myself in this pop world and arranging things for people and dealing with orchestras and string sections, and

I suppose I thought I ought to be doing this myself.

I started doing a few commercials, and I did some commercials for Tony Kaye, the director of *American History X*, which were very well received, and it was only ironically by being in the Art of Noise that people started being interested in me to do film scores. We were asked to do a film score for a comedy called *Disorderlies*. It was probably over ten years ago, and it was for a fairly major studio, but it wasn't a great film. But for me, it was a great opportunity to get started, and I found that I really liked the work, and it really suited me.

Was it the [Art of Noise's] "Peter Gunn" cover that gave people ideas?

Film people sometimes make very obvious connections, and obviously they thought, "Ah, here we are—a new instrumental-sounding band, maybe a new sort of Tangerine Dream."

How do you think your pop-music background applied to film composition?

Well, everything helps. I think the thing about being a film composer is that you have to be pretty eclectic—be able to turn your hand to all sorts of different styles and genres and be familiar with the latest rhythms and the range of an obscure instrument.

I think being studio-literate helps because obviously I'm not intimidated by the studio, and I never have been. I've always thought it was another part of the creative process.

How do your classical music studies fit in with film work?

Film scores are often based on short themes, and it helps if you've got some way of developing these themes and making them sometimes last four minutes and sometimes last 40 seconds. One ends up doing it subconsciously. But you realize looking back on it that you've used fairly mainstream classical music techniques to do it.

Suppose you had a few notes of a theme. It might go "da-da-dum." If you keep the same melody but change the rhythm of the notes, maybe half it or double it, you find yourself going off on a new tact and getting some new injection of life into it.

I always think it's important to choose your initial theme very carefully because you're going to be married to it for a long time. You might have to generate an hour's worth of music from a very short, little piece of theme.

Do common themes run through all your scores?

If there's anything, and it probably runs through everything I do, it's that I'm very interested in the color of sound. And I'm very interested in the juxtaposition of different things, ethnic instruments juxtaposed with symphonic instruments, and I'm interested in the ancient and the modern. I don't know why, but it has always been something that's fascinated me, from when I first heard a symphony orchestra I wanted to know how those sounds were made.

What has been your favorite score?

In retrospect, my favorite work is *The Full Monty* because I got an Oscar for it. But it was really hard work at the time. Sometimes comedy is not a bundle of laughs to actually do.

We found this song ["You Can Leave Your Hat On"], a Randy Newman song. There was a version with Joe Cocker singing it, which they laid on the film, but for various reasons it wasn't right. Tom Jones was really high on the wish list of people to do this song, and I think because I already knew Tom and had done a record with him [Art of Noise's cover of Prince's "Kiss"], I was probably top of their list to do this score.

Tom, I could tell when I first spoke to his manager, was a little bit nonplussed when I talked about the subject

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of the film and thought maybe, "Why is Anne doing this film? It doesn't sound very promising. It's about six unemployed steel workers who start to strip to make a living." And I think Tom might have thought I was a bit... classier than that. [Laughs] Anyway, I managed to persuade him to do it. I said: "No, it's really good, Tom! It's not just about that. It's all about the human spirit and triumphs in the face of adversity and all that sort of stuff."

Anyway, Tom actually liked the film very much and was able to fit in a recording session to do it though he was actually on tour at the time, and we had to do it in a really short period of time, in an afternoon up in Newcastle.

What was the rest of the score like?

Well, what we devised for *The Full Monty* was a little sort of odd band full of slightly unusual instruments that you wouldn't normally put together, like a harmonica and an acoustic guitar and a baritone sax. The thought process behind that was that these men who come together and form this group—they're all very, very different and have different personalities, and you think, this is never going to work when you see them first rehearsing together. And in the end, it all comes together, and they do this marvelous show.

So that was the reason behind getting this weird little band together, and that proved to be very much a spur to doing something different because with a group like that you have to do quite quirky, interesting harmonic and rhythmic moves. The reggae thing really seemed to fit. That sort of loping rhythm seemed to fit the rhythm of the piece.

How did it feel to get the Oscar?

That was terrific because I'll have to say right up until they announced my name, I thought I was a rank outsider.

Let's talk about your composition process. When do you get a first look at the film?

I never write anything without looking. I prefer to see a rough cut of the film rather than read a script. I find it difficult to get the feeling of the atmosphere of a film from a script.

What sort of thoughts do you have when you first see a film?

Usually one or two things happen: Either you have an idea straightaway—the sort of sound that you want or the instrumentation or one particular sound that you want to feature—or you don't.

With *American History X*, I watched it a couple of times, and nothing came

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to me musically. It's quite a difficult film to watch, much less conceive of music for. But after a while I thought this is really the story of two boys, Derek and Danny. I thought maybe this can give me a starting point, and I can use a boys choir. I put this idea to Tony [Kaye, the director], and he thought about it for a day, and then he rang me up in great excitement to say, "I thought about the boys choir. It's brilliant! I love it! It's perfect!" He said, "It's very Nazi, as well, so just go with it. It's wonderful."

So sometimes these ideas take a little while to sink in, and the greatest thing you can have when you compose a film score is a bit of time to think before you have to charge straight in and do it.

How do you usually structure a score?

Once I've had my thinking time and have worked out the instrumentation and sounds I want to use, I like to start at the front. I like to start at the beginning and make the music develop in line with the drama developing. I've talked to other composers about this, and they don't all do it this way. Some people like to find the emotional center of it and work from the climax and then work backward and work forward, so I'm still experimenting with the actual way of doing it. Because of the nature of film nowadays, you very rarely get a completely finished film to work with, and if you did start at the beginning, you might find that they've changed the beginning after you've written the first cue.

How many pieces do you normally like to have in an orchestra? And do you have a favorite setup?

It depends. There's a great difference between having 20 in an orchestra and having 70 in an orchestra. Seventy is a big sound, a symphony orchestra sort of size, and 20 is a lot more intimate, and you can hear a lot more of the individual instruments rather than the wash of symphonic sound. It depends on what you want to do—*American History X* used a 70-piece orchestra.

I've tried several different things with setups. Sometimes in films it's nice to have violins on either side, rather than on one side, so you've got more of a stereo picture with the violins. Sometimes it's good to have the basses in the middle.

What about your use of choirs and choral parts? It's really distinctive, and effective, in American History X, ***for example. Why do you gravitate toward them so often?***

There's an immense range of emotions you can get from a choir. In *American History X*, it's a boys choir. In *Ancient and Modern*, it's a choir of 16 or 18 people. It can be so many things: It can be very eerie, it can be very warm, it can be very disconcerting, it can be very glassy sounding. I'm very drawn to it.

Art of Noise doesn't put the emphasis on vocals very much, ironically.

Yes, it's really the sound of the voices, the sound of the words, the sound of the sound that we're interested in. We're not really interested in doing pop songs that say "I love you, and don't you forget it" sort of thing.

What made Art of Noise get back together for The Seduction of Claude Debussy***?***

I think there were a lot of things really. We all shared an admiration of Debussy both as a musician and as sort of an icon for the 20th century. It seemed like an interesting idea to go right back a hundred years to find the source of some new ideas now.

Did you have any idea what kind of influence you'd have on others with your sampling work in Art of Noise?

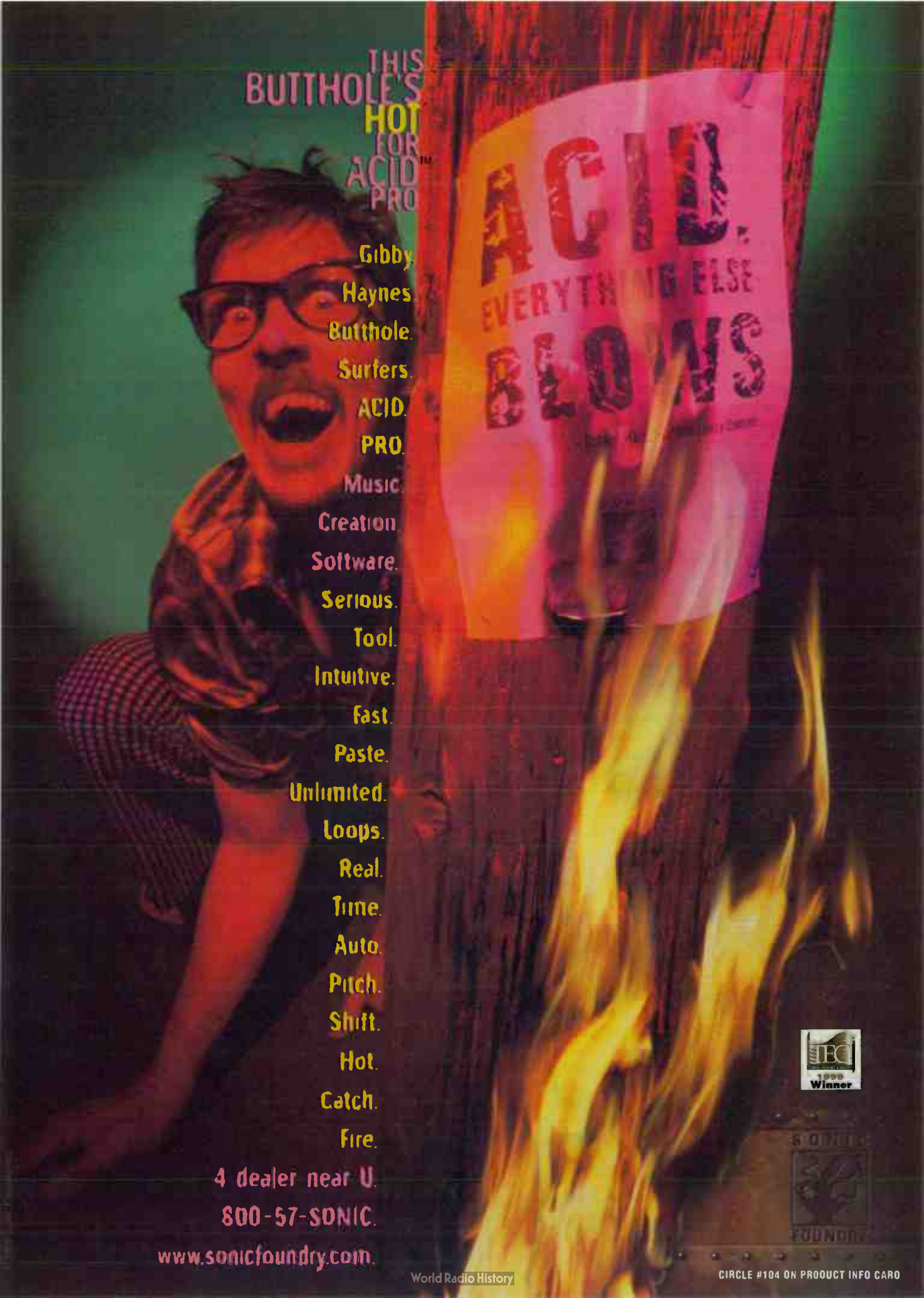
It actually had more than I ever thought. Lots of people claim to have been influenced by us, groups like the Chemical Brothers, Daft Punk and Moby.

When we did [the first record in 1983], we had no idea that it would be successful. I thought of it as quite an avant-garde, experimental group—if anything, we might have a little bit of cult success—but I didn't see us having big hit records.

What about Ancient and Modern—***how did that recording come about?***

It's the first album I've ever done which is, if you like, a solo project, although it seems ironic to call it a solo project because there's probably 60 musicians on it. But it's a solo project in as much as I'm not collaborating with anybody else. Obviously in Art of Noise, I'm just part of the group, and when I do film scores, it's always in collaboration with the director and other people involved.

I wanted to do something that had a purely musical inspiration, and I was inspired by the sound of choirs and the English pastoral music I used to hear when growing up. I was also inspired by the textures and rhythmic vitality of the so-called minimalists, Philip Glass and John Adams, and I'm always intrigued by the sound of the recording studio. I wanted to make a classical piece that was actually designed to be a CD, not designed for performance.



***What sort of recording techniques did you use in making* Ancient and Modern?**

It's a classically conceived record, but there were occasions when I recorded the choirs separately from the orchestra, overdubbed them, and doubled them up and did the percussion in layers. Nothing particularly tricksy, but things that classical recordings generally don't do.

***What do you find so modern and relevant about 500-year-old source music, in the case of "Coventry Carol," on* Ancient and Modern?**

I think that music has an endless life. People grew up with some of these tunes, and they can be immensely nostalgic. The actual nuts and bolts of them are so wonderful that composers are always going back to the past. There's a lot of this sort of thing going on: borrowing and recycling. It's very ecologically friendly, I think. ■

PHOTO: CHRISTOPHER LOVI

The main control room at Times Square Studios Ltd., with 15 user stations, is centered around a 256-port CS9600 RTS ADAM Matrix System from Telex.

—FROM PAGE 151, TIMES SQUARE STUDIOS

stalled back in the '40s, Times Square has been thought of as the hub to national and world events. The Ball drops in Times Square, and that's how the nation understands the changing of the year. So, for our ABC clients, the studio provides a great location with tremendous views and great connectivity. The same would apply to third-party clients."

The main second-floor studio, dubbed the Marquee, includes an audio control room built around a 48-fader Solid State Logic Aysis Air digital broadcast console. "The Aysis Air has the feel and look of a great traditional analog console, and many of the operators I've dealt with feel this is important," Hartnett says. "But at the same time it's a fully digital mixer with a ton of routing capability. It was designed to be used in live production and yet be so much more. It can be reset to any previous condition, and sources can be routed around internally to suit any user. To date, it has been rock-solid."

Rock-solid performance is obviously critical when you're broadcasting live programming to millions of people on a day-to-day basis, and all Times Square Studios purchases are based on performance in mission-critical circumstances. "We use Sennheiser wireless microphone systems," Hartnett says. "You pay a premium for this stuff, but it pays for itself in reliability and performance. We use Vega for our RF intercoms and Lectrosonics for the wireless IFB systems. It's all tied together into a large antenna system, which is bandpass-filtered and distributed between our two studios.

"We have a mixing/sweetening room which has its own analog mixer, a Sony DMXE-3000," he continues. "A 24-bit Digidesign Pro Tools nonlinear editing system with Tascam DA-88, 360 Systems DigiCarts and Sony PCM-7040 DAT recorders round out the room. We have a Sony AES/EBU digital audio router, along with a Telex ADAM 256x256 matrix. This AES/EBU matrix is further broken down into audio pair levels. As you know, most of the current tape-machine formats employ four audio channels. Our routing matrix routes are in AES/EBU pairs."

Rock-solid performance is obviously critical when you're broadcasting live programming to millions of people on a day-to-day basis.

"The costs [of digital] have come down, and it's more affordable," Hartnett says. "The installation and checkout go more quickly since not as much time is spent in alignment. With digital you get a wide timing window, so it's easier to test and maintain. There is a much greater variety of equipment to choose from. The science of compression and digitization is a lot further down the road, and we're all benefiting from the results."

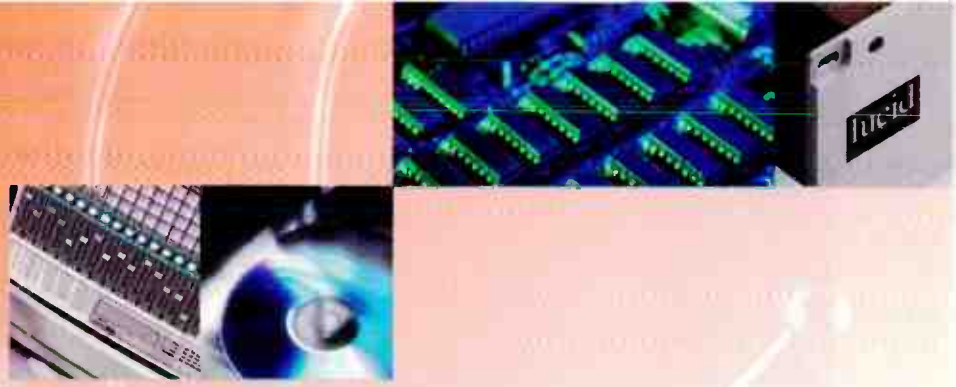
Hartnett points out that Times Square Studios has "rather extensive connectivity" with ABC Network at West 66th Street, about 25 blocks uptown. Digital audio and video tielines connect both northbound and southbound. Additionally, data connections provide serial control and data streaming capability.

ABC was planning to devote more than a day's worth of programming to end-of-the-millennium shows and will use Times Square Studios' Sony MAV-1000 digital server extensively during production. "We also have a Sony DNE-1000 nonlinear video editing system, and we expect that ABC will begin to use this system in a regular fashion very soon."

Although the company anticipates regularly booking sessions with outside clients in the near future, Hartnett is not prepared to hazard an opinion on the breakdown of billable hours. "I'm not so sure that assigning a percentage is appropriate just yet, but we have already started to accept work with others and have completed a few jobs which were outside of ABC."

Next time you visit NYC, stop by 43rd Street and Broadway between 7 and 9 a.m, wave up at Charlie and Diane. But don't bother yelling out to them, unless the windows are open. ■

Gary Eskow is Mix*'s New York editor.*



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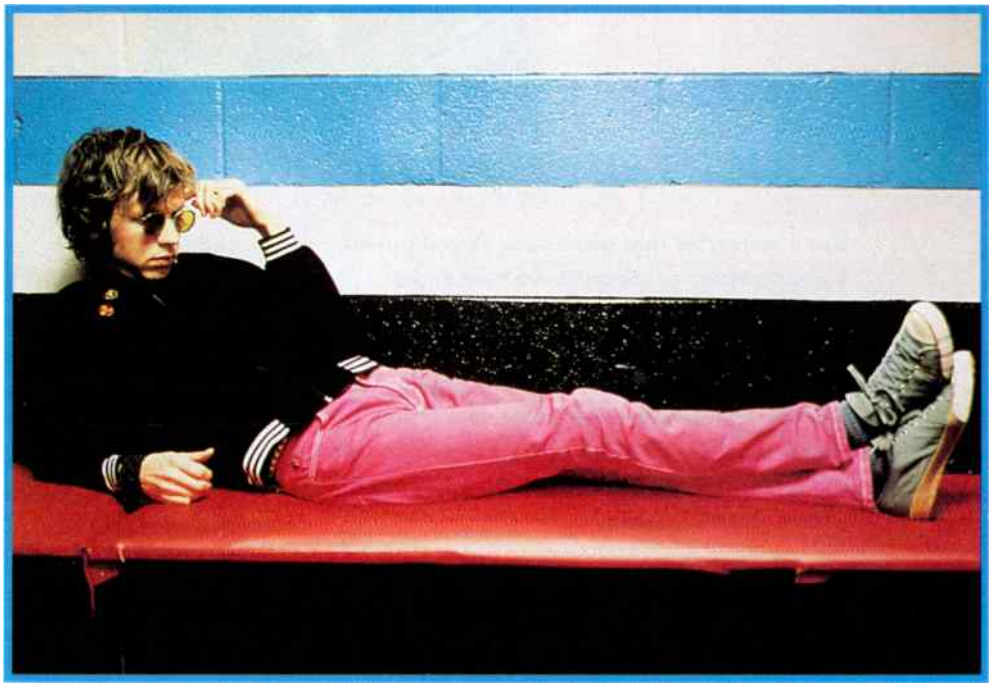

PHOTO: CHARLIE GROSS

BECK FINDS THE FUNK

OFFBEAT APPROACHES RIGHT ON TRACK WITH "MIDNITE VULTURES"

by Kimberly Chun

According to the buzz, Beck was really going to get down and dirty on his new album, *Midnite Vultures*, and it probably appeared that way to some when the extra-large condoms were broken out.

But co-producer Tony Hoffer says they were simply a practical solution when Beck jumped into his pool to record some vocals. "We just put these jumbo condoms over the C12 [mic], he would go underwater, and we'd stick the mic underwater, and it wouldn't get wet," explains Hoffer, who also assumed the role of engineer/mixer/programmer/sound designer as well as poolside mic wrangler. "It definitely has a very, very cool sound."

Some of those tracks surfaced on "Get Real Paid" and "Milk & Honey," Hoffer believes, but it was hard to keep track of all the sounds on the 40 songs that he and fellow L.A. co-producer/engineer/mixer/programmer Mickey Petralia worked on with Beck, who also produced and mixed. (The Dust Brothers also produced two tracks.) The result is an album that captures the sprawling chaos of end-of-the-century American culture, and particularly crazy, sexy and cool L.A., as Beck raps "Local shopping malls receive/Anonymous calls/Hot like a cheetah/Neon Mamacita/Eat at tacoria/Pop lockin' beats from Korea/Looking like jail bait/Selling lots of real estate" on "Hollywood Freaks." Evoking the teeming decadence of *Sticky Fingers* with its fluorescent crotch shot cover, *Midnite Vultures* (DGC) matches the polymorphous perversity of the lyrics about threesomes, predators and "bitch-slapping" coquettes with equally over-the-top grooves. R&B beats get busy with C&W fills, and new wave riffs bump and grind with Space Invader beeps and blips. Dense with allusions, loops and samples scavenged from the inner depths of an obsessive's record collection, all the sounds blend together organically into a super-freaked miasma.

Midnite Vultures also finds Beck getting intimate with Pro Tools technology in addition to quirky homemade

—CONTINUED ON PAGE 176

GONZALO RUBALCABA

FROM CUBA WITH LOVE

by Chris Walker

Since his debut in 1980 as a teenage piano prodigy, Cuban phenomenon Gonzalo Rubalcaba has been consistently expanding his horizons. His remarkable keyboard prowess attracted the interest of the late Dizzy Gillespie, who became Rubalcaba's supporter and mentor. Under the jazz icon's tutelage, he flourished and became a highly touted emerging jazz artist. With his once-raw talent refined and focused, he proceeded to consort with top-echelon jazz players such as bassist Charlie Haden, drummer Jack DeJohnette and reedist Paul Motian on many noteworthy recordings. Concurrently, Rubalcaba also developed as a solo artist and was soon in demand for live performances throughout the world, culminating in 1993 with his first concert in America.

Now a U.S. resident who has not relinquished his Cuban citizenship, Rubalcaba continues to make music that challenges both himself and his ever-increasing listener base. Perhaps his most remarkable recording to date is the ambitious *Antiguo* on Blue Note. The recording, which was released almost a year ago but continues to find new fans, is extremely complex in both conception and execution. It blends Afro-Cuban rhythms, state-of-the-art electronic keyboard effects and vocal elements. Previously, Rubalcaba has dabbled in the electronic domain with such releases as *La Nueva Cubana*, *Giraldilla* and the Grammy-nominated *Rapsodia*. What was new for him on *Antiguo*, however, was the integration of additional elements interacting with the electronics. Augmenting his keyboards are members of his band—Reynaldo Melian on trumpet, Felipe Cabrera on bass, Julio Barreto on drums—a choral section, classically trained Dominican pop diva Maridalia Hernandez, a Santarian chanter named Lazaro Ros, three *bata* drummers and a four-piece horn section.

"This is just an additional step to the work that I had done before in the field of electronics," Rubalcaba says through an interpreter. He says he has difficulty classifying the project, describing it instead as "one of my moments of evolution as an artist. The CD is a universal concept; it has a universal language with the music and is intended to be enjoyed. It's hard to call it one specific thing. It has a little bit of everything including classical, fusion, quite a bit of jazz, and certainly a lot of Afro-Cuban rhythms. Regarding the concept of the project, my intention was to try to make Afro-Cuban music universal. Generally, one thinks that something transcends when it goes beyond the normal stage of what everyone thinks it should be, and it moves over to a much higher level. I found a lot of enrichment in this, and it took me to a higher plane doing this kind of work.

"I haven't heard anything that is quite like this," he continues. "It does, however, have its influences and elements from things my peers have done in the past. I do pay homage to some of the stuff that was done before. I wrote the pieces as if I was constructing a big mural. In the beginning, I started writing here, there and everywhere. A lot of material was developed from improvisation that I did via computer. For a while the improvisations were nothing but that. Eventually I took them to a compositional level where they started making sense and had a feel to them. The process was analogous to giving a canvas to a kid and telling him to paint whatever he wanted and wherever. Then you come after him and put it all together. I wasn't following any particular order. The project did acquire an order eventually."

PHOTO: MICHAEL WONG

The result of Rubalcaba's labors is a CD of great depth and complexity—even he acknowledges that "it's not easy to understand. You can't just sit down and listen to it a couple of times. It not only has a high degree of complexity for the listener, the complexity is really present everywhere on this work—compositions, the synergy between everyone participating, the percussion, the harmonics and being able to interweave all the concepts."

Rubalcaba produced the CD himself, leading sessions in four studios in four different countries during the course of a year. "The fact that I was the producer didn't make it any easier or harder," he comments. "But it was great that I was able to produce it. It was a very personal project, and nobody else would have been as dedicated as I was.

"The production was gigantic, and the logistics of everyone being together and doing their stuff was wild."

—CONTINUED ON PAGE 184

LED ZEPPELIN'S "RAMBLE ON"

By Blair Jackson

Arguably the first great hard-rock band, as well as the group that opened the doors to heavy metal in the early '70s, Led Zeppelin was born out of the ashes of the influential British blues/rock/R&B band The Yardbirds; in fact, the group's first tour was under the name the New Yardbirds. Here's the background: Jimmy Page was a successful London session guitarist in the mid-'60s, playing on records by a diverse list of top British bands. His early influences were American rock 'n' roll and blues players from the '50s, including Chuck Berry, Scotty Moore, James Burton, B.B. King and Elmore James. Meanwhile, The Yardbirds had enjoyed a few years as a top club band in England, first with Eric Clapton as lead guitarist (he left in 1965 to join John Mayall's Bluesbreakers and later formed Cream, the original "heavy" band), then with Jeff Beck as guitar hotshot. They managed to score a few pop hits in both England and America, but the internal dynamics of the band were always a bit dicey. In June '66, bassist Paul Samwell-Smith left the group to become a producer, rhythm guitarist Chris Dreja moved to bass, and Jimmy Page joined as a second lead guitarist, giving the band a formidable front-line attack.

By October 1967, though, Beck had left to form the Jeff Beck Group with Rod Stewart and Ron Wood. Page appeared on Beck's classic *Truth* album in '67 and continued to tour with The Yardbirds, but by July '68 the group had split up. Page and Dreja decided to carry on together and form the New Yardbirds, but Dreja dropped out to become a professional photographer, so Page was left to recruit a band on his own. First he hired John Paul Jones, who was already well-established as one of London's top session bassists and arrangers. For lead singer, Page asked and was turned down by Terry Reid, but Reid recommended a 19-year-old singer from Midlands named Robert Plant, then fronting a group called Hobbstweedle. Plant, in turn, suggested drummer John Bonham, who was in a group called Band of Joy at the time. Almost immediately, the quartet discovered they had a rare chemistry and a truly awesome power. They cut their classic first album with producer/engineer Glyn Johns in just two weeks, then went to Scandinavia in mid-September '68 for a tour as the New Yardbirds. Upon returning to England, they scrapped the name and became Led Zeppelin, after Who drummer Keith Moon's joke about "going down like a lead zeppelin," to describe particularly bad gigs.

PHOTO: HERB GREENE

In San Francisco, 1969. L to R: Robert Plant, John Paul Jones, John Bonham, Jimmy Page.

Led Zeppelin was an instant success in both Britain and America, and it's easy to see why: This powerhouse group was in a league of its own. Page was certainly one of the top guitarists in England, as incendiary a picker as Clapton, Beck or Alvin Lee of Ten Years After. Bonham was practically a force of nature himself—musical in a Keith Moon kind of way, but with a raw explosiveness that could be frightening. Jones was more than just a strong anchor on bass; he was both a melodic foil for Page and a rhythmic dynamo. And there had never been a singer quite like Plant, whose voice truly was an instrument, soaring to unimaginable heights and cutting through the big sound behind him with visceral passion—a rock siren if there ever was one. It was the deep, heavy blues, turned up to "11," and mixed with crunching rock 'n' roll, but also eerily beautiful folk strains that were part of both Page's and Plant's backgrounds. On Led Zeppelin's first tour of America, which began the day after Christmas in 1968, they opened for groups such as Vanilla Fudge and Iron Butterfly, but they consistently blew the headliners off the stage. By February of '69, the first Zep album was rising quickly up the U.S. charts, propelled by the FM radio success of such tracks as "Good Times, Bad Times" (has there ever been a lead-off track that better encapsulated what a group was all about than that one?), the frantic "Communication Breakdown" and the long, loping blues of "Dazed and Confused." The album would eventually reach Number 10 in the U.S., beginning a long love affair between the band and American audiences.

With their first album riding high on the charts, Led Zeppelin stormed across America in the spring of 1969, playing theaters and ballrooms primarily, blowing minds from coast to coast as Cream had done a year and a half earlier. Because of the demands of their touring regimen, the group decided to make their second album in England and America, recording during breaks in their schedule. To aid them in the studio in the U.S., they hired the British en-

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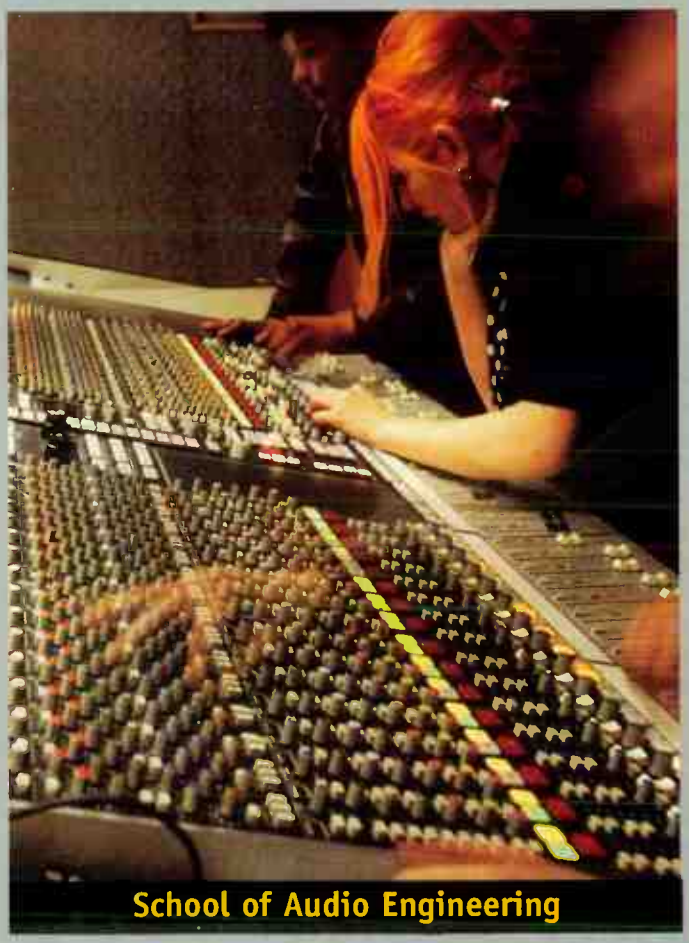

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gineer Eddie Kramer, who had done some remarkable work in New York with Jimi Hendrix on his *Axis: Bold As Love* and *Electric Ladyland* albums, and had an impressive career that included work on seminal albums by The Kinks, Donovan, Traffic and many others.

"I hadn't actually worked with Led Zeppelin before this," says Kramer, who still lives in New York. "But I knew Pagey years before I worked with him, since the mid-'60s. During '64 and '65, he was doing a lot of sessions around London, so everyone knew him. I was the assistant on some of the early Kinks stuff at Pye Studios, and then, about two years later, I worked with him at Olympic on 'Hurdy Gurdy Man' by Donovan. During the period at Olympic, too, John Paul Jones was becoming well-known as a session musician. Both Pagey and Jonesy were sort of the hot guys right around '67, '68. Jonesy was incredible—he'd walk into the studio with a score stuffed under one arm and the bass under the other, wheeling in a

Cool Spins

The Mix Staff Members Pick Their Current Favorites

Jacques Loussier Trio: *The Bach Book—40th Anniversary Trio* (Telarc Jazz)

The French pianist Jacques Loussier has carved out an interesting niche for himself. For much of the past 40 years, he's been known primarily for his jazz interpretations of Bach. To date, he's sold more than 6 million records, which probably makes him the most successful Bach interpreter ever. Bach's melodies are very much intact throughout this disc, but as in jazz interpretations of standards, they are usually jumping off points for explorations and improvisations by Loussier, bassist Vincent Charbonnier and drummer Andre Arpino. When you hear a modern bassist and drummer attacking Bach, you realize how much rhythm is inherent in the pieces to begin with. It's hard to "improve" on perfection, but there's so much playfulness, inventiveness and obvious affection in the arrangements, it's hard not to be moved and delighted by the Trio's work. With such well-known pieces as "Jesu, Joy of Man Desiring" and "Brandenburg Concerto No. 5 in D Major" among the five major pieces tackled here, this disc is certain to have wide appeal.

Producers: Jacques Loussier and Elizabeth Note. Engineer: Patrice Ques. Studio: Studio Miravel (Le Val, France).

—Blair Jackson

Sheryl Crow and Friends: *Live From Central Park* (A&M)

Part live greatest-hits album, part all-star revue, this CD finds the celebrated Ms. Crow leading her band and a handful of very talented friends through some of her best songs, including "Everyday Is a Winding Road," "Leaving Las Vegas," "My Favorite Mistake," "If It Makes You Happy" and "All I Wanna Do." I don't own any of Crow's earlier albums but have liked the above tunes when I heard them on the radio, so I'm happy to have them all in one place, performed with lots of energy. The all-star part of the CD is more of a mixed bag, however. The Dixie Chicks sound fine on Crow's "Strong Enough," and Chrissie Hynde is a spirited foil for Crow on "If It Makes You Happy." But not much new comes through on Stevie Nicks' "Gold Dust Woman," Keith Richards' "Happy" or Eric Clapton charging through "White Room" for the 10 millionth time, despite Crow's best efforts. No doubt, it was exciting to hear these tunes live, but

—CONTINUED ON PAGE 188

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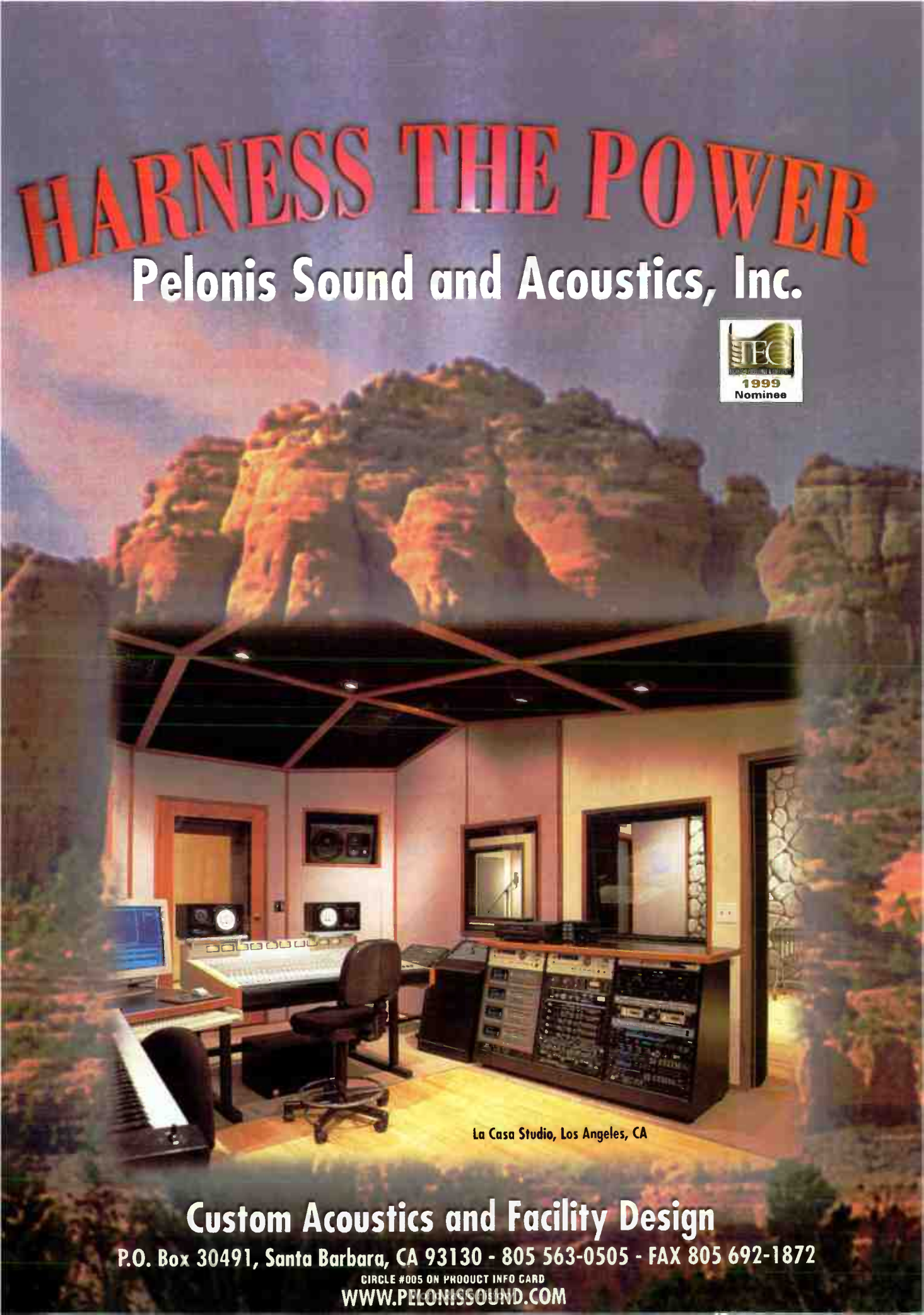

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B-15 amp. He'd stand up on the conductor's rostrum and conduct a 60-piece orchestra, with the bass in his hands. He was a great arranger. I think he's the unsung hero of Zeppelin. He and I were actually good friends. Page I didn't know that well back then, though I certainly knew his reputation."

Kramer got his start in the early '60s when he was hired to be a "tea boy" at Advision Studios in London. "I made the tea and swept the floors; I was a gofer, running messages," he remembers. "But you learn so much working for a studio that does film and commercials. I learned how to do sessions on my own. I did some jazz, which I was very into, and other things as well. The studio had these little boards that used to spark and fart—they were primitive beasts! I remember every day the first chore you did was you took the faders apart and cleaned them."

From Advision, Kramer went to Pye Studios, where he worked with producer Shel Talmy—"a great guy; I was very influenced by him. But Bob Auger was the first guy who really showed me the tricks of the trade; he was my mentor. Pye was a great studio. It was the hottest studio in town, and it had great equipment—Ampex gear, Westrex lathes, Pultecs, Neumann mics. That was the basis of my sound, and it still is today. Bob and I used to go out and do live recordings: big symphony orchestras on three tracks—left, center, right

with three Neumann U47s, and away you go! I learned a helluva lot from him because he also taught my next mentor, who actually ended up running Olympic Studios, Keith Grant.

"But when I got to work with the Zep boys in '69, we had to work in all these little studios around New York. It was hardly ideal. They kept coming in and out of New York. They were on tour and they'd come into the studio a day here and a day there, and they'd take this big, bloody steamer trunk of tapes with them wherever they went because they wouldn't trust anybody. They were very, very paranoid about somebody making off with their tapes. So we recorded whenever and wherever we could. I remember we cut pieces of 'Moby Dick' [which featured a John Bonham drum solo on it] in one studio and then chopped it together with stuff we did at another studio. In fact today on 'Moby Dick' you can hear a terrible edit I did; I go crazy when I hear it, but there it is, part of bloody history!"

This month's Classic Track, "Ramble On," is a perfect example of Led Zeppelin's genius in microcosm. Written by Page and Plant (surely one of the more underrated songwriting teams in rock), it opens with a lovely, almost pastoral passage dominated by Page on steady acoustic guitar, rhythmic finger-tapping on some small hand drum (Kramer doesn't remember the specifics—whether it was a bongo, or an African or Indian drum), a swooping bass part and a calm, even lead vocal. Eventually, though, it bursts into a

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full-throttle Zep attack on the chorus, with electric guitar (in addition to the acoustic) and a full drum kit. Throughout the song there are different guitar textures—a Page trademark—and near the end of the track there's some creative double- and triple-tracking on Plant's vocals, as he sings lines against himself. Lyrically, too, it shows two sides of Plant's writing—it's a love song about wanderlust, but, like a number of other Zep songs, it has a mystical/magical side, with its reference to medieval characters.

Strangely enough, there is some dispute over where "Ramble On" was actually recorded. On the remastered CD version of *Led Zeppelin II*, the credits indicate it was recorded at Manhattan's Juggy Sound, a small R&B studio run by a producer named Juggy Murray. It's a studio where Kramer occasionally worked with Jimi Hendrix, and it's not out of the question that he did some work with Led Zeppelin there, too, but he notes, "Maybe this is the time to correct that. I'm almost positive that 'Ramble On' was cut at Groove Sound, which was another little studio in the same area as Juggy Sound. It was an R&B studio also, a small, funky-ass studio. I remember they were playing so bloody loud and the control room was so small that it was coming through the walls, and I could hardly tell what was live and what was in the control room until afterwards when I played it back. But they got it down so fast, it wasn't funny. They were so great, and very professional. Both John Paul Jones and Jimmy were studio musicians first so they had that discipline. They knew what they wanted to do and how to work in the studio. They had a very strong work ethic. And John Bonham was without question the greatest rock drummer I ever recorded."

The entire album was cut on 8-track; Groove Sound had Scully recorders and a small custom board. The entire band would play live for basic tracks; solos and overdubs were added later, sometimes during the mix. For drum miking, "I probably had my usual setup of a [Neumann] 47 on top, a 47 on the foot, [Shure] 57 on the snare and I don't know what on the hi-hat—I probably didn't even use a mic on the hi-hat, but I might have used two overheads. We used very few mics in those days." Bass was captured by combining a DI signal and a mic on the bass cabinet. Page's guitar sound usually consisted of two combined mic signals—perhaps a 57 or a Neumann U67 at the amp and then another mic six feet away in the room.

"Jimmy always had a lot of guitars and a lot of amps," Kramer says. "If my memory serves, most of what he did on that record was with smaller amps. I know that when we were at A&R [Studios] one afternoon doing overdubs, which is why we ended up mixing there—we liked the room—he brought in this small Ampeg amp with a little 10-inch speaker in it, and that was what he used for the solo [on 'Ramble On']." The distinctive sound of the solo comes from Page harmonizing with himself on two tracks and creatively using feedback. "That's also an edit; it comes from two studios—the track was done at Groove Sound and then the solo is from A&R. We had to chop in and out."

Plant's vocals were recorded using a U67. "I used a lot of 67s in those days, and it's still one of my favorite mics," Kramer says. "They're great on guitar amps, great on overheads. The [U]87 never sounded quite as good to me."

So the track lineup probably broke down like this: "The drums would probably be in stereo on one and two, the bass would be on three, guitar on four and five, and then six, seven and eight would be vocals and percussion," Kramer says.

Then and now, Kramer liked to print effects as he went rather than adding everything at the mix stage. "I put all my sounds on tape," he notes. "EQ, compression—it all goes printed to tape because then I know how it's going to sound afterwards, and it makes the mixing easier. A lot of people like to cut flat. That's bullshit! Commit! Don't be wimps! That's it. That's the sound. All you have to do later then is put the faders up and adjust levels."

Kramer and Page (who is credited as producer) mixed the record together at A&R Studios—four hands on the board, working in a couple of marathon sessions. "We recorded all over the place and we ended up with all these tracks from Vancouver and L.A. and London and New York and mixed the entire record in only two days, over a weekend at A&R Studios on Seventh Avenue," Kramer recalls. "It was tough because it came from all these studios recorded by different engineers [including Andy Johns, Chris Huston and George Chkiantz]. It was up to Jimmy and me to fine-tune and tweak and make sure that everything matched up. That's why we wanted to overdub and punch-in solos, to make sure everything was as powerful as it could be. It's all part of the creative process.

"Page is a master," he continues. "He was very much in control, knew what he was doing at all times. He had great ideas for sounds, and he was an innovator and a real maverick, too. He heard something in his head, and he had the technical expertise and know-how to extract it from both the musicians and the engineers. He had a master plan in mind, but he would also allow things to happen, like the accident in 'Whole Lotta Love': On that song, where you hear the word 'woman' and it sounds like Robert is far away...that was track seven bleeding or breaking through onto track eight, but it sounded good so we left it in."

The console at A&R was a custom model with just 12 inputs—"very primitive," Kramer says now—but that wasn't terribly far from the state-of-the-art in that era. As for processing, Kramer's primary tools were an EMT plate, "lots of tape delay and phasing and assorted weirdness."

When *Led Zeppelin II* was released in November 1969 it quickly shot up to Number One in both the U.S. and UK, and "Ramble On" was among the most popular tracks played by progressive radio. ("Whole Lotta Love" was the

album's bona fide hit, though Led Zeppelin was never really a singles band.) Kramer went on to work on four albums with the group—*Houses of the Holy, Physical Graffiti, The Song Remains the Same* and *Coda*. Led Zeppelin was one of the most popular rock bands of the '70s and was among the most influential. Their reputation was tarnished somewhat in their later years by tales of excess that were extreme even by rock 'n' roll standards, but there was no denying that all the way to the end—which came following the death of Bonham in 1980—Led Zeppelin rocked *hard*, and their first two albums stand with the greatest albums of the late '60s. ■

—*FROM PAGE 166, BECK*

recording setups. If *Ricky Martin* broke an analog/digital barrier by being the first hit CD to be created completely within a hard disk system, *Midnite Vultures* might be seen as one of the first to exploit the full capabilities of digital media, as well as the possibilities of the humble and hermetic project studio recording. Most of the songs used more than 48 tracks, and some had as many as 80 or 90 tracks with beginning intros and ending pieces, according to Petralia. "Pro Tools kind of saved the day," he says with an amazed chuckle. Fifteen 9-Gig hard drives would be floating around the studio at any one time.

Most of the work on the CD began in July 1998 at Beck's Soft Studios, then in his new Pasadena home. A former sound effects designer for clients such as Sega and Disney, Hoffer first toured with Beck as guitarist Smokey Hormel's replacement a few years ago. Petralia was enlisted after doing some impressive polka and hardcore punk remixes of songs from the Grammy Award-winning *Odelay*, and he had worked with Beck on his remix of a Björk song as well as collages and soundscapes for a George Condo exhibit.

"It was like hanging out with your friends and making music. It was never like we're working on the follow-up to a major release," Petralia says. "There was never any pressure, there was never a label or management. It was very cool like that. It was like sitting in your friend's home studio and just banging out some music."

Beck, Hoffer, Petralia, bassist Justin Meldal-Johnson and keyboardist Roger Joseph Manning Jr. would seal themselves in the studio from noon to 2 or 4 a.m. and build the songs from scratch. "The songs would usually start with some kind of rhythm or basic programming. Beck and I would go through a bunch of records and look for some cool loops or some cool sounds to grab and make drum beats out of," Hoffer explains. "Sometimes it'd be the temp, and then sometimes it would be the final main thing. Then he'd usually add bass and keyboards after that, tons of keyboard tracks and sometimes a bunch of bass tracks, and then start laying guitar down.

"Then we'd get down to the sort of nitty-gritty of making sense of it all, editing it for weeks," he continues with a laugh. "Just one song, and getting very, very microscopic and surgical, scientific, with it. Just the way that a snare lays back a certain way. And when I say scientific, I mean getting *so* inside of the song, *so* inside of the beats and *so* inside the waveforms that you're...you're...you're in the matrix." [Laughs]

"From that point where most people were finished, then that's when the fun really started in terms of the layering and all those little elements that kind of make up the whole soundscape," Petralia recalls. "While the initial stage would take probably two days, the fine-tuning and the tweaking and the flossing would take about two weeks per song, getting everything *really* dialed in."

Beck's plan for *Midnite Vultures* was initially more up-tempo and techno, Petralia says, with "lots of drum machines and very harsh synth sounds." But it evolved into "a record that was fun to listen to and something that was fun to play for two years on the road," explains Petralia. "A good way to cap off the end of the century.

"Other elements were coming into the project, other inspirations," he adds. "We were listening to other stuff at the time, whatever we heard that given day, whatever we felt like we'd do we'd take on." Everything was fair game: something they heard on their car radio that day, Master P, the Cleopatra label's *Goth Box*, Busta Rhymes and Scandinavian death metal band Rotting Christ. "Anything that looked or sounded cool or had a good title, we'd check out," Petralia says. "There are always endless supplies of records over there from the last four decades—we'd just throw them on."

The co-producers' encyclopedic knowledge of music came in handy.

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"Beck would request a punk/Motown/new-wave breakdown, and so we'd help him execute that," Hoffer says with a little laugh. "So we were very involved in helping him with his ideas and getting them to not only sound good but kind of impress him in a way. Try and blow him away with just going beyond having sounds. We'd be working on a song, and I'd think it was sounding really great and pretty much ready to be mixed, and he would want to go further with it, and spend another week or two on it. He would just want things tweaked and sounding beyond the beyond, and so I would just take things with him and just *really* push it."

The found sounds culled from those listening sessions made up a large part of the record. "Half the sounds on the songs are manipulated samples, tones, beats or just textures off some other sources," Petralia says. "It could be something like an ambient sound that was turned into some kind of instrument and played, or a horn sample we took and made our own, or a horn lick we cut up enough to where it's a whole new section now."

The producer/engineers used a Mackie 32x8 to monitor in the downstairs den, while most of the tracking was done through outboard gear in various rooms in the '50s post-and-beam house. "The glass wall and brick had a very nice, acoustic feeling. The room was definitely not treated in any way," Petralia says. "Everything was one instrument at a time, and we had the run of the house, so we'd be doing horns upstairs in the living room on one song, and drums in the 'B Room,' another bedroom. For the horns, it was great: The room had a giant ceiling about 20 feet high, and it was just wide open. It had a pretty roomy sound to it."

Petralia says they relied on Brett Averill's racks of vintage Neve 1073s and Distressors, which were also used for mixing. "We used a lot of the API pre's because Beck's voice sounded really good through them," says Petralia. They used Shure 58 and Neumann 87 mics for Beck's vocals, as well as a B.L.U.E. bottle mic, which Petralia describes as similar to a U47, "but not as dark."

Beck's vocals went to extremes, Hoffer says, either taking "just a touch of reverb if anything" or going into interstellar overdrive through a vocoder. In the end, Beck primarily recorded "many tracks of different voices to make it sound like a bunch of people, and he'd use some funny or different voices," he says. "The way it all adds up it may sound like effects, but it's all him."

Beck did have a unique "tube" mic, Hoffer says: "We'd take toilet paper tubes or paper towel tubes and put them on the tip of the microphone and set them back a distance from something, from an amp or a vocal. Depending on the length, it would be a real focused, tight vocal sound. We called it the Elephant. 'Get the Elephant,' and that meant Mickey or I would have to go dig around, usually through the trash for these things."

The signals from Beck's array of old amps, including a Silvertone and Vox, were sent through the APIs or the Neves. Beck's dishware also got in the act. "We used to put a lot of dishes and silverware and cutlery around the amps. It would definitely change the sound of the recording, give it a more vibrant sound, as if you were in a French kitchen," says Hoffer, who adds that Beck would slay them with his amazing cooking skills. "We'd spend an hour or so placing the meatloaf pan strategically in relation to the amp and the microphone. There was an Ampeg Jet, a small little Combo, and we had these other amps that we got at

the swap meet; we didn't know what kind they were. Some local hippies made them. They were made out of particle board—homemade deals with big knobs on them. They were also small, small amps, and they sound really cool, real trashy and really *fat*."

"We also liked the API graphics [EQ] because they were so quick. We could use them very quickly," Petralia throws in. "Things would happen very quickly in the studio. You'd be working on a bass part for three hours, and Beck would come in and say, 'Okay, I'm ready to do my vocals, and you'd have two minutes to set up your mic and chain. The graphic always seemed to work so well, because you could dial it in while he was doing his first pass."

Speed was essential to capture Beck's many spontaneous ideas, Hoffer agrees. "In a way, you've got to be—not only where he's at, which is three steps ahead—but you've got to be a couple more ahead planning," he says. "'Well, that mic's in use, we've got to be ready to jump to this or that.' Just making sure that there are enough free tracks, just knowing how he works, and knowing the general path that all the songs would take and making sure you don't get stuck anywhere in the path, because the songs roll real fast."

Petralia relied on a few offbeat chains. "Justin has an insane bass rig, with tube pre's and an amazing pedal board: It's about 4-by-8 feet, and it's on a giant piece of plywood that he hauls it around on. Pretty impressive, it's like day-glo green, and you don't know what the pedals are—they're all painted out. It's a cartoon gone wrong with his pedal board," he says. The bass would be recorded through the pedals or the bassist's Demeter pre into a SansAmp or into the Neve or through the Distressor with Petralia making sure "the bass wasn't too big but had more of that pluckiness that we liked a lot."

Another part of the process was observing what Manning would drag into the studio. "Every day, it was part of the project too: What would Roger bring down today?" Petralia says with a laugh. "He had this amazing collection. You'd hear this banging coming down the stairs of the studio, and there's Roger with some new Anvil case from some band from the '70s like Jefferson Starship or Suzi Quatro, and it would be a Jupiter 6, vocoders, a Mini-Moog or an ARP Odyssey." For Manning, they recorded through the APIs.

As Petralia describes it, between

Beck, the bandmembers and the producers/engineers, they had enough unusual equipment to stimulate their imaginations. "It was kind of like whatever was there at the house. The only thing we ever rented were a couple of mics. The only time we went outside to big studios were for drums and strings [which included viola by Beck's father, David Campbell, tracked at NRG Recording Services], but that was it," Petralia muses. "It was like a biosphere. There was no reason to go outside. With the fruit trees in the yard, we were self-sufficient."

Beck bandmembers such as guitarist Hormel, drummer Joey Waronker, trombone player David Ralicke, tenor saxophonist David Brown and trumpet player Jon Birdsong were joined by guest artists including former Smiths guitarist Johnny Marr, vocalist Beth Orton, and country session players Herb Peterson on banjo and Jay Dee Maness and Greg Liesz on pedal steel. Petralia and Hoffer were both blown away by Marr, whom they considered a formative influence. "If you were to tell me when I was 15 that some day Johnny Marr is going to be sitting next to me, playing my guitar, playing on a Beck song that I'm recording, I would have laughed hysterically in your face," says Hoffer, who has known Beck for a decade.

Peterson and Maness also had a slight case of culture shock. "Just the look on their faces when they heard the songs for the first time down—the bemusement and...frustration," Petralia remembers with a laugh. "But I think it was Herb who said, 'Oh, I get it,' after a couple passes. Once they got going, they nailed it. It's fun to work with people like that from a whole other school because you can learn so much from them. Like I kept trying to turn Jay Dee's amp up, and he's all, 'If I can hear a buzz in it, then it's too loud.' They play their amps *very* quietly, so that was interesting."

Hoffer was far from bored behind the board during the tracking of the album. In fact, on "Milk & Honey," he's credited with both chorus guitar and the "broken furniture" that makes the transition to the acoustic guitar part a little less "mellow." "That's funny. Beck, man, that's Beck for you, right there," he says with a chuckle when he discovers the liner note. "He wanted the sound of five chairs breaking. So we drove around on our bicycles all around Pasadena, trying to find some furniture that they put out in this neigh-

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borhood on a certain day. What we ended up finding was one chair and a drafting table, and so we dragged everything back to the studio on bicycles, and then we threw everything off the balcony onto the patio below and recorded it."

Beck found inspiration in some unlikely places for "Mixed Business" and "Pressure Zone," Hoffer recalls. "Beck really likes going to the car wash, and there's this place that was sort of down the street from the Pasadena house, and we had a little Powerbook, a little 8-channel mixer that was battery-operated, and we'd just go in the car and do some vocals there in the car while going through the car wash. We'd pay the guy like 50 bucks, and he'd let us go through it and go back around again. Someone would be driving, I'd be recording and he'd be working on lyrics, and he'd track some vocals right there in the car. It was more for inspiration, I think, just being in that environment, and it definitely had the sound of a town car."

If you were to tell me when I was 15 that some day Johnny Marr is going to be playing my guitar, playing on a Beck song that I'm recording, I would have laughed hysterically in your face.

—Tony Hoffer

Waronker repaired to the Pasadena house's bedroom to record the drums, as well as a storage room downstairs, which offered a very tight sound. Much of the drums were eventually re-tracked at Hollywood studios Grandmaster Recording and Sunset Sound, but they often ended up going with the "storage room drums" because, Petralia says, "It just had a sound. Sometimes when you work that way, too, at the house, it just has that vibe of hanging out with your friends. You can capture stuff, more

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Mickey Petralia and Tony Hoffer

moments, that way, as opposed to, I think, a studio with everyone in the control room telling the drummer what to play and when."

The editing and tweaking phase moved to Beck's current house in the Silver Lake district of Los Angeles. Petralia and Hoffer worked with Beck, programming many of the rhythm tracks and mutilating the already-obscure samples. "Each beat is dissected to the *n*th degree. There's no way that anyone could tell you where any of these beats came from," Petralia says. "You just take it in and cut it up note for note, replay it, time-stretch it, de-tune it, put it through the Moog various ways, rearrange it, reconstruct it, deconstruct it, flip it, make it a lot more hyper than it was initially."

Later at NRG in Hollywood, the mixing process became so intense that they switched from Studio Vision to Pro Tools to save time, says Petralia. "A lot of times, we'd be doubling up on things. We'd only have two 24 tracks, so if there was a song where there were 65 tracks, you're doubling up on a good amount of tracks on the tape machine," he says. "So you have to think very logically, and that's how Pro Tools helped, in that visually you can see each track on the screen. It would help you arrange how you could lay it out on the board and how and where you can double up on tracks."

"It was a pretty large beast to tame because there was so many tracks," Hoffer adds. "Some of the songs like 'Get Real Paid' and 'Milk & Honey' are epic in a way, and have so many different parts to them, arrangement-wise—five or six different parts, completely different pieces of music that don't repeat ever again. Lots of tracks to manage, so there was a lot of file management and track management going on in the mixing, but for the most part we had to get pretty scientific with the EQ'ing just to get all these things to layer together properly."

After two months of mixing, Petralia says, "We'd taken over the lounge with another computer, which was our side hatch, where we were doing either B-sides or editing. And then we took over Studio B and then took over an iso booth for Studio D, as we referred to it. So we had four Pro Tools rigs going."

One of the hardest parts was deciding which of the 40 songs would end up on Beck's *Midnite Vultures*, says Petralia. Another was adjusting to the outside world, adds Hoffer, particularly since the CD was completed. During the making of the album, he says, "We never went out. We were very unsocial. It got to the point where we didn't know how to react to people in public. I went to see a movie last night, and I was like, 'What do I do in the theater? I just sit here and watch the thing. I don't bite the person next to me?' You forget. You're just living in this bubble for 12 or 14 months with the same guys, probably like the military."

Or it sounds like being on the space shuttle, a strange combination of physical isolation and media attention. "It didn't hit me until the very, very end, when we pretty much mixed the whole record," says Hoffer, who prepared samples and backing tracks for the *Midnite Vultures* tour and remixed the B-sides, "This Is My Kru" and "Arabian Nights." In January, Hoffer is scheduled to take turns going out on the road with Beck to work on the next album beginning with *Vulture*'s leftovers. "When we started having some press people come down to the studio to talk with Beck, they'd pile into this little tiny room, and I'd play them some finished mixes, and I was kind of realizing, man, these songs are actually pretty amazing. This sounds really good! It's all right! I'm definitely feeling it!"

For more information on Midnite Vultures *and to view video clips of Beck working in the studio, visit www.beck.com.* ■

—FROM PAGE 167, GONZALO RUBALCABA

Overseeing the engineering aspects of this unique recording was Peter Darmi, who had worked with the pianist on a previous CD, *Imagine*. "I consider this my career masterwork," he says of *Antiguo*. "I did everything on this thing, from soup to nuts—tracking, overdubs and the mastering. It was probably the most unusual piece of music I've ever worked on, and certainly the most brilliant. The concept for each of the pieces was simply amazing. Each one is an orchestral piece in itself."

The New York-based Darmi was equally impressed with the musicianship of all the players and Rubalcaba. "It was an interesting blending of live and electronic stuff," he comments. "Gonzalo's drummer, Julio, is brilliant—he could play these things with blazing speed and accuracy; he sounded like he was MIDI'd up. All those guys were a knockout group. When we were in Cuba and the horn section first looked at that fly shit [complicated notation] on the charts, they just about rebelled. They were saying, 'This is impossible. Nobody can play this.' But Gonzalo talked them through it, and they came in and played this stuff flawlessly. They were great session players; they'd make a mint in New York or L.A. But Gonzalo is a heavyweight because of his technical abilities and his musicality. He's the most technically astute keyboardist I've ever worked with, and that includes Herbie Hancock."

Rubalcaba wanted the recording to be completely digital and entrusted the technical details to Darmi. "We had 64 tracks of ADAT flying together at one point. The reason I chose ADAT was because we tracked this thing all over the world," Darmi explains. "We cut the basics at Klang Studio Leyh in Germany, then in Cuba and the Dominican Republic for vocals and overdubs. Also it got taken to Guatemala. So I needed something that was portable, reasonably reliable and would work under a lot of different conditions, yet it would still give me that crisp digital sound which I needed for his music. This stuff is ultra clean.

"I chose ADAT over the DA-88 because of the interface mostly," he continues. "The BRC on the ADATs stores all sorts of project information, which you can recall—punch-in points, cues, location points, titles. And because each of the pieces on the CD was so long and complex you needed to have a fair amount of information stored within the medium. I know a lot of

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people bitch about ADATs, but even with 64 tracks, I didn't have any trouble waiting for things to lock up quickly. I was using XTs, and, *click, click, click,* within three seconds all 64 tracks were banging away."

Darmi says that this project was constructed more like a popular music recording than either a typical jazz or classical CD. "We did the basic tracks like a rhythm section," he says. "You know—piano, bass, drums and trumpet. We had a guide track, which was a 2-track rough mixdown to MIDI-up with this thing. That gave us an idea of how all the parts would work together. Later on, we expanded into more tracks, and we broke the synth parts down into their multiple components. Reeds, voices and percussion were all overdubbed just like a regular record, basically. The place we really departed from that structure were the synth parts, where we had these many, multiple layers that were programmed. To make all these things sound like a cohesive whole, we had to do all sorts of funny manipulations. I did things like compressing the reverb returns and doing a sidechain link. In order to make this stuff flow, I had to sonically, as well as levelwise, blend stuff together. Of course, you want the brilliance to come through as well as the deep bottom.

To make a cohesive whole, I did things like compressing the reverb returns and doing a sidechain link.

—Peter Darmi

"But most of the real hard work," he continues, "was done in pre-production. That entailed a lot of synth programming. I wasn't around for that. Gonzalo spent many nights composing this thing; he didn't write it overnight on the back of a napkin. This was a couple of years in the making. The recording was merely documenting what he had been working on for a while."

Not surprisingly, a project that used so many different media, sound sources and studios made for a "very complex mix," Darmi notes. "It's very detail-oriented stuff. I was pretty sure that none of the full mixes were the ones that

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made it to the record, and I was right. There was only one that we took the mix as it came off the ADAT straight to the mastering lab. We just mixed to Panasonic DAT and mastered on Sonic Solutions.

"The reason I didn't transfer it was because I didn't want any data corruption. I was anticipating potential problems such as phase differences, which would have been immediately noticed. The D-to-A on the XT ADATs is fine. People say it sounds brittle, and it does if you're doing orchestral or largely acoustic pieces. But *Antiguo* is largely a synth recording so the character of the sound is not natural to begin with."

Though Rubalcaba has been constantly busy since *Antiguo* came out, and has even had another Blue Note disc released to typically great reviews (*Inner Voyage*, which finds him in a pleasing trio setting, with additional support from sax player Michael Brecker on some tracks), *Antiguo* is clearly a project that continues to hold special meaning to him: "I worked on *Antiguo* for two years and completed it, but I feel that there is still work to be done. I would like people to listen to it, so I know whether the music touches people's hearts and if we're doing the right thing with this work." ■

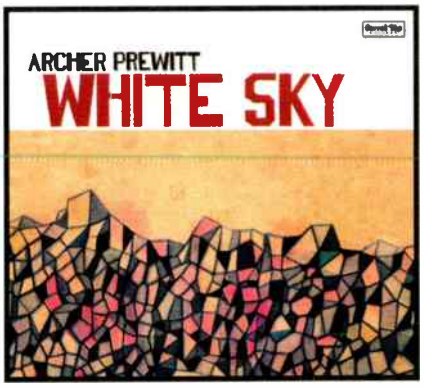
—FROM PAGE 170, COOL SPINS

they seem slightly out of place here. Still, the star-studded finale, a kinetic version of Dylan's "Tombstone Blues," kicks major booty. Play it loud!

Producer: Sheryl Crow. Mixed by Chris Lord-Alge. Mixed at Image Recording (Hollywood, CA). Mastering: Doug Sax/The Mastering Lab. *—Blair Jackson*

Archer Prewitt: *White Sky* (Carrot Top Records)

When no one noticed, soft rock made a comeback. Am I the only one that mistakes Ben Folds Five and the Verve Pipe for Seals & Croft or Air Supply, when flipping through channels on the radio? Can the resurgence be attributed to some kind of alt-rock/hip hop backlash, or a never-ending quest for background music in shopping malls? With that in mind, a listener might be tempted to lump Chicago multi-instrumentalist Archer Prewitt in with that mushy crew after hearing *White Sky*'s "Shake," which sounds suspiciously like Boz Scaggs and, well, Chicago. After all, Prewitt gave this kind of mellow mood music indie cred as the guitarist/keyboardist in his other band, the Sea and Cake, and even made softness a virtue as a visual artist with his acclaimed

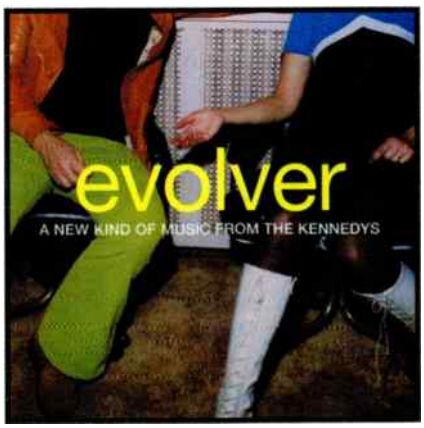


comic, *Sof' Boy*. Soon, however, the gentle orchestrations of his second solo CD wipe away uncool associations with, say, Deodato. Let the laid-back horn arrangements, jazzy vocals, glockenspiel, strings and mellotron wash over you with "Raise on High," "Motorcycles" and "Summer's End." Evoking the pastoral yet dramatic sounds of Nick Drake, Prewitt makes a light touch and a distaste for bombast fresh again. This big softie just may revive the joys of slow dancing and easy listening.

Producer: Archer Prewitt. Engineer: Kenny Sluiter. Additional recording: Jeff Boyd, Mark Greenberg and David Max Crawford. Studios: King Size Sound Laboratories, Stroppy Studios, the Poi Space and Mayfair Recording (all Chicago). Mastering: Kenny Sluiter/King Size (Chicago). *—Kimberly Chun*

The Kennedys: *Evolver* (Zoe)

I can't keep up with these folks. Just when I'd settled in and become a fan of Pete and Maura Kennedy's pleasing modern folk music, they've plugged in and "Beatled" out. It's not quite as weird and wiggy as The Beatles' *Revolver*, but there's definitely a serious '60s strain running through most of this CD, with twanging 12-string guitars, shimmering stacks of vocals and bright hooks galore. The modern twist on this project is that it was mostly recorded in various hotel rooms, with the

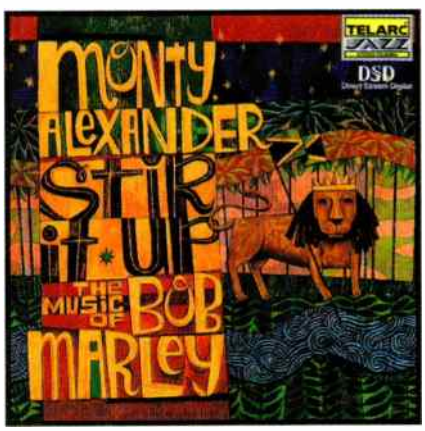


happy couple playing most of the instruments and singing most of the parts. There's a fair amount of interesting, *tres '90s* programming work, too. There are retro parts and harmonies that resemble the Beach Boys, Byrds, Beatles and even the Mamas & the Papas, but running through it all is the intelligence of Pete Kennedy's arrangements, which sound like they've been more heavily influenced by Lindsey Buckingham than by George Martin. Lyrics are simple and easily digested. This CD probably won't change your life, but it has an attractive sheen and consistency.

Producer: Pete Kennedy. Engineers: Pete and Maura Kennedy. Recorded in various hotel rooms. Mastering: Charlie Pilzer/Airshow. *—Blair Jackson*

Monty Alexander: *Stir It Up—The Music of Bob Marley* (Telarc Jazz)

Jamaican jazz pianist Monty Alexander was a contemporary of Bob Marley but never met or played with him. This instrumental tribute to the reggae great brings together small groups of Jamaican and American musicians to riff on a dozen tunes written and/or sung by Marley, including such well-known classics



as "Jammin'," "Stir It Up," "No Woman No Cry" and "I Shot the Sheriff." Montgomery and company frequently stray from the original reggae settings in favor of jazzier tempos, always to good effect—this disc is best when the settings aren't slavish imitations of the originals. Marley's songs were unfailingly melodic, so Alexander has lots to play around with as the primary soloist in these breezy arrangements. What this disc could use more of is Marley's edge—at times various songs teeter very close to schmaltzy, piano-bar easy listening. But on the best tracks, such as "Jammin'," "Crisis" and the explosive "I Shot the Sheriff," the band and Alexander manage to uncover fresh ideas that make for stimulating listening. Both the U.S. and Jamaican rhythm sections are in top form, loosening up when the music calls for it and always supporting Alexander sympathetically, and the flow between the reggae and jazz sections is remarkably smooth and harmonious.

Producers: Glen Browne and Robert Woods. Engineers: Jack Renner and Robert Friedrich. Studio: Avatar (NYC).

—Blair Jackson ■

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COAST TO

PHOTO: MAUREEN DRONEY

Bottlefly at Royaltone's Studio B, L to R: Assistant engineer Mike Pilar, co-producer Eric Caudieux, Bottlefly member Richie Wermerling, Royaltone president Jane Scobie, Bottlefly member Lizard and mixer Mike Fraser

L.A. GRAPEVINE

by Maureen Droney

The debut release for the buzz-about-town band Bottlefly is being put together by an international coalition: five British musicians, led by keyboardist Richie Wermerling, singer Mark Arnell, French co-producer Eric Caudieux and Canadian mixer Mike Fraser. I stopped in at Caudieux's multilevel recording aerie one chilly October night to check out the scene, as, high in the hills above Studio City, he and the London-based band were finishing up overdubs.

Rapid-fire insults and jokes from the irrepressible members of Bottlefly dominated our conversation, but Caudieux did manage to interject a bemused explanation of how the project had come about. "I heard a tape of theirs almost two years ago, and they stuck in my mind," he recalls. "Then, when Terry Lippman became my manager, I gave him the tape. I didn't hear from him for a few days, then he called back and sang me all the songs over the phone. In fact, he loved it and said, 'Let's sign them.' He flew to England, brought them back in June, and we started working in July."

Originally from Paris, Caudieux is a musician and composer as well as a programmer and producer. His previous work includes projects with producers Trevor Horn and Garth Richardson, and with artists from Metallica and Everclear to Rob Zombie and Luther Vandross. He's also done programming and editing for cuts on the soundtracks for the films *Strange Days* and *Indecent Proposal*, and, with audio/visual artist Lol Creme, he's co-written and designed music for TV commercials and

—CONTINUED ON PAGE 192

NY METRO REPORT

by Gary Eskow

The world keeps shrinking, all the way into the computer and back out, and studios in New York have had to keep abreast with the changing work methods of musicians who have their own project studios—and that includes just about everyone in town these days. Initially terrified when low-cost tracking options became available to the everyman, savvy studio owners are now finding that they can offer artists services that can turn them into clients, not competitors. That's what happened recently when Manhattan native **Keith Levenson** came to **Charles de Montebello**, the owner of **CDM Sound Studios**, with a project.

Levenson prepares scores in his Pelham Manor studio on a rig that includes, get this, seven computers blown out as fully loaded DAWs. Lest this give you the impression that Levenson is a MIDI nut unfamiliar with writing for real musicians, this composer/arranger's resume includes all of the orchestrations for *British Rock Symphony*, a volume of classic songs featuring performances by Eric Burdon, Roger Daltrey, Alice Cooper, Paul Rodgers, Ann Wilson and Thelma Houston, backed by a full orchestra. This work, like many of his compositions, began on manuscript paper, moved into the computer and ended up being recorded in London, L.A. and "wherever one of our vocalists might have been at a given moment."

After graduating from high school in 1978, Levenson headed uptown to Columbia to study theater. His keyboard chops led to a variety of gigs, and in less than a year, he was out of Columbia and into the club scene as conductor for—Eddie Fisher. "I like Eddie. He's certainly out there," Levenson says. "It's funny. I was conducting for him at 19, but I couldn't go into the casinos where we

—CONTINUED ON PAGE 193

Keith Levenson

COAST

NASHVILLE SKYLINE

by Dan Daley

Births and Rebirths—Woodland Digital is back from a tornado-induced hiatus. On April 16, 1998, two tornadoes ripped through Nashville, and in the process, ripped the roof off Woodland, plunging one of Nashville's longest-running facilities into a $700,000 nightmare of water, wind and recalcitrant insurance adjusters. The studio's longtime owner, Bob Solomon, persevered, however, and the studio reopened in early October, repaired (although many insurance claims are still pending) with the addition of a third control room equipped with a Soundtracs DPC 260 24-bit/96kHz console and fitted for as many as eight channels of surround mixing.

The studio wasn't all that had to be rebuilt, however. Loss of revenues meant that virtually all of the staff had to be laid off. Woodland is back with a new set of staffers. One is fairly big news: Milan Bogdan, who contributed heavily to the early successes of Masterfonics and is widely regarded as the architect of Emerald Recording's recent renaissance, is coming aboard as general and studio manager. In addition, Neve technical guru Fred Hill has been named as chief engineer.

New Yorkers "Void" Caprio and partner Keith Spacek have found a niche in Nashville during the past several years. After seeing the potential in Nashville's underground rock and pop scene —something that's been oft-discovered but rarely successfully leveraged—they decided to open Interzone, a studio that would allow them to develop productions with rock and pop bands as well as maintain a for-hire facility that

—CONTINUED ON PAGE 196

PHOTO: DAVID GOGGIN

Hole lotta love behind the console at Ocean Way Recording Studios in Hollywood when Courtney Love, center, recorded and mixed "Be a Man" with engineer/producer Jack Joseph Puig (left) and Hole guitarist Eric Erlandson for Oliver Stone's latest film, Any Given Sunday.

A Million Dollar Quartet, and then some, holed up at The Village in West L.A.: the musical crew of director Wim Wenders' film Million Dollar Hotel. *Pictured in Studio B, standing from L to R, Wenders, Bono of U2, producer Hal Willner and Robbie Robertson, and, seated, actress/vocalist Milla Jovovich.*

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

A new kind of social club was in at The Village in West L.A.: U2 vocalist Bono, actress and singer/songwriter Milla Jovovich and *Buena Vista Social Club* director Wim Wenders worked on the soundtrack album for *Million Dollar Hotel,* Wenders' new film starring Jovovich, Mel Gibson and Jeremy Davies. (The film is scheduled to premiere at the Berlin Film Festival in February.) Producer Hal Willner and engineer Eric Liljestrand mixed and overdubbed the songs, which included Daniel Lanois on guitar and vocals, Brian Eno on synthesizers, Bill Frisell on guitar and Jon Hassell on trumpet...Chris Vrenna (former Nine Inch Nails drummer/programmer) produced the Jack Off Jill CD *Clear Heart Grey Flowers* at Amethyst Digital in L.A. He also contributed production and remixed Rob Zombie's "Return of the Phantom Stranger" for the *American Made Music to Strip By* CD...At Track Record (North Hollywood), Me'Shell NdegeOcello tracked vocals with producer Allan Cato and engineer Brian Springer. Meanwhile, producer Rick Nowels worked on an Interscope CD by Enrique Iglesias and mixed and edited new songs by k.d. lang with engineers Randy Wine and Steve

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—FROM PAGE 190, L.A. GRAPEVINE

Comedy Central.

About the Bottlefly project, Caudieux says: "It was great; first off because they had songs that were already written and arranged. But, since they had so many songs, it sounded like ten different bands, and that's where I came in. I helped them to put together something that sounded like it was all from the same band, one that truly reflected themselves. That was the exciting part, because Bottlefly are as pop as pop can get, but there are also a couple of rock guys in the band, and I wanted to accommodate everything. It was a merger of a lot of things, and, somehow, we made it work."

The working relationship between Caudieux and Fraser (AC/DC, Aerosmith, Metallica) began a while ago with Metallica's boxed set *Live Shit: Binge & Purge*, which Fraser mixed and Caudieux edited. Post-Bottlefly, the two were headed to The Plant Studios in Sausalito, Calif., where Caudieux was producing Joe Satriani's upcoming release and Fraser was handling mixing chores.

Mixes for Bottlefly were done in Burbank at Royaltone's Studio B. Source tracks came from Pro Tools and analog 24 and were mixed down to DA-88s through an Apogee PSX100 24-bit splitter. "It was a lot of work, and it was a lot of fun," says Fraser. "It was a lot of work because, when you work in Pro Tools you can have practically unlimited virtual tracks. So some songs had 70 or 80 tracks, and mixing that can be a challenge. It was a lot of fun because the band is on ten the whole time, and the music is great. It's happy and uplifting, and I found that very enjoyable."

It's Lippman who is the behind-the-scenes force among all these diverse personalities; Bottlefly (which he co-manages with Pat Dorn), Caudieux and Fraser are all signed to his management company, dubbed TLC. No novice in the business, Lippman has plenty of experience working with bands, writers and producer/engineers. In his previous management role at Lippman Entertainment, he was instrumental in launching the careers of Matchbox 20 and producer Matt Serletic, whose *Yourself or Someone Like You* is now certified seven times Platinum. Lippman has also worked closely with producers Nellee Hooper (Madonna, Massive Attack, Björk) and Rick Parashar (Pearl Jam, Blind Melon, Alice in Chains), as well as a number of others.

Now, Lippman is striking out on his

own to build the kind of business he's been thinking about for years. "The nature of this company is to be a creative hub for a diverse musical talent pool," he comments. "I've been fortunate in my career. I've been associated with some very successful projects from their inception to their realization of multi-Platinum status. Over the years, I've been around a lot of great record-makers, and I've learned how to facilitate what they do. That's what I've been groomed on; that's what I know. I also have experience in setting up the marketing and promotion of records. My goal at TLC is to integrate my clientele's resources with the music industry at large and to create win/win opportunities for all concerned."

The roster at TLC is an interesting combination of cutting-edge up-and-comers and vets with solid track records, including Charles Dye, Jim Wirt, Clif Magness, Geza X, Rick Neigher and Tony Visconti; also managed by the company is the band Candlebox. In addition, Lippman has his own label already in place. Named Left Hand, the imprint is distributed by Universal Music Group with Bottlefly scheduled to be the first release.

"TLC is very entrepreneurial," Lippman states. "I, [TLC manager] Michael Davenport and the staff work on all aspects of our client's careers. The diversity of our roster is by design; I think it's very important to mix the seasoned producers with the upcoming ones. I've learned so much from all of them."

Although Bottlefly is a new band, the members have amassed quite a bit of industry experience. Co-producer, writer and keyboardist Wermerling was previously the front man for the successful British pop band Let Loose. Questioned about the feasibility of a record-making British/French/Canadian alliance, he laughs, "We do have a lot of fights, and a lot of bruises to show for it."

Lead singer Arnell is the other co-writer/producer in Bottlefly; he and Wermerling have worked together for several years through several band incarnations. "We started out kind of grunge and Bush-like," he says, "but the music progressed to being less dark and to having more pop melodies. We did so much stuff that we finally started to really have fun doing it, and we kept on with the fun part."

"But it did take a conscious effort," adds Wermerling, "to say, 'Let's go for something that's different and more fun.' We really wanted to bring the concept of the song back in. Along with that, we felt that music was getting a bit boring, and we wanted to do something that would bring a smile back to people's faces."

Okay, we're intrigued by the descriptions of Bottlefly's music; now we need an explanation of the name.

"The idea came the day I caught a fly in my house and put it in a jar," Arnell says. "I put a napkin on it and left it there all day. By evening, it was still alive, so I said to Richie, 'I've got this fly in a bottle, and I want to bring it over, put a mic on it, and tape it buzzing around.' And that's what we did. The fly kept itself alive in the jar till we miked it up; then it died. It had served its purpose. Now we're hoping that we make it the most famous fly ever in the world."

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were appearing! I wrote the charts for an album he recorded in '82, and the 12 people who listened to it liked my arranging, I think, because I ended up getting more gigs." Assignments for Sandy Duncan, among others, led to jingle jobs and eventually a bunch of Broadway assignments.

"I became known as the theater guy who knew synths and rock," he says. "I worked the pit on *Best Little Whorehouse in Texas*, *She Loves Me*, *Chess* and *Annie Warbucks*, among others. It was a lot of fun." In the mid-'90s, Levenson conducted the orchestra on a Roger Daltrey tour, and Levenson says they remain "mates—Roger's a really sweet guy." When producer David Fishof came up with the idea of tracking orchestral arrangements of classic Brit pop, Daltrey recommended Levenson.

Levenson bears the torch for a new generation of arrangers, a class that is thoroughly knowledgeable when it comes to the time-honored method of applying pencil to paper, and razor sharp in the application of computer-based recording techniques. But seven computers and multiple MIDI sequencers? "I find that different sequencers handle specific tasks better than others, so I'll fire up Digital Performer for some things, and Cakewalk for others, for example," he says. "Extending that philosophy, I think the Mac is more appropriate for certain tasks and has the development to back it up, and the PC is more appropriate

for other stuff. For example, I got into Gigasampler very early on, and that's only available for the PC. I'm now very impressed with the software that's coming out of Bitheadz. They're available for both platforms, but their PC stuff is ported over from the Mac side. I'm also a big Sonic Foundry fan, and their products are only available on the PC."

As experienced as he is, Levenson learned a few things working on *British Rock Symphony*, which will be released on Point Music. "This project was an amazing journey. It started out here in my place. Stop two was Metropolis Studios in London, where we recorded a rhythm section that [Ringo Starr's son] Zak Starkey put together. By the way, he's an absolutely amazing drummer; there's no patronage involved in his success." After completing drum tracks on more than a dozen tunes, Levenson trotted over to CTS Studios in Wembley to record the orchestra on a pair of Sony 3348s.

"Ron Nevison was brought in as a co-producer on the project. We needed the kind of singing talent that he had access to, not to mention his great engineering skills," Levenson explains. "We made 24-track slaves and tracked vocals everywhere. Then we took the entire mess to the Record Plant in L.A. to mix. This is where I got a kick in the pants that I'd like to share with *Mix* readers.

"At this point in the process, we're nine months past our orchestral dates in Wembley. The tracking at CTS was done to a very high standard, but with an orchestral date mind-set that is in opposition to the isolation way of thinking that most of us rock guys work in. We'd been working with submixes during the interim and not worrying about exact balances. When we put everything up on a 96-input SSL and found that the oboe was softer than we wanted, we discovered that it was impossible to isolate it! Damn! How could we fix the problem?"

At about this time, computer CPU speeds were getting fast enough to make the concept of software samplers and synthesizers a plausible notion. "I was intrigued by the Unity DS-1 sampler made by Bitheadz and checked it out early on," Levenson says. "The *Brit Rock* album was the first project I used it on, and it helped enormously. After transferring all of my Akai sample libraries over to the computer and selling the hardware samplers themselves, I set out beefing up the reeds, some string parts, percussion and French horns using samples triggered within Unity

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DS-1. What we did was transfer our original tracks over to a Pro Tools rig. I then doubled parts using the Bitheadz software. The results were fantastic!

"These days, I don't leave home without three things: my passport, my G3 400 Powerbook and my Bitheadz software, especially Unity DS-1 and their keyboard library Black and White," he continues. "I also carry an Alesis QSB controller, which I plug into my Opcode MIDI Port 32, which is their USB interface. With this complement of tools, voila, I have a Steinway in my hotel room. I also plan on using the Unity DS-1 on gigs in the near future.

"I don't want to sound like a Bitheadz endorser, but I'm a big fan of theirs. The Unity editor in particular is a remarkable achievement. You can add effects in real time, and it's extremely intuitive to use. For my money, Unity DS-1 played back on a Mac with a MOTU 2408 interface sounds better than Gigasampler on the PC with a Layla interface, although I'm not really sure why.

"Anyway, my bottom-line message to fellow composers who work on projects like the one I've just described is this: Think about isolating instruments in advance. Also, if you plan on adding synths after the orchestra is laid down, leave sonic space for them!"

When Levenson was tapped by Dave Chaimson of Sonic Foundry to compose four demos to highlight the capabilities of their Vegas native hard disk recording software, he turned to de Montebello to help complete the project. "In order to fully show off this software, I wanted to have some live guitar and horn parts. Simply laying down a bunch of MIDI tracks would not have revealed the fact that this is a true recording system. I can't record players in my project studio the way they can be tracked in a dedicated live room, and so I went down to Charles' studio to track these parts and mix."

CDM is based on a new mode of thinking. Specializing in voice-over and post-production work for spots and a lot of audio-book work, de Montebello does more tracking and mixing inside the computer than he does using outboard gear and a traditional console-based environment. "I have a custom PC Pentium 2 that was built for me by Waves Distribution, and I do 85 percent of my work inside this box," says de Montebello. "I use a pair of Yamaha O3D consoles and some outboard gear, but most of my processing, including the extensive mastering work I do for project studio clients, is handled in the PC.

"Keith's Vegas project was interesting," de Montebello continues. "We worked in several different ways. On one or two of the tunes, he brought in his own computer, and we used the Yamaha consoles as a digital throughput path to get his tracks into my computer. Once the material was residing in my box we were able to go ahead and add live tracks.

"On the other pair of tunes, Keith simply brought down DATs that had stereo mixes of .WAV files, which I loaded into my Vegas software, and on we went. One point I'd like to mention is that people are, in my view, way too caught up with timecode issues. The flexibility that comes with working in a nonlinear multitrack environment is such that all you really need are your ears, and maybe a two-beep! It's so easy to slide tracks around until they feel right."

De Montebello has a piece of advice for those who want to record native and use plug-ins. "It's true that the computer can get bogged down when you start adding lots of Direct X effects in real time. Remember: The old adage that less is more is sometimes true! Also, you can always print tracks with effects and go on working. If you later decide that there was too much reverb on your backing vocal comp track, for example, you can simply trash that file and recall the original."

Levenson continues to look forward. He's currently working with a multitude of manufacturers, including Korg, Sonic Reality and Apple, developing new forms of entertainment for Internet and multimedia applications. (Keith can be reached by e-mail at Kleven1111@aol.com.)

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—FROM PAGE 191, NASHVILLE SKYLINE

would appeal to others in that market.

"Like a lot of people who come here from New York and Los Angeles, I was attracted by the lifestyle and the cost of living," says Caprio, who picked up his nickname from his high-school band days on Long Island years ago. He came to Nashville three years ago to reconnoiter and then sent for his partner. "The studios here are great, but I was used to working in places up in Woodstock, where the vibe is much more relaxed and the focus is more intensely

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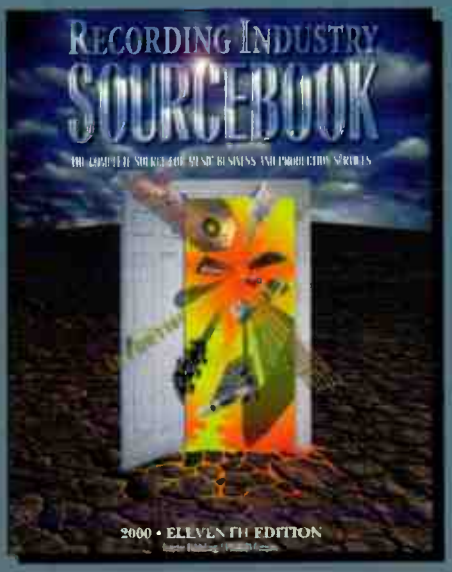

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on long-term projects. Nashville can be a factory town when it comes to music."

The pair built most of the one-control-room facility themselves, creating three separate sizable recording spaces with 12-foot ceilings and hardwood floors. There is a Mackie 8-bus console and a very vintage 3M 2-inch 24-track deck, abetted by three 20-bit Alesis ADAT decks.

Caprio believes Interzone can be a successful hybrid facility. It houses both the partners' music production work and Caprio's music library productions, and it's available at attractive prices, between $300 and $500 per day. Interzone also has built in onsite CD-R duplication and Internet promotion. But Caprio does not see Interzone as existing outside the local studio community. "I want to be part of it," he says. "I've been here for three years, and I've met them, and I like them. Nashville can have that kind of effect on you, even if you're from New York."

Not quite as new but more fashion-forward is Universal Digital, a three-year-old company on Music Row that has developed a strong niche in two nontraditional audio areas in Nashville: computer telephony, and mastering for Internet music and video formats. Company president Drew Oeltmann founded Universal in early 1999 after working at another Nashville voice talent company, Worldly Voices. Building on that experience, Universal Digital started compression services for a range of clients. For the IRS, for example, it did as many as 500 telephone-prompt audio clips. But in just the last few months of 1999, music and music video compression for the Internet have boosted the company's revenues by as much as 25%, and Universal began drawing work from a host of Internet startups that have mushroomed in recent months in Nashville, such as tappedinto.com. "The funny thing is that doing this same sort of work for music is actually easier than doing it for telephony," Oeltmann says.

Telephony remains the bulk of Universal Digital's business. This shows considerable potential for further growth from foreign markets, as U.S. cellular providers establish footholds overseas in countries where markets outgrow the ability of land lines to keep up. "If a U.S. company gets the contract to put in cellular service in the mountains of Brazil, they need voice prompts in Portuguese, and they'd rather come to us than to try to find a studio in São Paulo that understands compression," Oeltmann explains.

Why is Nashville getting much of this work? Aside from the fact that location is less an issue in virtual commerce, Oeltmann notes that there is no tax on recording services in Tennessee, and the city's lure as a media center gives companies like his access to a wealth of voice talent from a wide variety of cultures and languages. And then, of course, there is the base of engineers, musicians and peripheral services like equipment rentals. "It's all right here," he says.

E-mail Nashville news to danwriter@aol.com or fax 615/646-0102.

—FROM PAGE 191, SESSIONS & STUDIO NEWS

MacMillan. Also, **Foreigner** tracked new songs for a CMC release. **Marti Frederiksen** and **Mick Jones** produced; **Mikal Reid** and **Sergio Garcia** assisted...**Warren Zevon** was in at **Signet Soundelux Studios** (L.A.), working with engineer **Jimmy Hoyson**...It's in the DNA at **DNA Mastering** (Studio City): **A.J. Croce**, son of **Jim Croce**, had a project mastered by owner/engineer **David Donnelly**. Engineer **Brad Vance** worked on an Atlantic CD for **Mr. Big** with producer **Pat Reagan**...**Norm McDonald** overdubbed at **Westlake Audio** (L.A.) for an upcoming comedy album. **Brooks Arthur** produced, **Gabe Veltri** engineered, and **Pablo Munguia** and **Fredrick Sarhagen** assisted. **Oblivion Dust** also tracked and mixed songs on their Avex Trax release with producer **Ray McVeigh**, co-producer/engineer **Krish Sharma** and assistant **Kevin Guarnieri**...**EPMD** worked with **DJ Quik** and **Xzibit** on a Def Squad/DreamWorks CD at **Skip Saylor** (L.A.). Quik co-produced with **Eric Sermon**. **Regula Merz** assisted...At **Scream Studios** (Studio City), **David Kahne** and **Brian Eno** produced **Sugar Ray**'s "Spinning Away" for the upcoming film *The Beach*. **James Murray** assisted...Producer/engineer **Ed Cherney** recently did Extasy, namely **Extasy Recording Studios South** (L.A.), and tracked a new Universal album by **Jann Arden** with engineer **Ronnie Rivera**...

NORTHWEST

Sir Mix-a-lot and the **Presidents of the United States of America** mixed it up at **Rainstorm Studio** in Bellevue, WA. Their new group **Subset** was joined by **Paul Speer** and **Steve Carter**...**Xtreme Studios** (Seattle) picked up a scoring session for *Picking Up the Pieces*, Alfonso Arau's black comedy starring **Woody Allen**.

Picking Up the Pieces
composer Ruy Folguera

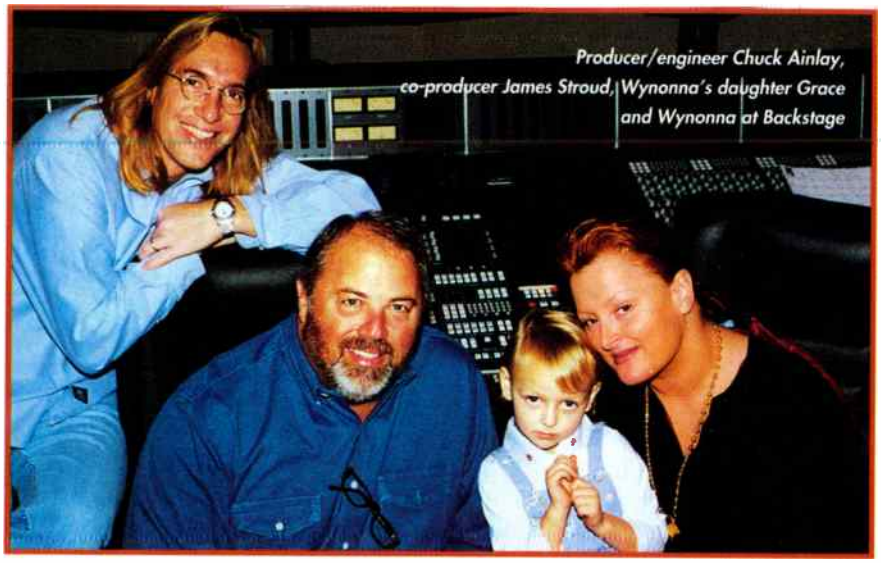
Gustvao Borner mixed Ruy Folguera's score with music supervisor David Franco and assistant Steve Smith ...Joel Jaffe of Studio D (Sausalito, CA) engineered and mixed live sessions for broadcast on 97.3 Alice radio, including performances by Smashmouth and Indigo Girls...At Soundhouse (Seattle), Scott Crane engineered sessions with noted artist/producer Hector Zazou, who called upon Seattle luminaries Bill Rieflin, Jeff Greinke and Dennis Rea...Swiss rock band Mostly Harmless flew in to Hanzsek Audio (Seattle) to work with engineer Scott Ross...Tucker Martine engineered sessions with Sick Bees, Carrie Akre, Acetylene and Mount Analog...At Egg Studios (Seattle), Wanna Be's, Rick Roberts (former Posie), The Troops and The Drews all worked with in-house engineers Conrad Uno or Johnny Sangster...Rex Recording (Portland, OR) hosted the Backstreet Boys, who did the background vocals on one song for Elton John's upcoming DreamWorks release. Patrick Leonard produced; David Channing engineered...At Laughing Tiger Studios (San Rafael, CA), Dwayne Wiggins of Tony! Toni! Tone! recorded and mixed his forthcoming Motown solo debut with engineers Ari Rios and Joey Swails...Barry Corliss at Master Works (Seattle) mastered a live CD by The Herbivores (with Jay Roberts) and a project by Two Loons for Tea (with Pat Mastellato and Brad Hauser)...Tin Hat Trio mixed their upcoming Angel CD at Different Fur (San Francisco) with producer Hans Vendle, engineer Mark Orton and assistant Mark Slagle...

NORTH CENTRAL

Recording John Malkovich: Audio Recording Unlimited (Chicago) recently took on the not-so-surreal task when the actor dropped in to re-record parts of his dialog for the upcoming film *Shadow of the Vampire*, directed by Elias Merhige. Engineer Mark Zeboski hooked up with Magmasters Studios in London vida ISDN lines for the ADR session. "John was great to work with," said Zeboski, who recorded 47 scenes of dialog in less than four hours with the

John Malkovich

Steppenwolf Theatre co-founder... Smashing sessions at Chicago Recording Company: Smashing Pumpkins mixed their new Virgin album with mixer Alan Moulder. Billy Corgan and D'Arcy also made a guest appearance on Cheap Trick's first DVD, filmed at Chicago's Metro with authoring by Sean Sutton and 5.1 surround mixing by Harry Witz. R. Kelly produced sessions with Secret Weapon, Talent and Changing Faces & Sparkle with engineers Tony Maserati, Jeff Lane and Ron Gresham. Jazz legend Ramsey Lewis and Danny Leake mixed two Narada albums by the Lewis trio and Urban Knights 3...No sleep for Lullaby for the Working Class: Bandmembers Mike and A.J. Mogis recently put out a new record, *Song*, on Bar/None Records, and they've been busy recording a host of indie rock bands at their project studio, Dead Space, in Lincoln, NE. Crank! bands the Gloria Record, Boy's Life and Cursive and Secretly Canadian combos Songs Ohia and Swearing at Motorists have recorded there...Ancient of Days recently made a second attempt at musical immortality at Immortal Productions (Canal Fulton, OH), where they tracked and mixed their album with producer Cal Moore...

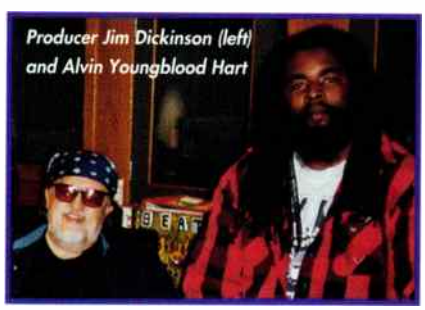

Producer/engineer Chuck Ainlay, co-producer James Stroud, Wynonna's daughter Grace and Wynonna at Backstage

NORTHEAST

Magic Shop kept generating the magic in NYC: *Yo, I Killed Your God* guitar guru Marc Ribot recorded his new Atlantic CD with producer J.D. Foster, engineer Andy Taub and assistant Juan Garcia. Eagle-Eye Cherry tracked new songs with producer Rick Rubin, engineer Dave Schiffman and assistant Garcia. Joey Ramone worked with producer Daniel Rey, engineer Jon Smith and assistant Garcia. Ben Folds Five tucked themselves into the studio with producer Caleb Southern and engineer Garcia, and Arto Lindsey produced Spanish vocalist Marissa Montes with engineer Pat Dillet and assistant Reto Peter...Mariah Carey's hit song "Heartbreaker" was mastered on Quantegy's GP9 analog audio tape at Quad Studio (NYC) by engineer Dana Jon Chappelle...Spacehog found studio space at Bearsville Sound Studios (Bearsville, NY) with producers/engineers Paul Kolderie and Sean Slade and engineer Damien Shannon ...Anthony Resta and Karyadi Sutedja worked on Shawn Mullins' CD at Bopnique Musique (North Chelmsford, MA)...

SOUTHEAST

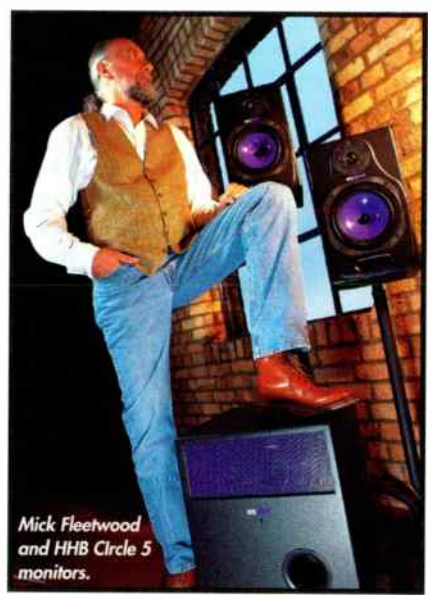
Wynonna whisked into a few studios recently: She mixed at Backstage Studio (Nashville) with owner/producer/engineer Chuck Ainlay (on the new SSL Axiom-MT console) and at East Iris (Nashville) with producers Gary Nicholson and James Stroud and engineers Ed Cherney and Kevin Szymanski...Rod Stewart rasped out vocals for his new Warner Bros. CD at New River Studios (Fort Lauderdale, FL) with producer Chris Neil, engineer Simon Hurrell and assistant Steven Reines...At Bias Recording (Springfield, VA), Bob Dawson tracked and mixed the Charles Brubeck Quintet's *Without Measure*...Clout hammered out the groovecore with producer/engineer Rob Tavaglione and mastering engineer Dr. Strangelove at Catalyst Recording (Charlotte, NC)...Steely Dan guitarist Elliott Randall worked on an Internet project at SoundMixers Recording Studios (Pembroke Park, FL) with engineer W. Damian Mazur...Alvin Youngblood Hart mixed his next Rykodisc release at Ardent Studios (Memphis, TN)


Producer Jim Dickinson (left) and Alvin Youngblood Hart

with producer Jim Dickinson and engineer Pete Matthew...

STUDIO NEWS

Cosimo Matassa's J&M Recording Studio was designated on an official historical landmark by the city of New Orleans on December 10. The date is the 50th anniversary of the historic first session of Antoine "Fats" Domino and Dave Bartholomew at the studio. Ray Charles, Little Richard, Lloyd Price, Jerry Lee Lewis, Roy Brown, Professor Longhair and Guitar Slim also made pioneering rock 'n' roll and R&B recordings there...Doppler Studios (Atlanta) installed an mSoft ServerSound hard disk audio retrieval system...Mick Fleetwood chose the HHB Circle 5 monitoring system for his studios in the UK, L.A. and Hawaii. He'll use them to review Fleetwood Mac's live sessions for the BBC


Mick Fleetwood and HHB Circle 5 monitors.

...NeverNever Music recently moved to the trendy Los Feliz area of L.A....Patchwerk Studios (Atlanta)., owned by Atlanta Falcons tackle Bob Whitfield, recently scored its first SSL 9000 J. Producer/composer Kenny "Babyface" Edmonds' Hollywood studio, Brandon's Way, also acquired a 9000 J. ■

Fax your Sessions & Studio News to 510/653-5142 or e-mail Kim_Chun@intertec.com.

▪ STUDIO SHOWCASE ▪

Akashic Recording Studio

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Nestled in the wilderness above Boulder, Akashic provides the environment conducive to your best, most inspired work. Featured in *Mix*, Aug. '94 ("truly a top-flight facility"—*Blair Jackson*). Pro Tools MIXPLUS, Sonic Solutions mastering, audio upgrades optimized console and 2" 24-track analog (Sony MCI JH-24), Sontec, Tube-Tech, Jeff Rowland, Cardas, Steinway, Lexicon, Ecoplate I & II. Clients: Big Head Todd & the Monsters, String Cheese Incident, Patrick Leonard, Bill Frisell, Ron Miles, Richie Cole. Leasing and residential services available.

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ANALOG TO DIGITAL CONVERTERS

Rosetta 96k
24-bit Analog to Digital Converter

The high-end quality analog to digital solution for the project studio. With support for both professional and consumer digital formats you can now record your audio at a higher resolution and with greater detail than standard converters found on MDM's, DAT's and DAW's. Ideal for mastering or tracking.

FEATURES–
- 24-bit, 44.1-48, 88.2-96 kHz Sample Rate (±10%)
- 116dB dynamic range (unweighted)
- Improved UV22HR for 16 and 20-bit A/D conversion

FRONT PANEL:
- Power switch • Sample Rate (44.1, 48, 88.2, 96kHZ)selector • 16-bit (UV22), 20-bit (UV22) and 24-bit resolution selector • S/PDIF-ADAT optical selector • Soft Limit on or off • 12-segment metering w/ over ondicator & Meter Clear switch • Level trim

REAR PANEL:
- XLR balanced inputs • 2 x AES/EBU for 88.2/96kHz 2 channel path, Coaxial S/PDIF, switchable S/PDIF or ADAT optical outputs • Wordclock out

AD 9624
24-bit Analog to Digital Converter

Transparent analog to digital conversion designed to bring your music to the next level. XLR balanced inputs feed true 24-bit converters for revealing all the detail of the analog source. 16-bit masters can take advantage of the AD9624's noise shaping function which enhances clarity of low level signals.

FEATURES–
- 24-bit precision A/D conversion • Support for 32, 44.1, 48, 88.2 & 96kHz sample rates • Wordclock sync input • Selectable 16-bit noise shaping
- Simultaneous AES/EBU, coaxial and optical S/PDIF outputs • 20-segment LED meters w/ peak hold & clip indicators • **ALSO AVAILABLE:** DA9624 24-bit D/A converter

DIGITAL MULTI-TRACK RECORDERS

TASCAM
DA-88 Modular Digital Multitrack

The standard digital multitrack for post-production and winner of the Emmy award for technical excellence, the DA-88 delivers the best of Tascam's Hi-8 digital format. Its Shuttle/Jog wheel and track delay function allow for precise cueing and synchronization and the modular design allows for easy servicing and performance enhancements with third-party options.

FEATURES–
- 1:48 minutes record time on a single 120 min tape
- Expandable up to 128 Tracks using 16 machines
- User-definable track delay & crossfade
- Shuttle & Jog capability
- Auto punch with rehearsal
- SMPTE, MIDI and Sony 9-Pin sync capability
- Options include RC-828/898 Remote Controllers, IF-AE8/IF-88SD digital interfaces, MU-Series meter bridge, MMC-88 MIDI machine control interface, SY-88 Sync Card

DA-38 Digital Multitrack for Musicians

Designed especially for musicians, the DA-38 is an 8 track digital recordor that puts performance at an affordable price. It features an extremely fast transport, Hi-8 compatibility, rugged construction, ergonomic design and sync compatibility with DA-88s.

ALESIS
ADAT M20
20-bit Digital Audio Recorder

The M20 represents Alesis commitment to meeting the high-standards of world-class audio engineers, producers, studio owners and high-end video and film post production studios. A new professional digital multi-track, the M20 records 20 bit for outstanding sound quality. Combined with a host of production features like SMPTE/EBU, the M20 is a powerful tool.

FEATURES–
- SVHS Recording format - up to 67 minutes recording.
- 18-XLR connections (9 in and 9 out) as well as a 56-pin ELCO connection. • Digital I/O
- Includes LRC remote and a digital cable.
- 24-bit, 64x oversampling recording, 20-bit, 128X over-sampling playback

ADAT XT20 Digital Audio Recorder

The New ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra high fidelity 20-bit oversampling digital converters for sonic excellence, it could change the world.

FEATURES–
- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.

ADAT OPTIONS–
- **BRC** for all Adat (except M20) w/ 460 locate pts. smpte/absolute time & bar and beat timing references, digital editing and transport control for up to 16 ADATs
- **AI3** 20-bit 8 channel analog - optical I/O interface
- Remote control
- Servo-balanced 56-pin ELCO connector
- Built-in electronic patchbay
- Copy/paste digital edits between machines.
- **CADI** remote control/autolocator for M20 w/ jog/shuttle & rj-45 ethernet connector for long distance cable runs
- **Adat/Edit** integrated PCI digital audio card and software for recording and editing on Mac & Windows computers

CD RECORDERS

HHB
CDR-850 CD Recorder

The new HHB CDR850 is one of the most comprehensive CD-R, CD-RW recorders available today. It delivers the outstanding sound quality that HHB is known at a lower price than previous models. Equipped with a complete range of analog and digital I/O and easy to use one touch recording modes make the CDR850 suitable for any audio environment no matter how sophisticated or demanding.

- CD-R, CD-RW compatible
- All functions accessible from front panel menu
- 4 one touch recording modes: 2 manual, 2 automatic
- Sample rate converter accepts any digital signal from 32kHz to 48kHz including varispeed
- Copies all CD, DAT, MD, DVD and DCC tarck starts
- Complete user control over SCMS
- Balanced XLR analog I/O. Unbalanced (RCA) phono analog I/O, AES/EBU digital input, coaxial & optical S/PDIF digital I/O

STUDIO DAT-RECORDERS

TASCAM
DA-45HR Master DAT Recorder

The new DA-45HR master DAT recorder provides true 24-bit resolution plus standard 16-bit recording capability for backward compatibility-making this the most versatile and great sounding DAT recorder available. With support for both major digital I/O protocols plus the ability to integrate the machine into virtually any analog environment, the DA-45HR is the ideal production tool for the audio professional.

FEATURES–
- Word Clock
- 24-bit A/D and 20-bit D/A with dither
- XLR balanced and RCA unbalanced analog I/O
- AES/EBU and S/PDIF digital I/O
- Word Sync In/Thru
- Alphanumeric data entry for naming programs
- Independent input level adjustment capability
- Output trim for XLR balanced analog output
- Optional RC-D45 Remote Controller

Panasonic SV-3800

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 20-bit D/A converters to satisfy even the highest professional expectations. The **SV-4100** adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more. Panasonic DATs are found in studios throughout the world and are widely recognized as the most reliable DAT machines available on the market today.

FEATURES–
- 64x Oversampling A/D converter for outstanding phase characteristics
- Search by start ID or program number
- Single program play, handy for post.
- Adjustable analog input attenuation, +4/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search

Fostex
D-15 Pro Studio DAT Recorder

The new Fostex D-15 features built in 8Mbit of RAM for instant start and scrubbing as well as a host of new features aimed at audio post production and recording studio environments. Optional expansion boards can be added to include SMPTE and RS-422 compatibility, allowing the D-15 to grow as you do.

FEATURES–
- Hold the peak reading on the digital bargraphs with a choice of 5 different settings
- Set cue levels and cue times
- Supports all frame rates including 30df
- Newly designed, 4-motor transport is faster and more efficient (120 minute tape shuttles in about 60 sec.)
- Parallel interface • Front panel trim pots in addition to the level inputs

D-15TC & D-15TCR

The D-15TC comes with the addition of optional chase and sync capability installed. It also includes timecode reading and output. The D-15TCR comes with the further addition of an optional RS-422 port installed, adding timecode and serial control (Sony protocol except vari-speed)

SONY PCM-R500

Incorporating Sony's legendary high-reliability 4D.D. Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.

FEATURES–
- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls
- SBM recording for improved S/N *(Sounds like 20bit)*
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TUBE MICROPHONES

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legendary tube mic developed by AKG over 10 years ago. The carefully hand-ade large dual diaphram capsule offer a ky smooth, transparent high end, quisite mid-range and a deep, rich bass sponse. Nine polar patterns and 3 bass ll-off positions are provided for unsur-ssed flexibility. An outstanding mic for e serious recordist.

EATURES-

e-issue of classic tube mic the C12
olar patterns include: Cardioid, mnidirectional figure 8 and six intermedi-te settings accessible via remote control
position Bass-cut filter (Flat, 75 & 150Hz)
ıcludes N-12cr power supply, H15/T shock uspension 10M cable, W42 foam wind-creen and professional metal case
requency response 30Hz to 20kHz

audio-technica. AT4060

ombing premium 40 series engineering and vintage tube hnology, the AT4060 delivers ersatile and competent studio crophone. Low-noise and h SPL capabilities make the 4060 a premier vocal mic as ll as strings, guitars and other nanding applications.

ATURES-

) - 20,000 Hz freq response
ual gold-vaporized large aphragm elements
cludes the AT8560 power supply, AT8447 shock ount, rack mount adapters and case.

MICROPHONES

SHURE KSM-32

he new KSM32 side-address microphone fea-es an extended frequen-response for open, nat-l sound reproduction. itable for critical studio ording and live sound duction. Shure steps up he plate with another sic.

ATURES-

ass A, transformerless preamplifier circuitry for proved linearity across the full frequency range ceptionally low self-noise and increased dynamic nge necessary for highly critical studio recording. dB attenuation switch for handling high SPLs. witchable low-frequency filter to reduce vibration ise or to counteract proximity effect. eat for vocals, acoustic instruments, ensembles and erhead miking of drums and percussion. model also features an elastic shock mount which eatly reduces external vibrations.

BPM CR10

he BPM CR10 Studio Condenser Mic eatures a full frequency response for petition against the best of the best.

ATURES-

Gold diaphragm
itable for most guitar and vocal cording applications.
cludes Custom Aluminum Road se, XLR-cable, wind screen and stic suspension.

SAMPLING

AKAI S5000 & S6000 Studio Samplers

Akai is proud to announce its next generation of samplers with the introduction of the S6000 and the S5000. Building upon Akai's legendary strengths, both machines feature up-to 128-voice polyphony and up-to 256 MB of RAM. They use the DOS disk format and .WAV files as the native sample format allowing standard PC .WAV files to be loaded directly for instant playback - even samples downloaded from the Internet into your PC may be used. And of course, both the S6000 and S5000 will read sounds from the S3000 library.

FEATURES–

- OS runs on easily upgradeable flash ROM.
- 2x MIDI In/Out/Thru ports for 32 MIDI channels
- Stereo digital I/O and up to 16 analog outputs.
- 2x SCSI ports standard
- Wordclock connection
- Optional ADAT interface provides 16 digital outs
- .WAV files as native sample format

S6000 ONLY FEATURES–

- Removable front panel display
- User Keys
- Audio inputs on both the front and rear panel allow you to wire the S6000 directly into a patchbay from the back and override this connection simply by plugging into the front.

E-mu Systems, Inc. E4XT ULTRA Professional Sampler

The Emulator legacy continues with the new ULTRA series from E-mu. Based on the EIV samplers the new 32-bit RISC processing of the E4XT guarantees faster MIDI response, SCSI, DSP and sampling.

FEATURES–

- 128 voice polyphony
- 64mb RAM (exp. to 128)
- 3.2GB Hard Drive • Dual MIDI (32 channels)
- 24-bit effects processor • 8 bal. outs (exp to 16)
- Word Cloack& AES/EBU I/O
- EOS 4.0 software
- 9 CD ROMS over 2GB snds

MIC PREAMPS

HHb Classic 80 Pentode Tube Mic Pre

Fronted by a low noise EF86 pentode tube and 2 additional triode tubes per channel gives this pre amp detail, openness and presence. Input and output level controls allows precise control of harmonic contribution of the tubes.

FEATURES-

- 2 Channel Mic Pre • Balanced Mic Ins w/48V Phantom Power • Dedicated 1/4" instrument input
- High & Low pass filters w/ 3 cut off frequencies (HPF - 50Hz, 100Hz or 150Hz) (LPF - 5kHz, 10kHz or 15kHZ)
- Phase reverse on channel 2
- Drive & Peak LED's • Large rotary output faders
- Illuminated VU meters • 250V HT voltage rail

dbx 586 Vacuum Tube Mic Pre

The DBX 586 Vacuum Tube Dual Mic Preamp uses hand selected and matched premium 12AU7 vacuum tubes ensuring ideal characteristics for a warm, distortion free signal path. Custom designed analog VU meters monitor tube level insert path or output levels well Line/Instrument and mic inputs make the 586 versatile enough to use with virtually any input source.

FEATURES-

- Mic or line/instrument inputs on each channel. +4/-10 operation.
- Drive control for a wide variety of great tube effects
- 3-Band EQ with sweepable frequency
- Optional TYPE IV Conversion System outputs
- Separate 1/4" insert send/return on each channel

JOE MEEK VC1 Studio Channel

The Joe Meek Studio Channel offers three pieces of studio gear in one. It features a transformer coupled mic pre, compression and a professional enhancer together in a sleek 2U rackmount design!

FEATURES-

- 48V phantom power, Fully balanced operation
- Mic/Line input switch
- High pass filter for use with large diaphragm mics
- Extra XLR input on front makes for easy patching
- Compression In/Out & VU/Compression meter
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC

MONITORS

KRK EXPOSE E7 Active Studio Monitors

When you need a truly neutral sounding near field monitor, look no further than the Expose E7 by KRK. From the unconventional enclosure shape that eliminates the resonances found in parallel designs to the custom designed Kevlar cones and bi-amplification, every aspect of this reference monitor has been built from the ground up to deliver sonic purity.

FEATURES-

- 7" Kevlar LF Driver
- 1" Kevlar HF Driver
- 54Hz - 20kHz, ±3dB.
- Bi-amplified 140 watts/side @ 8 Ohms
- Neutrik XLR/ 1/4" combo connector
- 109dB Max SPL continuous

M6000/S Studio Monitors

The KRK M6000/S are designed for close-field monitoring. A smooth frequency response in a compact size make these units portable and efficient.

FEATURES-

- High power handling
- 82Hz - 20kHz, ±3dB.
- Compact and portable
- Low distortion
- Smooth frequency response
- Custom Gray finish.

MACKIE. HR824

These close field monitors from Mackie have a wide deep response with exceptional detail. Each pair of these biamplified speakers has been clinically matched to ensure optimum performance.

FEATURES-

- 8.75" polypropylene woofer, 1" aluminum dome tweeter
- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- 1/4" and XLR inputs
- Hi frequency adjustment, to fequency roll-off switch
- Frequency Response 39Hz to 22kHz, ±1.5dB

Hafler TRM-8 Powered Studio Monitors

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Trans•nova power amp circuitry.

FEATURES-

- 45Hz - 21kHz, ±2dB
- 75W HF, 150W LF
- Electronically & Acoustically matched
- Also Available!! TRM-6 Monitors

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—FROM PAGE 20, BIG CHAIR, BIG DEAL

Someday I am going to have to put some duct tape on it, as a sort of tribute to the American Way (and roadies the world over).

Anyway, sit back if you can in *your* favorite evening lounge chair—you know, the one you watch movies in or maybe just sit in with your feet up when you get home from work or after a good meal. Lean back and settle in. Pull all the levers if ya' got 'em, flip out the leg rest or pull up the 'ol ottoman. Get *comfortable.* Let it support you. Enjoy that warm feeling of familiarity. Let out that just inaudible sigh of pleasure and relief that comes when you feel comfortable again, and you realize how much you really missed it all day.

Now put your arms up on the rests. Take a few minutes, feel the Chairma...

VIRTUALLY COMFORTABLE

Okay, recess is over. Now get up, collect some pillows and blankets and bring them back to your chair. Sit back down, and use the stuff to pad, build up and modify whatever you need to in order to make the chair fit you *perfectly.* Duct tape may be necessary.

When you have it right, make your room as quiet as possible and sit back down, with your arms again on the rests. Close your eyes and let your head fall into the headrest you made out of sweaters and that pink foam your new video card came in. Try to let go of that fear that someone might come home and actually see you in this absurd cocoon. Just *sit there* for a moment.

This is how I want to mix.

I want to walk into an acoustically perfect room with no gear, no machines and no keyboards. I want to sit in a perfect chair, dim the lights, reach out slightly with my fingertips...and mix.

And the time has come. Just now. Sort of. Kinda.

Virtual mixing has long been a dream and even a plan of mine. Every new stereoscopic headset that I hear about, I try. Every data-glove, every RF position-detecting VR headset. But they have always been too big, too heavy, too hokey and too slow. Anyway, the displays have been far too low-res for the type of work we do.

But things have changed. Having cooperated with the chair-modification exercise at the beginning of the column, you already know exactly what you want your mixing chair to be. And you already know from experience how much easier it would be to build a great control room if you didn't have to worry about reflective ringing surfaces like consoles and racks. Not to mention glass. No glass. One person in an acoustic shell—a couple of speakers and the VR snake. One mixer with the entire world in 360.

THE EYES HAVE IT

Olympus is already selling the Eye-Trek, featuring radically new compound curve prisms that deliver bright, much more linear images than previous electric eyes and at significantly less weight. TFT technology is finally bringing us very colorful LCD images (although new organic LCD-type technologies are coming that promise quantum leaps forward—again).

I want to walk into an acoustically perfect room with no gear, no machines and no keyboards. I want to sit in a perfect chair, dim the lights, reach out slightly with my fingertips... and mix.

Sony is finally selling its new Glastron dual TFT LCD TV glasses as well. With *much* higher resolution than the Eye-Trek, the much higher price may well be justified.

While neither of these systems offer 3-D imaging, they both utilize dual LCD panels, one for each eye. This means that they are already mechanically capable of doing what we need for the visual part of truly functional VR mixing—they just need electronic conversion.

So we need the glasses stereofied, and we need to add a tiny antenna to each ear piece so that our VR system knows when we have turned to the right to reach the decay knob on our virtual rackmounted reverb.

Then we need one fast computer. Okay...Have you seen what the machines that came out this month can do? And imagine what dual copper G4s at a full Gigahertz will do before the end of 2000. This will be fast enough to put us into a suitable 3-D VR control room in real time without nauseating interactive movement delay.

There are new lightweight data gloves that have more than enough sensitivity and resolution to slide faders and twirl knobs—*with tactile feedback!*—and they are made out of breathable, fashionable Lycra.

Speakers stay the same. Earphones are out of the question—we just aren't there yet at all.

TRUE DRAG-AND-DROP

This leaves the VR DAW itself. I see two ways to go, and one way not to. Let's get rid of the "not to" first. No esoteric abstracts. No waving your hands through waves of 3-D Learyesque multidimensional, multicolored clouds in space. No stretching, bending or juggling geometric shapes. Nothing arbitrary—we can leave that to Microsoft. We should keep it simple. And here is what I think fills the bill.

The first way is the obvious. Not the most powerful or versatile, but certainly the most obvious and easy to grasp. We simply re-create a conventional control room. You reach out and touch something like you have always done, you see your own hand, and the data glove tells you with tactile feedback when you have contacted it. Heads-up meters and patchbay routing should be logical enough to appear in this new world right off the bat without scaring anybody. Zooming in for close work and pop-up windows for things like graphic EQs and RTAs should seem normal enough after a few days. Sound like fun?

Then try this. Let's say you have been using the interface above for three months or so, and you are ready to move up, to leave behind the constraints and limitations of your mechanical control room, be it real or virtual.

A camera in the studio takes a video of every player during every take. After all, you have been watching and interacting with him or her all day through a virtual video control room window anyway, so the data acquisition technologies are already in place. As you play back and add tracks, every recorded track plays back not only audio but the image of the musician playing it as well—in a 3-D virtual world. You pan

and image your mix by literally grabbing these little micro-muses and placing them where you want in the 3-D stereo field—left, right, closer, farther back.

New live tracks coming in appear right in there with the rest of the players but on little red disks to show they are being recorded. Arm a musician for automatic punch-in and he gets a flashing red wire-frame disk that goes solid when he is being printed. A row of 3-D squares float over the head of the player about to be punched—with each square turning from blue to red on the downbeats, counting down visually to the punch point. And you thought only *you* get the VR glasses?

And each one of the ghost-players can have a peak meter right by his or her side. Why not? All it takes is speed. *All* the technology is already here. There are no new technologies to invent for this to happen.

VIRTUAL SURF

Okay, now we give each little player projection a nice 3-D signal flow ribbon showing how the track is routed. One might go to a compressor before it goes into the mixing bus, for example. This compressor would be floating between the play field and you, showing attack and release graphics, and would open up for adjustment upon being touched. Why not?

All it takes is speed. All the technology is already here. There are no new technologies to invent for this to happen.

And did I mention that you could put stuff like gobos and giant pillows on this VR stage along with the players and hear the results in real time?

I see an amazingly clear way to show and edit complex automation data, but you do know I design virtual mixing interfaces, don't you? I gotta have something unique to show you at AES in a few years, don't I?

And I suspect I won't be the only one. Relatively soon you will have your pick of virtual control rooms. No doubt there will be everything from two kilobuck wire-frame home units to luxurious Bubinga-paneled acoustic disasters with floor-to-ceiling glass revealing endless waves of crashing Hawaiian surf. And again, why not? You will only be *looking* at this stuff; you don't have to *hear* it.

This is what I have dreamed of for decades. Well, it's not the *only* thing I have dreamed of, but it is the only one I am going to mention here.

I assure you that I am pursuing this technology, but I share some of my dream here now in hopes of getting you to start thinking about what you might want in a VR studio. So think it over. I will ask someday. ■

SSC sees the present as a virtual projection of historic images stored in the future anyway, so all this feels very natural to him. He thinks this sentence makes sense: Walk ahead, turn around and look back to see where you are now.

IT'S A NEW CENTURY... ARE YOU READY?

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An attendee addresses panelists with a question at StudioPro99

(L-R) Allen Sides, *Mix* editor George Petersen, Dave Reitzas, Dave Collins

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CIRCLE #143 ON PRODUCT INFO CARD

—FROM PAGE 40, ALAN MOULDER

I use it because it's quick. I have got a lot of samples in it that I can quickly flick through and see which ones suit the track. I don't like replacing sounds using MIDI maps because I find they drift. Especially with kick drums, the attack's not the same. The next thing, I suppose, would be to record it into digital audio and move it so it's spot-on, but at this stage I find the Forat much quicker. Also I can change the tuning, adjusting it as I go. I got into it early on, working with the indie bands who would get me in to mix records that had been recorded incredibly quickly in very small studios. The drum sounds weren't as good as they could have been, and they always wanted the guitars deafeningly loud. The only way to get the drums to cut, without having them loud, was to have a sample going underneath to give it some kind of presence and definition. The Forat's done me well; I think there are only two in England now, and every time I reach to turn it on I hope and pray that it's still working.

It's a bit surprising, but I like listening to* The Fragile *at low volume.

Yes, I definitely try to make a mix sound good quiet as well so I tend to mix very quietly. I have it loud at the beginning to get the general vibe, the feel of the rhythm and the drums, but once I'm happy with the basic way it's sitting, most of the balancing is done on the Auratone.

A single Auratone.

Yes. Also, the Auratone makes me mix the guitars louder.

What other monitors do you like?

KRK 7000s. Butch Vig and Billy [Corgan] were using them on *Siamese Dream*, and I got into them. Before that I was using NS-10s as everybody was. I grew to really like the KRKs. They have, since I've got them, time-aligned the bottom end, and what on earth possessed them to do that I can't imagine. I know at least five people who are queuing up for the old ones and don't want the new ones. Of all their range of speakers, and they've got loads of them, to me these are by far the most accurate. They're not particularly flattering, but for balance, I find them great. Everybody I work with likes them and wants a pair, and they can't get them because they don't make them.

Any new gear you're impressed with?

It's an amazing time, I think—there's so much great gear that's come out. Trent got one of those Virus keyboards, which was fantastic, and there's a sampling box—I think it's the SP-808 Roland—which has inboard effects which we used a lot. There's Distressors, and the TC FireworX is good. I've also got a dbx 160S, which I really like. I can't remember a time when so much good gear was coming out—it's expensive trying to keep up.

Do you find yourself doing less in the mix than you used to?

Yes, I'm not that keen to reach for the EQ or the compressor. I think that's something you learn, to try to make what's there work best on its own. I've learned that from the artists I've worked with, who are precious about their sound. They've spent a long while getting the guitar sound, and you're just coming to mix; they don't want you to steam in and ruin it. So, panning, sometimes a bit of slight compression—I guess that's dull really, isn't it?

Trent Reznor has said that the random button on a CD player is his enemy; obviously, the sequence on* The Fragile *was very important. It's interesting that you brought in an outside person, namely Bob Ezrin, [Pink Floyd, Lou Reed] to help sequence the album.

We were just punch-drunk really. I tried sequencing, and it took me three hours to get the first four. We thought we hadn't any objectivity left and it would be great to get somebody else to help. The running order was crucial; we knew if it was wrong it would be a very arduous journey.

It's definitely an album, one of the few these days, that sounds better when you listen to it all the way through. A lot of time was spent getting that right.

Making a whole album is a lot of work in itself. You've done two doubles,* Mellon Collie *and* The Fragile. *Any hints on keeping up the stamina to get through them?

[Laughs] I don't like double albums. But I go back again to my training—working at Trident was almost like being at boot camp. From the beginning, you were thrown into the long-hour deep end of sleep deprivation and of being able to keep it together. Stamina-wise, I can only think it's enthusiasm that keeps you going. On both of those albums, I was working with fantastic bands— you couldn't ask for more inspiration than you got from them. Every day you wake up and it's not a drudge to go into work; you're lucky to be there. It's really just enjoying it and loving it. ■

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—FROM PAGE 52, IN-EAR MONITORS

up, helping me to focus on his/her priorities. It also keeps me apprised of conversations with FOH, where things fall apart first, especially at festivals. And I can go out onstage and troubleshoot while listening to a problem channel or mix that's cued up on the desk. At the same time, the FOH engineer can talk down the intercom to communicate about what's happening at the mix position. Another benefit is that wherever I am, people at either end of the intercom can immediately page me without "flashing" by simply calling my name into the intercom.

BETTER COMMUNICATIONS

The most accurate way to monitor a wireless IEM mix is "on-air" via a similar belt-pack and IEM setup, not through headphones and the mixer's cue bus. The additional cost of a spare belt-pack seems insignificant compared to the crisis that arises when a performer's mix suddenly "goes down." The ability to change out belt-packs quickly in an emergency can protect a technician's sanity and perhaps their job. Other problems, such as the performer leaving the belt-pack (and ear molds) behind (in the limo, dressing room, hotel, etc.) are also avoided by having a spare. When monitoring several wireless mixes, it is not practical to keep moving from one spare receiver to another, and one often needs to solo channels and listen to speaker mixes from the cue output of the console. One solution is a stereo switcher that allows the engineer to select among the various signal paths.

An effective troubleshooting strategy is to use an entire spare wireless IEM system for cueing. This technique provides the same "on-air" response, along with the ability to solo channels and other mixes. An extra belt-pack for this wireless cue system allows the engineer to cue up any troubled mix quickly and hand over the spare with full confidence when moving to a new frequency and hardware. Simultaneously swapping the cue with the troubled mix at the back of the desk allows the operator or assistant to check out the wireless system in question immediately.

STEREO MIXES SOUND BETTER

Stereo IEM mixes allow for a greater variation in mix levels, improve the ability to discern more inputs via panning, provide a greater sense of realism and, most importantly, allow monitoring at lower levels. Spreading instruments across the stereo sound field makes it easier to separate sounds with similar pitch and timbre. Hearing perception is at least 10 dB more sensitive in stereo, so it's easier to listen and possible to maintain lower levels. However, be aware that in most wireless systems, less-than-perfect stereo separation will bring stereo-panned signals back toward center, a problem that is easily revealed by comparing a wireless IEM with a hard-wired in-ear system.

Guitar players often find the one-dimensional sound of their rig through a single microphone unsatisfying on IEMs. Both Hughes & Kettner's RedBox PRO and Whirlwind's Mic Eliminator are examples of active direct boxes with equalization networks that imitate a miked speaker cabinet. Rapco's DB-101SL is an inexpensive passive DI that has an EQ network and accepts speaker level inputs. In fact, many DIs can accept speaker level inputs as long as they are in parallel with an actual speaker to take up the load, including the ubiquitous Countryman Type 85 (beware the extra switch on the ¼-inch side that can get you in trouble). When used along with a mic and panned hard, the combination of direct and miked guitar inputs can offer a dimensional quality that not only sounds awesome in the ear mix but is also wide and full over the P.A. Many guitarists are extremely resistant to using direct boxes, so it must be made clear that the goal is to capture the sound after it leaves the warmth of the power amp's tubes (it doesn't work as well with solid-state). When they hear this, they'll understand what they've been missing in their ears. Board tapes will also reflect this improvement.

When mixing for IEMs, it's important to use reverb to create a credible acoustical space, if necessary by adding ambience effects to inputs that would otherwise sound dry through traditional monitor speakers. In fact, much of the challenge of IEM mixing is the creation of "sonic realism." Fortunately, it's more of a headphone and earbud world every day, and the IEM world is beginning to enjoy spinoff benefits from the growing general interest in surround sound. For example, a great deal of research has been directed toward 2-channel playback of multichannel sound—AKG's IVM technology is one result—and there is growing interest in reproducing the Head Related Transfer Function (HRTF) for headphone listening. (HRTF is the term used to describe the phenomenon whereby we localize sound, which depends on natural amplitude and phase shifts caused by the "shadowing" effect of the head. These directional cues for the brain are eliminated when we listen to music on headphones or IEMs, resulting in an auditory image that lacks the third dimension, and the sound mix is firmly localized in the center of the head.) Technologies aimed at the consumer and computer markets are yielding successively better auralization and spatialization that will almost certainly cross over to IEMs in the near future. ■

STEREO IEM MIXES ALLOW FOR A GREATER VARIATION IN MIX LEVELS, IMPROVE THE ABILITY TO DISCERN MORE INPUTS VIA PANNING, PROVIDE A GREATER SENSE OF REALISM AND, MOST IMPORTANTLY, ALLOW MONITORING AT LOWER LEVELS.

Mark Frink is Mix's sound-reinforcement editor. He can be reached at mfrink@teleport.com.

—FROM PAGE 98, UK MUSIC RECORDING

revenues from music recording, with record production and music management (Pet Shop Boys and Iron Maiden are management clients) and children's television programming making up the balance. The music recording division has become extremely active since Bernie Spratt took over its operations in late 1998, and it has acquired several new studio and mobile properties, including Nomis Studios, Classic Sound and Fleetwood Mobile, bringing the total number of facilities under its umbrella to eight.

Spratt is a 25-year studio business veteran who was with Chop Em Out until the mastering facility was acquired by Sanctuary Group. Spratt says that the recording division is aggressive in marketing its services widely, and that less than 10% of its revenues comes from within its own group of artists. "Recording studios are now like commodities, and you can't just go out and buy a big console and sit by the phone and wait for it to ring," he observes. Rather, he says, he's steering Sanctuary back to the service model based on staff engineers. "People, and the quality of the staff you provide, are better at differentiating studios in a commodity business environment than consoles are," he says.

Sarm Studios

SURROUND—OR LACK THEREOF

London isn't yet seeing any significant demand for multichannel audio. The overall DVD consumer video format was rolled out in Europe a year after its 1998 introduction in the U.S., and, though the DVD-Audio specification released earlier this year is putatively global, and the Philips/Sony SACD format has been seen in Continental studios recently, multichannel audio has simply not generated the same degree of interest—or equipment buying—that it has in the States.

Nonetheless, several studios, including Abbey Road, Metropolis and Sarm, have put in dedicated surround monitoring systems in anticipation of demand. Bill Ward, technical manager for Sarm, says a 5.1 monitoring array was included as part of a larger refitting of one of the facility's studios. "We don't know if the market is going to be there, but we'll be ready for it if it is," he says.

Others are holding off. "We've had a couple of requests, but no real demand yet," says Davidson of Virgin Studios. Davidson, like other facility managers, has bought additional speakers and amplifiers but has not yet committed to a dedicated 5.1 monitoring installation, preferring to set the gear up when it's requested. Virgin's studios don't charge higher rates for surround monitoring or mixing, but Davidson will charge for setup time of the additional speakers. Ridge Farm's Andrews expresses the feelings of many other London studio owners when he says, "There's no demand for it, and we don't need another round of upgrades right now."

Nevertheless, London is possibly poised for another round of upgrades. Since techno-based music has been a big component of the music business there for more than a decade, studios have been watching hard disk systems passing through their doors, but many have been reluctant to commit to specific systems. Now, say several studios, the market has apparently made its choice. "Up until recently, we and other studios had been essentially catering the studios to what clients were bringing in," says Sarm's Ward. "The RADAR systems did well initially—people liked their portability. But Pro Tools did well with their plug-ins, and it appears that Pro Tools is winning the market here. That's the system we've decided to go with."

Ward adds that, whereas hard disk systems were once used mainly by dance and techno clients and rock clients generally preferred analog, the technology is no longer a reflection of the music. Although analog remains strong, Ward notes that hard disk systems are being used by a wider range of music clients.

Large-format digital consoles have not taken off as quickly in the UK as in the U.S., a function of studio economics as much as anything else, says Ward. However, Manor Mobile has the UK's lone SSL M-T, and Abbey Road and CTS (which does mainly music for film and TV) have Neve Capricorn consoles. "In the four studio control rooms that we have," says Abbey Road's Buchanan, "three are analog and one is digital. That's probably about right for now. For mixing, so much good, easy-to-use outboard gear is still analog, so it's more convenient to stick with an analog desk."

"We have been one of the pioneers of all-digital consoles, being the first studio in the world to have a Neve DSP console back in 1984," says Peter Fielder, general manager at CTS. "We have subsequently continued our involvement with digital consoles by installing an AMS Neve Capricorn in 1995, and that has provided its reliability and some commercial success. However, in the UK, digital consoles have not yet made the breakthrough into the major studio market due to a number of factors, such as operational unfamiliarity, cost, and perceived unreliability. The sound of digital audio is still perceived to be inferior to analog. However, the market for more cost-effective digital consoles, such as Yamaha or Mackie, is growing mainly because the advantages of flexibility that digital can offer appeal to that marketplace, and the prices are more attractive."

"Large-format digital consoles are making much slower progress into the purely music recording market than originally anticipated," agrees AIR Studios' technical manager, Tim Vine-Lott. "This is primarily because engineers don't like the way they sound, and secondly because of the ergonomics of the control surfaces offered. They have made more significant inroads in classical recording, TV and film post-production where the automation and reset capabilities make them invaluable."

Sarm has two Euphonix CS2000 hybrid consoles—one owned by resident producer Trevor Horn—but Ward says the studio will wait a bit longer before choosing an all-digital console. "The concept of digital recording has been embraced for some time now, but the idea of digital consoles is still not quite there," he says. "I expect that to change in the next year or so. What I find interesting is that as much digital recording that has gone on in London over the years, you'd think that that would have propelled the idea of digital desks. But it hasn't. I think studio owners were concerned about being able to sell the rooms with them." ■

—FROM PAGE 140, TC WORKS SPARK

VST folders, or shells, in the program's Preferences menu, reboot the program, and the new effects appear in the matrix's plug-in menu. I hooked up all my Steinberg and Waves plug-ins and had a blast concocting unusual ambient sounds and *phat* masters.

A floating transport bar has all the controls you'd expect and more. There's stop, play, record and pause; fast-forward and rewind are accessed by a playbar with forward and back arrows at each of its ends; a dedicated loop button turns looping on or off; input, output and sample-rate information are displayed next to a large, easy-to-read clock (hrs:min:sec:ms) located in the middle of the transport bar.

A virtual jog shuttle wheel on the transport bar is a nice addition and works well, though scrubbing with a mouse can be annoying. Scrubbing operates with or without varispeed. With varispeed on, the wheel is sticky, letting you audition different speeds and pitches; with it off, the wheel always springs back to its default of zero. A real-time timestretch feature is also part of the scrub wheel. With the wheel in timestretch mode, you can change the speed of your recording, as much as 25%, without affecting pitch. I had little luck getting this feature to work smoothly (I didn't have time to try this, but again, the ASIO drivers supposedly fix this). However, an offline timestretch function found in the menu bar works fine and even has a BPM parameter.

MIDI (via OMS) is implemented as a way of importing and exporting files from samplers. Supported machines include: Akai S1000/S1100/S2000/S3000 Series, E-mu ESI and E4 Series, Roland S760, Yamaha A3000 and just about any sampler using SMDI. Akai CD-ROMs can be read directly by Spark. Keymaps and loops are not supported. Sampler communication is a nice feature, but there are more comprehensive programs out there for this task. However, with MIDI as part of its spec, Spark's future in MIDI peripherals is wide open (perhaps a MIDI jog shuttle wheel could be addressed); including MIDI was a sound decision.

SPARKS FLY

Version 1.01 has a few major problems (actually, one major one and a couple of minor ones). These are not bugs (the program never actually crashed on me) so much as they are poor design decisions on the part of Spark's development team. But before I start critiquing, I should say that these issues are being addressed by the folks at TC Works, and many will be remedied in the Version 1.5 release.

The biggest problem I encountered is the way Spark handles processed files. Spark's default setting overwrites the original file (e.g., "snare"), instead of generating a new file under a different name (e.g., "snare-001 efx"). It's far too easy to erase your original file and have it replaced with a processed file, without so much as even a prompt, when saving your session. (TC says they've fixed this in the 1.5 release.)

The file overwrite problem rears its ugly head again when dealing with regions. The program allows deriving multiple copies and regions from a single parent sound file without the need to write new, discrete, files to disk. This is perfect for simple, nondestructive, playlisting, *sans* effects. Unfortunately, as soon as you apply processing to a region, there's a chance that that region in the original sound file will be overwritten.

In short, an editing program should never write over an original file without adequate prompting and plenty of options to "save as" built into the prompts. A mastering program should never, ever, overwrite an original file, period. The program should automatically write processed files to a different name, preferably to a dedicated project folder created by the software on your hard drive. The programmers at TC Works are working on remedying this issue.

Until then, here are some simple workarounds, aside from making sure your files are always backed up. First, stay away from the Command-S keyboard shortcut; stick with the save actions listed on the menu bar. TC says that in 1.5 there are individual prompts to save audio files separately and that Command S will save a session. Working this way, you must always look before you save, making sure to save the project vs. the sound file, as appropriate. So if you Save As after processing a sound, you can select a new name and save the file before getting trapped in the overwrite snare. And lastly, don't count on Spark's one level of undo to come to the rescue—it can't undo a Save Audio File command.

Spark's other problems aren't nearly as serious. Folders and files in the file overview window are too easily deleted. Simply highlight them, hit delete, and they're gone—no prompt, no warning, no undo. There is no way to retrieve this information. One of those "are you sure you want to do this?" prompts would be nice. (TC says this has also been fixed in 1.5.)

When using the Create function in the Master View, a mono file run through a batch of stereo effects does not save as a stereo file. Though the effects are stereo, the output file remains mono. This is unfortunate, because Spark's stereo effects are awesome. The solution is to use a program like BIAS Peak to convert the mono file to stereo before working with it in Spark.

Finally, two of the three different options for turning looping on or off are quirky and appear to cause conflicts within the program. I found it's best to turn the looping off for master regions in the file pool. Also, don't bother with the loop action in the menu bar—leave it off. But if you stick with the loop on/off button in the transport window, everything seems to run smoothly.

BURNING UP

As we went to press, TC Works was set to release Spark Version 1.5. New features in this update include greatly improved project load times, MP3 file support, added crossfade options and more native plug-ins. The matrix will function as a VST or MAS (MOTU's real-time audio system) plug-in. This is important, as it allows the matrix to be plugged directly into programs such as MOTU's Digital Performer, Steinberg's Cubase VST or Emagic's Logic Audio. All the signal routing power and configurable processing offered by the matrix can now be used within your favorite multitrack audio application. Very impressive.

Despite some implementation problems, Spark is a truly unique and powerful application with a lot to offer. Spark's real-time processing and drag-and-drop user interface are excellent. The effects sound incredible. It didn't crash. And retail is only $499. With all that it does, along with the native plug-ins and Toast, it could have easily sold for twice as much. Without a doubt, this program is worth keeping an eye on—especially if you own a G4. Watch out for Version 1.5.

TC Works, distributed by TC Electronic, 742-A Hampshire Road, Westlake Village, CA 91361; 805/373-1828; fax 805/379-2648; www.tcworks.de. ■

Erik Hawkins is a musician/producer working in Los Angeles County and the San Francisco Bay Area. You can visit his fledgling indie label online, at www.muzicali.com.

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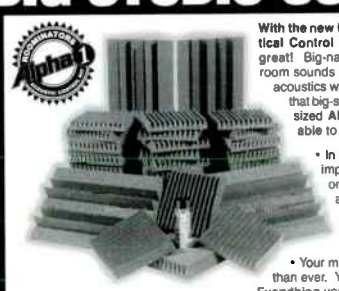

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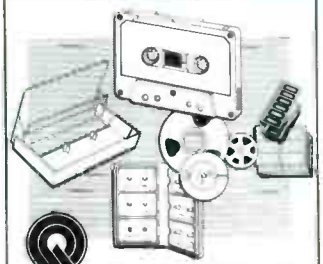

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Beautiful, contemporary house in Marin County hills on 2 private acres w/incredible view & world-class recording studio for sale. 35 mins. from SF. Modern, all conveniences, hot tub, dual fireplace. E-mail pluzy@aol.com or call (415) 258-8140.

Recording Studio for Sale on the East coast in a 100,00 person college town; the opportunity to be/stay in the music business yet live in a beautiful area. Many national publications have lauded this community for its culture, natural beauty and attractions, health & sports. Seller was an Emmy nominee while the client list includes Grammy nominees, Oscar winners and a past Poet Laureate of the U.S. The $650,000 price includes the real estate, all equipment and client list. Jim McVay, Roy Wheeler Realty (888) 776-2829 or jhm@jimmcvay.com.

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Other requirements: Payment must be included with copy: check, Visa, MasterCard or American Express accepted. Sorry, no billing or credit available. Full street address (PO boxes aren't sufficient) and phone numbers must accompany all requests. All words to be bold should be underlined. Copy must be typed or printed legibly in standard upper/ lower case. Publishers are not responsible for errors due to poor copy. Arrangement of characters may be altered in typesetting process due to space. The publishers are not liable for the contents of advertisements.

The small print: No stated or implied discounts allowed on new equipment sales. Publishers reserve the right to refuse or discontinue any ad deemed inappropriate.

Send coupon and payment to: Mix Magazine Classifieds, Attn: Robin Boyce-Trubitt, 6400 Hollis St., #12, Emeryville, CA 94608, tel. (800) 544-5530 or (510) 653-3307; fax (510) 653-8171. e-mail: mixclass@intertec.com.

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- ❑ Recording Services
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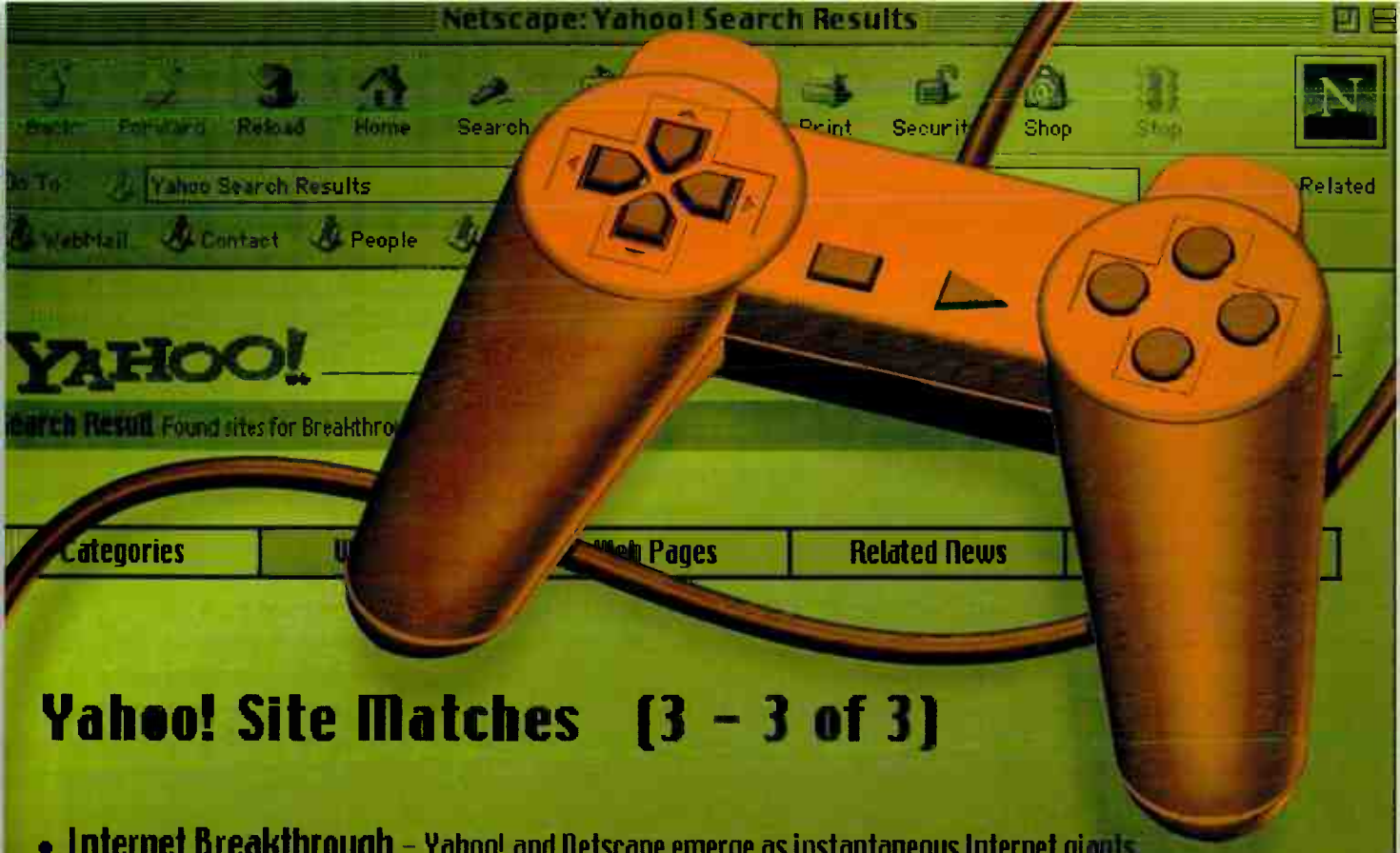

Yahoo! Site Matches (3 - 3 of 3)

- **Internet Breakthrough** – Yahoo! and Netscape emerge as instantaneous Internet giants, forever changing the way we communicate, play, and shop.
- **Gaming Breakthrough** – Sony Computer Entertainment releases the PlayStation®, ultimately selling over 100,000 units in the first weekend on the U.S. market.
- **Development Breakthrough** – The Game Developers Conference experiences record attendance, foreshadowing an explosion in the electronic game industry.

Coincidence?

1994

GAME Developers CONFERENCE 2000

March 8-12, San Jose Convention Center, San Jose, California

www.gdconf.com

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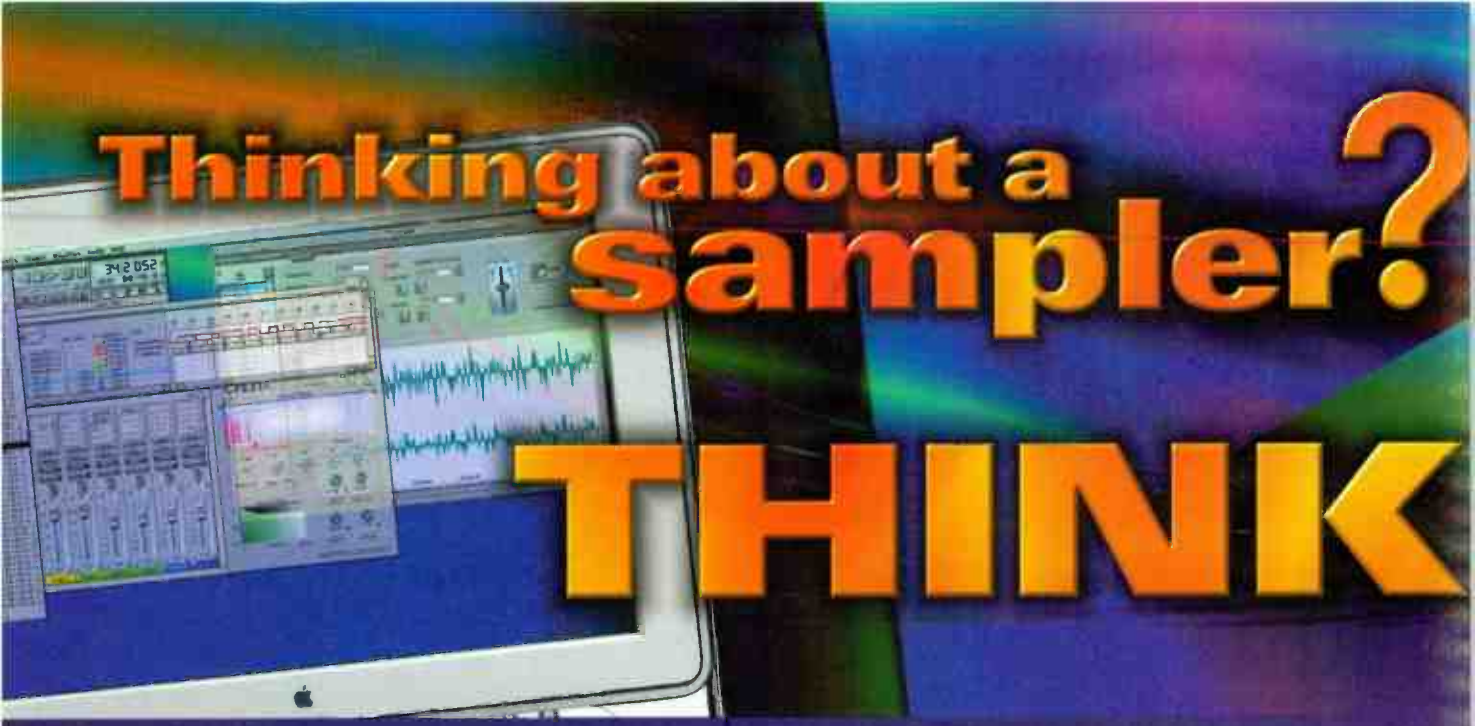

The computer.

Mac or Windows

Today's fatest PCs and Power Macs are well below the price of today's premium samplers. And they're as powerful as ever. Apple's new G4 Power Mac is so fast, it qualifies as a super computer! You can do a lot more than just sampling, and when you're not creating music, you can surf the net. Try that with a conventional sampler...

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The hardware.

MOTU 2408 family

Have you ever seen a sampler with this many inputs/outputs? And 24-bit I/O? Mark of the Unicorn's 2408 audio interface has set a new standard for computer-based hard disk recording. And now it's an entire family: start with an affordable core system that best suits your immediate I/O needs and expand later. At these prices, you can get exactly what you need. And you also get AudioDesk workstation software for Mac OS, with recording, editing, mixing, processing and mastering features that go way beyond traditional sampling. Add MIDI sequencing with a crossgrade to Digital Performer. And both programs function seamlessly with the ultimate sampler software from BitHeadz: Unity DS-1...

10 XDR MIC PREAMP CHS • 4 STEREO LINE CHS • 4 SUBS

The 1642-VLZ PRO: midsize luxury for $999*

10 XDR™ mic preamplifiers (on mono mic inputs Chs. 1-10) with the finest sound quality (and specifications) ever on a compact mixer. 0dB to 60dB gain range.

75Hz low cut filters on all 10 mic channels. Sharp 18dB/oct., phase accurate circuitry cuts infrasonics caused by stage rumble, wind noise and P-pops.

Sweepable midrange EQ on Chs. 1-8 with incredibly wide 100Hz-8kHz sweep range. Fixed shelving HF EQ at 12kHZ and fixed shelving LF at 80Hz.

Overload and ultra-sensitive, -20dB **Signal Present LEDs** on every channel.

4 aux sends per channel. Auxes 1 & 2 are pre/post switchable; Auxes 3&4 are fixed post-fader.

4 stereo line inputs. Unity summed w/mic-in chs 9-12, ±20dB chs 13-16.

8 mono line inputs (Chs. 1-8), with +15dB to -45dB gain range. **Bal./unbal. direct outs** on chs 1-8.

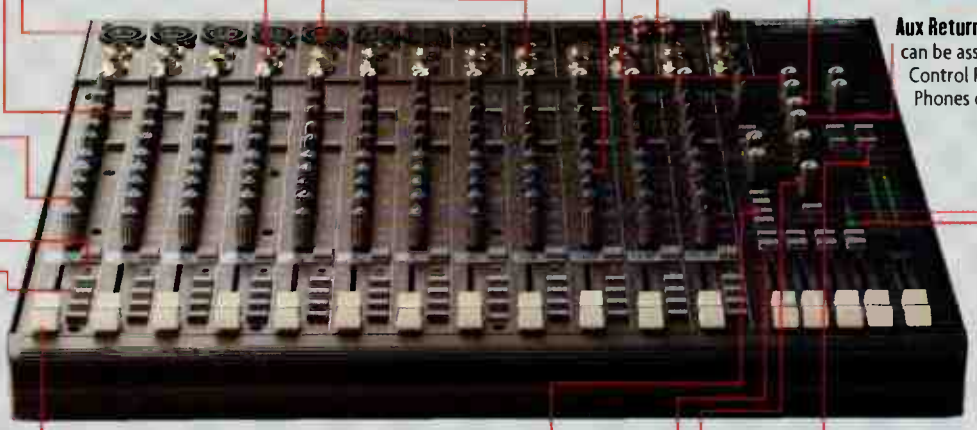
Inserts on the first 8 chs.

Effects to Monitor controls on Aux Returns 1 & 2 let you fold EFX back into stage monitor mixes independent of main PA.

4-band EQ on Chs. 9-16. With 12kHz HF, 3K Hi-Mid, 800Hz Low-Mid and 80HZ LF.

RCA inputs and outputs with tape input level control.

Aux Return 3 can be assigned to Main Mix or Subs 1 & 2 or 3 & 4.



Aux Return 4 can be assigned to Control Room/ Phones only.

60mm logarithmic taper faders with ultra-long-life resistance elements provide linear volume change from full-on to -∞.

On the back: Direct outs (Chs. 1-8, bal./unbal.), TRS mono-main output with level control, XLR stereo main outputs with recessed mic/+4 line level switch.

Control Room/Phones Section with separate headphone and control room level controls. Source Matrix selects any combination of Main Mix, Subs 1 & 2, Subs 3 & 4 or Tape for exceptional studio monitoring flexibility. Also lets you create a third live stage monitor mix or separate feed.

True 4-bus configuration with ch and master LR assigns. Each bus has 2 outputs, letting you hook up all 8 chs of a recorder without constant repatching.

Master Aux Return Solo switch.

Tape to Main Mix switch.

RUDE solo LED in bright ecologially-correct green.

Level-set LED + channel strip in-place stereo solo buttons make initial level setting fast and accurate.

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LIVE SOUND

8-TRACK RECORDING

You asked. We listened.

The 1642-VLZ PRO is packed with goodies including sweepable midrange EQ, 75Hz low cut filters to cut room rumble and drum vibrations, Control Room/ Phones switching matrix with individual level controls, four aux sends per channel, constant loudness pan control and in-place stereo solo.

Recording: The new 1642-VLZ PRO gives you the finest mic preamps ever offered on a compact mixer. Two dedicated channels for tracking. Eight for monitoring. And two stereo channels for effects. Plus "double-bussed" submix outputs so you can feed all 8 channels of your recorder without having to re-patch.

Live and Alive: Mixers aren't always sitting calmly on the side of the stage anymore. Often, they're out front. They're instruments. The 1642-VLZ PRO has plenty of mic inputs for vocals, guitars and drums – plus 4 stereo channels for DJs and Keyboards.

Call toll-free or visit our web site for complete information on the new midsize luxury 1642-VLZ PRO. Learn why it's the best compact studio or live sound mixer (and rip-roarin' Electronica sound collage board) on the planet.

* $999 suggested U.S. retail price does not include extra toppings or optional thick Sicilian crust. Your price may vary. No user-serviceable parts in this footnote.

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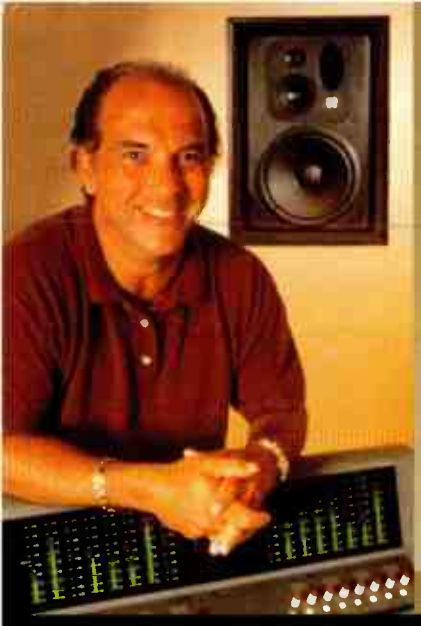

Neil Karsh is the Vice President of Audio Services for New York Media Group. Recently, Karsh selected LSR monitoring systems for two of his Manhattan facilities, *Lower East Side* and *East Side Audio*.

"We've installed the first of our LSR 5.1 surround systems at East Side Audio and it's a great addition. The sound is extremely clear and is enjoyed by our mixers and our clients. Everyone is very pleased with the result."

New York

LSR. Profiles

The world's most noted recording professionals discuss the world's most advanced monitoring systems.

NO.1: New York / Los Angeles

David Kershenbaum is a Grammy Award winner who has been on the cutting-edge of music production for decades. His discography is a remarkable *'who's who'* of popular recording.

"Speakers have always been important to me and I've had many systems that I have really loved. When Kevin Smith told me about LSRs, I tried them and was amazed at the accurate, flat response and how the mixes translated so well compared to other monitoring systems. Now we're using them to track our new records and we'll use them to mix, as well."

Los Angeles

The World's Best Performing THX® Monitoring Systems Are Also The World's Most Applauded.

Since its introduction in 1997, the system-engineered JBL LSR Series has become a favorite choice of engineers, producers and performers, many of whom have also become its most loyal advocates. More important, this acceptance is found in every major geographic area of the recording industry; from Los Angeles and New York to Nashville and London.

LSR 32 LSR 28P LSR 12P

Monitors Whose Performance Profile Was Determined By Science, Not Opinion.

During a half century of building the most technically advanced studio monitors, JBL has developed a long list of working relationships with key recording professionals around the globe. As a direct result of this unique collaboration, these industry leaders have chosen JBL monitors more often than any other brand. Not once or twice, but consistently for decades. In fact, JBL monitors are a part of the history of recording itself. Consider as examples, the now fabled JBL 4200 and 4400 Series that, at their launch, actually defined an entirely new standard and new category of monitor. Such is the case now with the entire LSR line.

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