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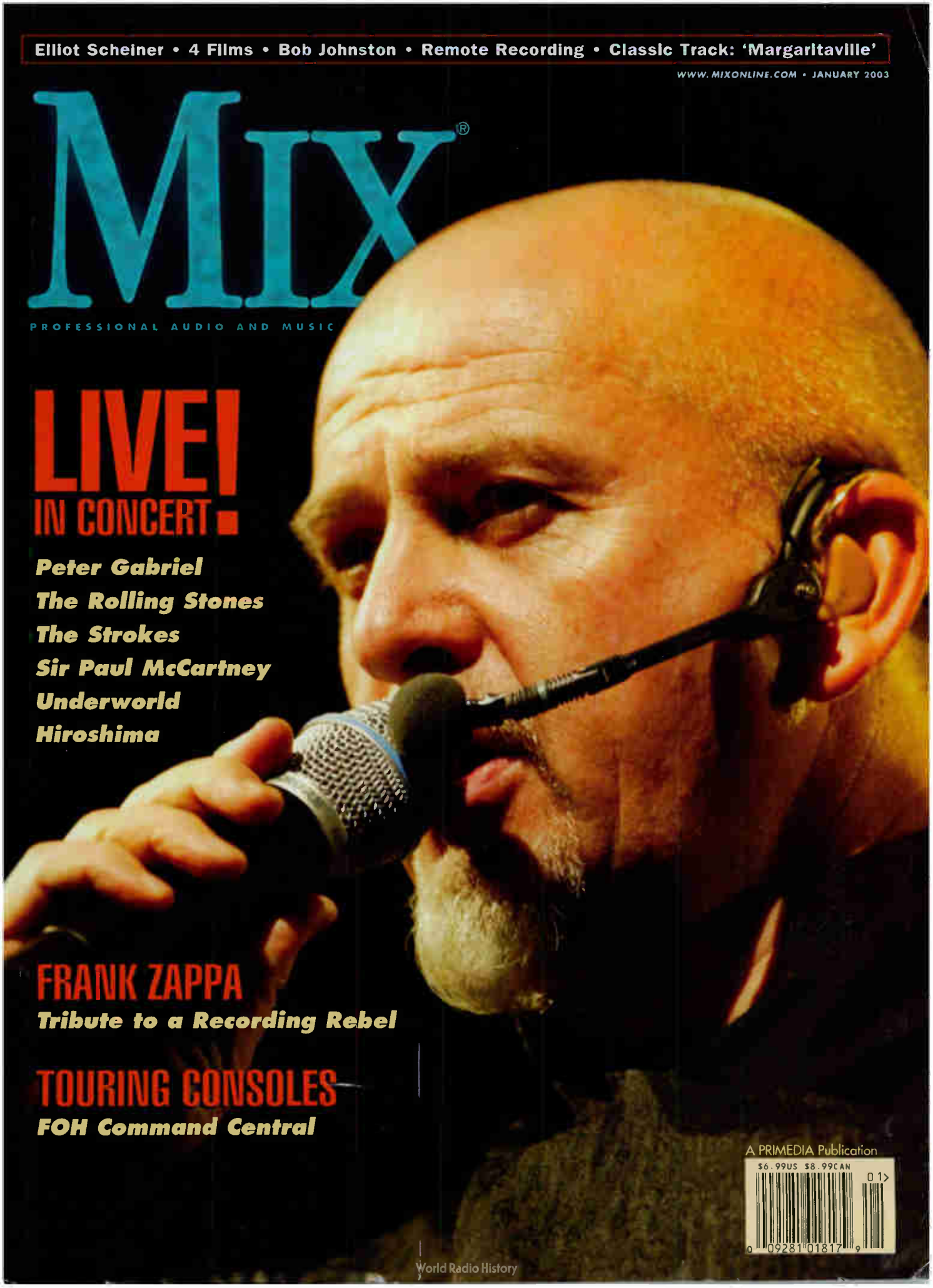

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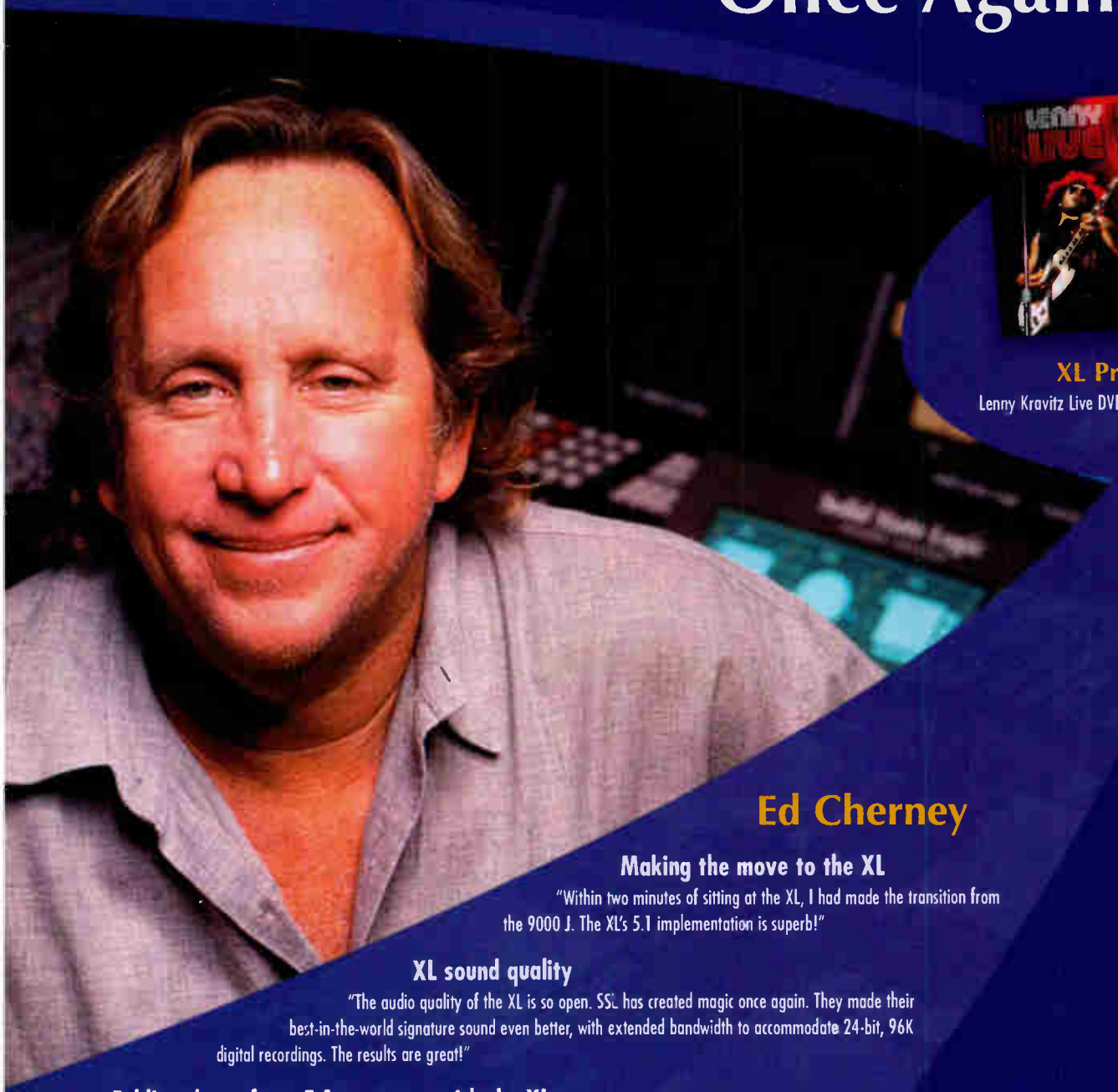

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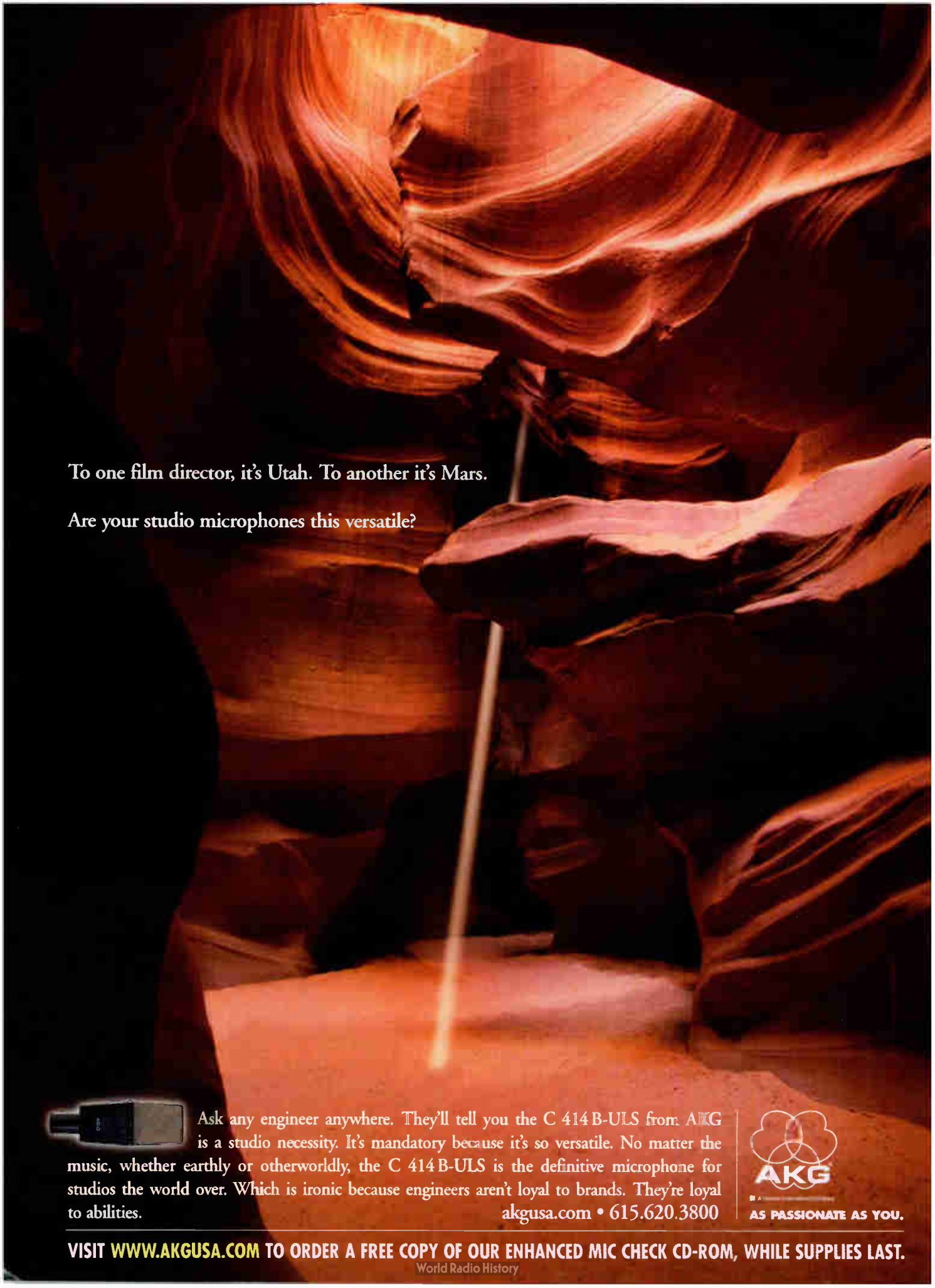

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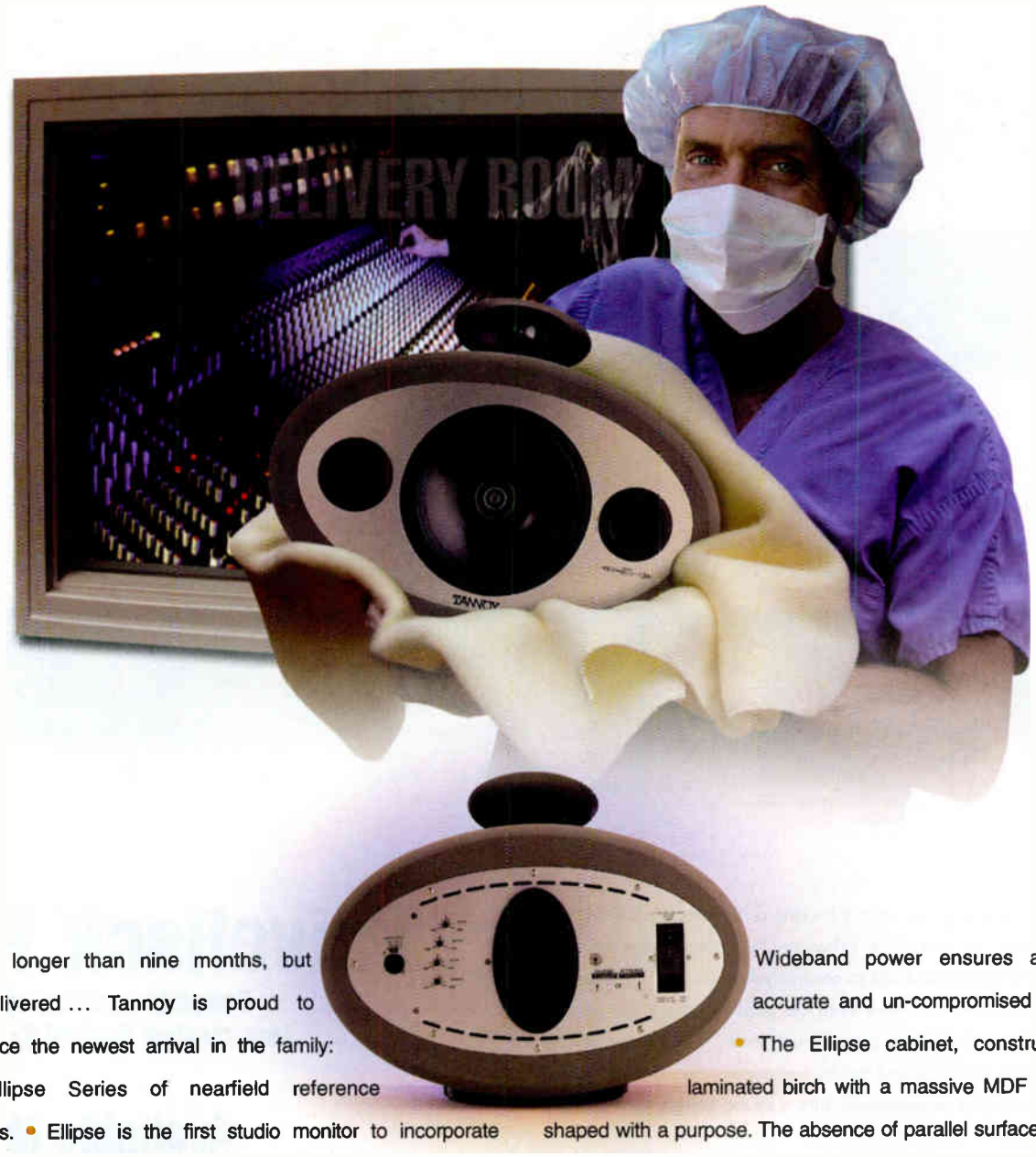

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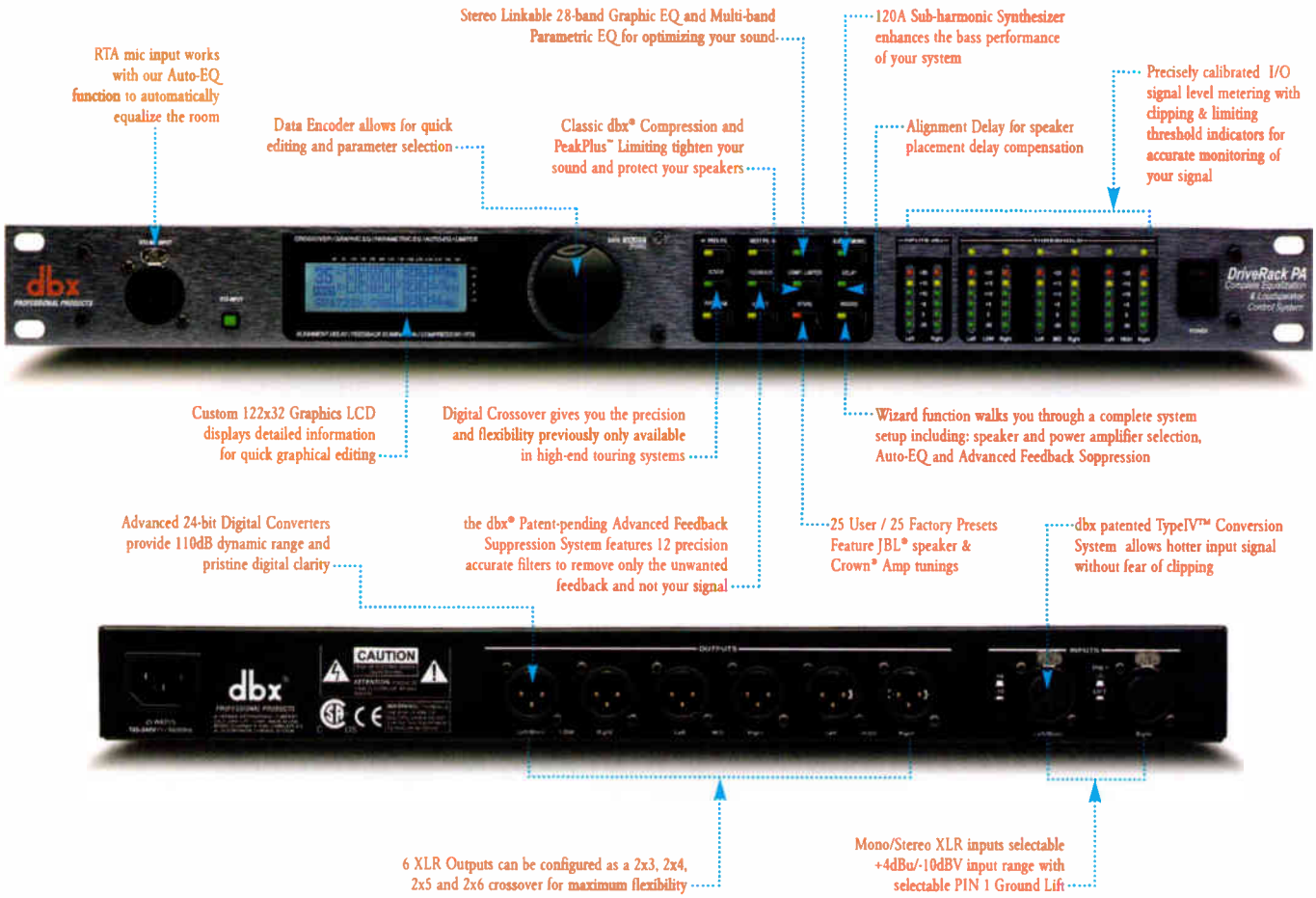

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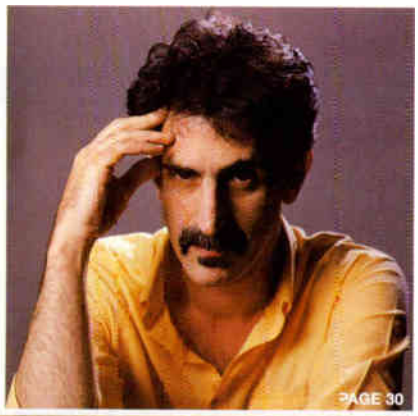

PAGE 30

PAGE 46

PAGE 86

PAGE 98

MIX®

PROFESSIONAL AUDIO AND MUSIC PRODUCTION

January 2003, VOLUME 27, NUMBER 1

features

30 We Are the Mothers and This Is What We Sound Like

Frank Zappa's Extraordinary Recording Techniques

Frank Zappa has a towering reputation as a composer, guitarist and band leader, but his career as a record producer is equally impressive. For over three decades, Zappa recorded himself and the Mothers of Invention in almost every tape-based format, creating a multigenre catalog of studio and live recordings, orchestral works, film soundtracks, tightly edited snippets of who knows what, innovative synthesizer compositions and bizarre musicals. In a two-part article based on interviews with several of his engineers, Chris Michie traces Zappa's extraordinary recording history and describes many of his original techniques.

46 The Big Trucks Keep Rolling

It seems that just about every aspect of the music industry has been affected by the tough economic climate and 9/11—including remote recording companies. But the mobile niche has its own business quirks, not to mention the pressure to get it right during the first live take. *Mix* talks with eight of today's top remote recorders.

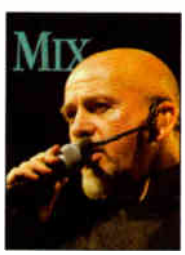
86 Mixing With the Best

The Latest in Top-of-the-Line Live Mixing Consoles

In this month's product roundup, we survey the best in today's live mixing consoles—both analog and digital, large-format and midsize, varied configurations, and much more. Pick from the more than half-dozen spotlighted boards for your next gig and give them your own personal road test.

Live Sound Special!

Get ready for this year's touring season by touching up on some SR fundamentals in the "Back to Basics" primer, in which *Mix* sound reinforcement editor Mark Frink revisits wedges, and Buck Moore breaks down club systems. And if you couldn't make it to some of the fall season's hottest concerts, no worries. *Mix* takes you behind the scenes at the recent Rolling Stones and Sir Paul McCartney tours. Plus, get a taste of Hiroshima's Japanese-flavored jazz stylings, the electronic arts of Underworld and an "All Access" pass to The Strokes. Coverage begins on page 98.



On road hiatus for almost a decade, the elusive Peter Gabriel is out supporting his latest release, *Up*. Sporting an L-Acoustic line array, QSC amps and a Yamaha PM-1D FOH console, the tour encompasses numerous onstage musicians alongside Gabriel in an in-the-round stage setup. Hang out with the sound crew on page 20. **Photo:** Rick Friedman

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World Radio History

sections

SOUND FOR PICTURE

78 ***The Two Towers*: Refining the Ring** *by Blair Jackson*

79 **Sound Secrets of *Harry Potter's* Chamber** *by Blair Jackson*

80 ***Star Trek: Nemesis*** *by Maureen Droney*

81 **Creating Future Past on *Treasure Planet*** *by Maureen Droney*

PAGE 112

LIVE MIX

98 **Tour Profile:** The Rolling Stones *by Gregory A. DeTogne*

104 **Tour Profile:** Sir Paul McCartney *by Mark Frink*

108 **Tour Profile:** Underworld *by Robert Hanson*

110 **Tour Profile:** Hiroshima *by Chris Michie*

112 **All Access:** The Strokes *by Steve Jennings*

114 **Back to Basics:**

- Techniques to Get the Most Out of Floor Monitors *by Mark Frink*
- Tips to Cope with Speeches, DJs, Screenings and Cabarets *by Buck Moore*

124 **New Sound Reinforcement Products**

126 **Soundcheck**

RECORDING NOTES

158 **Wilco** *by Gaby Alter*

159 **Silverchair** *by David John Farinella*

159 **Ralph Stanley** *by Elianne Halbersberg*

160 **Classic Tracks:** Jimmy Buffett's "Margaritaville" *by Dan Daley*

162 **Cool Spins:** The *Mix* Staff Picks Some Favorite CDs

COAST TO COAST

172 **L.A. Grapevine** *by Maureen Droney*

172 **Nashville Skyline** *by Rick Clark*

173 **New York Metro** *by Paul Verna*

174 **Sessions & Studio News** *by Robert Hanson*

technology

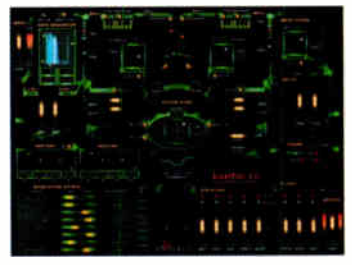
134 **Tools of the Trade**

140 **Field Test:** Akai DPS24 Digital Personal Studio

PAGE 140

145 **Field Test:** Antares Kantos Plug-In Audio-Controlled Synthesis, Sci-Fi Effects

148 **Field Test:** EarQ Technologies Reference Hearing Analyzer



PAGE 145

150 **Field Test:** Lynx L22 PCI Audio Card High Performance in a Small Package

152 **Auditions:** Snapshot Product Reviews

- Disc Makers Elite Pro Duplicator
- Millennia LPE-2 Archival Playback Environment
- Korg BX-3 Organ
- RØDE NT1-A Microphone

216 **Power Tools:** Waves Restoration Bundle *by Nick Batsdorf*

PAGE 216

columns

PAGE 26

22 **The Fast Lane:** Lest We Forget–How It Should Be Done *by Stephen St.Croix*

26 **Insider Audio:** War Stories–Memorable Moments in *Mix* Readers' Lives *by Paul D. Lehrman*

58 **Mix Masters:** Elliot Scheiner *by Maureen Droney*

65 **Project Studio:** Joe LoDuca *by Gary Eskow*

66 **Mix Interview:** Bob Johnston *by Dan Daley*

128 **Bitstream:** Toe to TOE–Networked Storage Developments *by Oliver Masciarotte*

156 **Tech's Files:** How Loud Can You Go? The Helpful Science of Bass Management *by Eddie Ciletti*

departments

8 **From the Editor**

12 **Feedback:** Letters to *Mix*

14 **Current/Industry News**

20 **On the Cover:** Peter Gabriel *Up* Tour *by Mark Frink*

186 **Studio Showcase**

190 **Ad Index**

193 **Mix Marketplace**

201 **Classifieds**

World Radio History

Make Mine MIDI

Twenty years ago this month, a quiet revolution began. Standards *never* come easily, but after years of backroom meetings between U.S. and Japanese manufacturers, the Musical Instrument Digital Interface (MIDI) was first publicly demonstrated to the public at the 1983 Winter NAMM show.

MIDI had its beginnings two years earlier, when Sequential Circuits founder Dave Smith—based on his meetings with visionaries such as Tom Oberheim and Roland's Ikutaro Kakehashi—presented a paper at the 1981 New York AES for USI, a Universal Synthesizer Interface. USI proposed a common note-on/note-off communications protocol between electronic instruments from different manufacturers. Meanwhile, similar efforts were under way by Japanese manufacturers (notably Roland, Yamaha, Korg and Kawai), and, in a rare example of insight and cooperation, U.S. and overseas companies began working together to refine USI into the more powerful MIDI standard.

There were other synth-control systems available at the time, ranging from the limited scope of simple control voltage and gate schemes to the elaborate Oberheim System, which combined that company's proprietary sequencer with its drum machines and synths. However, no other protocol offered the depth and universal compatibility of what has become known as MIDI.

At NAMM in January 1983, Dave Smith used a Sequential Prophet-600 to control a Roland Jupiter-6 synth. At the time, no one imagined the importance of this event.

As computers became affordable and more powerful, MIDI became a staple in studios, along with growing racks of keyboards, drum machines, sequencers and samplers. Soon, control rooms themselves were expanded to house all of this performance gear and provide a central nest to create entire works. Low-cost synchronizers (SMPTE and FSK) locked MIDI tracks to multitracks, leading to the concept of the project studio.

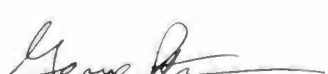
As time went on, the MIDI spec continued its evolution, adding features such as MIDI sample dump, MIDI time code (MTC), MIDI show control, MIDI machine control (MMC) and the flexibility of system exclusive (Sysex) messages that allow manufacturers to "personalize" MIDI control to suit any particular piece of hardware.

Another offshoot, General MIDI, standardized the assignment of MIDI channels to particular instruments and—combined with the universally readable sequences contained in standard MIDI files—opened the door for the widespread use of MIDI in computer games, multimedia, karaoke and Internet applications.

Combining MIDI-sequencing capabilities with DAWs allowed musicians to edit and manipulate vocals and acoustic instruments in the same manner as MIDI tracks, but also provided new avenues of creative exploration, especially in the area of effects automation.

The forays of MIDI into the consumer arena were far less successful—does anybody even remember the 1988 CD+MIDI format? Yet even on the MI/pro side, MIDI has had many critics, calling for the creation of a faster, wider-bandwidth MIDI-2 spec; but so far, nothing's materialized. Now, 20 years later, MIDI is still with us. Standards never come easy, and an entire industry owes a debt of thanks to the hard work of many individuals and manufacturers who contributed to MIDI's birth, growth and expansion.

Happy Birthday!



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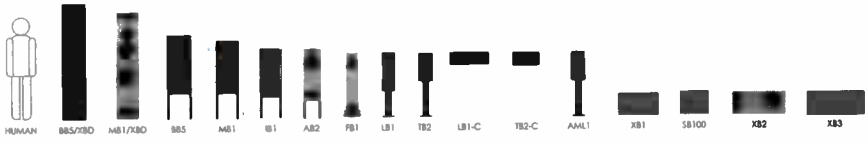

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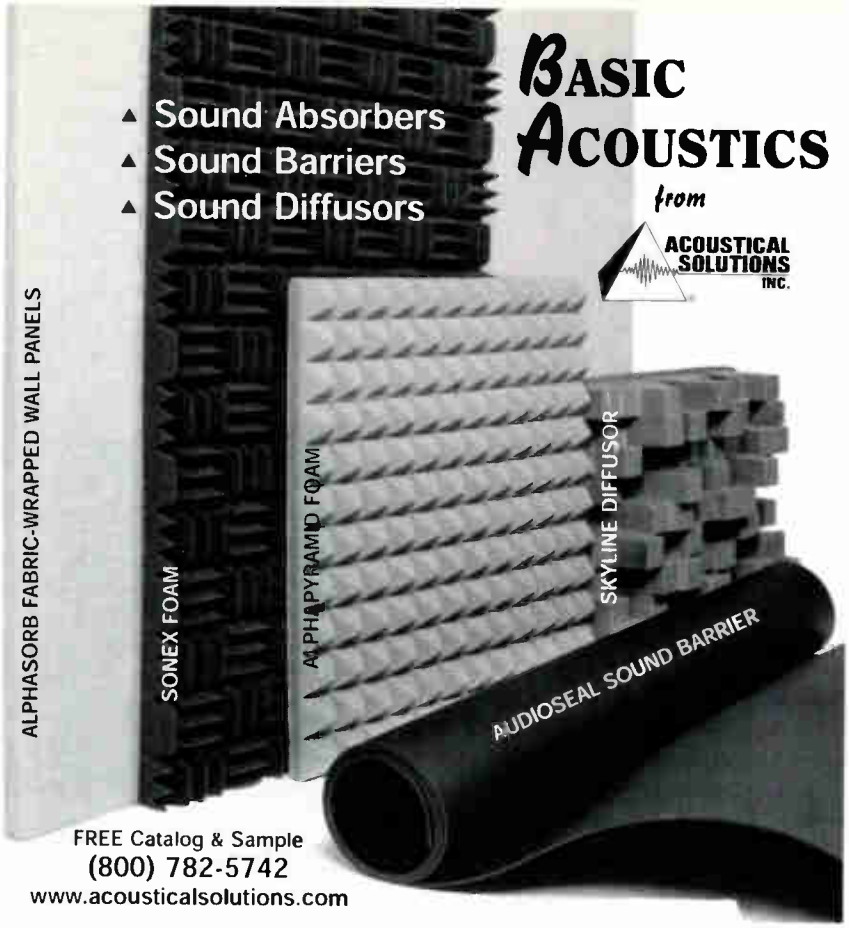

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World Radio History

Letters to Mix

CREDIT REPORT

On page 18 in the section "*Mix* Looks Back" ["Current"], you have Debby Boone's "You Light Up My Life" as having no studio information available. I was the engineer, and the studio was A&R Recording, Studio A1, in New York. Refer to pages 221 and 232 of *Mix*, August 1998, for more details.

Incidentally, I think Geoff Emerick must have worked at a different Abbey Road from mine. One time, well before 1962, a setup engineer refused to install a limiter I requested, pointing out that there was a memo forbidding the use of limiters on a session! I took him up to the manager, who, in no uncertain terms, informed him that the engineer in charge of the session is to be given anything necessary to get the sound he wants. That memo was canceled forthwith!

That was the only time in my entire tenure at Abbey Road—1958 to 1968—that anybody told me what I could not do. And that included very close-miking to drums and anything else I thought necessary to get the sound I wanted.

Malcolm Addey
New York City

LATENCY IS AS LATENCY DOES

Ned Mann's article on DAWs ("The Great DAW Challenge," October 2002) contains some significant errors when he touches on latency in "native" systems. He writes: "...fantasy than a reality when it comes to large files. The song that starts out with 16 tracks and a somewhat livable 3ms delay setting will die an ugly death when it reaches 64 tracks of audio, 128 plug-ins and 16 virtual instruments. In order to record a session with this file, all of the tracks would have to be bounced to disk."

I can't argue with Ned's empirical observations here, but this is not about latency; it's about system load. Latency is a function of the audio-interface hardware, the audio-interface device driver, the operating system scheduler and the application software. Any properly written DAW will exhibit "all-or-nothing" behavior with respect to latency: It can either meet the current latency setting or it cannot. When it can't, nothing can be done except reduce the load on the system. If Ned has a system whose behavior with respect to latency degrades in a somewhat linear fashion as the load increases, he should consider using a different DAW.

Ned also writes: "This is not the DAW dream. Although many interfaces feature 'no latency' inputs, these are generally limited to a stereo pair, with the live inputs combined with the stereo mix from the sequencer and fed directly to the interface's output."

This simply isn't true of any of the audio interfaces one would seriously consider for pro work. The RME Hammerfall Series, for example, do not suffer from the limitations that Ned describes, and neither do any of the many interfaces based on the ICE1712 chipset. If you are interested in pro work, then the first thing to be sure of is that you are using an audio interface that is properly designed for such things, and most of the interfaces covered in *Mix* and other magazines are not: They are aimed at simultaneous recording of stereo pairs and not much else, even when they do provide multichannel I/O.

He goes on: "...necessary for the pro user. For the moment, at least, Digidesign dominates this approach. In addition to zero latency on input, Digi hardware also provides confidence monitoring, extensive DSP power, high track counts and extended sample rates. It also offers compatibility with most major studios, in addition to the highest reliability."

True compatibility comes from protocols and connectors, which is why things like S/PDIF and ADAT are so important. I would also like to point out that Digidesign hardware and software are entirely proprietary. If Digidesign ever folds—it may seem unlikely at this point in time, but corporate America has witnessed bigger surprises—your investment in this technology will have reached a dead end. Many companies that make audio hardware have cooperated with free software developers so that the information needed to interact with and control the hardware is public and visible. Even if these companies go bankrupt or switch their focus away from current products, it will be possible to use their hardware.

Paul Davis
Linux Audio Systems

Paul Davis has some important misunderstandings of the issues in my article. The total system load (i.e., plug-ins, native synths) that a given DAW can handle is determined by a number of factors. But the most important factor in deciding what a given system is capable of is clearly the sample buffer for the hardware driver.

This sample buffer governs the size of the data packet that the CPU will process. A smaller buffer fills up more quickly, resulting in less monitoring delay on incoming signals (those being passed through the A/D converters, processed by the CPU and routed back out the D/A converters). However, processing data in smaller packets places a higher load on the CPU, which results in reduced power for plug-ins. Therefore, in order to record live musicians, low sample-buffer settings are used, whereas high settings are used for mixing.

My example showed that while files start small (and allow for small sample-buffer settings), as the file grows, it is very possible to begin to receive error messages from all native-based DAWs, regardless of how fast the CPU is. Switching to a higher buffer setting is fine if you have "printed" all of your tracks to disk. However, if you are triggering live MIDI tracks in the mix, these will all have to be re-adjusted to compensate for the delay. A last-minute guitar OD can pose real problems for studios running maxed-out DAWs because they can't reduce the sample buffer to an acceptable level. In contrast, Digidesign's HD and TDM systems avoid this by using DSP power (not the system CPU) and can monitor 128 tracks with virtually no delay—all with EQ and compression. Enough said.

Paul correctly points out that there are interfaces that use DSP acceleration to provide "low-latency" settings (such as the Hammerfall and the new MOTU PCI-424 card), which they achieve by keeping the incoming audio off of the system bus completely. Importantly, MOTU's control panel for the just released PCI-424 card enables DAWs to combine two types of tracks: those with low latency (i.e., a singer) and with high latency (i.e., a native reverb) at the same time. This will eliminate the need for an external mixer and reverb when tracking. Users will also be able to run large systems more efficiently and with higher sample buffers, providing more "power."

While this is an important step in the progression of native systems, one must bear in mind that these nonlatency tracks do not hit the system bus and therefore cannot use native EQ, compression or other plug-ins. If you have a Neve handy, that's not a big deal. But for most engineers tracking a live date, not having EQ or compression is huge. Despite the gains made in monitoring, DSP cards (such as Digi's HD systems, the TC Powercore or the UA Audio's powered plug-in card) still add power to native systems in very important and compelling ways.

—Ned Mann

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SHIFT_RECORD

MING AND FS SPOT-MIKE NISSAN CAR SOUNDS

Finally, a commercial that audiophiles can get behind. In the new Nissan Altima commercial, DJs Ming+FS (www.mingandfs.com) portray an experimental production team who mike every conceivable sound the Altima makes (from squealing tires, an engine revving up, the whir of moving the car seat back and forth and plenty of car door/trunk slams) with an AKG 414 mic and a Tascam Porta-DAT. The car sounds were recorded by Mo-phonics (Venice Beach, Calif.) and transferred to Pro Tools.

THE V6 NISSAN ALTIMA

"We kept the setup really simple by picking the car sounds that sounded best naturally," the duo said. "For example, the car door and trunk slamming were used for the kick drum."

At the duo's studio, Madhattan Studios (Hell's Kitchen, New York City, which is pictured at the end of the spot), each sound byte was loaded into an E-4XT Ultra sampler and sequenced via Mac G4 Dual Processor running Digital Performer 3; mixing took place through a Yamaha 02R. "Besides pitching the sounds using the sampler, we didn't really effect or EQ the sounds much," Ming+Fs said. "The delay on the melody line was added in DP3 using a multitap plug-in."

BLUE MEN IN VEGAS

BLUE MAN GROUP AUDIO

Blue Man Group and Virgin Entertainment Group have designed and created a custom DVD booth that showcases the 5.1 mix of their Grammy-nominated debut album, *AUDIO*.

The 8x7-foot booth (which resembles a giant PVC tube, like those used in their show) was unveiled last month at the Virgin Megastore at Caesar's Forum in Las Vegas. Booth design and sound system were provided by Bose. Seth Freed, general manager of Blue Man Group Records, said, "We are thrilled that music fans will be able to experience 5.1 surround sound technology. It is such a cool way to listen to our music."

CD producer: Todd Perlmutter. Mixer: Mike Fraser. Engineer: Andrew Schneider.

For more, visit www.blueman.com/dvdbooth.

RUSS BERGER CREATES LATIN LEGENDS SOUND

Latin music label Freddie Records (Corpus Christi, Texas; http://freddierecords.com/) has built a new complex for its corporate and merchandising offices, as well as its centerpiece—Legends Sound Studios, a recording, mastering and MIDI facility.

"For our new studio, we wanted something that was more in line with the whole mood of the music we make here," said Freddie Martinez Jr., Freddie Records VP of operations. "With the Latin influence, the colors had to capture and match the artists' styles and our whole vibe."

The studio now boasts two control rooms, two recording rooms, a MIDI production room and a mastering suite, as well as a relaxing lounge and courtyard.

TRIBAL TUNES

Gary Cherone (Extreme/Van Halen) stepped into Prism Sound Studios (Acton, Mass.; www.prismsoundstudios.com) with his new band *Tribe of Judah* to mix the title track "Exit Elvis" with engineer John Ellis for their upcoming CD release on Spitfire records.

Standing, from left: Gary Cherone (vocals), Mike Mangini (drums) and Steve Catizone (keys/programming). Seated, from left: Leo Mellace (guitar) and John Ellis (chief engineer/owner).

World Radio History

COMPILED BY SARAH BENZULY

SCORING "TWO TOWERS" WITH A/V SAN

Grammy® Award-winning music engineer David Gleeson, scoring engineer John Kurlander and systems expert Mark Wilsher put the finishing touches on Howard Shore's score for *The Lord of the Rings: The Two Towers* at Abbey Road Studios. Gleeson, associate producer on the project, used an eight-seat Studio Network Solutions A/V SAN PRO at Abbey Road, plus several smaller A/V SANs for remote location recording.

The Two Towers used multiple recording locations around London, including CTS Watford, Sir George Martin's AIR Lyndhurst Studio and Henry Wood Hall, in addition to Abbey Road. An A/V SAN PRO with three terabytes of storage was installed at Abbey Road, which served as the main base of operations for mixer Peter Cobbin and main editor Michael Price. Smaller-recording SNS A/V SANs were used at the remote locations, in tandem with Digidesign Pro Tools and Prism converters. An A/V SAN was also installed at The Film Unit in New Zealand for the film's dub.

"The amount of data and drive space that you use quickly notches up," Gleeson said. "The only way to have any given piece of music available to do an overdub at pretty much any time was to go to a smaller SAN. You've got 100 musicians and a huge crew, the clock's ticking and something's down—it's very, very unpleasant to be in that predicament with any piece of gear. You have to know it's 100-percent reliable. The editors simply work instead of dealing with drive issues. I'm definitely very happy with the way this system performs."

For more on *The Two Towers*, turn to page 78. For more on Studio Network Solutions, visit www.studionetworksolutions.com.

IT COULD HAPPEN

GRADUATE STUDENTS INTERN WITH FLEETWOOD MAC

After 900 hours of studying, Arizona's Conservatory of Recording Arts and Science students John Haley's and Phil Nichols' graduation required an internship at a working studio. For them, it was with L.A.'s Cornerstone Studios, where Fleetwood Mac was in mixing their 2003 release.

"They were amazingly well prepared, considering the situation we've thrown them into," said mix engineer Mark Needham (Cake, Chris Isaak, Elton John). "You've got 112 tracks of Pro Tools, a 48-track Sony 3348 digital machine, analog decks and Neve automation all to lock up. They've handled every task I gave them, which is pretty sharp."

PHOTO: DAVID GOGGIN

Pictured at the Neve VR are, from left, Phil Nichols, Lindsey Buckingham, Mark Needham and John Haley.

"The band has been very cool and easy to be around," said Haley. "The equipment has been much more temperamental," added Nichols.

The release was recorded at Lindsey Buckingham's Bel Air, Calif., studio with engineer Ray Lindsey and at Ocean Way with engineer Allen Sides.

ON THE MOVE

Who: Richard Gentry
What: general manager, Crest Audio
Previous Lives:
- 2000-2002, Northeast business manager, Bose Corporation Professional Division
- 1999-2000, director of sales and marketing, Symetrix Pro Audio and Lucid
- 1997-present, advisory board member, Arizona's Conservatory of Recording Arts and Sciences
- 1989-1999, various positions, Hafler division of Rockford Corporation
- 1987-1988, pro manufacturer representative, RADON
- 1970-1988, pro recording artist, singer/songwriter

Main responsibilities: To make Crest better so that our customers always think of us first.
If I could do any other profession it would be... recording artist and/or producer, or a professional race car driver.
A session that I would have loved to be a "fly on the wall" for was... Jimi Hendrix, Electric Ladyland Sessions.
The ultimate DVD re-release would be... *Le Mans* with Steve McQueen. Those classic duels between Porsche and Ferrari were amazing.
Curently in my CD changer are... Linkin Park's *Hybrid Theory*, Norman Vincent Peale's *The Power of Positive Thinking*, Tribal Voices' *Music from Native Americans*, Carlos Montoya's *The Art of Flamenco*, *The Best of Paganini* and John Coltrane's *Blue Train*.
When not in my office, you can usually find me... with my wife and kids exploring a new town, new shop, a new car dealership.

BERKLEE TO TEACH ONLINE

This month, Berklee College of Music will launch www.berkleemusic.com, an online school, job site and networking destination for the music industry. The site will offer a "Jobs and Gigs" section and several dozen of Berklee's non-performance music courses.

The Berklee professor-led classes range from four to 12 weeks; a partial list includes: Desktop Music Production; ProTools Basics: Set Up and Recording; ProTools Digital Audio Editing; Pro Tools MIDI Recording and Editing; Marketing Yourself In the Music Industry; Finale: Strategies for Speed and Style; Finale Basics: Essential Techniques; MIDI Sequencing Basics; and Accelerate Your Music Career.

Those interested in the classes can visit www.berkleemusic.com/school or call 617/747-2146.

World Radio History

SIR ELTON LIVE AT NAMM

On Friday, January 17, 2003, Yamaha and NAMM will present "A Benefit for Music Education," a concert featuring Sir Elton John performing with Ray Charles, Vince Gill, Amy Grant, Bruce Hornsby, Norah Jones, Diana Krall, Michael McDonald, Brian Wilson and other luminaries. Held at the 14,000-seat Arrowhead Pond arena in Anaheim, Calif., the concert is not open to the public; only participants in the Winter NAMM trade show and their guests can attend. During the event, John will receive Yamaha's 2003 Lifetime Achievement in Musical Excellence Award. Proceeds from the tax-deductible ticket sales are earmarked for various music education programs. For more information or to order tickets, visit www.namm.com.

HAPPILY MIXED

Mitch Dorf of POP Sound (Santa Monica, Calif.) was named West Coast Mixer of the Year by the West Coast branch of the Association of Music Producers (AMP) on November 1, 2002, at Groove Addicts' new recording facility in Los Angeles.

NEW STUDIO DOTS NEW YORK SKYLINE

Longtime sound engineer Jonny Sheehan (MTV and VH1 live shows) and noted drummer Tom Kaelin (Merle Saunders, the Rainforest Band, Rick Danko) have opened their own studio in Brooklyn, dubbed Blue Dot Studio. Recently working in the new digs was multi-Platinum producer/engineer Dave Swanson, Blues Traveler's John Popper, Dave Schools (Widespread Panic), world music star Roykey and DJ Logic.

Featuring a high-ceilinged live room, the low-key studio also offers a vintage Neve console, Pro Tools|HD and film soundtrack capabilities. Commenting on the vintage Neve, Sheehan said, "I always kept a home studio in my Brooklyn basement, and once the Neve console came into my possession, I decided to take it to the next level and open a full-service facility."

Check out the good vibes at www.bluedotrecording.com.

Industry News

President and CEO of Sound on Sound Recording's (New York City) **Dave Amlen** has been named president of **SPARS**...**Kathy Gornick**, president of Thiel Audio Products is the first female to chair **CEA**'s (Arlington, VA) Board of Directors and Executive Board...Newly created **Inter-M Americas** (Chester, PA) has named **Charles D. Moore** its VP and general manager. Helping him out will be **W. Douglas Wilkins**, director of sales and marketing, and **Alfred J. Mock**, inside sales manager...**Michael McGinn** will take charge of **Shure**'s (Evanston, IL) global marketing and sales as that division's executive VP...**Eventide** (Little Ferry, NJ) announcements: **Ray Maxwell**, VP of sales and marketing; **Kevin Garant**, sales manager for China, Japan, India and southeast Asia, will be based out of Melbourne, Australia; and the company will now distribute pro audio products from **Princeton Digital** (Princeton, NJ) and **Manifold Labs** (New York City) through its dealers in the U.S. and worldwide...**QSC** (Costa Mesa, CA) new hires: **Jon Sager**, contractor/consultant liaison for installed sound, and **Ray Van Straten**, retail market-development manager...**Summit Audio** (Watsonville, CA) has brought on **Damon Gramont**, sales manager...**TC Electronic** (Sherman, CT) welcomed **Andrew Witte**, New York metropolitan sales representative.

19TH ANNUAL TEC AWARDS CALL FOR ENTRIES

The Technical Excellence & Creativity Awards nominating panel is accepting product nominations for the 19th Annual TEC Awards, to be held October 11, 2003, in New York. To be eligible, products must have been released and in commercial use during the period from March 1, 2002, to February 28, 2003.

Categories are Ancillary Equipment, Digital Converters, Amplifier Technology, Mic Preamplifier Technology, Microphone Technology/Sound Reinforcement, Microphone Technology/Studio, Wireless Technology, Sound Reinforcement Loudspeaker Technology, Studio Monitor Technology, Musical Instrument Technology, Signal Processing Technology (Hardware), Signal Processing Technology (Software), Recording Devices, Workstation Technology, Sound Reinforcement Console Technology, Small-Format Console Technology and Large-Format Console Technology.

Companies that wish to nominate products should send complete product name and qualifying category, date first commercially available (proof of shipment may be required; beta test sites do not qualify), and a contact name and telephone number.

Companies that wish to nominate Outstanding Studio Design Projects should send the studio name and location, date completed, name/phone number of the architect(s), the acoustician(s) and the studio owner(s).

Send all information to TEC Awards, 1547 Palos Verdes Mall #294, Walnut Creek, CA 94597; fax 925/939-4022; Karen@tecawards.org. Forms can also be downloaded from www.tecawards.org. All entries must be postmarked by Friday, January 31, 2003.

World Radio History

PLUG THIS IN

"If I could only take one DSP effects box with me to the moon, it would have to be the Kurzweil KSP8."
Alan Howarth, Engineer, Composer

"I really like the KSP8 and from the minute I hooked it up it has become a vital part of my mixing session."
Michael Wagener, Double Trouble Productions, Inc.

"The KSP8s routing flexibility and parallel processing capabilities were ideal for the situation. We also used one to process Mike Garson's main piano sound. Using the same sound source through a combination of subtle distortion, EQ, and ambience effects we were able to get piano sounds that had quite radically different character. For many songs, instead of changing patches on his keyboard, Mike's just changing to a different KSP8 chain program."
Tony Widoff, Programmer: David Bowie *Heathen* Tour

"This is the one to beat."
Paul Orofino, Engineer - Milbrook Studios

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HEARING FILM HITS CLASSROOMS

The Hearing Aid Music Foundation (www.hearingaidmusic.com) has just completed *Listen Smart—Safely Handling the Power*, a 15-minute educational film designed to raise awareness among young students about noise-induced hearing loss (NIHL) and to encourage safer practices in consuming high-dB sound.

Industry leaders and artists involved in conveying their experience and advice on hearing conservation include producer Matthew Wilder, Moby, Ozzy Osbourne, Darren Hayes (Savage Garden), Cyndi Lauper, Wyclef Jean, Lars Ulrich (Metallica), Tracy Bonham, Evan Seinfeld (Biohazard, *Oz*), Deborah Harry (Blondie), Brad Delson (Linkin Park) and entertainment impresario Russell Simmons.

The film and a teacher's aid booklet are being distributed throughout the U.S. and Canada and other English-speaking countries worldwide. The film was partially funded by a grant from Shure; additional funds came from Sony Music Studios, BMG Entertainment, V2 Records and Xoff Records, as well as private donations.

NOTES FROM THE NET

"I will survive" seems to be the running mantra (or joke, depending on which side of the legal battle you are on) for Napster, which was saved when a Delaware bankruptcy judge approved a $200,000 emergency loan from Napco Acquisition. Napster hopes that the injection of funds will keep the company afloat until the U.S. Bankruptcy Court approves an acquisition offer from Roxio. The CD-burning company announced that it would shell out $5.3 million to acquire Napster's intellectual property and technology patent portfolio; the company said that it would not assume any of Napster's debt, the subject of which is still in litigation. As of press time, auctioneer DoveBid will host a Webcast of Napster's remaining fixed assets.

Did you get my memo? The RIAA, MPAA and songwriters' associations have sent a letter to the heads of Fortune 1000 companies, cautioning them that the file-trading activities of their employees could put them at legal risk. Taking advantage of fast Internet connections and a wealth of space offered on corporate Intranets, more and more employees are finding, distributing and storing illegal entertainment (both music and movie) files, according to the letter. Earlier, these groups sent a similar letter to university officials, warning them of a growing file-sharing use on their networks.

"THE PICTURE"

Working at Marcussen Mastering (Los Angeles), Erik Zobler (standing), Lon Neumann and Stephen Marcussen (right) take a break from the 5.1 SACD remix of Dianne Reeves' The Calling.

CORRECTIONS

The Ward College of Engineering is actually the Ward College of Technology ("Insider Audio," November 2002). Ward has the Audio Engineering Technology program, and the College of Engineering (a separate school at University of Hartford) has the Music Acoustics program. Also, Scott Metcalfe is pictured on the left, not on the right.

GRM Tools' contact information ("New Instrument, FX and Utility Plug-Ins," September 2002) should have read: "GRM Tools is distributed worldwide through Electronic Music Foundation in partnership with INA-GRM (www.grmtools.org)."

Mix regrets the errors.

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www.mixonline.com

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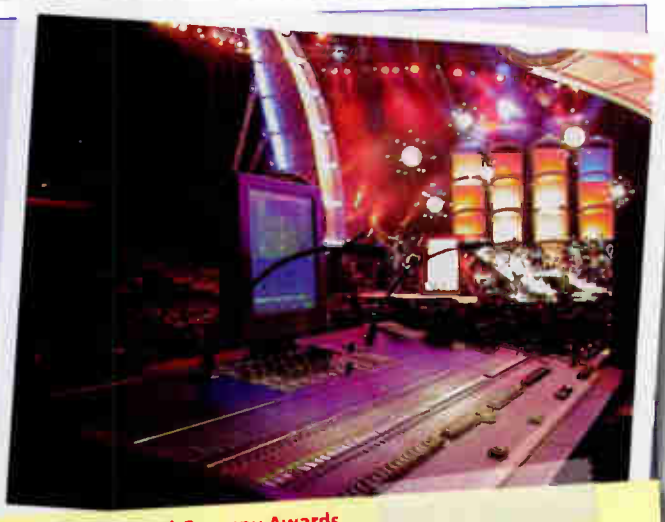
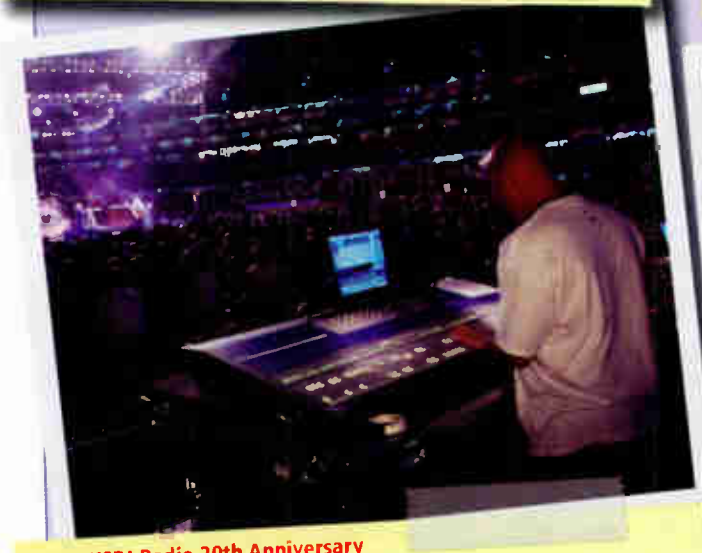
Show: **E.T. the Extra-Terrestrial 20th Anniversary Re-Premier**
Company: **Delicate Productions, Camarillo, CA**
Venue: **The Shrine Auditorium, Los Angeles, CA**
Console: **Innova SON**

"The Innova SON provides isolation, linkability, ease of installation and overall product integrity."
—**Lyle Dick**, Engineer/System Designer



Show: **44th Annual Grammy Awards**
Company: **ATK/Audiotek, Burbank, CA**
Venue: **Staples Center, Los Angeles, CA**
Console: **Innova SON**

"Having equalization and delays on every output coupled with dynamics and equalization on every input channel complemented the Grand Live's already small footprint by reducing the need for outboard gear."
—**Andrew "Fletch" Fletcher**, Assistant FOH Engineer



Show: **KSBJ Radio 20th Anniversary**
Company: **LD Systems, Houston, TX**
Venue: **Houston Astrodome**
Console: **Innova SON**

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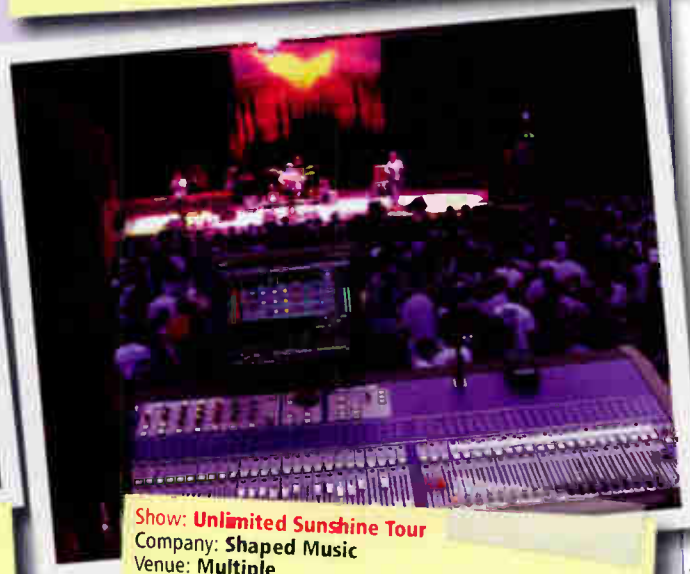
—**Robert Ausmus**, Director of Operations



Show: **Unlimited Sunshine Tour**
Company: **Shaped Music**
Venue: **Multiple**
Console: **Innova SON**

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World Radio History

Peter Gabriel's Growing Up Tour

By Mark Frink

Peter Gabriel's first tour in nearly a decade, which stopped at two dozen North American cities in late 2002, featured an in-the-round arena stage conceived by Robert Le Page, who also designed Gabriel's 1993 Secret World tour. The sound system, a collaboration between Firehouse Productions and AudioTek, was also no ordinary speaker package. Because Gabriel's latest album, *Up*, explores a vertical design theme, it was only fitting that the sound system largely consisted of line arrays, with associated amp racks flown above. *Mix* caught the show in Boston.

The main speaker system employed four clusters, each made up of a dozen L-Acoustic V-DOSC speakers with three of the smaller dv-DOSC models hung beneath. Two of these, angled outward a few degrees, were aimed down the longer axis of the arena and were mirrored—with L/R channels reversed—on the opposite side of the center-floor stage. Twelve-box arrays of dv-DOSC units aimed at the arena's sides completed the stereo image, which could be detected throughout most of the venue. Six-box columns of E-V MTL quad-18 subs were flown at each side of the stage, providing even low-end coverage without causing bass build-up in the center. AudioTek's CSW-118 subs supplemented the lows at the circular stage's perimeter; frontfill was provided by a ring of JBL's new VerTec VT 4887 compact line array modules. AudioTek's John "Drano" Drane and crew chief Greg "Chico" Lopez flew the rig, while L'Acoustic designer Florent Bernard made daily calculations for trim height and splay for even coverage.

The system is powered by a half-dozen double-wide racks, with QSC PowerLight 9.0 amps on the lows and 4.0 amps for mids and highs. The in-the-round stage requires that amplifiers also be flown; Firehouse's Tim Fraleigh climbed into the tech grid to make final connections. To accommodate the long signal runs from the mix position, AudioTek chief engineer Scott Harmala implemented QSC's RAVE system. The XTA DP-226 processors in AudioTek's drive rack were fitted with an AES I/O option to take digital 24-bit/48kHz outputs from the FOH Yamaha PM-1D's matrix and feed them to redundant master/slave QSC RAVE units. From there, signal was shipped over 1,000-foot fiber-optic runs to two flown amp-rack positions, which were also cross-connected. The complete fault-tolerant digital signal path also carried QSControl amplifier control and telemetry signals.

PHOTO: RICK FRIEDMAN

The sound crew, from left: John Drane, Tim Fraleigh, Jeff Briggette, Jim Warren, Greg Lopez, Bryan Olsen, Florent Bernard and Bob Lewis

Mix engineer Jim Warren, well-known for his FOH work with Radiohead over the past decade, supplemented the PM-1D's internal effects and dynamics with a couple of TC Electronic M•One reverbs and a TC D•Two delay, plus a Tube-Tech CL2A compressor on Gabriel's headset mic and a dbx 160S compressor on his handheld.

Firehouse principal Bryan Olsen has toured with Gabriel for the past two decades. Assisted by Bob Lewis, Olsen operated two Midas Heritage 3000 consoles to provide in-ear mixes for Gabriel, his six bandmembers, along with the Blind Boys of Alabama, plus Hukwe and Charles Zawose, both RealWorld Records artists from Tanzania. Other than Gabriel's and Rachel Z's keyboards and Ged Lynch's drums, the revolving round stage was bare. The monitors were used to display a common view of Emagic's Logic Platinum, which is used to play additional backing tracks and as an elaborate cue system for the performers.

RF tech Jeff Briggette coordinated over 30 wireless frequencies daily. Shure PSM-700 systems were used for in-ear mixes, along with Aphex Dominators and Olsen's company-branded Firehouse 6500 custom ear molds. Vocal mics were all Shure UHF wireless with Beta 87 handhelds for Gabriel and the Blind Boys, plus WCM16 hypercardioid condenser headsets for everyone else. Also wireless were David Rhodes' and Richard Evans' guitars and Tony Levin's Stick. Evans also played a flute through a WCM16 headset mic that fed his own effects rack, and wireless WL50 lavs were used for Zawose's drums and hand percussion. Because the stage was bare of floor monitors, the Blind Boys and Hukwe and Zawose, who opened the show and joined in on a couple of songs, were also fitted with IEMs.

The ambitious production required long hours to load in daily, as most of the contents of 11 trucks ended up in the air. The immense workload, combined with multiple back-to-back shows, meant that soundchecks were simply not possible on some days. The event contains many surprises, and there are plans to return to the U.S. for a 2003 leg after a spring tour in Europe. ■

Mark Frink is Mix's sound reinforcement editor.

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The Mogami Edition Valve Microphone is a culmination of years of research into what people look for in a Tube Microphone. What do they like about the "vintage" German Mics and moreover what do they dislike about them? It seems universal that "Tube Noise" is the greatest concern, especially when recording digitally. We took care of that by individually selecting time proven 12AT7 tubes and coupling to a newly designed FET output stage. Many dislike the "dark" sonic characteristics inherent in some of those older designs. Our capsule exhibits a brighter characteristic with an airy quality. Also, most agree 4-figures for a microphone is a bit "over the top". The V69 Mogami Edition microphone is reasonably priced in the low 3-figure range. And finally, to insure all of these qualities end up on the track, The V69 is internally wired with Mogami and is supplied with Mogami tube and studio microphone cables.

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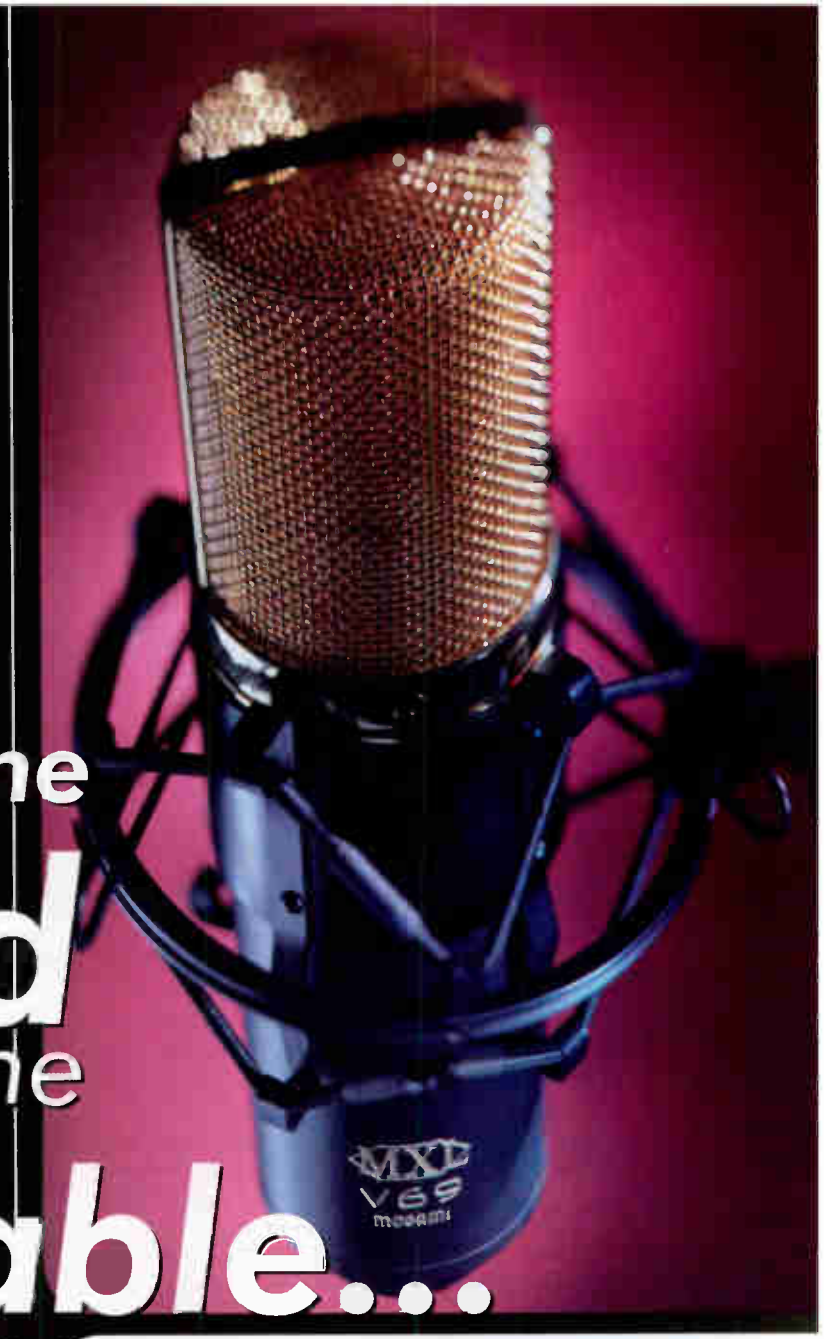

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World Radio History

BY STEPHEN ST.CROIX

Lest We Forget

How It Should Be Done

I have been called a Renaissance man. I have been called brilliant. I have also been called a long-haired freak, dirty commie hippie, totally insane, Officer, baby, dangerous and, certainly worst of all, sir. And I have been called way too late at night, so all of my numbers are now diverted to the office.

And because you can't reach me, I will try to reach you. I will begin with SSC Cliff's Notes so that you may more accurately judge my veracity as you read the advice that I offer—no, *plead*—this month.

MY QUALIFICATIONS

My careers have included car and motorcycle racing, drag racing, high-tower pier and cliff diving, sculpting and painting. After a few serious accidents on the drag strip, I became a drummer and, later, a guitar player, figuring I would meet just as many women playing music as when I did racing, but might bleed less. Turned out to be about the same amount of blood loss.

I have also been a dude (as in dude ranch), boardwalk T-shirt airbrush "artist" and surfboard builder. Then came custom bike builder and painter, commercial welder, commercial scuba diver and graphic arts designer.

At 18, I moved to Europe and managed to design some guitar effect boxes that sold to a couple of major companies, while landing studio guitar gigs in Italy and the UK that ended up on the air.

Around 28, I became much more serious about music. I began proper practice—eight hours a day, seven days a week—and expanded into composing, engineering and producing. At 30, I became a successful audio-hardware designer/manufacturer (signal processing and, later, DAWs), weaponry designer, consultant in several arenas and, recently...much, much more serious stuff.

And I've been pretty lucky with all of this: Each of these careers has done well, and each provided a full lifetime's education. Collectively, they have determined who I am today.

MY DISQUALIFICATIONS

My avocations have been equally diverse: sky diving; racing every kind of motorized land, sea and air vehicle made except snowmobiles; competition surfing; competition body building; and building the most inappropriate street vehicles possible.

MY CONVICTIONS

I am an extreme animal rights advocate and have never shot a living thing that didn't wear clothes (with the exception of two mercy executions). I was a tree-hugger until a giant tree came through my bedroom roof and hugged me back.

I spent a year in Europe reading touchy-feely inspirational existentialism in what seemed like every language but English, all in the comforting blue-twilight glow of the endless snow-covered fields of Sandoz outside my bedroom balcony. Every morning, the same tripping cows would stand in a meter of snow and count the flakes as they landed on their noses. This is where I learned that reality is relative, and like it or not, your relatives are reality. And, of course, that Godot is *not* coming.

MY ACQUITTALS

Most of my vocations have required significant knowledge and experience in multiple disciplines. In fact, I think my main trick in life has simply been to combine multiple technologies or sciences in ways that the merely sane would never dream of.

This has served me very well. Being pretty well-versed in audio, electronics, metal work, manufacturing techniques, silicon design and packaging design has allowed me to successfully introduce my first product—and three new technology families it incorporated—into the pro audio marketplace. The Marshall Time Modulator had the industry's first flexible circuit boards. A complicated front panel that would have required a complex wiring harness and a two-hour construction was replaced with two flexible PCBs that reliably loaded in 30 seconds.

Integration of multiple technologies, under my direct control, has paid some pretty big bills.

> Though I no longer listen to radio in any form, I have friends who do. And it is for their health and well being that I make this request: Pick one damned instrument and learn to play it!

DO WHAT I SAY, NOT WHAT I DO

So, as you can imagine, I am a real believer in understanding all aspects of what you are doing. And, as you could guess, when I began recording in earnest, it was

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World Radio History

natural for me to carry this thinking over and do damned near everything myself—from redesigning head preamps to aligning the decks to playing every instrument and then mixing the final tunes. I still have the Theremin I made from scratch in 1966. Now, this level of follow-through is, in hindsight, clearly freakin' insane, but it gave me one hell of a foundation and understanding for the *mechanics* of playing and recording music.

LES PAUL MCCARTNEY

Les Paul did it all. Did he ever. It is safe to say that he not only pioneered the concept and use of multitrack music recording, but he established the paradigm that we all still use today. I listen to a lot of Les and Mary. It keeps my ego under control, sorta. He *built* those hits, and he did it the hard way. But it is important to understand that he could also *play. One instrument.* Well.

And Paul McCartney. When he first began his solo efforts, I used him as *the* example of what could happen if one musician had total control: If one person wrote the tunes, played the instruments, sang the verses, recorded the result and mixed the album.

When a single soul (rubber or not) does all of that, his personality's characteristics and taste are added—no, *multiplied*—with each step. The end product is a sort of distilled essence of the creator; a concentrate.

Now, Sir McCartney certainly pulled it off, as did a few others in their own right. But they are few and far between; *very* far between, in fact, when it comes to styles and taste. Take Frank Zappa and Steve Miller. Though neither has a history of solely isolated multistep creation, their individual personalities and taste, along with their level of technical mastery of their instruments, certainly determined what their records sound like, with or without a conventional band.

But most artists who try their hand at this incredibly Dangerous Game may produce an interestingly pure initial effort or two, only to eventually degenerate into a fed-back amplified caricature of themselves. Absolute control corrupts absolutely.

DINOSAURS, MAN NEVER EXISTED ON EARTH TOGETHER

Except, of course, in the music industry.

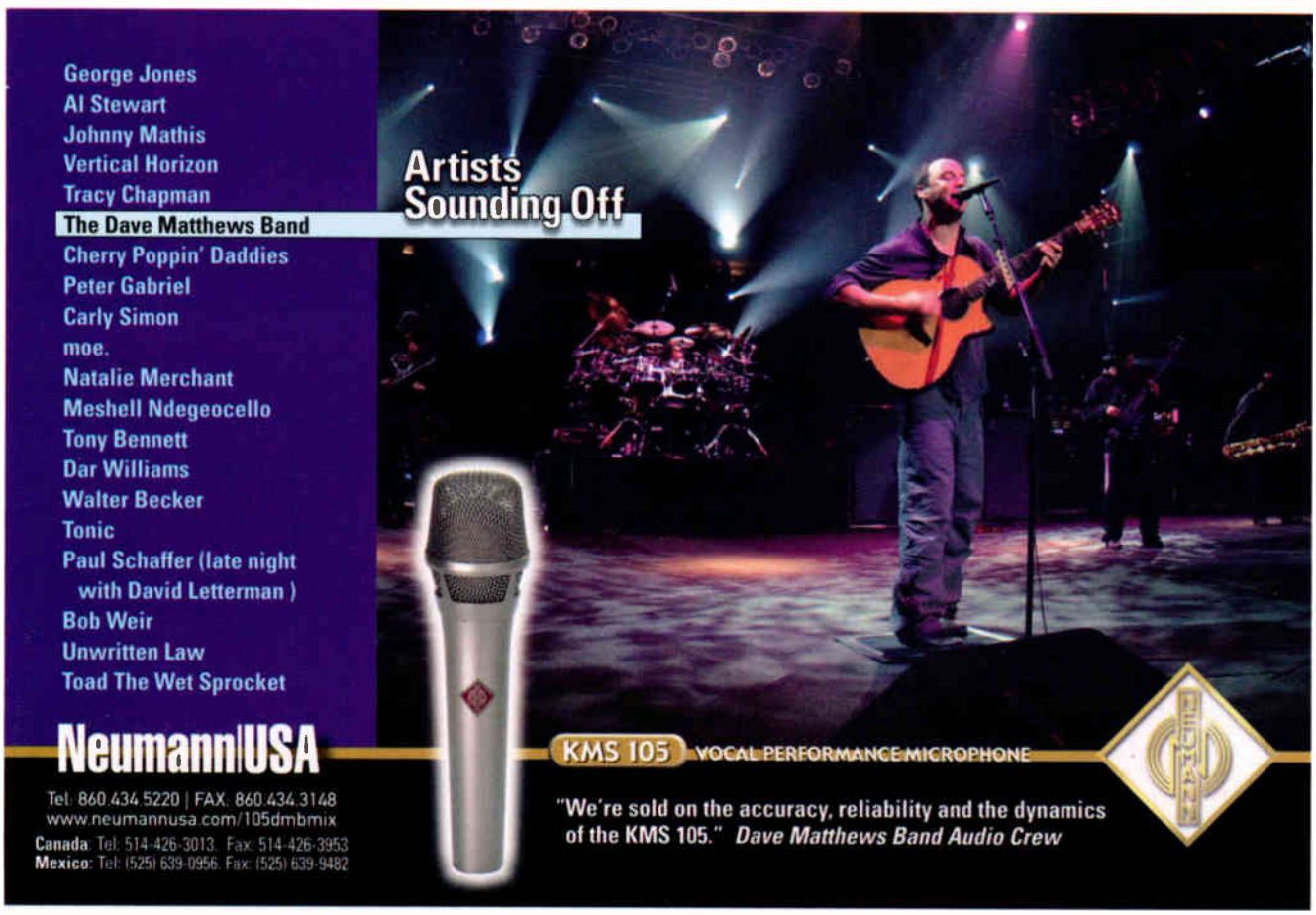
Well, well, well. Here you are, reading through the seemingly endless pontifications of one who professes to be skilled in the Dangerous Game himself. But here is where I turn on you.

The Specter of Technology has stomped in the mud along man's stream of music and left giant footprints that these lesser life forms are falling into. As these craters fill and fossilize, cross-sections of the resultant stone may someday be sold in trendy little shops along Fisherman's Wharf in Seattle or 7-Elevens in Palm Springs, Fla. Labeled as "Self-Delusional One-Man Bands," they will be all the rage. Their owners will revel in the knowledge that their stunning array of fossilized instruments don't even have the normal wear that one would expect from being played—almost as if they were bought, played a couple of times and then put aside. Strats will be found with their *original* strings intact.

TEK NINE, AIN'T IT A CRIME?

Any crime has two basic components: motivation and opportunity. This is certainly not a crime of passion, so that leaves greed—the pursuit of easy money—as the

—CONTINUED ON PAGE 183



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World Radio History

BY PAUL D. LEHRMAN

War Stories

Memorable Moments in *Mix* Readers' Lives

ILLUSTRATION: JO RIVERS

One of the best parts of moderating Mix Forums online (www.mixonline.com) is that I get to read and, most of the time, approve all of the messages submitted by site visitors. I like reading your technical questions because they keep me up-to-date about what kind of problems you're having with gear, techniques, business and a bunch of other topics. I like discussing and arguing issues like analog vs. digital and RIAA vs. everybody, because they tell me where you stand and what's important to you.

But my absolute favorite part of the gig is reading the "horror stories" you contribute about recording sessions, live shows and, yes, even church services from hell. You've told us about pompous producers getting their comeuppance, idiot clients finally (or sometimes never) realizing the error of their ways, and horrendous screwups that you admit to and laugh at now. As the great Steve Allen said, Comedy = Tragedy + Time.

We've got well over a hundred horror stories online now, and this month, I thought I'd share a few of my favorites. I've changed any identifying characteristics in the stories to protect both the innocent and the guilty, but I haven't done any serious checking on whether any of them are actually true. After all, as journalists since time immemorial have known, one should never let the facts get in the way of a good story. I'll just have to take your word for it.

THIS ONE TIME, IN THE STUDIO

PUNCH-IN, RINSE, REPEAT: Many years ago, I worked with my partner on a project with a famous producer. We only had a few days' time to record, overdub and mix three songs. Late one night, we were working on punching in a vocal section of a song, and after the first take, I let the tape machine roll a bit further into the song. The producer (who was dozing in the corner of the room) said, "One more time." So we rolled it back and did it again. Again, he said, "One more time." We kept going like this for nearly an hour until we realized that "One more time" had been recorded on the tape at the end of the first take. But we kept on hearing it because after each new take, I

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World Radio History

would punch out right at the end of the vocal. We found out that the guy had actually been asleep for the entire hour we were going over and over the part.

YOUR HIGHNESS: It was a 24-track analog mixing session. The producer and the mix engineer were hard at work when the executive producer came in and started to assert his presence by pressing some buttons on the mixing console: mutes and solos. At a certain moment, he pressed Solo on track 24, which was, of course, timecode—and very loud. He looked shocked. "Are you guys using this on the song too?" "Yes, of course," said the engineer. "Well," said His Executiveness, "please keep the volume of this track pretty low."

THE HUMAN METRONOME: I accepted a call to track a rock band's demo late last year. The band set up quickly and seemed on top of things. They wanted to loosen up by going straight to 2-track for a little while. I was asked to set up a single vocal mic, and there was also this one extra fellow who appeared not to play anything but asked for a set of cans.

The female vocalist came in, smiled at me through the glass, adjusted the mic stand, and pretty soon, the band started counting off. I noticed, however, that the vocalist was not wearing headphones, so I hit the talkback and asked her if she wanted cans. The "extra" guy said that I had to speak to her through him. Thinking that I was dealing with an ego here, I said, "Fine, please ask her if she wants cans." His reply: "It would be no use; she's stone deaf."

> Again, he opened his eyes and this time started to look up toward the sky. Finally, he stopped playing and raised his arms up and said, "God!!" So I answered, "No, you dork, it's Antonio, and I'm in front of you!"

His role, it turns out, was to conduct her so that she knew when to come in—a human metronome who knew how to sign. You cannot imagine the sounds she created in her role as a "vocalist," although the "lyrics" were right on meter. The band has a strong local following north of Baltimore, or so they say.

EVEN THE DOG CRIED: A woman booked an hour of time in my studio and showed up on the appointed day with her husband of 25 years. They told me that they were about to redo their marriage vows, and he wanted to sing a particular song to her during the ceremony but was afraid that he might not be able to pull it off, as he might be overcome with the emotion of the moment. So they decided he should record the song, and they would play the tape at the appropriate point.

Made sense to me. I started to copy the background-music cassette they'd brought in over to the multitrack so he could overdub his vocal. The song was, unfortunately, "Wind Beneath My Wings." Now we *all* know how difficult that song

—CONTINUED ON PAGE 184

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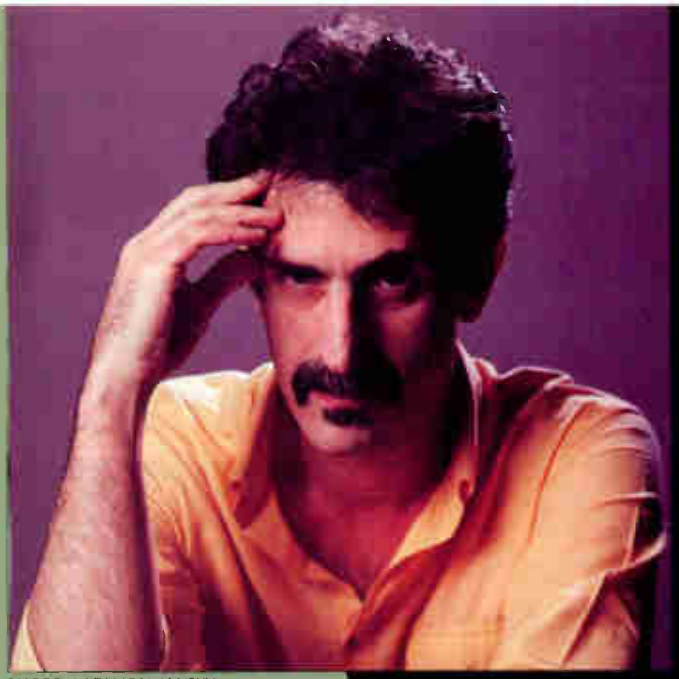

PHOTO: LADI VON JANSKY

Frank Zappa's Extraordinary Recording Techniques: A Selective History

WE ARE The Mothers

...AND THIS IS WHAT WE SOUND LIKE!

By Chris Michie

Frank Zappa has been justly celebrated as a composer, guitarist, bandleader, social and political commentator, scourge of the religious right and free-speech activist. Less commonly noted is that Zappa was an early adopter of almost every significant new recording technology since the dawn of multitrack, and often used those technologies and devices in entirely original ways. The Zappa catalog, which now numbers in excess of 70 releases, contains countless examples of innovative uses of technology and many outrageously original solutions to musical and technical problems.

Although it is not strictly necessary to know how Zappa created his art in order to appreciate it, *Mix* readers are more likely than most to appreciate the originality of Zappa's many recording experiments and admire his logical approach to problem solving. This article, based in part on interviews with several of his recording engineers, will describe Zappa's recording methods during the '60s, '70s and '80s, and trace how they evolved to take advantage of technological advances in recording and stagecraft.

World Radio History

PHOTO: TOM COPI

The Mothers of Invention live onstage at the 1969 Newport Jazz Festival. At front, left to right: Don Preston, Jimmy Carl Black (drums), Zappa, Art Tripp (drums), Roy Estrada. At rear, l-r: Motorhead Sherwood (partially obscured), Buzz Gardner (in hat), Bunk Gardner (obscured), Ian Underwood.

When the Mothers of Invention first came to public attention with the 1966 release of *Freak Out!*, the group's apparent leader was, at 25, already an industry veteran. A self-taught musician who had been composing orchestral scores since his teens, Zappa had engineered and produced records since the early 1960s, chiefly at Paul Buff's Pal Recording Studio in Cucamonga, Calif. In 1962, temporarily solvent thanks to a partial payment for one of his early film scores, Zappa took over Pal, renamed it Studio Z and entered the world of business as a studio owner. "Meanwhile, my marriage fell apart," Zappa wrote in his autobiography, *The Real Frank Zappa Book* (co-authored with Peter Occhiogrosso, Poseidon Press, New York, 1989). "I filed for divorce, moved out of the house on G Street and into Studio Z, beginning a life of excessive overdubbage—nonstop, 12 hours a day." This aberrant device-centric behavior, a theme that recurs frequently in Zappa's lyrics, was made possible in part by the fact that Pal contained the world's only staggered head, 5-track, half-inch tape recorder, constructed by Buff at a time when mono was the industry standard.

Zappa's productions at Pal were not excessively complex—mainly jazz, surf, doo-wop and novelty numbers—and activities at Studio Z came to an end soon after Zappa was busted for "conspiracy to commit pornography" and briefly jailed. (Zappa had been set up by an undercover cop who commissioned a suggestive tape for a stag party, and then arrested Zappa for producing it.) Nevertheless, when the Mothers of Invention (M.O.I.) entered T.T.G.'s Sunset Highland Studios in L.A. to record their debut album, Zappa probably knew more about recording than most West Coast rock musicians. Zappa certainly impressed MGM/Verve producer Tom Wilson, who hired him as arranger for several non-Mothers sessions. And, though Wilson was the producer for the two-LP *Freak Out!* and its successor, *Absolutely Free*, Zappa produced all subsequent M.O.I. albums.

PHOTO: LADI VON JANSKY

Zappa in the control room of his personal studio, the Utility Muffin Research Kitchen

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Having recorded the first two M.O.I. albums in L.A. on 4-track equipment, Zappa moved to New York's Mayfair and Apostolic 8-track studios for most of *We're Only In It For the Money*, an LP best known for its cover parodying The Beatles' *Sgt. Pepper's*. Recorded in late 1967 and released March 1968, *WOI-IFTM* features snippets of orchestral music that Zappa wrote and conducted during sessions for Capitol producer Nick Venet almost a year earlier. Originally intended for release in August 1967, the orchestral album was delayed due to a dispute between Capitol and MGM, which claimed that Zappa was under exclusive contract, foreshadowing Zappa's many legal troubles. By the time *Lumpy Gravy* was eventually released, Zappa had transformed the all-instrumental project into a bewildering collage of music, conspiratorial dialog recorded under the grand piano at Apostolic, Motorhead Sherwood riffing on cars, cartoonish sound effects and "snorks." As Zappa himself recalled, he had spent nine months editing the 2-track master.

This wholesale revision of a completed work became a common theme in Zappa's work. As he explained to *Rolling Stone* interviewer Jerry Hopkins in early 1968, "It's all one album. All the material on the albums is organically related, and if I had all the master tapes and I could take a razor blade and cut them apart and put it together again in a different order, it would still make one piece of music you can listen to. Then, I could take that razor blade and cut it apart and reassemble it a different way and it would still make sense. I could do this 20 ways. The material is definitely related."

True to this philosophy, Zappa continually returned to his original material, re-editing and resequencing albums several times before they were released or, in several cases, shelved. He also remixed almost the entire catalog for both vinyl and CD re-releases, often deleting, augmenting, re-editing or replacing performances that he considered less than ideal.

One of the early Mothers lineups—the so-called "vaudeville band." Top, left to right: Jim Pons, Mark Volman, Howard Kaylan. Middle row, l-r: Aynsley Dunbar, Ian Underwood Don Preston. Zappa at bottom.

THE '60S—UNDERGROUND FREAK-OUT MUSIC

Though sophisticated and innovative in terms of content and presentation, the first three M.O.I. albums are somewhat dated in terms of their "sound," a shortcoming that Zappa later addressed by overdubbing new bass and drum parts on the *We're Only In It For the Money* tapes in the mid-'80s. However, along with *Lumpy Gravy*, the first three albums (now available in a threefer package from Rykodisc) introduced several production techniques—and musical and lyrical themes—that would feature prominently in later releases. Both *Absolutely Free* and *We're Only In It For the Money* featured non-stop, segued album sides arranged as suites of songs, interspersed with field recordings of bandmembers' dialog and sections of *musique concrête* ("natural" sounds modified by tape manipulation). These audio jump cuts and sudden changes in ambience were also reflected in the music, as doo-wop, pop songs, political commentary, fuzz guitar rock and cocktail jazz all piled up on each other. As the years went by, Zappa's edits became smoother, to the point of undetectability, but he consistently used editing as a compositional tool and created many coherent (if idiosyncratic) compositions from apparently random audio scraps.

Though Zappa's "teenage" songs were deliberately simplistic, he increasingly augmented the M.O.I.'s guitar band instrumentation with keyboards, brass, woodwinds and orchestral percussion (timpani, marimba, vibes, etc.). As his arrangements became more demanding, Zappa began expanding the band, and by late 1966, the original M.O.I. was joined by two experienced jazzers (woodwind player Bunk Gardner and pianist Don Preston) and a second drummer. A year later, the band also included two conservatory-trained "classical" musicians (multi-instrumentalist Ian Underwood and percussionist Arthur Dyer Tripp III), and Zappa was fronting a group in which several players could both sight read his increasingly complex compositions and improvise with confidence.

The next two M.O.I. albums—*Cruising With Ruben & The Jets* and *Uncle Meat*—took full advantage of both the M.O.I.'s increasing musical competence and access to a new set of recording tools. By late 1967, Apostolic Studios had installed a prototype Scully 12-track recorder, and the overdubbing opportunities it afforded, together with a variable-speed oscillator used to modify the machine's 30 ips tape speed, allowed for the creation of a completely new sound palette. As Zappa pointed out in *Uncle Meat*'s unusually informative sleeve notes, the new technology allowed engineer

Uncle Meat was partly recorded on a prototype 12-track and features many complex arrangements created by extensive overdubbing.

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Dick Kunc to assemble one composition with 40 overdubbed tracks built into it, an extraordinary accomplishment in the days before noise reduction.

Uncle Meat remained unreleased for over a year after the original sessions, giving Zappa plenty of time to edit in some examples of the 1968 10-piece M.O.I. in concert, creating a set of recordings that mixed live and studio tracks without any attempt to disguise the fact. On one track, "King Kong," Zappa edited straight from a studio performance into a section recorded live at the Miami Pop Festival, a highly unusual edit in any musical idiom. As a double album of mainly instrumental music, *Uncle Meat* had a limited market, but it was extremely influential among musicians and remains a fan favorite.

16-TRACK—THE MASSIVE IMPROVE'LENCE

In mid-1969, Zappa disbanded the original M.O.I. and began the 16-track sessions for what would become *Hot Rats*. As before, Zappa made extensive use of overdubbing and varispeed effects to create dense and unusual keyboard and woodwind arrangements; otherwise, the record was relatively straightforward—no segues and no jump-cuts. As 16-track became the new recording standard for rock and "progressive" music, Zappa's production innovations became less remarkable. Nevertheless, *Hot Rats* remains a fascinating example of what could be achieved in the new format.

By the end of the 1960s, Zappa had released seven albums of original material, two of them double-LP sets, and had enough in the can for a projected 12-album set to be called *The History & Collected Improvisations of the Mothers of Invention*. (This much discussed and frequently revised collection was never released, and Zappa soon plundered the material to produce two M.O.I. retrospectives, *Burnt Weeny Sandwich* and *Weasels Ripped My Flesh*, both superbly edited collages of live and studio material.) By the end of the 1970s, there were another 18 releases in the catalog, including five live (or mainly live) albums, a two-LP film soundtrack, a triple-LP concept album, a collection of orchestral compositions and two largely instrumental works that further explored the jazz-rock tendencies suggested by *Hot Rats*. This prodigious output is even more remarkable when one considers that Zappa toured consistently throughout the decade, spending up to 10 months of the year on the road; one gig list shows an average of over 80 shows a year and a peak of 130 in 1974.

> It's all one album. All of the material on the albums is organically related, and if I had all of the master tapes and I could take a razor blade and cut them apart and put it together again in a different order, it would still make one piece of music you can listen to.
>
> —Frank Zappa

As well as rehearsing and recording his frequently changing road bands, Zappa also produced other acts, including Grand Funk Railroad (*Good Singin', Good Playin'*), sued two record companies and his manager for "aromatic accounting practices" and, at the end of the decade, built his own studio.

Featuring live and studio tracks by the original M.O.I., plus an expressive Little Richard cover from the Hot Rats sessions, Weasels Ripped My Flesh sports a striking Neon Park cover design.

THE '70S—TIME IS MONEY

During the early 1970s, Zappa worked mainly in 16- or 24-track studios in Los Angeles, including Paramount, Bolic Sound, Whitney and Record Plant, with a few sessions at Caribou in Colorado, New York's Electric Lady and London's Trident. Kerry McNabb succeeded Dick Kunc as Zappa's primary studio engineer and should receive at least partial credit for the superb sound of such popular albums as *Over-Nite Sensation* (1973) and the 1974 *Apostrophe (')*, which crept into the Top 10 and was Zappa's first Gold record. ("Don't Eat the Yellow Snow" even cracked the Top 100.) Also produced during this period was *One Size Fits All* in 1975, which features an audacious, if

BEST BOOKS ON FRANK ZAPPA

The Real Frank Zappa Book, Frank Zappa with Peter Occhiogrosso, Poseidon Press, 1989. By far the most entertaining account of Zappa's life and work, though inevitably less than critical and not entirely accurate. Superbly illustrated by A. West.

Cosmik Debris: The Collected History & Improvisations of Frank Zappa, Greg Russo, Crossfire Publications, 1998. Revised 1999. An invaluable resource that illustrates an exhaustive chronology with many rare photos, record covers and press clippings. Includes an excellent introduction to 20th-century classical music (and its presumed influence on Zappa) by Chris Sansom. Also contains all of the major lists: discographies, gigs, bands, films, TV and radio appearances, unreleased projects, etc.

The Frank Zappa Companion: Four Decades of Commentary, edited by Richard Kostelanetz, Schirmer Books, 1997. A collection of the more intelligent and revealing interviews, reviews and critical articles. Dry, but informative.

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barely detectable, edit in the lead-off track, "Inca Roads"—Zappa cut direct from the original tracks, recorded on an L.A. soundstage for a TV special, to the guitar solo section from a live performance recorded in Helsinki, Finland. This technique of lifting a solo from a live performance is one that Zappa would make frequent use of, reflecting both his growing skill as an improviser and dissatisfaction with studio-recorded guitar solos.

Zappa had been taping the M.O.I.'s live performances since their first gigs in 1966, and Dick Kunc made many excellent recordings on a portable setup that included an 8-channel mixer and a 2-track

> Frank was notorious for pulling solos off of songs that had been done years earlier. He'd pull a guitar solo off this song and put it on that song. Sometimes totally different songs.
>
> —Davey Moire

Uher. With Kunc gone, responsibility for making "road tapes" was delegated to various members of the road crew, including Davey Moire and George Douglas. Moire, who met Zappa during the live recordings that went into *Bongo Fury* (1975), joined the organization when Zappa asked him to mix FOH for the Royce Hall (UCLA) concerts, which resulted in the *Orchestral Favorites* album (recorded in 1975, but not released until 1979).

Though road tapes were typically recorded on a Scully 4-track at 30 ips with Telefunken C-40 noise reduction, Zappa also arranged for his guitar solos to be recorded wild onto a stereo Nagra, a technique that provided him with a ready library of solos more or less dissociated from their original accompaniment. "Frank was notorious for pulling solos off of songs that had been done years earlier," recalls Moire. "He'd pull a guitar solo off this song and put it on that song—sometimes totally different songs."

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Zappa dubbed the technique "xenochrony," from the Greek words *xeno* (strange or alien) and *chrono* (time). As he explained, "In this technique, various tracks from unrelated sources are randomly synchronized with each other to make a final composition with rhythmic relationships unachievable by other means." For example, in the case of the *Zoot Allures* track "Friendly Little Finger," the solo guitar and bass were recorded in a dressing room on a 2-track Nagra and then later combined with an unrelated drum track for a piece called "The Ocean Is the Ultimate Solution," with additional instrumentation scored to complement the newly produced time signatures. Xenochrony proved to be a powerful new compositional tool for Zappa, and he returned to it many times over later albums.

Not surprisingly, Zappa's tape archives were extensive, if not particularly well cataloged. "But he was uncanny," says Moire. "He knew every note of every recording he ever made. He knew exactly what was on every single tape he ever made. And it was all in his head. If he wanted to work on something, by God, he'd tell you right where to go to get it. He's one of the most amazing guys I've ever met, and he had a mind like a steel trap. Never forgot anything."

PEDAL-DEPRESSED PANCHROMATIC RESONANCE AND OTHER HIGHLY AMBIENT DOMAINS

Starting in 1975, Moire worked on several albums with Zappa in Studio B at The Record Plant. "It had this lovely API console with the API 550A EQ modules, and that beautifully warm API input stage," Moire recalls. "A lovely desk and 3M tape machines. We did a lot of really cool stuff. Frank once had me cut a piece of foam out and mount a Pignose amp on the harp of a Bosendorfer grand piano, pointing down to the soundboard in the piano. Then he went out and put a sandbag on the sustain pedal, determined what he was going to play, and then, with those little rubber mutes that piano tuners use, he muted out the detrimental harmonics, knowing what he was going to play, knowing which strings were going to resonate."

It was during this period that Zappa fired his manager, Herb Cohen, and became embroiled in various lawsuits against Cohen and Warner Bros. One result was that the *Zoot Allures* final master had to be cut from Zappa's own 15 ips safety copy, as legal complications made it impossible to recover the 30 ips master. Another consequence was that the live double-LP *Zappa In New York* (1978) remained unreleased for over a year, and Zappa was effectively barred from recording in L.A. studios or even gaining access to his now massive tape archives. Summarizing the experience some years later, Zappa noted, "The only way you can fight a record company is to be able

***Recorded at Paramount (while Zappa was still in a wheelchair), this often overlooked collection features novel sonic textures, superb soloing and swinging big band arrangements. Now available as a threefer with* Hot Rats *and* Waka/Jawaka.**

to afford the legal battle that they'll whip on you. A company as big as Warner Bros. has lawyers from here to Pacoima. And all they do is smother you in paperwork, and then you have to wait five years before you go to court."

In 1979, four Zappa albums were released, but two (*Sleep Dirt* and *Orchestral Favorites*) were of older material that he'd previously submitted to Warners in an attempt to end his contract. The two newer works—the two-LP *Sheik Yerbouti* and the two-volume, three-disc *Joe's Garage*—form an interesting contrast in recording methods. Apart from a couple of live tracks recorded on the Scully 4-track and the xenochronous bass and drums duet "Rubber Shirt," all of *Sheik Yerbouti*'s tracks were built up by overdubbing over live recordings. *Joe's Garage*, on the other hand, is an all-studio album (recorded at the Village Recorder and Kendun Recorders by Joe Chiccarelli), but every guitar solo except one is xenochronous, having been extracted from a live performance and "flown in" to the studio multitrack. This unusual process was also used in reverse: Zappa would pick out a solo, specify a meter and have drummer Vinnie Coliauta play along, inventing polyrhyth-

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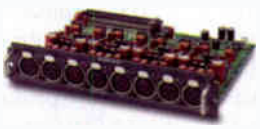

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mic interplay as he went. (For more details on the *Sheik Yerbouti* and *Joe's Garage* sessions, see Blair Jackson's "Classic Tracks" article in *Mix*, September 1998.)

THE '80S—THE UTILITY MUFFIN RESEARCH KITCHEN

Joe's Garage was the last album that Zappa made at a commercial studio. According to David Gray, who was part of the road crew since early 1976, "Frank was talking about [his own studio] ever since I first joined, but it got extremely serious in '78. A lot of the reasoning behind it was logistical. This way, he could work when he wanted to work and it didn't require him to block-book anything so that he could come in when he wanted to. And Frank clearly liked to work at night. And I think he felt he could try a lot of stuff, in essence at no cost penalty, when he owned it himself."

Designed by Rudy Brewer, with considerable input from Zappa and his technical staff, the studio was a no-expense-spared professional setup—estimates of its cost range from $1.5 to $3.5 million. Essentially built as an addition to the Zappa home in the Hollywood Hills, itself in an almost constant state of modification, the studio required substantial foundation work, which was somewhat complicated by the fact that bedrock was further down than had been anticipated. Nevertheless, the Utility Muffin Research Kitchen (UMRK) was more or less complete by late 1979; the first sessions produced the single "I Don't Wanna Get Drafted," which had been started at Ocean Way with Allen Sides engineering.

Gray recalls that UMRK included a large recording room that was "a little bit larger than the classic studio. We sort of had a live-end/dead-end kind of thing going on. And there was a huge, glassed-in echo chamber. And a fairly large drum booth, a very good-sized vocal booth and then a fairly large, open live-end/dead-end area with high ceilings. Compared to what was out there, like The Village, this room was quite large. It was as good as any commercial studio."

In addition to the recording rooms, the facility included a couple of acoustic echo chambers, one of them set up for eight sends and eight returns, along with a shop area and a tape-storage vault. The console, a Harrison 4832, fed two 24-track Ampex MM1200s and a 16-track 3M M79, plus 2-track and 4-track Ampex ATR-102s with interchangeable ¼-inch and ½-inch head stacks. Noise reduction was Dolby A-type, with four M16 racks for the multitracks and 361 modules for the 2- and 4-track recorders. Zappa already owned a selection of outboard equipment, and he steadily added to his collection of vintage processing gear and classic mics. "M50s, U87s, U67s, all the older ones," recalls Gray. "He definitely really liked the sound of the vintage microphones. We either built or repaired the power supplies for them and re-tubed them. And by the time we were done, he had an excellent complement of vintage Neumanns and Telefunkens."

> He knew exactly what was on every single tape he ever made. He's one of the most amazing guys I've ever met, and he had a mind like a steel trap.
>
> —Davey Moire

The original monitoring included a soffited LCR array of three-way Westlake-style JBL monitors with two additional rear speakers—Zappa anticipated mixing film soundtracks, and quad was not yet officially dead. Near-field monitors included JBL 4311s and Auratones.

Hailed by many as Zappa's most satisfying studio album, One Size Fits All features Zappa on fretless electric guitar, George Duke's virtuoso synthesizer manipulations, Ruth Underwood's dazzling percussion and Johnny "Guitar" Watson's flambé vocals—essential.

Often frustrated by commercial studios' foldback systems, Zappa requested a sophisticated headphone monitoring system. "We had a whole little thing called a 'self-mix matrix,'" recalls Gray. "Basically, you could send any channel to this routing matrix and each individual out in the room could get four channels that they could mix themselves in headphones. I think we had eight or maybe 10 positions."

Of the console, Gray says, "I think at the time, the Harrison was an excellent choice. It was a reasonably priced console, as consoles went, and was extremely flexible. [It was] infinitely repairable, quite modifiable and it sounded pretty damn good. I think, perhaps, if SSL had been a little further down the line at

BEST INTERNET SITES

http://home.epix.net/~eichler/reviews/zappa/overview.htm: Prog-rock fan Bob Eichler's comprehensive overview of Zappa's entire *oeuvre*. An excellent place to start.

www.stereophile.com/showarchives.cgi?73: A definitive collection of reviews written for *Stereophile* by Richard Lehnert. Essential for sorting out the best-sounding vinyl pressings and CD remasters. (Some LPs still sound better than the FZ-approved Rykodisc CDs.)

http://globalia.net/donlope/fz/chronology/index.html: A fascinating timeline that indicates where and when most Zappa tracks were recorded and by which bands.

www.iron-sausage.com/main.htm: A large collection of interviews with Zappa from a wide range of sources. [Currently unavailable—try in Friendly Little Finger, a massive collection of links to Zappa-related sites: http://home.online.no/~corneliu/zappa.htm]

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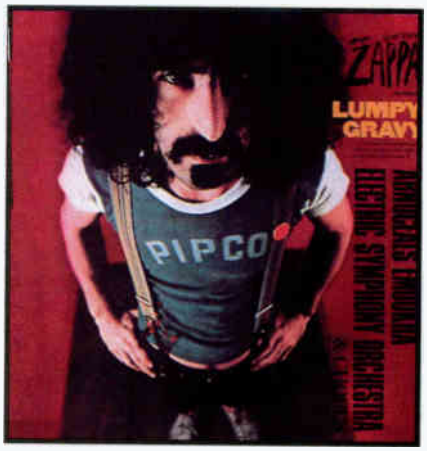
that point, we might have gone that way. They were shipping this little 2-channel strip around town. It had in-channel compression and some other things that were not only desirable but sounded really good. But delivery was an issue, and they were kind of new and unproven."

With his own facility up and running, Zappa now needed an engineer and, after putting him through an audition both in the studio and at a rehearsal space with his live band, hired Mark Pinske. An experienced touring sound engineer who'd worked for Clair Brothers, Showco and Maryland Sound, and had toured with Weather Report and Melissa Manchester, Pinske had been working at Quad Eight Electronics designing film consoles.

Starting in 1980, Pinske mixed FOH on the road and, between tours, began mixing live tapes at UMRK; *Tinsel Town Rebellion*, a two-LP set released in 1981, was his first completed project. By this point, Zappa had a considerable backlog of 24-track remote recordings, plus an ever-expanding archive of road tapes recorded on 4-track and 1-inch 8-track. "Some of them turned out fairly decent," says Pinske. "A number of engineers had left behind some really brilliant recordings. When you pulled some of them out, you just wondered how some of these got so good."



Originally an instrumental album recorded with a 50-piece orchestra, Lumpy Gravy was extensively edited and re-sequenced by Zappa while a label dispute postponed its release.

George Douglas, who joined the organization in 1980, remembers making road tapes from a position just behind the stage with two Yamaha PM1000 consoles and a Tascam 8-track. "It was obviously less than ideal, as far as monitoring went," he notes. "After the European tour, I asked for and got a Midas 32-channel 8x8 and set up a Dolby rig and two 3M M79 24-tracks."

The next technology upgrade came when Douglas and Pinske convinced Zappa to purchase the Beach Boys' recording truck. Both the truck and its Neve console required considerable refurbishment—stored for years at Beach Boy Mike Love's seaside estate in Santa Barbara, Calif., the truck was badly rusted—and Douglas also built a 150-channel snake/splitter system, with 102 channels available in the truck. "We told Frank we had only 90 channels, which was just as well, as his first mic input list was for 99 channels," recalls Douglas. A Midas console was installed at right angles to the Neve, and two additional Carvin boards, the fruits of an endorsement deal, were mounted on the truck's side walls. Another endorsement deal with AKG provided the 1981 tour with a full complement of AKG dynamic and condenser mics.

Next month—Part 2, in which Frank Zappa pioneers digital multitrack recording and meets the Digital Gratification Consort. ■

Chris Michie is a Mix *technical editor.*

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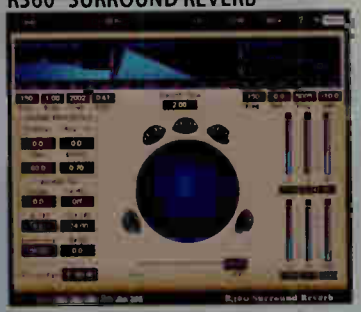

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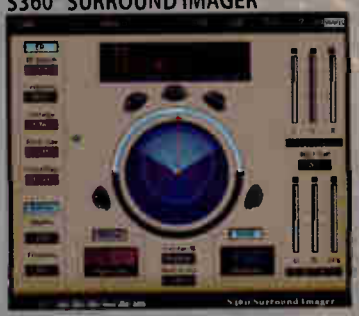

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World Radio History

The Big Trucks

BY BLAIR JACKSON

These are challenging times for every aspect of the audio business, and none more so than for the hearty souls involved in remote recording. The issues facing this group look familiar to anyone who owns or works in a conventional recording studio, including the need to stay current with gear, staying profitable in a tough economic climate, continually looking for new revenue sources and adjusting to changing market conditions, and dealing with an unending stream of new competitors—some armed with semipro equipment, others with millions to spend. But the remote business also has its own unique pressures; among them are space limitations of remote trucks, interfacing with video companies on broadcast and DVD projects, dealing with the quirks and inconsistencies of different venues, constant travel and long, long days (and nights), and the fact that most of their work involves live performances, so they often get only one shot to get it right.

Recently, *Mix* spoke with eight of the top players in the remote recording field about issues they face individually and as a group; then, we constructed a wide-ranging "forum" from the separate interviews. Our cast of characters: Steve Remote, Aura Sonic Ltd. (Flushing, N.Y.); Peter Yianilos, Artisan Recorders (Ft. Lauderdale, Fla.); Greg Hartman, Big Mo Recording (Silver Spring, Md.); Randy Ezratty, Effanel Music (New York City); Gary Ladinsky, Design FX (L.A.); Kooster McAllister, Record Plant Remote (Ringwood, N.J.); David Hewitt, Remote Recording Services (Lahaska, Pa.); and Richard "Vance" Van Horn, Sheffield Audio-Video Productions (Phoenix, Md.). It's interesting to note that nearly all of these owner/engineers have been at the top end of their field for two decades or more, weathering the vagaries of the fickle audio business. And, indeed, that's where the discussion begins.

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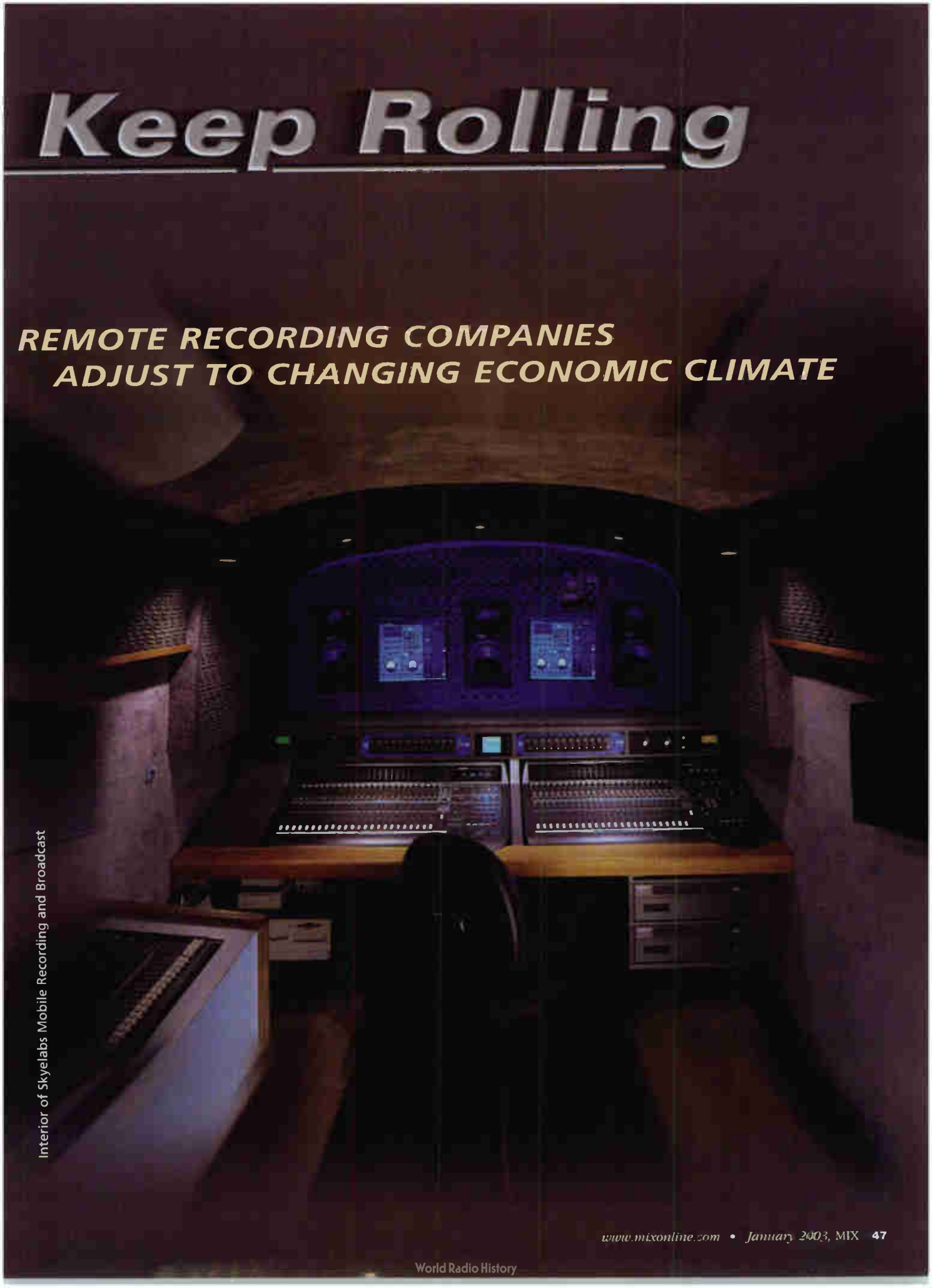
REMOTE RECORDING COMPANIES ADJUST TO CHANGING ECONOMIC CLIMATE



Interior of Skyelabs Mobile Recording and Broadcast

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The Big Trucks Keep Rolling

What does it say about the remote business that it has been dominated by so many of the same companies through the years? What is the field's enduring lure?

David Hewitt: It's a funny thing about this business—it's a niche and it isn't one that any sane person would get into, so already you've eliminated a lot of people who might get into it. I mean, the time and travel requirements are *so* extreme. And now, it's also something that's rather difficult to get into. It costs a lot to build and maintain a good truck, and I'm not sure there's the work out there to support too many more people.

Still, there are more players these days. The lower end of the market has come up—there are a number of smaller trucks out there—but the question from the producers and the artists is always, "What has this guy done before?"

Greg Hartman: You look in the *Mix Master Directory* Remote Recording section and what used to be four pages is now 14 pages, so it's not that new players aren't coming along, but because it's so specialized, people tend to call on the guys they trust to make it work because of the experience. You've got one shot to get it right and one shot only, and a lot of people don't want to take a chance with the smaller players.

Almost everyone knows somebody with an ADAT, DA-88 or Pro Tools rig. Most musicians can—and some do—call a local recording studio or a friend with machines, but our clients choose to call us, or any of the reputable remote trucks, because they know the difference. Clients understand that we offer more than a rack of multitrack machines. They want our mic package, our mic preamps, our splitters, our monitoring environment, and more importantly, our clients want a company that has a deep understanding of mic placement, interfacing with P.A. companies and video trucks, power issues and a long track record of getting it right.

Vance Van Horn

Gary Ladinsky: I came from the studio world: slugging it out for days on end and doing things over and over and over again. The live thing is so refreshing by comparison. You do the show, you pack up and everyone goes home, or on to the next gig. And there's definitely an adrenaline rush when you're doing a live show that's being broadcast across the country. It's like bungee jumping or something...with a pack of gear on your back!

Steven Remote sets up for a Bruce Springsteen ABC-TV appearance.

Peter Yianilos: It's a labor of love; there's no other possible explanation. It's all-consuming—you can never seem to get away from it. I think some of it is that a lot of people in the music business are really, really in love with music. And there's a certain amount of irrationality involved. I know that applies to me personally. I have somebody managing the business side [Natalie Eckart] to prevent me from making stupid choices because of my love for music. At Artisan, we've elected to *just* stay in music because it's what I really, really love, and I know I can do it as well as anyone, and I'd rather not get into other sources of revenue just because they're revenue. But like I said, it's irrational!

Besides pressure from the lower end, there's pressure from above, too, from the new generation of super video trucks.

Kooster McAllister: That's right. What's happening is all of these new trucks [the video industry] is putting out now, they're spending the money to put in an Oxford or a Libra or whatever to make it so that they're a self-sufficient truck and don't need to pull a separate audio truck anymore.

Randy Ezratty: The video trucks are attempting to eliminate the need for us, and I think that's a big mistake. These video trucks are putting these very powerful digital desks in their trucks, and in some cases, they can do a decent job of providing audio and video in the same truck. But in most cases, it's kind of a sham: It looks good on paper, but it doesn't quite have the attention to detail and the actual expertise to really get the job done. Effanel took the plunge six years ago by putting a Capricorn in the truck, and we sort of went through the learning process in front of lots of people and helped make it safe for that concept to be accepted on the road. I'm all for evolution, but the one thing I do have a problem with is the concept that these small closet-sized control rooms in a video truck with someone who doesn't really record music for a living thinking that they can do a respectable job—that I have a problem with.

McAllister: The thing is, the people that video trucks tend to pull from are production mixers, as opposed to music mixers. And it's gotten to where All Mobile [a video company] at this point has sort of seen the light and now they will hire me—even if they don't need the truck—to come in if they have a music show, because they realize they don't really have the expertise to make a good music mix.

Steven Remote: One way we're responding to the challenges of the super trucks is diversification. We provide a wider scope to the entertainment community, which includes rentals, audio support, engineering services and, in 2003, our new (dual-expanding wall) truck will be online. It's not your ordinary remote truck; it's a totally modular design. One day, it can be set up as a mastering room; the next day, it can become an on-location Foley room or video-assist for a film shoot. The idea is to cater to all production ventures. It's the prefered situation for engineer/producers with their own gear that need a great room on-location. They can hire the truck, fill it up with gear from our huge inventory or bring in their own stuff. You can mix and match as you want. There's no need to have "rock 'n' roll" equipment on a classical date, etc. The infrastructure is what makes this work—

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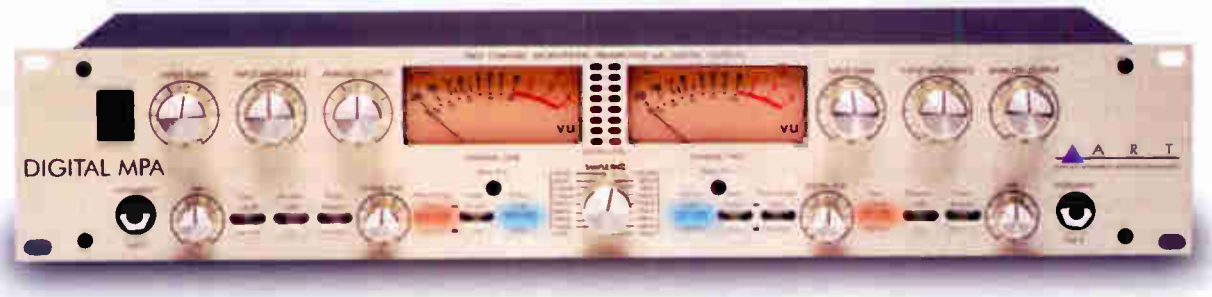

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The Big Trucks Keep Rolling

it's all there: speakers, monitors, patchbays, computers, distribution communications, proper power, HVAC, lighting, etc. For big TV shoots, we can set up to four 48-channel consoles—two music mix consoles, a broadcast desk and the "guest" position, which could be a Pro Tools rig or a playback desk. After that date, change it again by placing a small console and a bunch of couches if applicable or transform the room into a rehearsal space or whatever floats your boat.

Yianilos: Video trucks have been getting richer and richer. Sports have been a real solid market for them. They're about the only people in the business that can afford a $700,000 console. Audio trucks cannot support that investment. So they put that console in there and then the next step is to throw in some tape machines. My experience is that very, very few video trucks I've been in—and I've been in the best—have really what I would call a mixing environment. They have noisy power supplies, improperly placed speakers; they just don't have the audio side down. So I'm not worried about that in terms of my own business.

Vance Van Horn: At Sheffield, we have video and audio trucks and we keep them separate: The audio truck is almost all entertainment, and the video trucks are almost all sports. We have just started to combine both trucks as packages for people. We just did a DVD for Jimmy Eat World where we used both. The audio truck is almost always paired with a very high-end video truck. Oddly enough, some of these big video truck owners of these $6 or $7 million trucks are still saying that they want to bring in an audio truck even though a lot of them now have nice audio sections in them. I think when those trucks came out, everyone said, "Yeah, you can do the audio in here," but now I think there's a little bit of a backlash and reality check on that.

It seems as though with the broad range of projects you all do, you have to be ready with any media, from Pro Tools to MDMs to 2-inch.

Remote: We own most of the popular recording media and don't have to rent much stuff. The formats we make available include DA-98HRs and 78HRs, MX-2424s, 3324S machines and our 2-inch

Gary Ladinsky

analog machines. We still have 13 DA-88s—they are solid workhorses.

Not everyone has upgraded to 24-bit yet, so when recording 16-bit, I prefer to use the DA-88s. Keeping them in good condition with proper maintenance is the key to their success.

Hartman: We do have to be ready. We have 96 tracks of MDMs, 48 tracks of hard disk and 48 tracks of 2-inch with SR. We also have all of our harnesses ready so that if a client wants to run Pro Tools, RADAR or DASH machine, it can be wired in quickly and neatly.

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out—if you really look at the maintenance seriously and treat them like your firstborn. That also means running backups everytime.

There are more and more live albums being made from bands carrying their own MDMs on the road with them. Pearl Jam put out an entire tour's worth of live CDs that way.

Ezratty: They made pretty good MDM recordings with really good mic preamps onstage. Pearl Jam was a client of mine, and probably still will be if they do a big live concert [broadcast], but when it came time to doing live CDs, they made their own recordings. Same thing with Phish. We just did Phish's DVD mixdown, but we didn't make the recording; they did it themselves on the road, and I have to say, it sounds good.

Van Horn: At the beginning, there was a lot of resistance [to MDMs in the remote community] and they said, "We're not going to run the DA-88s and DA-78s." I've got news for you—*everybody's* running them. The thing you have to explain to people is those are semipro consumer machines and they work great and they sound great, but the reality is, a DA-78 is not going to hold up against a Studer 827; that's a fact. You can't always convince someone of that, though, and, of course, we'll run whatever format they want. We always run a Studer 48-track digital as backup.

Ladinsky: The customer is always king; we're here to help and advise. We'll do whatever they want, but, of course, you have to back everything up. We do a lot of Sony 48-track stuff. They're safe and reliable. But not everyone wants it. If they want DA-88, that's fine. If they want MX-2424, we'll do that. When we did the Santana *Supernatural* [DVD], we did it to RADAR with a 48-track backup. They originally wanted to use two RADARs, but I said, "Let's back it up with tape." Same with Pro Tools. We've never had any failures on any of the live shows we've done with it, but we always back up on tape.

David Hewitt

Yianilos: We've been printing everything to 24-bit MDM Tascam. It's as simple as this: two-hour tape load. Then what we generally do is transfer the tapes into Pro Tools for posting. We have the HD system, and it sounds beautiful. It changed everything when we updated. Before, Pro Tools was a convenience. Now, it's a really damn good-sounding format.

We still have analog machines, and, in fact, I converted mine to 16-track because now that they're not requested much, I'm keeping them as the ultimate for those that really care. We can always put a 16-track on and record their favorite instruments to that, and then bounce it into Pro Tools from there if that's what they want.

Hartman: We demo'd a lot of hard disk systems—we looked at the RADAR, the Mackie, Tascam. We ended up going with the MXs because the client can walk away with the drive and plug it into their Pro Tools rig. There's no question that hard disk recording is catching on, but everybody's still a little queasy about it. We always run a linear tape backup.

I think we're looking at a day, probably not too far down the road, when we finish a show, we won't hand anything over to the client; instead, when they pay their bill, we will e-mail them a password and say there are your files, take them away! That's coming sooner than we all think.

McAllister: I'm definitely getting a lot more requests for hard disk-based recording, and that's a scary avenue to go down in a location recording show. We just did a Barry Manilow project, recording it to Pro Tools|HD. Each show was over two hours long; we did three shows. And at the end of each show, when the operator would hit Stop, the whole system would crash. Luckily, I had it backed up with DA-98s, but we really didn't know until they got back into New York and had to extricate all of the audio if the files were even savable. Pro Tools does not like writing huge files; you do a three- or four-minute song and that's fine. You put it into record for three hours and the system doesn't like it. But I'm taking the hard disk plunge and getting a RADAR because it seems to be the most stable; and the new software version makes it so that the files are compatible with Pro Tools, so a transfer can be done.

Peter Yianilos

Has the rise of 5.1 and DVD added much to your business?

Ezratty: These days, we assume that most of the projects we work on are going to have multiple format versions. Even if we're doing a live radio concert, the concept is that if there's a visual component, there might be a DVD. If it's a TV thing, it's almost a given that it will become a DVD.

We've done quite a bit of DVD work. We did U2's DVD, Brian Wilson, Santana, Madonna, Korn. The good thing about the Capricorn is that we also have a Capricorn studio, so the tapes we generate in the recording we can take back in the studio and pick up where we left off. So what started out as a four-day U2 project in Boston turned into a five-week mixdown afterward. Santana was a couple of days, followed by weeks of mixing.

It's a healthy thing for me to be able to go to the client and say, "You might not have all of the contractual stuff in place right now for a DVD, but I think you better assume that it might happen, because the extra few thousand dollars you might spend, plus a little more attention to detail, will pay for itself." It also tells the client that you're going to give the project as much attention to detail as you possibly can.

Hewitt: For us, DVD has been the extra that gets plugged in on top of our regular work. In some ways, it's like the way video came onto the scene in the early '80s; it's something that's now a part of the package. Maybe we get a live CD, a home video; now, we've got a DVD.

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The Big Trucks Keep Rolling

the last date on the tour, and in a situation like that, we don't do all that much differently because we've always been interested in delivering the proper ambience for a live show, and that's really what the surround is. We already use a Soundfield mic, generally in the most favorable ambient position we can find, and hopefully a couple of omnis in the far corners and some additional audience mics so that the mixer has full options when he takes it back to the studio. What we'll often do is put those on the 8-tracks and really spread them with individual mics and all that, and then print a stereo submix of the audience on the 48-track, but give them the option of going back and starting it up for the DVD.

McAllister: In the past, I used to mix my audience down to two tracks; now, I'll just run a separate DA-98, broken out to at least eight audience mics, so that whoever mixes it can dial in whatever depth they want when they go to post it.

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Did September 11 affect your business much? What does the current climate look like?

Remote: For us, 1999 was the year to beat economically. At the beginning of September, I looked in my books and noticed that we exceeded '99s numbers. Since we booked solid from September 3 to October 17, with just a couple of days off and had plenty of dates for November and December booked, I was convinced 2001 was going to be our best year yet. Well, it didn't happen. 9/11 wiped out much of the rest of the year for us. Thanks to a few solid dates, we hung in there. Things slowed down dramatically until the middle of March [2002], then it mushroomed, and has been pretty busy ever since.

Van Horn: 9/11 affected us quite a bit on the video side. We were supposed to do a show at the White House the next day, so obviously that one went away. And for the video trucks, a lot of the sports shows slowed down. The industrials and commercial work we do—the big conventions we fill in the week with—completely went away for a while, too.

But we just had one of the best years we've ever had, mainly because the video trucks have done well in spite of 9/11. I like to think, too, that that the digital console [an Axiom MT] in the audio truck has continued to be a draw. As I say to the rest of [my remote recording colleagues], when we have a great year and they don't, usually the following year is just the opposite: They have a great year and we don't. That's the pattern I've seen.

Ladinsky: For Design FX, the remote business is only one aspect of our operation, and we're doing fairly well. We're getting some DVD work, but I'd like to get more. We do some big awards shows—like we always do the *Soul Train Awards*—and there always seem to be more awards shows! There isn't as much live album work as there once was.

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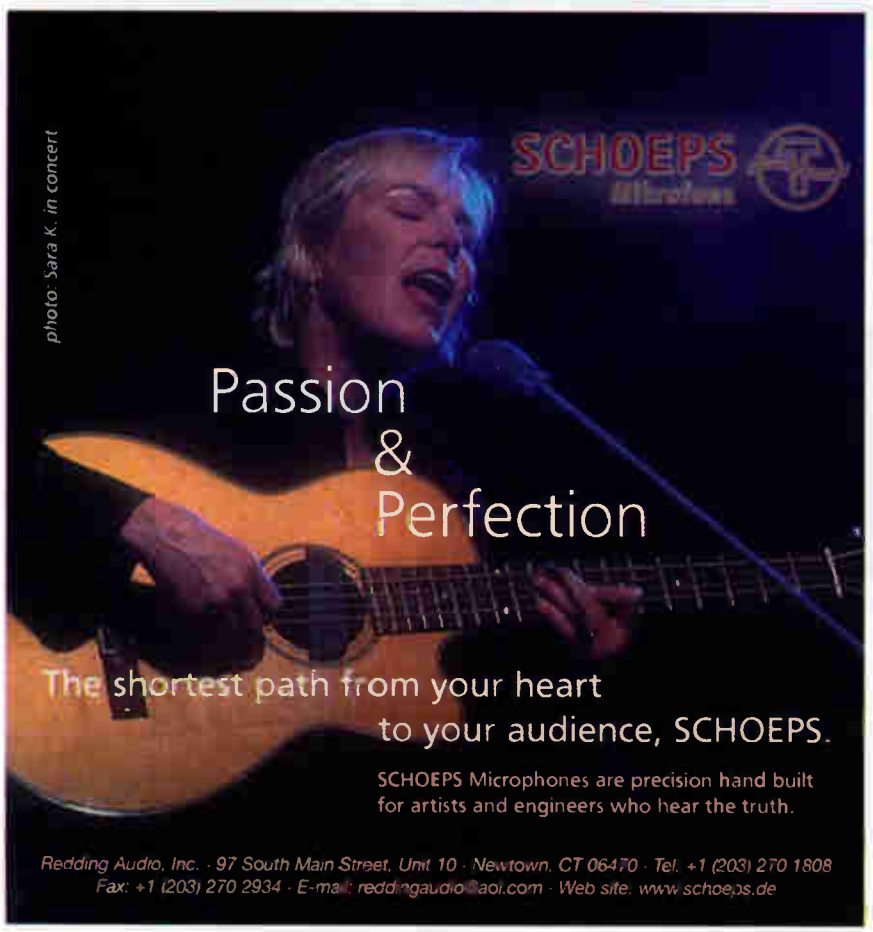

The Big Trucks Keep Rolling

Personally, if I had a record company and I had a roster of artists, I'd make sure I got something in the can live from every tour. Down the road, I want to pull something out, use it as a promo, put out a record or just get it for posterity.

Of course, no matter how much or how little work we do, we still have the problem where we book a show and then someone else calls for the same day!

Yianilos: We've been more affected by the general economic climate than by 9/11 specifically. We've found that our rock-steady clients are still great clients, but the projects that just fly in the door are way down. In times like these, it's nice to have regular clients, like we've been doing the *Tom Joyner Morning Show* for the past four years, and we have steady work with both Univision and Telemundo doing music production and mixing.

Hewitt: For us, the business has been erratic. I think there's still a lot of uncertainty out there. Budgets are smaller.

Shortly after 9/11, we did the "Concert for New York City," and that's certainly one of the most meaningful things we've done in recent memory; that was really a very, very special show. We also did one on the anniversary this year. We went out to Liberty State Park, across from the Statue of Liberty, and they built an outdoor stage for a public television special with a classical orchestra and various singers and so on. We did the dress rehearsal the day before and then September 11 was going to be a live telecast. Well, that day, these 40- or 50-mile-an-hour winds came up, and they actually had to pull the plug on the event. You can't put 90 people onstage when things are blowing around. What was interesting is that rather than not showing anything, they aired the dress rehearsal. These performers are so good that the rehearsal was good enough to put on the air. About the time I got home from packing everything up, I turned on my TV to the special and they had this big crane shot that showed all of the empty seats. The camera sort of zoomed into the soloist and you had that New York skyline and the space where the towers used to be. It was very effective. It was like they were playing for the people who had died; there was no one in the audience. It made my hair stand up. ■

Blair Jackson is Mix*'s senior editor.*

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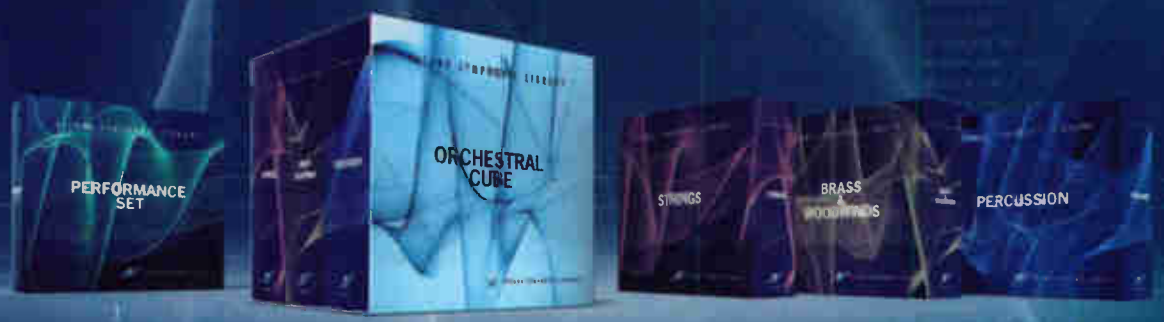

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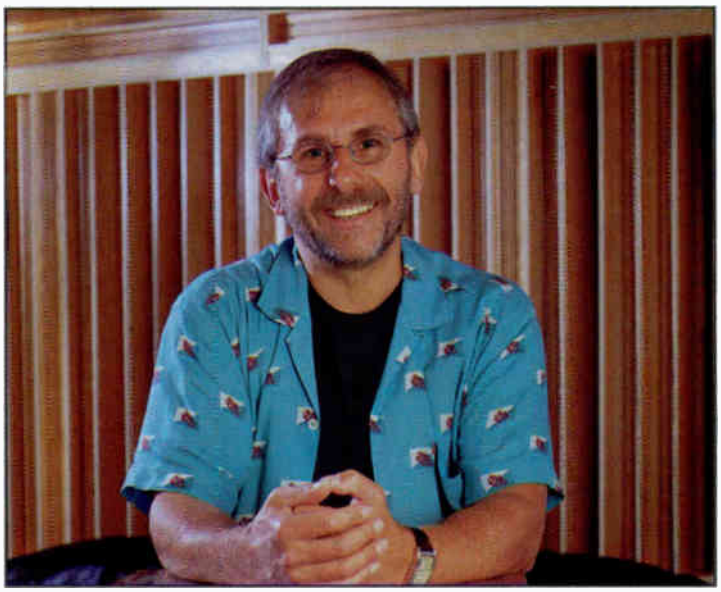
BY MAUREEN DRONEY

Elliot Scheiner

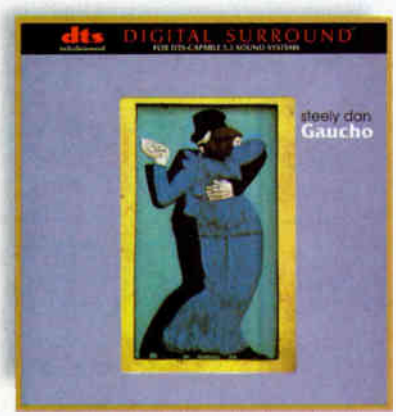
Dialed Into Detail, Capturing the Soul



I once heard a group of established engineers debate who was the best all-around engineer. It should have been a difficult question, given the opinionated nature of the average audio professional. But in a few minutes, they were in agreement: Elliot Scheiner.

Another story: Not long ago, three producer/engineer/owners of a studio who had just completed installing a new 5.1 mix suite were giving me a tour. As we walked into the new room, the maintenance technician and assistant were setting up for the day's mix session. To check the positioning and balances of the multiple speakers, they were playing back a DVD of *Hell Freezes Over*, The Eagles' live video recording. There were six people in the room, all longtime recording studio veterans, with the requisite jaded tastes, but, when the first notes of "Hotel California" rang out, we all stopped what we were doing, jostled for a place in the sweet spot and settled in to listen. Everyone in the room was rapt, listening for the pure enjoyment of it. It was one of those memorable moments. Y'all should have been there, because the only word to describe that recording's sound is "gorgeous."

The man behind the board for those sessions was, of course, producer/engineer Elliot Scheiner, someone long-known for making recordings that are somehow both pristine and soulful. Since his early days with Van Morrison and notorious taskmasters Steely Dan, he's worked with Toto, Jimmy Buffett, Bruce Hornsby, Rickie Lee Jones, Smokey Robinson, David Sanborn and many others, garnering five Grammy Awards and 10 additional nominations. He's also been the recipient of two Emmy nominations for Outstanding Achievement in Sound Mixing and three TEC Award nominations. His recent pioneering work in 5.1 surround mixing has made him in demand in the genre; besides The Eagles, he has done projects for Faith Hill, Sting, Beck, Steely Dan, Donald Fagen and the current surround *pièce de résistance*, Queen's *A Night At the Opera*.



Scheiner started his career in New York at A&R Studios, working under legendary producer/engineer Phil Ramone. For many years, he's done much of his work in Los Angeles, but his heart remains on the East Coast. He makes his home in Connecticut, choosing to work in Manhattan whenever possible or at Connecticut's Presence Studio. I spoke with him by phone one autumn morning as he was preparing R.E.M.'s *Document* for a 5.1 mix.

Just a few questions about your career beginnings, please. How did you know that you wanted to be an engineer?

I didn't. I was a musician, a drummer. I beat around in a lot of rock 'n' roll bands; nobody that really made it. And I realized, after being on the road in a bus and doing these horrible tours, that it wasn't what I wanted to do.

At the time, my uncle, Chauncey Welsch, was a studio musician in New York, an "A" player. I said, "I can't do this. But I want to be in the music business; I want to make records." He took me over to A&R Studios, because he was doing a date there, and introduced me to Phil Ramone. We talked for about five minutes, and Phil said, "When can you start?" I said, "Now." And that was it. I was on the payroll.

Just being in a control room and watching Phil work was so awe inspiring; I was just so taken by all that was happening. It was only a jingle, but seeing

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what was going on—the interaction of Phil with the musicians and the arranger and the composer, and the agency people, even—it was so electric. I knew right then and there that that was what I wanted to do.

Did you spend some years at A&R working your way up?

You've got to remember, this was 1967. So the technology wasn't archaic, but it was minimal. Phil taught me the same way he was taught by Tom Dowd and Bill Schwartau. You were given a room to work in and you had to know what the room was about. You had to understand the acoustics of it, where to put certain instruments, what mics to use on them and how to place a microphone.

PHOTO: PETER CHAKIN

Given all of these variables, sometimes you put up a mic, and when you listened in the control room, you'd say, "This doesn't sound right." We were taught that when that happened, something was different in the room. There were more people or fewer people, or whatever, and that made it sound different. So you went and moved the mic until you got it right, because there was no EQ or compression in the console; the room that we worked in had two Pultec EQs and two Fairchilds. That was that. You were very selective about what you used.

So there really wasn't that much trouble you could get into.

[Laughs] That's absolutely true. You had to know how to mike an instrument and where to place it. That was all there was to recording. You had to be able to mix because it was pretty much live. It was only 4-track, so if you were doing a big orchestra in the room, you pretty much had to put your rhythm section on one track. You put the strings and horns on the other track. That left two tracks open for lead vocal and background. Since you had to mix [all of the instruments] to two tracks, you had to be able to hear what it should sound like. You had to have some kind of instinct about what it was going to be.

For a long time, there has been a trend toward "fix it in the mix." But I think it's becoming important again to people to get things sounding right when they're recording, because then it's easier to just mix inside your workstation.

It depends on who's recording it. For the guys from my era, that's always been the case. We always made sure we recorded it correctly going in because we felt that there was no going back. We're still of that mind, whereas the younger guys, you know, "We'll just get it in there. I can fix it once it's in. We can move it, we can slide it, we can take out any distortion, we can add distortion, we can put amps on it. We can do anything."

So, I'm not sure that everyone is getting on the page where they think that they have to record it better going in. I've seen too many files lately that have no care put into them. Actually, the tracks that I get on analog are often better. For instance, I just mixed Beck's latest record [*Sea Change*] in 5.1. It's with a band, and most of the vocals are live, and it was very well-recorded. Not only did Nigel Godrich record it beautifully, but he also put the effects on tape. He was totally committed to it, and it was just awesome to put up the faders and mix it like that.

Didn't it used to be a goal to have a "straight-line mix?"

You knew that you were a good engineer if you recorded it so that whoever was mixing could put all the faders at zero and it was a mix. [Laughs] I don't ever think that I got that.

In your career, you've worked with many people who were very sonically conscious.

Well, that was primarily Steely. I've never worked with anyone else who was into it to that degree.

Here's a quote about Steely Dan and Aja: "It was the record that took their obsession with sonic detail to new heights."

That would probably be pretty accurate.

Were you that obsessive also?

No. They just liked what I did on certain things. Like I would end up doing the tracking and mixing and nothing in between. They liked the way that I record a track. It had the sonic structure that they liked, that's all.

Have you consistently used the same microphones throughout your career or are you using completely different ones than you did in the beginning?

The funny thing is that a lot of it has come full circle. When I started, all we had were really great tube microphones and, obviously, the classic list of dynamics. But as the newer microphones started to come in, everything was about, "Let's try this new thing." It seems like that's how it was right up until about 10 years ago. Now, people are looking back and going, "Wait a second, these records that were made 30, 40, 50 years ago really sound better than anything today."

I use a lot of the old tube mics, but I use a lot of new mics, as well. The one thing that *has* maintained a constant for me over the years is the snare drum mic. I've used the same one since the first day I recorded, right up till now.

And that would be?

A [Shure] SM57. And I don't use a bottom mic; I only use the one mic on top.

If you were tracking today, what other drum mics would you likely use?

I'm pretty consistent about the drums. For the toms, I always use [Audio-Technica] ATM-25s. I love those mics for toms. They take a beating, they really do. You can slam those mics and they're fine. They sound great flat; I never have to EQ them. So not only do they take an enormous amount of sound pressure level, but they're just great-sounding.

How about for bass drum?

Through the years, it's changed. That was flavor-of-the-day. We were always searching for the best bass drum sound. When I started with Phil as an assistant, he used the [AKG] D-12 on the kick. Most guys used either the D-12 or the [E-V] 666. I used those for quite a long time, and then the [E-V] RE-20 showed up. After the RE-20 was the Sennheiser 421, and I used that for a long time. Now I never touch that mic. The only mic that I really use for kick right now is the [AKG] D-112. I will sometimes use an RE-20 also, but most of the time, it's a D-112.

Where do you tend to put the mic on the kick drum?

Assuming that there's a hole in the skin, I put it just a little bit past the hole, just ever so slightly inside. There have been

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so many trends. I remember when they wanted to take the whole head off. When I started, you basically put a mic on the beater side or on the other side. Most guys put it on the front side of the drum. At A&R, we put it on the beater side. But you know, if you listen to earlier records, the bass drum sounds weren't that great.

So, once there was a hole in the front head, or no front head, you didn't continue to mike the beater side—you didn't need to. And the bass drum sounded infinitely better that way. Then, of course, we started stuffing things in them.

Blankets, bricks, sandbags...

We did all sorts of stuff. Shelly Yakus worked at A&R also; he and I started on the same day. And I remember walking into his session one day and he'd rigged this thing on the house bass drum where he took the head off but left the screws on. Then he took bungie-style cords and a tape reel hub, attached the bungies to the hub and hung it right in the middle of the drum.

Suspended it.

Right. Then he put eyebolts in to secure an SM57 to the middle of the hub. It was the best-looking thing. You know, a lot of times we do things because they look great.

Really?

In this case, the idea was, how loud can you be? So, Shelly did this thing, and it sounded pretty good. I tried it, but I could never get it to sound good.

What's something you did because it looked great?

I did a date once with an Australian artist. We were working in a smaller room and it was two guitars, bass and drums. They were using an enormous amount of amps and they were worried about the leakage. I knew it would be a problem no matter what, so I figured I'd do something a little weird. I set up scaffolding in the studio, and I put all of the amps at the top of the room.

You had to carry them up on a ladder?

Actually, we had guys who could do that. They set up ladders and carried them up to the scaffolding. We put the mics up there, and we did the whole record that way. I don't know if it made any difference or not, because we'd never heard the amps down on the floor! But I've got to tell you, when the band walked in, they were frantic with excitement. It was definitely a vibe.

Right then, back to drums. Overhead mics?

I try to stay with tubes most of the time. I would use AKG C-12s, I'd use [Neumann] U67s or [Telefunken] 250s.

You prefer warmer rather than brighter for overheads.

Well, the C-12s are pretty bright. I've used those and the C-12A. I've even used—as far as new mics go—these AT-4060s. Those are tubes, and they're pretty nice-sounding, as well.

Do you generally use room mics?

I always put up room mics, but I never used them all that much. Actually, I'm using them more now than I have in the past.

Because of surround?

Yes, and also even for stereo. Like with Steely, we recorded room mics on the new album, and in the mix, I'm using a fair amount of them, which is different for us.

Where did you record that project?

Sear Sound in New York. All analog.

That's a change for you.

No, that's a change for [Steely Dan]. I always try to record analog. That's my primary choice. I talked them into it. It was funny the way that it worked. They did one song there [at Sear] that was for a tribute to Joni Mitchell. They have unbelievable mics there, and when you walk in the door, all of a sudden, it's 1974. It's wild. There are even beads on the entryway. So there's this vibe. And when we got into the studio, I looked at Walter [Becker] and said, "Can we do this in analog?"

You just kind of casually slipped that in, because you were in that vintage environment?

Yeah. And he said, "This is a tribute, let's do it." So we did it analog, and they were amazed; they'd forgotten how good analog sounds. Because of that, when we started the new record about two months later, they said, "Let's do it analog." And we did. The basic tracks are all analog; all of the overdubs were done in a workstation.

> You knew that you were a good engineer if you recorded it so that whoever was mixing could put all the faders at zero and it was a mix.

SELECTED CREDITS

P=producer, M=mixer, E=engineer

America: *Homecoming* DVD (2001, P/E/M), *Human Nature* (1998, P/M)

Dave Grusin: *Two For the Road: The Music of Henry Mancini* (1996, E)

Donald Fagen: *The Nightfly* (1982, M)

The Eagles: *Selected Works: 1972-1999* (2000, P/E/M), *Hell Freezes Over* (1994, P/E/M)

Fleetwood Mac: *Very Best of Fleetwood Mac* (2002, P), *The Dance* (1997, P/E/M)

Glenn Frey: *Best of Glenn Frey* (2002, P/M), *Classic Glenn Frey* (2001, P/M), *20th Century Masters* (2000, P), *Strange Weather* (1992, P/E/M), *Soul Searchin'* (1998, P/E)

Jimmy Buffett: *Boats, Beaches, Bars & Ballads* (1992, P), *Feeding Frenzy* (1990, E/M), *Off to See the Lizard* (1989, P/E)

Natalie Cole: *Ask a Woman Who Knows* (2002, E), *Stardust* (1996, E)

Steely Dan: *Two Against Nature* (2000, E), *Citizen Steely Dan* (1993, E), *Gaucho* (1980, E), *Aja* (1977, E)

Toto: *Mindfields* (1999, P/E/M), *Tambu* (1995, P/E/M)

Van Morrison: *Moondance* surround mixes, *Moondance* (1970, E)

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How about mixing?

Analog and digital. Just last week we finished off a couple of mixes, and Walter said, "Maybe it's time to A/B the analog and digital and see what we're going to use." So I set it up to A/B, almost perfectly, and the analog killed it. And we were using the 24-bit, 96kHz digital.

I'm surprised.

It was so far beyond it that they weren't convinced. They said, "Let's take it to a mastering room." So we did and did the same process, and the analog still killed the digital on a completely different machine.

Very few people have actually had the opportunity to do that kind of accurate A/B comparison, listening to the same program material in the different multitrack formats, side by side.

I've found that when I do a seminar at Berklee, the kids want to know, "How can we get our hands on analog?" They want it, but it's not around. That's becoming a problem. And I think this is so cyclical—eventually, it will come back. I'm thinking about buying the 2-inch 8-track machine, because when I mix in surround, that's what I use.

But you also use a digital workstation.

If I'm working with old product and obviously the old tape can't be used. You bake them and you make a transfer, and that's that. I dump them into [Steinberg] Nuendo, and I work off of that. Nuendo is my multitrack. I use a lot of the EQ and processing in there. When I'm working at home, I have the Yamaha DM2000 digital console and Nuendo, and I make full use of it.

I'm a big fan of how the guitars on your records sound. Do you still use a Shure SM81 for strumming rhythm parts?

I don't stray much from that. For strumming rhythm parts on guitars, the SM81 is the best as far as I'm concerned. It's so impacting, so powerful, and it doesn't distort. It's great for that. I've never used it for anything else.

If you're going to compress a rhythm guitar, what would you use?

Well, I was using the Summit—the TLA-100—because it would really slam down on the acoustic and sound great. I've recently been using the 160-SL, the new dbx—the blue-faced one. It's an incredible-sounding compressor. But like the TLAs, if you don't really slam it hard, it will eat up the top end. When I hit it a little harder, it sounds more even to me.

You like a tube U47 for picking guitar parts. What else might you use on them?

Nothing.

Nothing? Just leave it alone, no compression?

No, the only time I put compression on a guitar is on the acoustic strum part. I don't use much compression at all. Like I said earlier, I grew up not having compressors, so with Phil, I'd say, "What do you do here?" Then he'd say, "You use your hand on the fader."

You used your hand, you rode a fader and you acted as a compressor. I've gotten used to doing that. I watch guys

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come in, throw on a compressor, throw on an EQ and then never touch the fader again. Everything is predetermined.

For me, part of it is that I feel, as an engineer, you are as much a part of the performance—especially when you are doing a live band—as any member of the band. And you're interpreting what they're doing and your hand rides dictate that. It's not a constant compression where everything is safe, everything is slammed and everything is at a certain level. A lot of times, the dynamics are totally missing when people do that. It's like when some guys are digitizing stuff, they maximize it and there are no dynamics. A lot of the problem with music today is the lack of dynamics.

You use an SM57 for electric guitars, and you've said you put it on the best speaker in the stack. How do you find the best one?

Usually the guitar player can tell you.

I guess I should have known that.

I always rely on guitar players: "Where on this bottom?" And they will point out, "Right here." They know exactly where. For the guys that don't know, you just mess with it.

In your career, you seem to be very flexible in going with changes in technology. You're very adamant about certain things, but it's more about how the finished product should be rather than about what you use to get there.

That's true. Like having a home studio. That's something I thought I would never do. I'm a big proponent of commercial studios, and I think everyone should make records in commercial studios and not in their home. But right now, there are certain projects that wouldn't be done at all—smaller records that just don't have the budget to do that. The attitude is, if we can't do it for a certain amount, we can't do it. And especially for 5.1, for an emerging format, there needs to be more selection, more titles.

> I grew up not having compressors. You used your hand, you rode a fader and you acted as a compressor. I've gotten used to doing that.

So I'm glad to do it. But I still definitely try to work in major studios for almost everything.

What advice would you offer to someone starting out?

There is no one way right now because of all the different technology, but I would say that finding a mentor, like I did with Phil Ramone, can be very important—find someone you really respect. And apprentice; try to gain as much knowledge as you can from that person, and also from all of the other people in the industry that you come in contact with.

You have to be respectful of everyone in the industry. Every day is a learning experience, and everybody has something important to offer. ■

Maureen Droney is Mix*'s Los Angeles editor. This interview and 26 others appear in* Mix Masters, *her new book coming this month from Berklee Press, www.berkleepress.com.*

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BY GARY ESKOW

Joe LoDuca

Scoring Hits From Detroit 'Burbs

LoDuca's SSL-Nuendo-GigaStudio workspace.

Joe LoDuca

Growing up in Detroit in the mid-'60s, Joe LoDuca had the opportunity to soak up the rich Motown tradition. Built on the back of the working man, Detroit is infused with the look, smell and sound of ordinary people. "So much regionalization has been lost in music," says LoDuca. "Back then, there was a rock-solid beat that every player in town had. I remember going to California and sitting in with groups. I'd be trying to figure out where the downbeat was!"

In fact, LoDuca—who has remained in the Detroit suburbs while growing a highly successful career as a film and television composer with L.A. clients—had the opportunity to play with many legendary Motown session vets. He even recorded a session in the original Berry Gordy Jr. studio. "Pistol Allen was one of the drummers who played lots of the old dates," LoDuca recalls. "His sound and approach to the beat was everything you remember from Motown. I also had the opportunity to play with Beans Bowles. Beans played all of the baritone parts that you remember from the Motown hits."

Local boys do move on, however, and LoDuca was fortunate enough to hook up with one of them in 1982 when he scored director Sam Raimi's first film, *Evil Dead*. "Sam's been critical to my film success," LoDuca says. "I scored his first three features, and through him met Richard Kraft, a composer's rep who's now a principal at Blue Focus Management, one of the largest firms of its kind in L.A. Richard was also the producer of the *Evil Dead* soundtrack, which was my first.

"But, man, that first score taught me that I needed to do things differently. I was leafing through a click track book trying to make hits. We also rented the first Prophet V in Detroit for that date. After that, I bought a Roland SBX-80. That sync box remains, for me, the single most revolutionary piece of hardware ever built. It was rock-solid!"

LoDuca's work on *Xena: Warrior Princess* and *Young Hercules* (among others), which has earned him over a dozen Emmy nominations and one statue, features expressive and highly realistic orchestral simulations. Consequently, he is picky about the samples he uses.

"Ilio Entertainment is head and shoulders above the rest, in terms of creativity and quality," he says. "Eric Persing, Bob Daspit and Skippy Lemkuhl are brilliant in what they do. Being musicians themselves, they understand what musicians need. I also appreciate that they make provisions for those of us who use multiple platforms and systems. I have heard composers assemble entire scores with little more than the *Distorted Reality* CD-ROM!"

Little by little, LoDuca's studio grew along with his career. At the center of his project studio sits an SSL SL 4000 G Series board. One might think that, given his choice to remain a hometown boy while making a career in Hollywood, LoDuca would work on Pro Tools to establish simple and complete interaction with L.A. post houses. But that's not the case. His large sound is built with Nuendo, Cool Edit Pro and three GigaStudio computers, with lots of physical routing to his board. "Delivering .AIFF or .WAV files instead of a Pro Tools session has not posed a problem for any of the mix houses we deal with," he says. "We are now delivering OMF sessions from Nuendo. Cool Edit Pro is a great tool for editing. It's where we assemble our tracks for final mixdown.

"I've successfully supplied dub stages in L.A., New Zealand, Paris and Vancouver for close to 10 years now," he adds. "At first, we used ISDN lines. Then we supplied our music editors with dedicated PCs for transmitting over the Internet via LapLink. Now, just about everyone has access to high-speed transmission and FTP software. I really haven't felt the need to move over to Pro Tools."

It's not always easy being a Hollywood composer based in Bloomfield Hills, Mich., but Joe LoDuca has built a pretty nice life for himself and his family. Staying close to home, LoDuca says that he's had to build trust with his clients. "Sure, being far away makes that trust factor more difficult to achieve than if I were living down the street from a producer in L.A.," he admits. "But at the end of the day, this business is about being able to deliver the goods. Fortunately, I've been able to do that without ever having to leave the area where I grew up." ■

Gary Eskow is a Mix *contributing editor.*

World Radio History

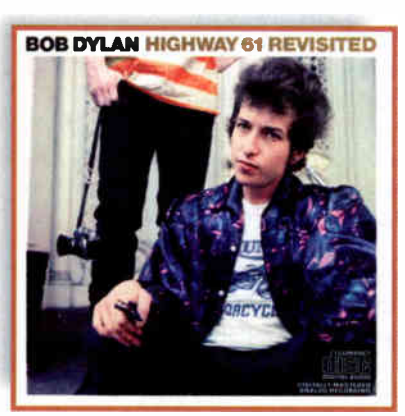
BY DAN DALEY

Bob Johnston

A Fearless Producer on Classic Dylan, Cash and More

As we walk through the hall at BMI in Nashville, which has graciously provided a huge conference room for this interview, Bob Johnston gets accosted by virtually everyone of a certain age who sees him. The receptionist will barely let go of him, telling an onlooker, "We go *waaay* back!" Harry Warner, another BMI veteran, shakes Johnston's hand vigorously and reminds him, "You sure shook up this town." Johnston, looking a bit more bedraggled in an open-necked shirt and Bolshevik's beard next to Warner's natty-blue sport coat and razor-creased Dockers, replies, "All I wanted to do was give the musicians in this town some work." "You sure did," Warner says.

What's more, Johnston gave them the chance to work with artists who otherwise might never have passed through Nashville. And his light hand on the records he produced also probably helped those artists through doors that might not otherwise have opened. In Johnston's case, as much as for any other producer ever profiled in *Mix*, the records speak for themselves: Bob Dylan's *Highway 61 Revisited*, *Blonde on Blonde*, *John Wesley Harding*, *Nashville Skyline*, *New Morning* and *Self Portrait*; Simon & Garfunkel's *Parsley, Sage, Rosemary & Thyme*, *Sounds of Silence* and *Bookends*; Leonard Cohen's breathtaking *Songs From a Room* and *Songs of Love and Hate*; Johnny Cash's ground-breaking live albums *At Folsom Prison* and *At San Quentin*; and countless other gems from artists including The Byrds, Marty Robbins, Patti Page, Willie Nelson, Dan Hicks and the New Riders of the Purple Sage.



The Fort Worth, Texas, native graduated from staff producer for Columbia Records in New York (1965-67) to running Columbia's Nashville operations for a couple of years before becoming one of the industry's first major independent producers. There were some rough years and the almost *de riguer* run-in with the IRS. But Johnston, now 70, remains an animated conversationalist with a sharp memory and an even sharper tongue.

What brought you to New York? You were starting to have some success as a songwriter.

A music publisher named Robert Mellin brought me up there. This was 1964. Someone there then helped me get a staff production job at Kapp Records. One day, I heard this great record by Aretha Franklin and I found out that Bob Mercy, who worked at Columbia Records, was the arranger. He was also a producer for Barbra Streisand and Andy Williams. I was doing one of my first productions, this new artist from North Carolina named Helena Troy, and I wanted Bob to do the string arrangements. Later, I ran into him in the hall, and he asked me if I had any songs for Andy or Barbra, and I said, "No, just some demos." I played them, and he thought they were better than anything else he had, so he asked me if I wanted to work for him. I said, "Hell, no, but I'll work *with* you." He looked for an office for me but there were none available, so he found this broom closet down the hallway, started tossing pots and pans out of it, and said, "Here's your office."

What was your big break as a producer?

Mercy came over with this old record of Patti Page's and said, "See what you can do with her." I went to see a bunch of movie people in Hollywood and got this song called "Hush, Hush, Sweet Charlotte" [from the film of the same name], and we recorded it. I went to see Seymour Poe, who worked with [Darryl F.] Zanuck, and told him that there were seven other

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records out on this song—which wasn't unusual in those days—but that Columbia would get behind Patti Page doing it, and there'd likely be an Academy Award nomination in it. He said, "You've got two minutes." I put the record on his turntable, and you could see the opening string parts really got to him. Thirty seconds into the song, I pulled the needle off the record and he said, "What are you doing?" I said, "Your two minutes are up." He says, "I'll call you Monday." I said, "You'll call me later today." He did, and that became a big record.

From left: Johnston, Dylan and fiddler Doug Kershaw in session for Dylan's Self Portrait

Sounds like you had to have more than talent in those days—you also needed testicular fortitude. What in your background gave you that?

My great uncle was a concert pianist. My grandmother wrote songs with the guy who wrote "When Irish Eyes Are Smiling," and my mother wrote songs till she was 92, including "Miles and Miles of Texas," which Gene Autry and Asleep At the Wheel recorded. I grew up in a musical element and I was very sure of myself when it came to music. When I was in the Navy, I stopped into a servicemen's club in Boston and I was singing a song there, and in walks Frank Sinatra. I stopped singing, but he told me to go ahead and finish the song. He wouldn't sing till I was finished. I saw him with his entourage and some great-looking women and thought, "That's a great way to make a living."

***Not a lot has changed in the business since then. But you became a producer in an era when labels owned studios and staff producers were given artists almost as a matter of chance. How did you wind up producing Bob Dylan's* Highway 61 Revisited?**

I heard him, and I wanted to work with him. He was a prophet, and in another few hundred years, they'll realize he stopped the [Vietnam] War. Mercy asked me, "Why do you want to work with him? He's got dirty fingernails and he breaks all the strings on his guitar." But I wanted to. I was afraid they'd give him to [Byrds producer] Terry Melcher, so I had a meeting with John Hammond, Mercy and [Columbia Records president Bill] Gallagher, and they said, "Okay, you do him."

Dylan had had a falling out with his previous producer, Tom Wilson. What did you bring to the picture, and what was your first meeting like?

It was in the Columbia Studios on West 52nd Street. I just walked up to him and said, "Hi, I'm Bob Johnston," and he just smiled and said, "Hi, I'm Bob, too." As for producing, I always say I'm someone who just lets the tapes roll, but anyone who can't write songs, can't sing, can't produce, can't perform really shouldn't be working with an artist. You need to relate on their level, if for no other reason than you can stay out of their way when you need to. All of the other staff producers at Columbia were tapping their feet out of time and whistling out of tune and picking songs based on what their boss liked last week so they could keep their jobs three more months. But I figured Dylan knew something none of us knew, and I wanted to let him get it out. Also, I should tell you that though "Like a Rolling Stone" was on *Highway 61*, it was produced by Tom Wilson. I produced all the rest of the songs on it.

> Dylan was fast, and you never knew what he was going to do next. With Paul Simon, something in the studio might take an hour, it might take a day, a week, a month. He was very meticulous.

What were the sessions for* Highway 61 *like?

The old studios on 52nd Street were a big complex with tons of staff engineers. I walked in on the first day, and there was a German engineer in the studio waiting for me, and he said, "Vot are ve vorking on today?" I told him it was Bob Dylan, and he said, "Do ve haff to?" And I said, "Hell, no," and got another engineer. [That turned out to be Mike Figlio, who also recorded Tony Bennett's "I Left My Heart In San Francisco," and who would follow Johnston down to Columbia Nashville a few years later.]

I don't know how Tom Wilson recorded him, but when I did Dylan, we set up all of the musicians in the same room, with Bob behind a glass baffle so you could see him. With Dylan, you always had to keep your eye on him. He came in and played a song to the band once and that was how they learned it. He never counted off, just launched right into it, so you always had to keep the tape rolling. And that wasn't easy at Columbia; we were using 4-track for that record, 8-track on *Blonde on Blonde*, and the machines were way down the hall. We had union engineers, so one would be in the control room at the console with me, and I'd say, "Roll tape," and he'd tell his assistant near the door, "Roll tape," and he'd yell down the hall to a guy at the other end, "Roll tape," and then they'd start all over again yelling, "Is tape rolling?" God, it took 20 minutes to get those damned machines going. It was like a *Three Stooges* short. So I got in the habit of using several machines with Dylan so as not to lose anything. He would start a song on the piano, and if the musicians dropped out during it, he'd go to the guitar and start playing another one. I lost one song that way and said never again, so I always used multiple machines.

How do you mike a guy like that?

I always used three microphones on

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MIX INTERVIEW

ley Harding, he was staying in the Ramada Inn down there, and he played me his songs and he suggested we just use bass and guitar and drums on the record. I said fine, but also suggested we add a steel guitar, which is how Pete Drake came to be on that record.

***I have to ask about Dylan's notorious vocal sound change for* Nashville Skyline.**

If you listen to all of the records in a row—*Highway 61*, *Blonde on Blonde*, *John Wesley Harding* and *Nashville Skyline*—you'll notice his voice changes on every one. It's just something that happened. *Skyline* was just the most noticeable change. I never changed microphones on him. Hell, if he came in singing like *The Chipmunks*, and if Johnny Cash came in playing a ukulele, I couldn't care less, because they all knew something no one else knew—they were artists.

You were recording Dylan at the same time you were working with Simon & Garfunkel?

Yes. Always had multiple albums going on at once. All at Columbia's Studios in New York or Nashville. *Highway 61* and *Sounds of Silence* were done at the same time, same for *Blonde on Blonde* and *Parsley, Sage, Rosemary & Thyme*, and *John Wesley Harding* and *Bookends*.

Did you ever get Simon & Garfunkel or Leonard Cohen down to Nashville?

Paul Simon came down for about a week once. But we did *Songs From a Room* with Leonard in Nashville.

You followed Tom Wilson onto Simon & Garfunkel as well, right?

I did. He was the one who had put the drums and band on [the song] "Sounds of Silence" while Paul was in England. But I did the rest of the album.

Dylan and Simon & Garfunkel must have been very different working experiences.

Very. Dylan was fast, and you never knew what he was going to do next. With Paul Simon, something in the studio might take an hour, it might take a day, a week, a month. He was very meticulous. He knew how to make records. He had made lots of demos, and he and Art had [made records] under the name Tom & Jerry. He really didn't need me or Roy [Halee, then a Columbia staff engineer and soon to coproduce with Simon], except to bounce things off of.

Did they do their vocals together?

No, they overdubbed them separately. I don't recall which microphones we used on them, but Paul helped choose those, too. He chose the musicians. He hired the newscaster to come in and record the [voice-over] for "7 O'Clock News/Silent Night," another song that I think helped end that war.

You produced the two records that brought Johnny Cash's career back to full steam, the live records from Folsom Prison and San Quentin.

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Columbia didn't want to do those, either. But I called Warden Duffy at Folsom Prison and set it up. Good thing, too. Sold 7 million records.

***What was the equipment used for* Folsom?**

We had a truck full of whatever we could take from Columbia Studios in Nashville. Charlie Bragg, who was on staff at Columbia, was the engineer. The show was done in the prison cafeteria, and it was huge and echoing, and catwalks and hard surfaces everywhere. So, we put up as many mics as we could on the stage, sometimes a couple or three for each player, close in. We recorded it to 8-track. But it was the show that made itself, really. I think the most important thing I did on that recording was, instead of having an announcer work the audience up, I told Johnny to walk out there and just say, "Hello, I'm Johnny Cash." You can hear the explosion after that.

You ran Columbia Records in Nashville for a short time before going independent. What prompted you to leave Columbia?

I knew I could do better on my own. After *Highway 61* and *Sounds of Silence*, Columbia put together a pot for the staff producers, and I got $3,000 in addition to my pay as a staff producer. After *Parsley, Sage* and *Blonde on Blonde*, I got $6,000. For those records? Screw that. So I went off on my own.

And during the following two decades, you produced records for Willie Nelson, Tracy Nelson, the New Riders, and had a few hits, such as Michael Martin Murphey's "Wildfire."

I was never afraid of going independent. I never worried what would happen to me. I just moved forward.

To coin a phrase, what have you done lately?

I've formed a new record label called JAM, with myself, [former AM/FM/Clear Channel executive] Chuck Armstrong and [veteran music-business attorney] Paul Marshall. It's going to be a record label that offers a Bill of Rights for recording artists. Too much of the business is determined by guys in suits these days, people who are too afraid of being fired instead of determined to make good music. In that kind of environment, there can't be another Beatles or Stones.

Wasn't it like that when you were staff at Columbia? Didn't the "suits" have complete control over the artists?

Yeah, but they didn't have complete control over me. ■

Dan Daley is Mix*'s East Coast editor.*

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The Two Towers

Refining the Ring

by Blair Jackson

PHOTO: PIERRE VINET

Re-recording mixer Christopher Boyes

Two down, one to go. Director Peter Jackson's take on *The Lord of the Rings* trilogy is a spectacularly ambitious undertaking: three films, each well over two hours, released just a year apart. They were shot all at once in Jackson's native New Zealand two years ago, but the posting and extensive visual effects work (also mostly in New Zealand) has been going on ever since, and will occupy dozens of people's days until next December, when the final episode is released.

For the sound post-production crew, the latest installment, *The Two Towers*, was an opportunity to build on the sonic foundation created for *The Fellowship of the Ring* and to refine ideas and systems. The team that brought the sounds of Middle Earth so brilliantly to life—and earned an Oscar nomination in the process—was largely intact for *The Two Towers*, including sound designer David Farmer, supervising sound editors Ethan Van der Rijn and Mike Hopkins, and re-recording mixers Christopher Boyes (lead mixer and effects), Michael Semanick (dialog), Michael Hedges (music) and others. This time around, Boyes also brought in Gary Summers to help him with the Herculean premix. Post work took place at the Film Unit in Wellington, New Zealand, using an assortment of platforms, ranging from the Euphonix System 5 to Pro Tools (the choice of the sound editors) to Tascam MMR8s.

"Having the library of sounds from the first film was a fantastic place to start from when we began working on film two," says Van der Rijn. "We were able to really focus on the areas of the film that were entirely new: locations, winds, tree talk, and movement and sounds for massed Uruk-hai marching and chanting, etc. We were also able to deepen some sections of the library, which we already had a really good basis for, such as all of the combat sounds, as well as the initial vocal palettes for the Orcs and Uruk-hai."

"Having done the first film," notes Boyes (who won an Oscar last year for his work on another "small" film, *Pearl Harbor*, and had won previously for *Titanic*), "we went into film two knowing more about the likes and dislikes of the director: his way of working, his preferences and knowing what kind of stylistic approach he likes to take for certain scenes. For instance, we have a number of scenes where music is used to let the audience experience the events in a more detached, less visceral way. In these scenes, effects are treated in such a way that they take on a ghostly, echo-y quality—weaving in and out of the music as if they were swimming in the air around us. We used this approach on film one in Boromir's death, along with slow, dreamy visuals to stretch out time and space. We returned to this style in film two; but this time, it also served as a way of taking the audience out of the head-on intensity of the battle for moments of time. In this way, it allowed us to shift the drama from individual events to a more massive global event and, at the same time, give the audience a rest sonically.

"The success of the first film had everything to do with the way the second one went," Boyes adds. "It was a vote of confidence in us as a team that he was willing to let us start the final mix in his absence. When we started final mixing, he was still trying to finish [recording] Howard Shore's score in London, so we set up a 'polycom': We had a TV monitor and a camera pointed at us, and he would have the same thing pointed at him in his hotel room in London. We would send a computer file via a fat pipe—an ultra-wideband Internet connection—and then he would sit at a Pro Tools system with Genelecs and a video monitor and listen to our pass at the final mix for any given reel. Then he would send us back his ideas. It wasn't a perfect situation, but better to have that than flying blind or getting typewritten notes and not being able to see him describe what he wants. Of course, in the end, he came home and did his final pass with us on the dub stage.

"Peter's notes tended to be really clear and direct: 'I want this scene to start really quiet and subtle and then build. I want it to have this structure to it—we're going somewhere with it,'" Boyes continues. "For instance, there's a scene where the Uruk-hai are marching on Helm's Deep, this fortress built up against a huge rock cliff, and they're marching from afar, but there are so many of them that they set up this incredible rhythmic pulse as they're marching. There were certain desires on the editorial team to have that really be big and be felt and have this huge pulsing mass coming at you. And

—CONTINUED ON PAGE 84

World Radio History

Star Trek: Nemesis

A Generation's Final Journey Begins

by Maureen Droney

Phenomenon, franchise, lifestyle—call it what you like. The *Star Trek* television series and roster of movies—not to mention books, the Las Vegas theme park and merchandising—have created legions of devoted Trekkies who are notoriously picky about their obsession. So when it turned out that both a fresh perspective *and* a continuum were needed for film number 10, Paramount's *Star Trek: Nemesis*, the post-production sound crew had to devise a delicate balancing act.

"When I found out I was going to do the project, I went back and looked at everything from nine on down," says supervising sound editor Alan Murray, a veteran of the first *Star Trek* movie. Murray enlisted the help of friend George Watters (who worked on the films up until number five) and Jim Wolvington (who'd worked on six through nine) at the behest of co-producer Rick Berman.

"The producers are, naturally, very protective of the *Star Trek* sound," he continues. "The fan base is huge, and they get e-mails and letters from people saying, 'What are you doing?' if they change things. So we were ready with what we thought they wanted. But then we saw the film. It's a very different *Star Trek* than has ever been made. It's dark and action-packed, with tons of gun battles—a real roller-coaster ride. I realized we couldn't go in a traditional direction. Also, the director, Stuart Baird, wanted this *Star Trek* to have its own life."

Murray and his crew found that many long-established *Trek* sounds, like those for the phasers and the characters' "transports" between places—which always had a musical base—didn't work this time. "When I put that kind of sound in, it just seemed wrong," Murray explains. "What I decided to do was change things but keep the producers apprised of what I was changing. After they started coming over for playback, they jumped right on the bandwagon. They also felt that this movie had to break out of the typical mode—that it dictated a different direction."

"It's a bold-sounding dub," agrees sound effects mixer Frank Montaño. "Stuart wanted to bring an edge to *Nemesis* that he predicated visually, and that allowed us a lot more freedom. The biggest kick was when we played back each reel and the producers would come in and say, 'We've never done that in a *Star Trek* before, but it's good and we like it.'"

Building on the original sounds, effects editor Jason King loaded almost the entire series' library, along with new sound files, onto a Powerbook and FireWire drives. Even with everything just a few keystrokes away, there was heavy pressure on the team. As is common with CGI effects, visuals sometimes took a radical departure from what they'd looked like at temp dubs. "It was pretty intense at times," Murray admits. "Sometimes while the director was waiting, we'd be working on a scene we'd never seen before, trying to relate it to the library and what I thought it should sound like.

"There are lots of things in this film that haven't been seen before in *Star Trek*: dogfights with five spacecraft doing all sorts of maneuvers, the little dune buggy that flies out of a shuttlecraft. The buggy has wheels, but they didn't want it to sound like it had an axle and an engine. We used jet whines and a cigarette racing boat with animals behind it to get a multilayered sound. Then the aliens showed up and they also had dune buggies that had to be totally different! Then there's the climax, with a huge alien ship so big it dwarfs the Enterprise. This project just kept getting bigger and bigger."

—CONTINUED ON PAGE 84

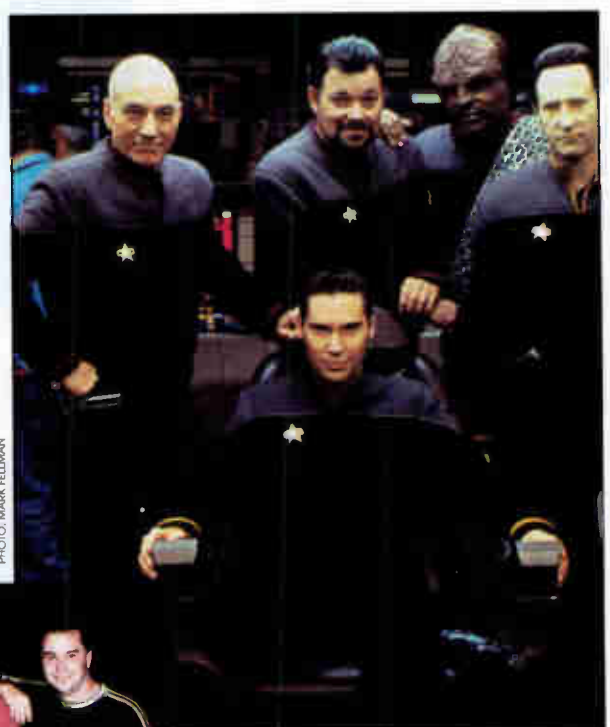


PHOTO: MARK FELLMAN

PHOTO: MAUREEN DRONEY

On the Bridge, l to r: Jason King, Alan Murray and Frank Montaño.

World Radio History

The Chamber of Secrets

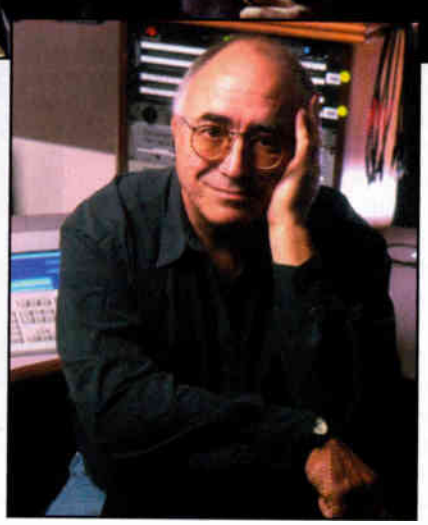
Sound Secrets of Hogwarts

by Blair Jackson

In the year since *Harry Potter and the Sorcerer's Stone* was released, it has gone on to become the second highest-grossing film of all time (after *Titanic*), one of the biggest video releases ever and the cornerstone for what should be a massively successful franchise. The second installment, *Harry Potter and the Chamber of Secrets*—released in November to huge crowds—employed the same cast (with a few additions) and crew. Much of the all-British sound team who worked on *Sorcerer's Stone* (covered in detail in the December 2001 *Mix*) also came back for the new film, but was augmented by a pair of Yanks: Sound designer and co-supervising sound editor Randy Thom, who's usually based at Skywalker Sound in Marin County, Calif., worked with *Potter* director Chris Columbus on *Stepmom* and *Bicentennial Man*. Co-supervisor Dennis Leonard, another Skywalker veteran, had worked with Thom on a couple of Robert Zemeckis' recent films, as well as *The Iron Giant* and other projects.

In general, *Harry Potter and the Chamber of Secrets* is a louder and more intense film than *Sorcerer's Stone*, with numerous interesting set pieces and exciting action sequences that allowed Thom plenty of creative opportunities. Thom did nearly all of his work in Pro Tools doing his initial conceptions at Skywalker, but then headed over to Shepperton Studios in England for the bulk of the assignment. Here are a few of his sound effects secrets.

PHOTO: PETER MOUNTAIN



Sound designer/co-supervising sound editor Randy Thom

THE WHOMPING WILLOW

When Harry and his friend Ron Weasley fly to Hogwarts in a bewitched car at the beginning, they crash it into a terrifying tree that has great moving limbs that attempt to crush the car and its occupants. "I was grateful that Chris [Columbus] was willing to drop the music for most of that sequence, because that's one of those scenes that could've been a just a cacophony of music competing with sound effects," Thom says. "My position about a sequence like that is, if the intensity and peril in a scene are explicitly being shown, there's really no reason to underscore it with music." As for the willow's sound, "There's lots of creaking of the limbs, some of which is just the old balloon trick: If you blow up a normal party balloon and you hold it in both hands and sort of twist it so that your hands squeak across the surface of the balloon, and you close-mike it, partly because of the resonance of the balloon, you get these great creaking sounds. We also wanted to give the whomping willow a voice—this sort of *rr-rr-rrr* growl—so my voice is in there, slowed down and EQ'd and bass-boosted, etc."

THE MANDRAKES

In Professor Sprout's class, the assignment is to re-pot these bizarre plants that have roots that look a lot like human babies and scream so loud that the students have to wear protective ear muffs. "I told Chris that we're sort of walking a fine line here," Thom says. "Obviously, it needs to be intense, but it can't be so intense that it chases the audience out of the theater. For the sound, we started with a baby crying. A woman whose husband was working on the movie had a one-month-old baby, and we recorded it in this little trailer inside one of the shooting stages. We managed to get the baby when it was waking up and really hungry. Then we combined that with some female screams to make it just exotic enough so that you think, 'Hmm, I've never heard anything quite like *that* before.' Then we pitched both sounds up, so there's a lot of 3 and 4k in that sound."

—CONTINUED ON PAGE 84

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Avast and Away!

Creating Future Past on *Treasure Planet*

by Maureen Droney

Disney magic still manages to bring out the kid in everybody, including the veteran creative and production personnel for the animated feature *Treasure Planet*. While you might expect the seasoned pros to take a blasé approach to their work, the opposite was true; all involved labored to outdo themselves to bring the modern-day version of *Treasure Island*, Robert Louis Stevenson's beloved pirate adventure tale, to life. Of course, it didn't hurt that *Planet* takes the action into a universe full of alien worlds and galactic wonders.

"They raised the bar again on this one with the animation," comments Terry Porter, dialog/lead mixer on a team with Dean Zupancic, sound effects, and Mel Metcalfe, music, with the dub taking place on the AMS Neve DFC at Disney's Main Theatre. "It's a combination of 2-D and 3-D animation, and the picture is spectacular. Of course, that makes the bar go up for audio, too. The soundtrack has to follow with the same degree of quality and care or it will feel detached from the picture. Directors Ron Clemons and John Musker [*Aladdin*, *The Little Mermaid*] are veterans here at Disney. They command expertise from all of us. The picture editor, Michael Kelly [*Mulan*, *Rescuers Down Under*], is also extremely meticulous. They all have very high expectations. That puts a lot of good pressure on us."

A major challenge was melding elements of the classic seagoing story with a large dose of futuristic action-adventure. "Throughout the project," says Academy Award-winning sound designer Dane Davis (Danetracks owner, *The Matrix*, *8 Mile*, *Bound*), "the directors maintained the concept of a 70/30 split—70 percent familiar, traditional sounds and 30 percent exciting, fantasy-based sounds. We constantly strove for a balance between them to create an 'antique future.'"

For example, pirate Long John Silver's ship—a creaky, old Spanish galleon with masts, sails, rigging and rope—floats through space powered by solar sails that crackle and glisten with electrical energy as they absorb light to power the plasma rocket engines. "It creaks like a traditional tall ship when it turns or lists," Davis says, "but it's floating through a vast space ocean. It couldn't sound like water, but it required the emotion and energy of wind and surf. Familiar and exotic at the same time."

PHOTO: MARK FELLMAN

To create the sound for Silver, a cyborg with a mechanical prosthetic arm, Davis' team scoured hobby shops and junk stores for antique windup toys and old spinning mechanisms. "We were able to manipulate those sounds to achieve the sophisticated end result we wanted," adds Danetracks' sound designer Rich Adrian, "but we purposely used unsophisticated sources to avoid sounding slick or sci-fi."

Silver's shape-shifting pet, Morph, got an even more organic treatment: "His molecules are constantly moving and rearranging," Davis explains. "I used Jell-O in my hands to create movements, then digitally stretched and particalized the sounds to take it a bit out of our world. To integrate his movement and voice, we created vocal components using my voice through a mouthful of Jell-O. Morph had to sound believable as an otherworldly creature, without coming across synthetic."

PHOTO: MAUREEN DRONEY

Lead Disney mixer Terry Porter

For most of the other dialog, a traditional approach prevailed, with clarity being the goal. "We did some experimentation," notes Porter, "especially with Ben the robot, a comic-relief character voiced by Martin Short. But everything we tried affected his comedy. Sometimes, when you start altering voices you lose emotion, and the last thing you want to do in a story like this is affect performances.

"I had 40 or 50 tracks of various voices —backgrounds, crowd and specific people," he adds. "The quantity wasn't as complicated as just getting a balance. I

—*CONTINUED ON PAGE 84*

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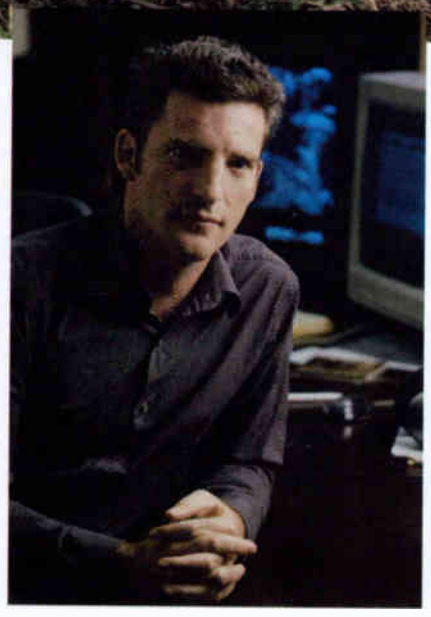
Two Towers

FROM PAGE 78

[Peter] came back and said, 'No, this needs to be subtle—so subtle that you feel the pulse, but you also hear the breath of the warriors waiting for this oncoming army.' It was a really poetic way to take it, and also, since that scene progresses into absolute chaos and mayhem, it was a great way to start because you've got something to build with."

PHOTO: PIERRE VINET



Supervising sound editor Ethan Van der Rijn

"What Peter articulated to us on the sound team in terms of his vision for the sound on film two was not so different from that articulated to us for film one," Van der Rijn concludes. "Rather, it was a further *deepening* of certain themes and motifs that we had started on film one. In many ways, this whole three-film project feels like a voyage of discovery that the whole sound team is engaged in together with Peter." ■

Nemesis

FROM PAGE 79

The depth of the sound effects, along with dialog, ADR and composer Jerry Goldsmith's score, made for a record number of tracks arriving at Universal's Hitchcock Stage for dubbing. "On one reel, we had something like 1,400 tracks," recalls Montaño. "Obviously, when you get to the final, with dialog, music and sound effects interwoven, there are times you have to sacrifice and times you take center stage. [Dialog and music mixer] Chris [Jenkins] worked with Stuart a lot on processing dialog, everything from pitch shifting and subharmonic information to a lot of different chambers. They came up with a very interesting-sounding track dialog-wise, which also elevated everything around it."

"I tend to gravitate to movies that will give me a challenge," says Murray with a laugh, "and this is definitely one of them. I think we took it to a new degree." ■

Harry Potter

FROM PAGE 80

INSIDE THE CHAMBER

Early in the film, Harry is spooked by a strange voice whispering "Kill! Kill!" in Parseltongue, a snake language Harry understands. Thom notes, "This was really through Harry's P.O.V., because once you get the feeling, as an audience member, that the sound and the visual images are being channeled through the consciousness of one of the characters in the scene on their way to you, then suddenly the filmmakers have enormous latitude to stylize the sound. I sort of wish there hadn't been as much real language in the snake tongue as there was. There's something about hearing English dialog that kind of goes to a different part of your brain than either music or sound effects does, and it kind of distracts you and pulls you back into the literal world, as opposed to the stylized world. But we still had fun with it. We did backward treatments on it and put it in reverbs and processed it heavily. The principal trick was to play each word in some kind of deep reverb—usually a chamber, with a long decay time—and then reverse that so you hear the word sort of rush in backward up to—in the case of the word 'kill'—the first consonant. And then you hear it play out forward, also with a lot of reverb, so it gives it this odd, sinister, otherworldly quality."

THE BASILISK

The evil snake monster that resides in the Chamber of Secrets "was quite a challenge," Thom says, "because it's a giant snake, but it's also like a dragon—not many snakes have teeth like that. He had to hiss, he had to roar and there were times at the end when he was in pain. We used a variety of things, including my voice and some horse vocalizations, elephants and various other things. The key, of course, is doing crossfades that allow you to believe you're hearing one thing instead of three or four things mixed together; one of the tricks is if both sounds have roughly the same pitch envelope, I'll alter my voice and the tiger's roar dynamically so they're changing at the same time. Likewise, if the volume envelopes are about the same, it'll help the idea that that's one sound." ■

Treasure Planet

FROM PAGE 82

had to keep it lively and busy, without disrupting the storytelling aspect or obscuring the dialog, which you really don't want to do in animation. In live action, you have a visual that helps you understand the dialog. With animation, even when the sync is incredible, you don't quite have that. You have to ensure that the dialog is crystal clear.

"We were also fortunate that [composer] James Newton Howard really understands the storytelling aspect of Disney animation. He wrote music, beautifully recorded by Shawn Murphy, that worked in and around the dialog, so we weren't constantly fighting busy music under important dialog.

"All the players were there to create a great soundtrack," Porter concludes. "Schedules are never carte blanche, but Disney Animation always allows us the time to do it properly. They expect a good soundtrack, and I think we really delivered it on this one." ■

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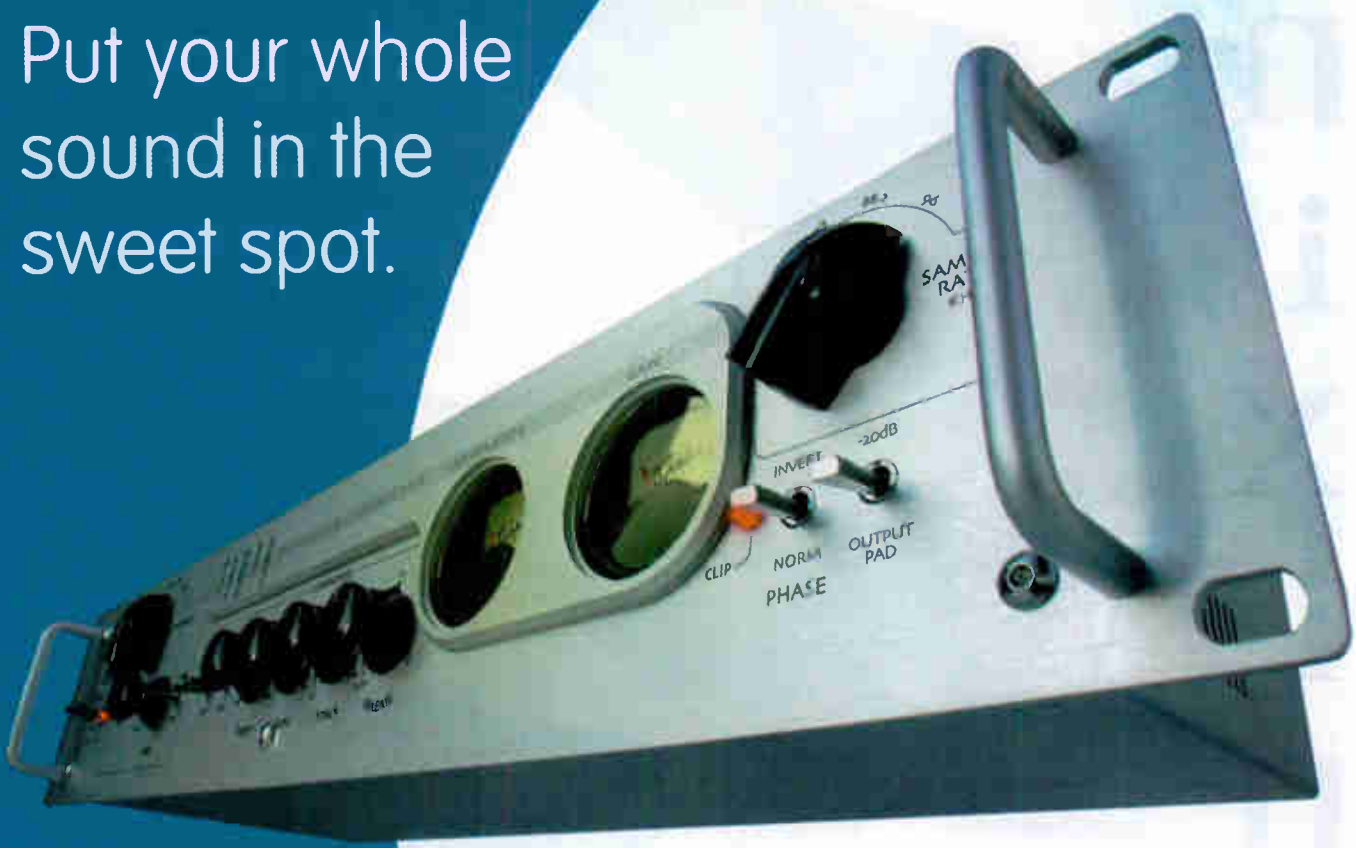

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The Latest in Top-of-the-Line Live Mixing Consoles

By Chris Michie

A few years ago, an objective observer might have predicted the end of the large-format live mixing console. Harrison/Showco and Yamaha had both introduced single-chassis consoles that could handle at least 96 channels on a single worksurface, and Soundcraft and LCS offered all-digital systems that featured compact, reconfigurable worksurfaces designed to take up a minimum of space, an important consideration for high-ticket tours and Broadway musicals. With prices of all-digital and digitally controlled analog mixing systems expected to drop, it seemed inevitable that large-scale analog boards would go the way of "bins, horns and tweeters" P.A. rigs.

However, while all-digital and hybrid analog/digital systems offer potential cost savings in terms of smaller FOH compounds and speedier truck packs, the large-format analog consoles' market appears to be holding steady. The past year saw the introduction of new large-format analog mixers from Audient, Cadac and Soundcraft, and midpriced models from a range of manufacturers remain popular. (It's worth noting that many of today's midpriced models offer more features and better specs than the state-of-the-art live consoles from some years ago.) Meanwhile, an all-new console from DiGiCo and a reconfigured midsize desk from InnovaSon have swelled the ranks of currently available all-digital consoles. For bands, rental companies, theaters and houses of worship, the selection of live mix consoles with 40 inputs or more has never been greater.

To check out what's available, we surveyed top-of-the-line analog and digital mixers, focusing on one from each manufacturer. Of course, most manufacturers offer a range of lower-priced products;

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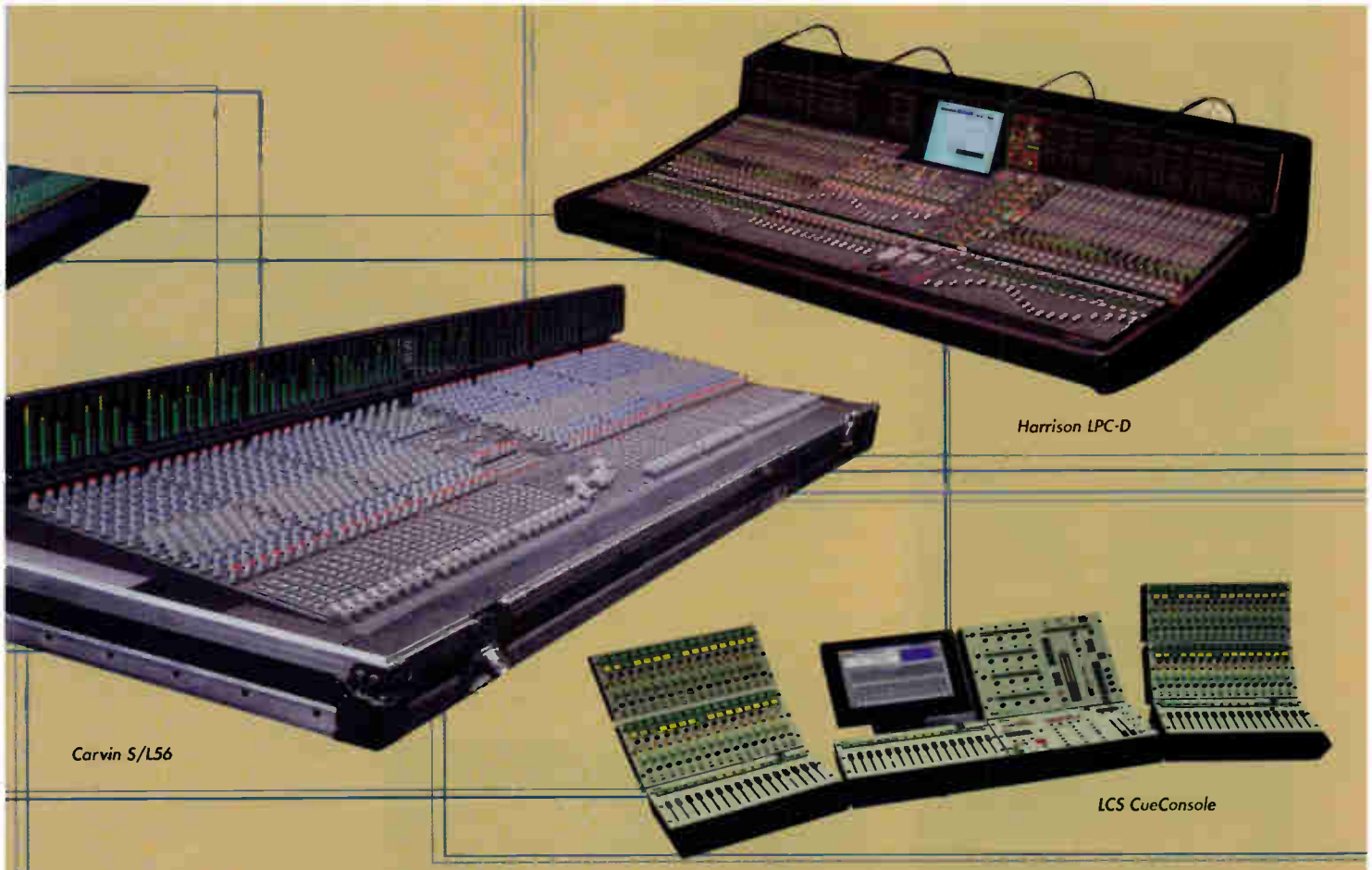


Harrison LPC-D

Carvin S/L56

LCS CueConsole

for further information, contact the manufacturers directly.

The ML5000 from **Allen & Heath** (www.allen-heath.com) is a dual-function analog FOH/monitor console incorporating the company's LCRplus panning system and robust VCA assignment, mute and snapshot automation features. Audio routing is via 24 group and auxiliary buses, eight VCA groups and an extensive output matrix. Input and output mutes can be assigned to one or more of eight dedicated mute groups, and the ML5000's console mute and VCA assignments can be stored in 128 snapshot-memory locations. Up to two 24-channel sidecar expanders can be added, allowing for more than 100 mono and stereo-input channels. EQ is 4-band with parametric mids. Additional features include 20 analog VU meters, Windows-based snapshot-memory archiving software and an intelligent PFL/AFL system. Standard frame sizes include 32 mono plus four stereo channels, 40+4 and 48+4. Price is $29,999 for the 56-input configuration (48 mono inputs, four stereo).

Audient's (www.audient.com) first console entry into the live sound market, the Audient Aztec Live Console (dist. in the U.S. by Audio Toys Inc., www.audiotoys.com), is available in 32, 40 and 48-input configurations, each with two stereo inputs. Housed in a completely modular frame, the Aztec features 12 VCA subgroups, a 12x8 matrix, eight audio subgroup outs with inserts, eight mono and two stereo aux buses, and LCR outputs. Channel EQ is 4-band with parametric mids, swept HF and LF with switchable bell/shelf curves, plus a sweepable high-pass filter. Each channel includes an eight-LED input meter. A stereo-ambience input on the master section facilitates in-ear monitoring, while scene automation and peak LED meters on groups, matrix and auxiliary outputs simplify routing and optimize gain structure. The low-noise, high-bandwidth mic preamps are a new design, and the welded tubular aluminum-space frame structure combines strength with light weight and ease of handling. Prices range from $39,700 to $54,900.

The Paragon II Production Console from **Audio Toys Inc.** (www.audiotoys.com) is designed for use in live sound, broadcast and theater applications. Offering 64 mic inputs and 12 stereo line input pairs, the Paragon II features eight mono and four stereo aux-send buses and eight stereo subgroups, eight stereo matrix outs, two main mono mix outs and two main stereo mix outs. All input channels have a stereo direct out and an insert send, each with its own level control. Fully expanded, the unit can provide more than 100 high-gain mic inputs. Audio-control capabilities include eight VCA groups and two VCA grand masters. Each channel has ATI's famous 4-band parametric EQ, a compressor/gate and true LCR panning with LCR audio subgroup capability. An onboard computer stores/maintains all channel, group and master scene information within a flash microcontroller on every input, which enables the system to respond instantaneously, eliminating system boot-up and response wait times. Enhancement options include channel and aux mute memory, eight-scene or 256-scene snapshot fader recall, and full

Cadac R-Type

World Radio History

mixing with the best

dynamic, SMPTE-based moving-fader automation. Prices start at $119,000.

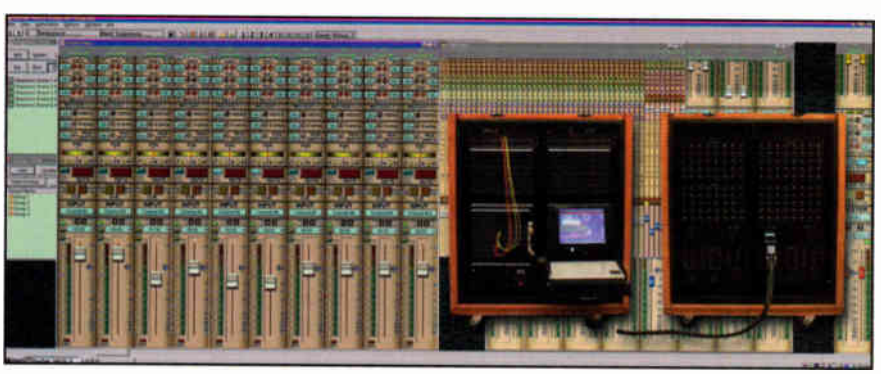
The R-Type Live Production Console from Cadac (www.cadac-sound.com) offers both FOH and monitor mixing facilities—console modules can be located in any slot in the R-Type's lightweight, monocoque-engineered 24-slot frame, each of which can easily be moved by two people. Cadac's unique "plug anywhere" modules allow rental companies to easily redesign the console exactly to match each tour's specification and budget. A typical configuration (using three of the R-Type's 24-slot frames) provides up to 51 inputs in any combination of mono or stereo, a full output section with 16 DC masters and dedicated LCR and stereo-output modules. Custom R-Type console configurations can handle 200 inputs and beyond. Price for a "fully loaded" R-Type approaches $190,000.

InnovaSon Compact Sy40

The dual-inline S/L56 56-input analog console from Carvin (www.carvin.com) offers a high feature-per-dollar ratio. Amenities include eight aux sends on each channel (two effects/four independent monitor sends and stereo in-ear monitoring), Analog Devices mic/line preamps, and ergonomically redesigned rotary knob and fader spacing for increased dexterity in a critical live mix. Also standard are two midsweep EQ bands/channel, a switchable low-cut filter to free up wasted power in the bottom end and a rackmount 400-watt power supply (more than double the S/L56's requirement). Price: $4,999.99.

Midas XL4

Crest Audio's (www.crestaudio.com) top-of-the-line FOH mixer is the V12, which is well-suited for a range of live concert and theatrical applications. The V12 is available in several frame sizes, from 24- to 48-input, all provided with an additional four stereo-input channels. Four-band parametric EQ is available on all mono and stereo-input modules, which also offer 18dB/octave high-pass filters and true LCR panning. There are 12 VCA groups for level and mute control, and the console has up to eight mono and five stereo-output mixes, plus 28 additional outputs. Fully balanced busing increases immunity to outside interference, and programmable muting of inputs and all outputs is standard. An optional link system can accommodate up to three main consoles and two sidecar expanders to create a 212 mono/stereo-input console. Prices for the V12 range from $76,000



Gamble DCX Event 40

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The digital system

for the **analogue engineer**

DiGiCo

D5 LIVE

system composition

> **console worksurface**
incorporating DSP engine, two hot swappable PSU's and slide out qwerty keyboard and trackball

> **stage DiGirack**
9U 19" rack mount, housing input and output connectors, two hot swappable PSU's and fibre optic connection with diagnostic facility

> **local DiGirack**
9U 19" rack mount, housing input and output connectors, diagnostic facility and two hot swappable PSU's

> **100 metres of fibre optic cable**
with connections on a drum

> **flightcase for console worksurface**

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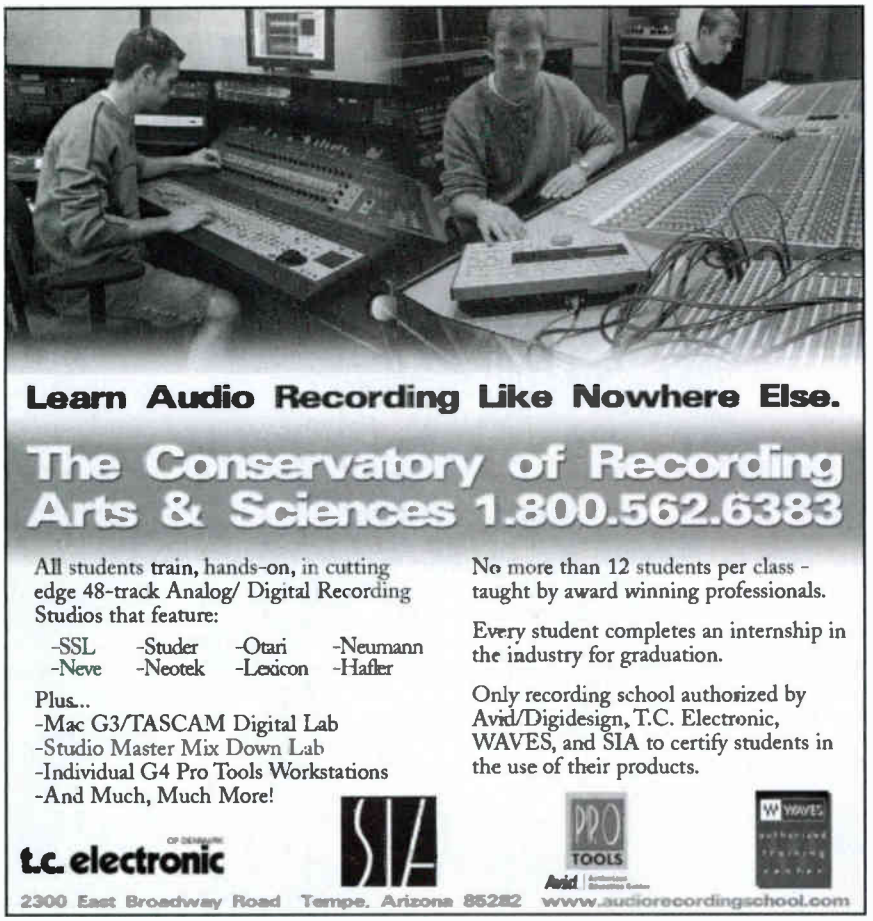
for a 52-input model (48 mono plus four stereo-input channels) to $67,000 for the 44-input, $58,000 for the 36-input and $49,000 for the 28-input. The 28-input V12 sidecar is $44,000.

DiGiCo's (www.digiconsoles.com) D5 Live digital console incorporates a user-friendly mixing surface using TFT touch-screen control. A 56-input D5 Live includes the console and flight case, a local (FOH) Digirack with A/D converters and I/O connections, 100 meters of fiber-optic cable and a second-stage Digirack with 56 mic inputs and eight outs. The 96-input D5 Live includes a second-stage Digirack (three in all), with a stage complement up to 96 mic inputs and 16 outputs. A/D conversion is 96 kHz; internal processing is 32-bit floating point. Four LCD touch-screens present selected features as they would appear on an analog console, with

DiGiCo D5 Live

fast, no-menu navigation and touch-sensitive controls. Forty internal buses provide multiple mono/stereo auxes and mono, stereo or surround buses. Three joysticks handle LCR, 5.1 or other spatial-panning applications. A USB "Q-Drive" key can store the entire console status for recall of all parameters on any other D5. Basic setups for FOH and monitor mixing are provided, with any number of user-storable/tweakable snapshots. Also featured are comprehensive EQ and dynamics processing for each input, an optional effects package, 24 VCA-style control groups and a 38x8 output matrix. The D5 can send direct-record feeds to a digital multitrack or DAW via a single MADI cable. The board can be rebooted with no effect on audio throughput and, on engine restart, automatically restores all current settings. List prices: $168,000 to $214,000.

The DCX Event 40 from Gamble Associates (www.gambleboards.com) is a digitally controlled analog console packaged in a 56x45-inch (HxW), self-contained,



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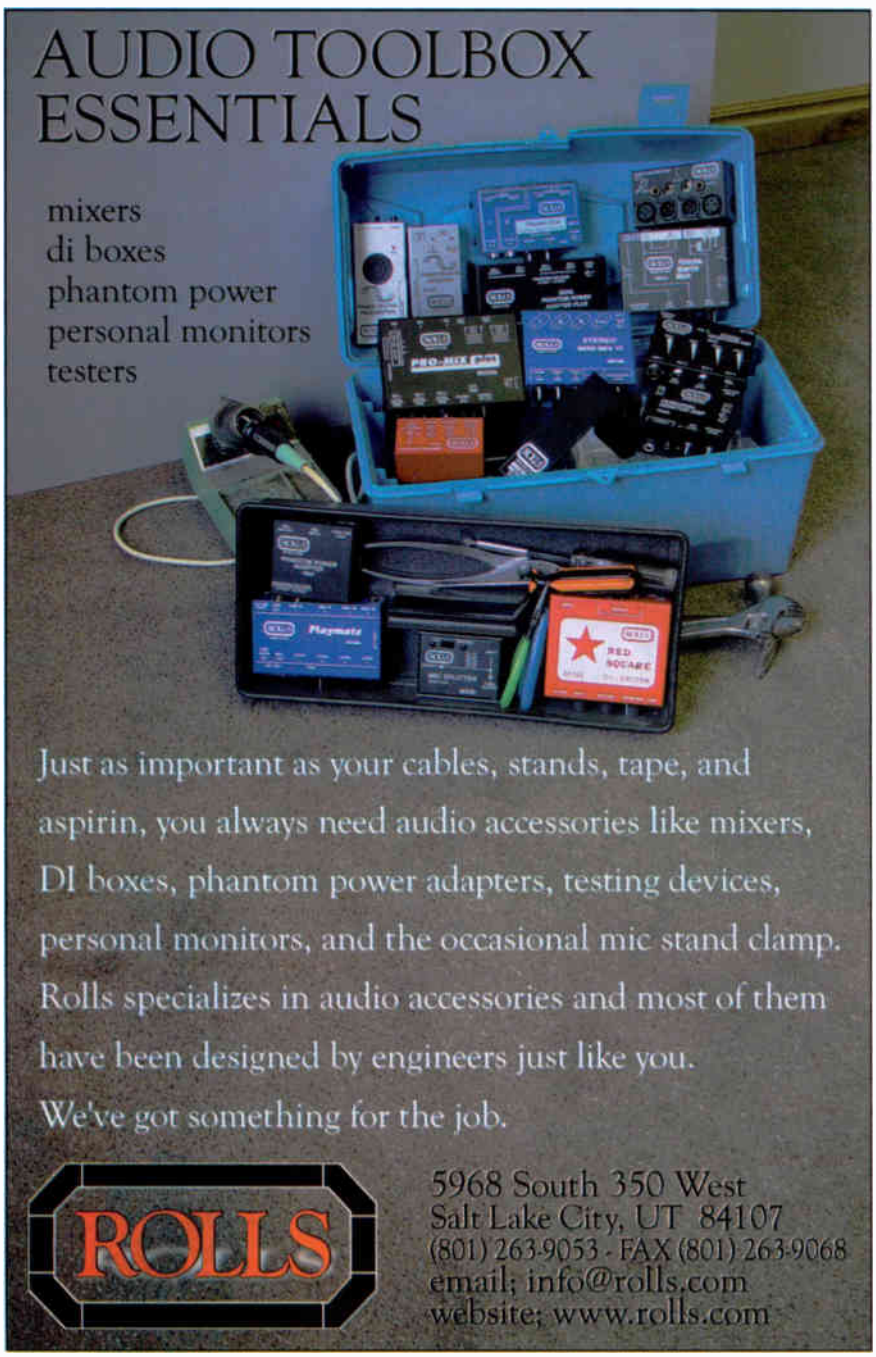
double-bay rack. The virtual console allows control of all functions via dual display screens and an optical mouse; using the Zoom View function is similar to looking at a portion of a typical console surface through a piece of glass. Offering 40 channels to control 80 mic and 80 line inputs, the DCX Event 40 is configured for eight stereo subgroups with inserts, 16 stereo aux sends and eight stereo matrix sends. Noise and distortion specs are excellent; the DCX Event 40 has no phase shift within the audible range of 5 to 20k Hz. All electronics reside on 60 plug-in module cards housed in VME-type card cages with separate power supplies for each. In space-critical situations, the DCX Workstation Roadcase may be placed at the FOH mix location with the DCX Event 40 rack located onstage; a supplied 100-meter CAT-5 wire links the two units. Price: $250,000.

The all-digital version of the TEC Award-winning Live Performance Console (LPC-D) digitally controlled analog system from Harrison/GLW (www.harrisonconsoles.com) was jointly developed with Showco. With a control surface measuring 74x40 inches, the LPC-D uses BeOS-based control software to control all audio parameters for as many as 720 mic and 240 line inputs arranged in three 80-input audio-processing racks. (Each input features one line and three mic inputs.) The audio-processing racks, normally situated on or near the stage, contain all audio cards and I/O interfaces. An automation computer in the processing rack executes all changes to routing and signal processing, as instructed by the digital control surface via a fiber-optic link. Because no audio passes through the control surface, any interruption of the digital data stream passing between the control surface and the processing racks is effectively inaudible; all audio assignments, levels and EQs remain frozen until the system resets and the control surface picks up where it left off. Due to its comprehensive routing and instant-recall capabilities, the LPC may be used for either FOH or stage monitor mixing. Each channel features a full dynamics section, 4-band EQ, high- and lowpass filters and 32 sends. Price is $250,000.

Mackie SR56•8

InnovaSon (dist. in the U.S. by Sennheiser, www.sennheiserusa.com) recently introduced its latest all-digital mixing console for live performance, the Compact Sy40. As with other InnovaSon consoles, the new Sy40 digital console consists of a control panel that connects to dedicated stage boxes via lightweight coaxial cables. Housed in the same chassis as the company's Compact Live digital console, the Sy40 supports 40 inputs, 12 stereo mix buses and 16 outputs, including mono LCR masters. When linked to the InnovaSon Stage Box, the Sy40 is expandable with up to 72 inputs/48 outputs. The Sy40's electronic I/O modules are compatible with the Compact Live, Essential Live and Large-Scale Live digital consoles, and each features a digital input-gain trim, 5- or 8-band parametric EQ and comprehensive dynamics control. Notch filters and delay processing functions are also available, with instant recall of all settings and comprehensive PFL and AFL monitoring throughout the signal path. Prices start at $41,000.



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Level Control Systems (LCS; www.lcsaudio.com) offers the modular CueConsole product line, featuring extreme console flexibility and an all-digital signal path. Working in tandem with the company's Matrix3 audio engine and CueStation control software, the CueConsole system provides all of the control and processing parameters to configure and run complex FOH and monitor systems. All processing functions—such as compression, parametric EQ, delay and virtual groups—are under dynamic control and are repeatable, enabling sound designers to create fluid crossfades and scene changes. CueStation control software also provides surround sound mixing capabilities. CueConsole controls the Matrix3 audio engines via four types of modular surfaces: Faders, Meters+, Transporter and Editor. Each surface is tailored to specific control functions, and they may be mixed and matched specifically for each application. CueConsole surfaces may be distributed for local and remote control via RS-422 and Ethernet connections, and Matrix3 audio engines may be digitally linked to provide up to 200 inputs and 512 outputs in analog, ADAT Lightpipe, AES/EBU and CobraNet formats. Because of the modular design and the ability to selectively reassign fader controls on-the-fly, CueConsole offers an extremely cost-effective and powerful solution when FOH mixing space is at a premium. CueConsole systems with Matrix3 and CueStation start at $60,000.

Soundcraft Series FIVE

The SR56•8 from Mackie Designs (www.mackie.com) is the company's latest large-format analog sound reinforcement console. Laid out in a 56x8x3 configuration with eight subgroups, center master section, LCR main outputs, four extra stereo aux return strips and a 12x4 matrix mixer, the SR56•8 features Mackie's VLZ input-channel circuitry for reduced noise and channel crosstalk. Channel EQ is 4-band with high and low sweepable mids and "Air" HF circuitry. Additional features include Mackie's UltraMute computerized group-muting system, a flip switch for exchanging stage monitor application functions and a new "monorail" tapered fader design. Price is $13,999.

The Midas (www.midasconsoles.com) XL4 Touring Package includes the popular XL4 console, flight case and spare power supply. The analog XL4's 48 mic inputs feature an improved mic preamp design, and treble and bass sections of the EQ section offer an extended frequency range and are switchable to fully parametric operation. Sixteen main audio groups can be assigned to any of eight automute groups and VCA control via 12 motorized VCA master faders. Up to

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  —Fletcher, Mercenary Audio

- "The **Mini-Me** is the way to go for high end sound... we now have a world class ADC to use in the field!"

  —Doug Oade

- "Nice sounding pre amp... sounds really sweet on my acoustic guitar w/bridge pickup..."

  —TJP

- "The **Mini-Me** is fuller, incredible on lows and mids... detail and fullness, not just clarity. I just ordered one, if that tells you anything..."

  —Scott Brown

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2,000 snapshot mix scenes can be recalled instantly, and all of the XL4's dynamic and snapshot automation features can be imported/exported in a variety of formats, either for archiving or for multiple console and system-linking applications. The XL4 Touring Package is $176,675.

The award-winning Series FIVE line of mixers from **Soundcraft** (www.soundcraft.com) is designed for a wide range of live touring and theater applications. Various frame sizes are offered, all with an additional four stereo mic/line inputs: 56 mono plus four stereo, 48+4, 40+4, 32+4 and 24+4. All Series FIVE models feature fully parametric 4-band EQ and sweepable filters on both mono and stereo inputs, 12 aux buses, eight subgroups, 10 VCA groups and LCR master outputs. A 16x10 output matrix allows for an additional send to be derived from the eight subgroups, LCR masters and aux buses 1 through 4, plus an external stereo line input; there are also three alternate stereo outs, one via 100mm faders and the other two on rotary pots. MIDI control allows for eight mute groups and up to 256 mute snapshot, plus MIDI control of external effects. Other features include LCR panning on inputs, comprehensive metering and a rugged power supply with onboard voltage display. Prices range from $54,995 for the 40+4-input version to $61,495 for the 48+4 and $72,950 for the 56+4. A 24-input expander module is also available for an additional $34,995, allowing for the creation of an 80+4 mix console for $107,945.

The **Yamaha** (www.yamaha.com/proaudio) PM-1D is a fully digital touring/installed sound console. Recipient of a TEC Award in 2001, the PM-1D configurations include both 48- and 96-channel versions, each furnished with 48 mix buses, 24 output matrices and 12 DCAs. The latest system software, Version 1.5, contains operational enhancements and new expansion capabilities, including dual-console mode, system cascade and remote MIDI-control change operation; when fully expanded, the system is capable of controlling up to 384 inputs, 192 channels and 96 mix buses. System features include complete recall and undo, a 32-bit internal audio path, 4-band fully parametric EQ and full dynamics processing on inputs and buses. Additional features include scene memory recall of channel A/B assignments, virtual channels and a user-defined number of aux sends, effects processors and graphic EQs. In operation, the DSP1D digital audio engine (typically located onstage) communicates with the PM-1D's 260-pound, 75x38-inch control surface via a 68-pin cable and two Ethernet connectors. If the control surface loses power or is accidentally disconnected from the audio engine, then the system will continue to stream audio uninterrupted. Prices range from $110,000 to $145,000. ■

Yamaha PM-1D

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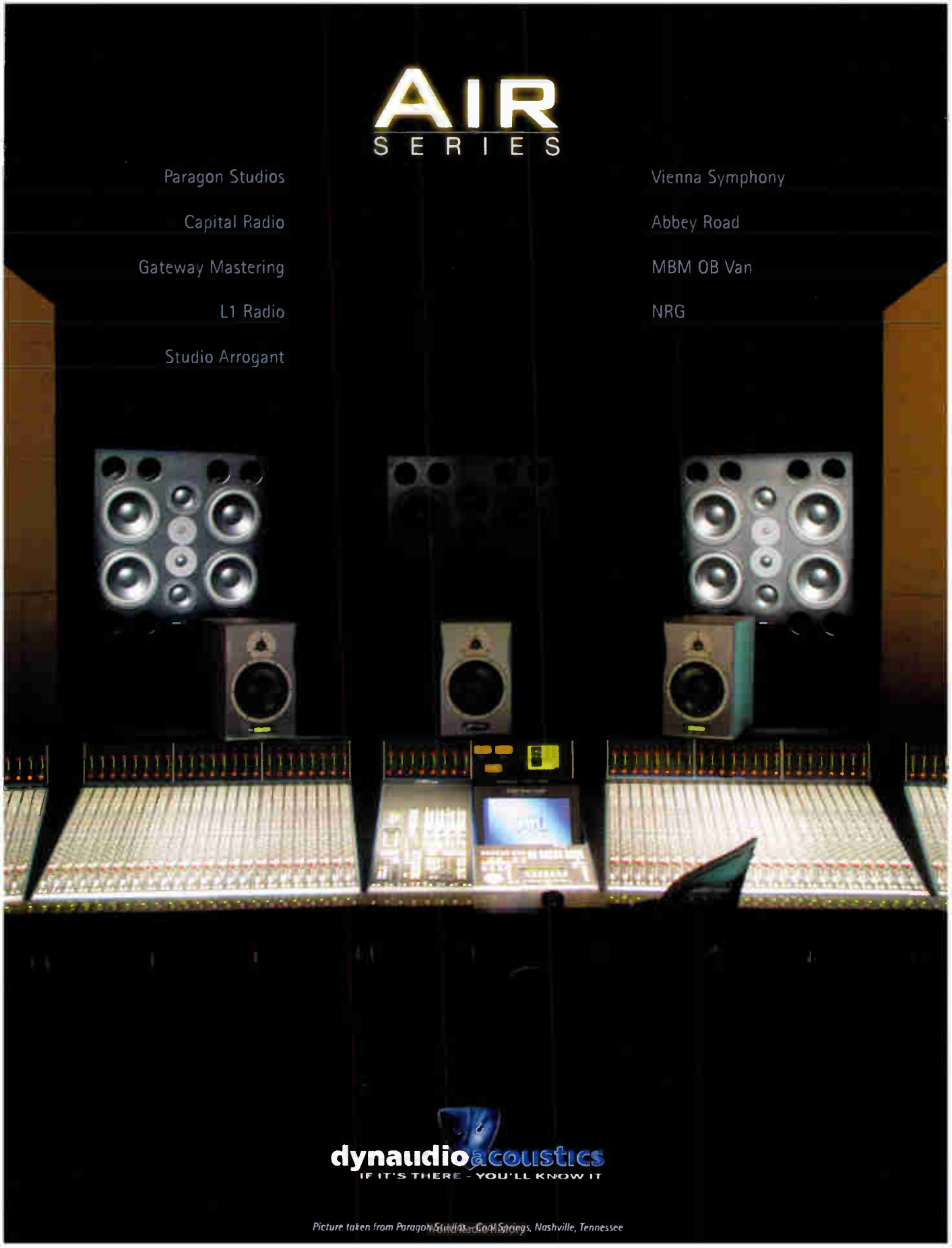
AIR
SERIES
Paragon Studios
Capital Radio
Gateway Mastering
L1 Radio
Studio Arrogant
Vienna Symphony
Abbey Road
MBM OB Van
NRG
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IF IT'S THERE - YOU'LL KNOW IT
Picture taken from Paragon Studios - Cool Springs, Nashville, Tennessee

World-class facility exclusively equipped with Dynaudio Acoustics monitors

Paragon Studios - now ready to service customers in the brand new 22.000 sq. ft. multi-tenant facility located in Cool Springs, Nashville, Tennessee - has installed Dynaudio Acoustics AIR15 surround systems in each of their control rooms.

Studio A is based on an 80-input Solid State Logic XL 9000K console and a custom-designed 64-output ProTools HD system. For monitoring studio owner Fred Paragano went for Dynaudio Acoustics Custom M4 Plus monitors with recallable digital crossovers, and a full-blown Dynaudio Acoustics AIR 15 5.1 monitor system linked through the TC Link network, controllable from an AIR remote. The monitor setup is tuned with the AIR PC-IP software package, developed for advanced calibration and

"Studio owner Fred Paragano went for Dynaudio Acoustics M4+ main-monitors and a full-blown Dynaudio Acoustics AIR 15 5.1 monitor system"

alignment of AIR systems, so that the engineer can choose between the AIR speakers or the M4 Plus monitors at the front (LCR), while always using the AIR speakers in the back as rear channels. The 9000K and the 5.1 monitor setup, top-end processors as the TC System 6000 Multi-channel Platform as well as projection screens, makes the studio suited for both audio recording and postproduction projects.

The facility consists of three studios. Studio A and B are identical in terms of shape, size and monitoring, while the third is a production suite with an overdub booth. All three studios share a centralized machine room and a massive Storage Area Network, the A/V SAN.

Paragon, Studio B

New standards at Capital Radio

Capital Sonics, the creative production division of Capital Radio took delivery of UK's first Dynaudio Acoustics AIR 6 THX approved 5.1 surround monitoring system.

"As far as the sound quality is concerned Dynaudio Acoustics have even improved on their existing strengths ..."

As Capital Sonics are expanding into different areas of commercial audio production they required a 5.1 system. Pete Stone, the head of production at Capital Sonics said, "We are producing a wide range of material and formats and require the very best and latest 5.1 monitoring technology. As we are very happy existing Dynaudio Acoustics users the obvious choice was the new AIR 6 5.1 system. It offers analog and digital inputs, which are perfect for interfacing with our Pro Tools system, and the ability to control the level of all 6 monitors with the AIR series remote control is invaluable."

"The system has really been well thought out for 5.1 with presets for different formats, sub bass management and EQ changes. As far as the sound quality is concerned Dynaudio Acoustics have even improved on their existing strengths with amazing stereo imaging, clarity, definition and have certainly set a new standard with the AIR series."

Pete Stone

World Radio History

Prominent Gateway Mastering installs AIR 15

Bob Ludwig's renowned mastering facility, Gateway Mastering in Portland, Maine, has installed an AIR 15 surround setup with an AIR Base-2 subwoofer. Mastering engineer Adam Ayan, who has been using the monitors for 4 months in one of Gateway's two mastering suites, says: "When we first heard the AIR monitors we were really impressed by the sound, especially the bass response blew us away. After having worked with it for some time I must add that not only the sound impresses me; built in features like Bass Management are absolutely amazing too".

Adam Ayan, Gateway Mastering

"...we were really impressed by the sound"

The AIR monitors have been used as nearfield monitors for 5.1 DVD-V, DVD-A and SACD releases. "I take a stereo source I've EQ'd and use the Dyns for 5.1 nearfield reference listening," Ayan adds.

Adam continues, "Going into the AIR's AES/EBU, therefore staying in the digital domain, and having powered speakers affords us the flexibility we need."
Ayan's diverse client list includes artists such as Tracy Chapman, American Hi-Fi, Phish, Pitchshifter, and the Brian Setzer Orchestra.

Adam Ayan is a graduate of the University of Massachusetts at Lowell's Sound Recording Technology program. He has worked with many of the industry's best producers and engineers, and has mastered albums and singles for many independent and major record label artists. Ayan's suite at Gateway Mastering & DVD opened for business in August 2001, and has been showcased in recent issues of Billboard and Mix magazine in the US.

Abbey Road: "They just sounded right..."

Abbey Road Studios have recently installed Dynaudio Acoustics AIR 15 5.1 monitoring system in one of the facility's three remastering suites.

Abbey Road's Senior Re-mastering engineer Peter Mew explains, "We needed an accurate but compact 5.1 system for this suite to make the most of the room and it's acoustics. Since the AIR 15 system is self-contained, installation was easy and the on-board DSP functions allowed us to accurately align the system for the room. The first time I tried them they just sounded right - natural, detailed with excellent imaging. The three user defined reference levels, the master volume control and the hardware & software remotes - for switching between stereo and 5.1 modes - are really useful".

"...the on-board DSP functions allowed us to accurately align the system for the room."

Peter Mew originally joined the Abbey Road studios in July 1965. As a Senior Engineer, Peter's role covers a broad range of responsibilities - he is involved in remastering audio for SACD releases, and digital remastering for the pop market. Specialising in Sonic Solution de-noise and remastering digital audio, Peter has worked with just about every sort of music imaginable from classical to pop, opera and rock.

His career highlights include a range of projects for major music artists including remastering the back catalogues of The Beatles, Queen and David Bowie. He has worked in various capacities on an impressive list of projects with artists who have become household names including Pink Floyd, Deep Purple, Elton John and Shirley Bassey.

Peter Mew, Abbey Road

World Radio History

Top-end sound library demands top-end monitors

Vienna Symphonic Library is a very ambitious project providing studios with an immense orchestral sample library of absolute top quality. Recorded in 24 bit/96 kHz stereo at Silent Stage, a specially designed recording facility near Vienna, the Library will consist of 1.5 million individual samples (5 terabytes of data) played by top-class musicians.

To provide the best possible conditions for listening to the samples, an audio optimized Cube has been designed - equipped with Dynaudio Acoustics monitors and TC Electronic Reverb technology. Technical Supervisor Dietmar

"The speakers excel all other tested models with the lowest hissing"

"Dietz" Tinhof explains: "Monitoring is crucial in a project like this; what we were looking for sound wise was an acoustically 'true', nevertheless pleasing and emotionally impressing monitoring system."

Dietmar continues, "First of all, the AIR-system matches all of the requirements outlined above: As an active monitor-system, there's no need for external amplifiers. Even more – no need for a dedicated D/A-converter! The addition of a Sub on both sides makes our setup actually a three-way monitoring, but more transportable. The speakers excel all other tested models with the lowest hissing. Above this, we got a remote-control as part of the package; an ideal addition for our purposes."

The Vienna Symphonic Library demobooth - The Cube

"These were the expected benefits; but during the actual installation-procedure, we learned to esteem the AIR-system for even more reasons," he concludes.

AIR monitors in blueprint studio

L1 Radio-TV is a public regional TV and Radio broadcaster located in Maastricht. A merger of two regional broadcasters recently turned L1 Radio-TV into a 150 staff company broadcasting 24 hours a day.

Due to the recent expansion L1 Radio-TV have decided to build a brand new broadcast facility in Maastricht. The new premises will be a 3600 sq meters multimedia building with 7 radio-studios, 6 TV edit rooms, a TV control room and 2 TV studios. All studios will be equipped with Dynaudio AIR monitor systems.

"This pure digital studio will be the blue print for the new studios next year"

Lucas Vroemen, Chief Audio Engineer explains: "We are already Dynaudio users, and are very happy to be so. We currently use Dynaudio Acoustics C2 monitors in our OB van and in our post-production studio."

"In the old building in Maastricht we just finished the RK2 studio, which is our On-Air studio for radio," Lucas continues. "This studio is an experimental studio equipped with Mandozzi digital equipment and two AIR 15 monitors. This pure digital studio will be the blue print for the new studios next year."

L1 radio host, John Hendrikx

"What we like best about the AIR monitors - and we've tested them thoroughly! - is the 'panorama' of the sound. The 'sweet spot' becomes a 'sweet area'. You can hardly tell where the speakers are placed. Very nice stereo image indeed!"

"It is an all-round monitor system - excellent for use in a broadcast environment. Whether it is popmusic, classical music, voice, - it all sounds very nice and "calm". Therefore it is very easy to work with, even if you have to work for many hours in a row."
The new facility is expected to open the doors in December 2003.

dynaudio acoustics
IF IT'S THERE - YOU'LL KNOW IT

AIR
SERIES

World Radio History

Arrogant and successful

Highly respected Belgian postproduction facility, Arrogant Music, based in Belgium, has chosen Dynaudio Acoustics AIR 15 for their new additional suites. Arrogant Music is a full service audio provider for the Video Game, Film, Advertising, Multimedia and Record industries, with clients like Walt Disney Interactive, Universal Interactive, MGM Picture, Coca Cola, Unilever, Sony Music, etc...

CEO & President of Arrogant Music, Pierre Roger, explains: "When we started looking for a building for our 5 new studio facilities the main requirements were large open spaces and lots of light and windows. We firmly believe that having a pleasant environment is important for our employees as well as for our clients. Part of a pleasant environment is also the best possible equipment, and we put a lot of effort into defining and finding the right equipment for our suites."

"The best and most flexible 5.1 monitoring system available..."

"For our Studio A (Dolby 5.1), we chose the AIR monitoring system from Dynaudio Acoustics. Like many other of our colleagues, we believe that AIR is the best and most flexible 5.1 monitoring system available on the market today."

Arrogant Music, Studio A

Moving AIR...

Olaf Mielke and Moritz Bergfeld met during their studies at the famed Tonmeisterinstitut in Detmold, Germany, and soon found that they share a passion for great sounding classical recordings. After their studies they started doing location recordings and very soon noticed the need for a recording truck with professional acoustic design. Their vision was to build a mobile studio that would allow audio professionals to work just as well on location as in any professional studio. They set out to build a truck with control room acoustics and only the finest equipment - a great workspace for engineer and producer alike.

"...giving more than sufficient SPL"

When it came to monitor selection, Olaf and Moritz, after many serious tests, decided on an AIR 6 5.1 setup. The result is simply outstanding and has amazed customers as well as Mielke and Bergfeld themselves. "The sound is evenly distributed, giving more than sufficient SPL any place in the truck – whether it is for classical music or a film score, Surround or Stereo," Olaf Mielke added.

World Radio History

Waves of the future

NRG Studios in North Hollywood, California, is one of the most influential and successful studios on the rock scene today. They started out ten years ago with Hootie & the Blowfish, and recently experienced a temporary climax with the US top-selling album of 2001, Linkin Park's "Hybrid Theory", that sold close to 10 million copies. Their list of credits include Godsmack, Puddle of Mudd, Hoobastank, Korn, Papa Roach, Alien Ant Farm and Lit - just to name a few.

Jay Baumgardner, NRG Studios

Producer, mixer and owner of NRG Studios, Jay Baumgardner, has chosen Dynaudio Acoustics monitors for all the studios. He explains: "We're exclusively Dynaudio Acoustics here. Every studio has a Dynaudio system. Studio A has M4s, studio B and C have C4s. Each studio has a pair of BM 15s, and we recently acquired a pair of AIR 15s. I just lent the AIR 15s to Josh Abraham who is doing the new Staind record. I think there is a big benefit to monitoring digitally directly out of ProTools into the AIRs."

"We're exclusively Dynaudio Acoustics here"

"I'm a big supporter [of Dynaudio Acoustics monitors, red.]," he continues. "I mean considering I didn't have any hits 'til I got 'em, and after I got them the first album I did, Papa Roach's "Infest" sold 4 million copies. I think the new AIRs are the wave of the future. We're building three more studios a block down the road. We're planning to equip all of them with 5.1 AIR 15 systems as well as giant stereo systems."

"Don Gilmour is working on the new Linkin Park album next door right now. "Hybrid Theory" was all done on BM 15s and M4s in studio A. The last Staind album was done here using the same setup. All the people who work here love the sound of the Dyns," Jay enthuses.

Jay Baumgardner and Dynaudio Acoustics have a long history together. "We did a shootout 6 or 7 years ago using all the available monitors at the time. To make a long story short the Dynaudios killed the competition," Jay recounts.

"I think there is a big benefit to monitoring digitally directly out of ProTools into the AIRs"

Jay has managed to influence the design of the monitors more than once. "It's real important to give feedback and have action taken. It's innovation, not just trying to copy somebody else. Other companies have shown less flexibility."

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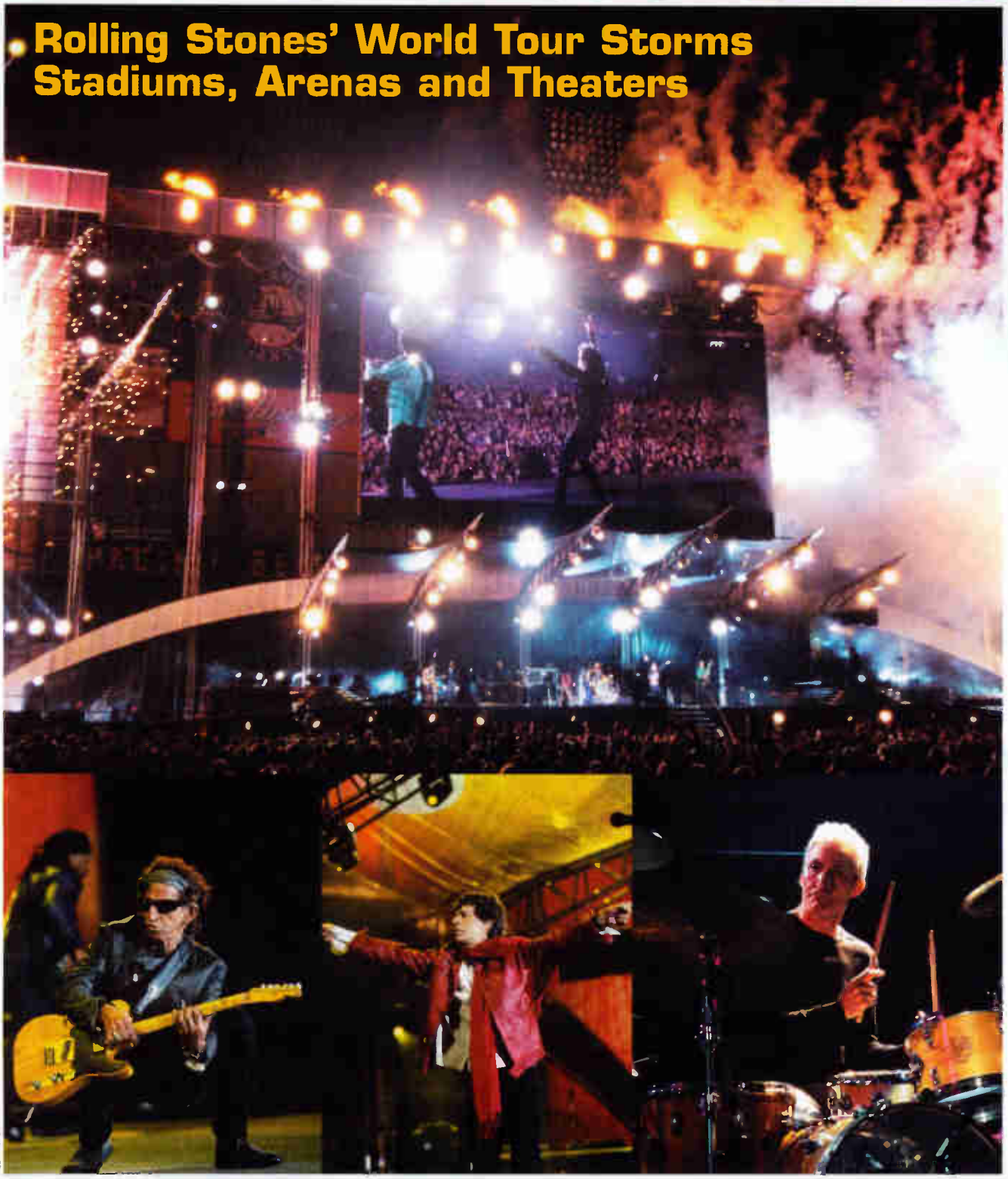

ALL PHOTOS BY STEVE JENNINGS

World Radio History

by Gregory A. DeTogne

Once again finding himself traversing the U.S. at FOH with the Rolling Stones, Irishman Robbie McGrath is somewhat bemused by America's post-9/11 preoccupation with security. "I grew up with terrorism," the 48-year-old native Dubliner and one-time Belfast University student says. "So I have a much calmer attitude toward all of the things going on in the world today. I can smell danger anywhere; it's in my genes."

McGrath's *sang-froid* under trying circumstances and his sixth sense for trouble serve him equally well in both his personal and professional lives. On this, the Stones' 2K2/2K3 Licks world tour, he relies upon his unflappable internal cool and normally heightened awareness to guide him over the road's rough spots, especially those found at the beginning of the journey, when all was new and chaos seemed destined to reign.

"This tour was a bit difficult at first," he confides just prior to a date in L.A., his voice slicing the air with a buoyant brogue, "because we found ourselves dealing with three different types of venues at each stop: stadiums, arenas and theaters. Obviously, the same gear had to do it all, and road cases were going every which way. It initially seemed like an accident looking for a place to happen, but we grabbed on with both hands, and, fortunately, nothing went drastically wrong."

Now closing in on its fifth month out, the Licks tour has settled into its own highly choreographed pace and runs with the smooth, unerring precision of a Rolex Cosmograph Daytona. Standing tall behind a pair of Midas XL4 consoles (one for the main stage, one for a B stage in arenas and stadiums), McGrath rides herd over an articulate, high-horsepower rig supplied for the typically extravagant Stones event by Des Plaines, Ill.-based db Sound. Based around an assortment of Electro-Voice X-line and Xlc line array components, the system was carefully crafted to meet the demands of production manager Jake Berry, the man behind past Stones forays, as well as recent U2, Cher and Tina Turner tours.

"The basic criteria we had to meet with this system revolved around how much space it would take up on the trucks, how fast it could be taken up and down, how much it weighed, the amount of real estate it occupied in the air and its capability to cover every square inch of any venue," db Sound's Harry Witz explains. "Beyond that, we also had to have the flexibility to quickly set up in an arena or stadium one day and a theater the next."

SHE COMES IN COLORS

To properly facilitate routing of the system components to their multiple destinations in each city, Witz and company devised a straightforward color-coding scheme. Anything marked with a green label is for stadiums only. Items wearing an orange label are for arenas, and white designates theaters. In some instances, multiple labels appear on the same piece of inventory, meaning that a specific element is destined for multiple setups. As a further aid to help the crew know what goes where, each label provides more precise details, such as a loudspeaker's position within a specific section of the one or more hangs it's destined for.

Power for all of the Licks' tour P.A. configurations is supplied by E-V P3000 amplifiers, with each amp rack housing its own XTA processor. On one day, an amp rack may be powering a full-range side hang in an arena. On the next, it may be pushing sub cabinets in a stadium or rolling down a ramp into a theater. Regardless of where it winds up, processing configurations can be programmed as needed via a computer link over an RS485 network on-site.

In McGrath's estimation, line array technology may not be perfect, but the system he's currently using with the Stones is bringing sound to places that have never heard it before, especially in stadiums. "Even if you're in one of the back rows in one of these big spaces, the sound is clear and intelligible," he notes. "The horizontal and vertical dispersion is fantastic, and the phase is more correct than with any conventional rig I've used with the band. That said, I wouldn't say the technology is a cure-all, but you have to look at the big picture. As live sound engineers, we shouldn't be out there wanking off like we're creating an album we'll all have to listen to for the rest of our lives. We're doing a two- or three-hour show. During that time, we have to bring as much of the sound as we can to as many of the people as we can. Sure, there are

Left to right: Dave Dixon, systems engineer; Jim Homan, assistant FOH engineer; Bruce Knight, FOH engineer (Sheryl Crow); and Robbie McGrath, FOH engineer (Rolling Stones).

Monitor engineer Chris Wade-Evans

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things inherent in line arrays I would let go of along the way to reaching that goal, but, overall, systems like this bring a hell of a lot to the table in terms of horsepower, efficiency, size and manpower needs."

The full-size stadium stage with moving video wall at San Francisco's Pac Bell Park.

HEART OF STONE

For McGrath, mixing the Stones is considerably more than just a job. "It's like owning land," he says. "You have a tremendous responsibility on your hands. When you own property, you have to take care of it—don't cut down all of the trees and piss in the rivers. Mixing the Stones is the same. It's an honor to be asked to look after music like this, so my job is to concentrate on what's really there and keep it intact for the audience. Keith's guitar sound has developed and evolved over the years, and it's not based upon effects. He is the ultimate figure of a man with a guitar slung around his neck, and when he plays, every fiber of his body plays through that instrument. If you're thinking about putting anything on him in the way of processing, you had better be pretty careful, because there is a hell of a lot of organic energy coming at you in every sense of the word. You can't use technology to change the Rolling Stones anyway, they are totally unique in that sense. As a unit, they are perfect, warts and all, if that makes any sense. Regardless of the huge lighting systems and sound systems you put around them, they are still the nucleus of the show."

Despite the presence of a formidable amount of outboard gear at FOH, McGrath uses little—if any—processing on

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MERGING

Keith Richards' guitar. The same holds true at Charlie Watts' drum kit, where mics are left open for the most part, there is no compression, and the only gates are on toms to govern overtones. For Mick Jagger's vocals, a tiny bit of compression is added along with some straightforward reverb according to a recipe based on the notion that "the character of his voice makes anything else unnecessary."

Faced with the same three-different-venues-in-the-same-tour dilemma as the rest of the crew, Licks monitor maven Chris Wade-Evans (or "Wevans" as he's more commonly known) took stock of the situation and sought out a console that could manage the larger needs of the A stage in both stadiums and arenas, as well as the smaller B stage and theaters within the same architecture. Ultimately settling on an R-Type Cadac design that packs the power of four 24-slot frames into a sprawling desk measuring 12 feet in length, Wevans' console utilizes three frames for input channels and one for all of the outputs and VCAs. As on the last tour, Wevans specified Firehouse wedges, and for those ready to use in-ear monitors—Mick Jagger among them—he chose Shure's PSM 600 IEM systems.

CAN'T YOU HEAR ME KNOCKING

"For me, the PSM 600s sound more natural than other newer, competitive offerings," explains Wevans. "Mick started with the system for the B stage in stadiums, but now he's taken to using it sometimes for arenas on both the main and B stages. The Cadac is a very clean-sounding board. It has a bit of automation on the end; I use it just so I don't have to go reaching for solos from the outer reaches. I ordered this desk with slightly more inputs than I used last time out, just in the event that I needed more mixes for odd stadium sidefills and things like that. I also originally planned to duplicate the vocal and main drum channels so that if the band needed radically different mixes in arenas and stadiums, they could be accommodated. It has actually turned out, however, that the mixes stay pretty constant between the two."

Upon the completion of a February 2 date in San Jose at the HP Pavilion, the Licks tour will close in the U.S. and chart a path for Europe and the rest of the world. "You can talk about it; you can try to explain it, but until you live it, you'll never really know," Harry Witz says of the experience of bringing sound to the World's Greatest Rock Band. "The magnitude, the intensity...it all puts you under a microscope with the whole world watching and listening. Sometimes it hurts, but when you hear the chords of a tune like "Start Me Up" cut evenly across every seat in a cheering house, the rewards clearly outweigh the pain." ■

Gregory A. DeTogne, based in Chicago, is a regular contributor to Mix.

World Radio History

SIR PAUL MCCARTNEY

FOH mixer Paul Boothroyd

ALL PHOTOS BY STEVE JENNINGS

by Mark Frink

When my travel plans were pushed back a day, I suddenly had the chance to drop in on Paul McCartney's Back In the U.S. show, which came to Portland, Ore., during the return leg of last spring's two-month tour. Dropping in at the stage door unannounced seemed unrealistic, but my gracious hosts went out of their way to show me around and even found me a seat, despite the impending arrival of Madonna's people, Alanis Morissette's folks and Cameron Crowe's entourage.

I was met at the stage door by Paul "Pablo" Boothroyd, who has been mixing McCartney since 1989, and has also mixed the last two AC/DC tours, as well as recent Eurythmics and Annie Lennox outings. Pab, as he is known to friends, mixes on a pair of Midas XL4 consoles, with the main inputs on the forward-facing desk and the ambience mics, drum overheads, keyboards, piano, effects and playback submixed from the desk to his left. He forgoes much of the XL4's automation ability, though he does rely on presets to restore fader positions at the top of each number. "I prefer to manually push up faders as it helps focus on the mix for each song," he explains.

And there are quite a few different scenes. In addition to playing his classic Hofner bass, Sir Paul jumps between keyboard, piano, acoustic and electric guitar and even a ukulele for George Harrison's "Something." Boothroyd favors Shure microphones throughout the input list, using KSM-32 condensers on guitar amps—Rusty Anderson's "Divided by 13" and Brian Ray's Electroplex Rocket 50—plus an additional SM57 on the Vox that McCartney plays his '58 Les Paul through. McCartney's Mesa Boogie bass amp is miked with an old-style Beta 57, which Boothroyd likes for its midrange bite and also uses it on the Ashdown rig that Ray plays bass through when McCartney is playing other instruments. All of the singers' mics are Shure Beta 58As, except for drummer Abraham Laboriel Jr.'s Beta 57A, which he swings around on a boomed gooseneck.

World Radio History

I've personally enjoyed Laboriel's drum skills during several k.d. lang tours, though this was the first time I could relish his vocal skills—he harmonizes with McCartney as often as anyone does onstage. Those who have seen this show either live or on television now recognize his enthusiastic playing and his DW kit with the word "driving" on the kick drum, which refers to the title of the latest McCartney album, *Driving Rain*.

NO MORE SWISHING

The stage very effectively uses movable banks of LED screens above and behind it for video, graphics and image magnification. In order to present a lower sightline, Boothroyd eschews overhead drum mics in favor of Audio Technica ATM35 mini-condensers placed a few inches directly under each cymbal's bell. "Centering the mic under the bell eliminates any 'swishing' from cymbal rocking," Boothroyd explains, noting that he developed the technique during the AC/DC outings. The close distance provides good isolation, and the cymbals could be heard clearly in the mix—even during the loudest numbers.

For effects, Boothroyd uses a pair of double-machine TC Electronic M-5000s, which provide a basic vocal reverb and a chorus effect based on the "King" preset for what Boothroyd calls "magic dust" on backing vocals. The other two machines provide a plate reverb for drums and a percussion setting for instruments. He also uses a TC Electronic D•Two delay for shadow echoes and answer delays on a couple of songs. For compressors, Boothroyd uses an Avalon 2044 on the lead vocal inserts, and has 10 dbx 160 SL compressors distributed among the backing vocals and most of the instruments. Drawmer DS-201 gates minimize drum channel leakage.

Each show is recorded for potential DVD and CD release on two Tascam MX-2424 hard disk recorders, which provide a total of 48 recording tracks. Of these, eight are dedicated to audience reaction mics: four Shure SM-91s at the front of the stage (a pair near the center and two more at the corners) and four Shure KSM-32s at the mix position arranged in pairs that are aimed at the rear and sides of the arena. To conserve tracks, Boothroyd downmixes a few channels: McCartney's vocal mics share the same track, and the second snare that Laboriel plays downstage with brushes during the acoustic part of the show goes on the kit's snare track. However, all eight AR mics are individually tracked for future use in post-production, which will provide both ambience and the sing-along "nah-nah-nahs" from "Hey, Jude" in surround.

REMOTE SYSTEM TWEAKING

Clair Brothers provided sound equipment for the U.S. shows, and the drive rack contained nine of the new Clair iO 2x6 speaker controllers from Australia-based Lake Technology Ltd. The setup dedicated an iO to each of the three sections of the main I-4 line array, one for the subwoofers, three more for side- and rearfill arrays, another for frontfills and one for potential shed lawn systems as needed. All of the iOs were controlled via Fujitsu touchscreen computer; system engineer Randy Wiley controls the system from a remote computer that connects over a wireless 802.11b "Wi-Fi" connection from any location in the arena.

Fully programmable, the Lake Technology iO processors can be grouped so that EQ filters can be adjusted for the entire rig or only sections of it, and additional layers of filters can be written to accommodate guest engineers and supporting acts. The filters can be used as parametrics or graphics, the software looks intuitive and user-friendly, and I'm sure we'll be seeing these processors on many future tours. Lastly, Boothroyd is also using the new Klark-Teknik Helix digital equalizer on the entire mix bus, employing its DN-27-style filters, which he prefers for their musical interaction.

For Portland's Rose Garden Arena show, the main speaker system was made up of two columns of 14 I-4 speakers firing the length of the arena in typical line array fashion, with a dozen of the companion single-18 subs hanging right beside all but the two lowest cabinets. The arena sides were covered by two more eight-deep I-4 columns with another half-dozen I-4 subs immediately adjacent. On the floor and in front of the stage, eight S-4 subs were deployed, along with two pairs of Clair's small P-2 frontfill speakers sitting on top and just below the edge of the deck. The I-4 system was powered with QSC 9.0 amps on the lows and Crown

World Radio History

Macrotech 3600s for the mids and highs, while Crest 9001 amps powered the speakers at the front of the stage.

"JUST LIKE THE RECORD"

Like Boothroyd, monitor engineer John Roden has also worked for McCartney since 1989, and his credits include a who's who of English rock bands. (See www.mixesmons.co.uk for the current list.) He mixes monitors on a pair of Midas Heritage 3000 consoles, though the second desk is only half full. The stage is littered with single-12 SRM wedges, with most musicians using them in stereo pairs. McCartney uses two pairs, one directly ahead of him for his vocal and another pair on the outside of these for a stereo mix of the rest of the band. "Paul's instructions to me were, 'Make me feel like I'm in the record,'" Roden reports. The I-4 line array main P.A. makes very little contribution to the stage sound, so Roden sends a full mix to two pairs of Clair R-4 three-way speakers used as fill speakers and laid on their sides. A wedge positioned upstage-left at the piano riser acts as a supplemental fill speaker for the rest of the band.

Roden is using 24 channels of dbx DriveRack processors and reports excellent support from dbx's Geoff Lissaman. The DriveRacks are across all of the monitor mixes and are even inserted on several inputs, such as McCartney's Martin acoustic guitar and Hofner bass. "Those familiar with the Hofner know that it's an acoustic instrument whose body resonance easily picks up sound vibrations, thus requiring careful equalization," Roden comments. He inserts dbx 160SL compressors on the vocals and bass inputs, and assigns Drawmer gates for the drums, though these are all used sparingly. In addition to the dbx DriveRack, Roden is also using a Sabine Power-Q on McCartney's vocal insert chain and typically uses the Power-Q's "search-and-destroy" mode ahead of time to find the most likely feedback frequencies.

Monitor effects consist of a Lexicon PCM81 for McCartney's vocal at the piano, a TC Electronic D•Two delay, which is used for only a few songs like "Can't Buy Me Love," and a Yamaha SPX-990 for acoustic guitars. One customized aspect of the monitor system is an onstage VCA fader for Paul "Wix" Wickins' keyboards, which routes the mix from the direct output back to two more inputs, allowing Wickins to turn himself up and down. For "She's Leaving Home," a live concert first on this tour, Wickins plays the classic string parts of the original arrangement on keyboards.

The show begins like *Cirque du Soleil*, with a half-hour of entrances through the audience of dozens of costumed actors—jesters, geishas, ballerinas, a strong man, a contortionist and, of course, a man in a bowler—an entertaining and theatrical alternative to a support act. Beyond the technical excellence exhibited by all departments, the McCartney show is a heart-warming, 33-song trip down memory lane, and the three-hour show goes by without an intermission. By the time he comes back for the second encore to play "Yesterday," there's not a dry eye in the house and The Beatles have been forgiven for not getting together one last time. If you missed the concert, check out *Back In the U.S., Live 2002.* ■

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

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UNDERWORLD

ALL PHOTOS BY STEVE JENNINGS

A NIGHT IN THE CITY

by Robert Hanson

Out in support of their latest album, *A Hundred Days Off*, UK dance act Underworld has embarked on a short fall 2002 North American tour. Following a successful run of European festival dates, the band and crew stripped their road show back to its most essential elements and, for logistical and cost reasons, opted to rent a full P.A. rig in each region. *Mix* caught one the few West Coast performances, at the Warfield Theater in San Francisco, where the band performed in October to a sell-out audience.

Underworld's approach to live dance music dictates a very different approach to sound reinforcement. Onstage, the band—now consisting of Rick Smith and Karl Hyde—make use of more than 50 tracks of playback material, live guitar, samplers, keyboards and live vocals, all mixed on-the-fly. Smith utilizes two Macintosh-based Logic Audio/Pro Tools rigs (a main and a spare), which contain all of the backing elements for each song. All of the tempo-synched tracks are arranged vertically in the session so that fresh arrangements and remixes can be achieved by muting and unmuting corresponding channels on the band's Midas Heritage 1000 console. Hyde is responsible for his own guitar, an Akai MPC 2000, Pioneer CDJ-1000 and vocals. The main vocal mic is a wireless Shure SM58A.

The onstage mix is then bused down to separate group tracks (bass, lead synths, sound effects, etc.) and corresponding channels for kick drum, guitar and vocals. The only stage monitors are two Funktion-One Resolution 2 full-range enclosures and two F-218 bass cabinets. Hyde, however, uses a set of wireless headphones.

"Each song has differently numbered tracks and parts," FOH engineer John Newsham explained. "When they recall a song, Rick has a [tape] strip that matches the song with all of the parts. The automation on the Heritage helped a lot with muting and levels. He kind of does a live remix of the tune. We've been 'round with it so many times: 'How do you do this stuff live?' For a long time, the only way we could do it, technically, was for him to send me a complete mix of what he was doing and then some splits. This time, with the Heritage, Rick can use his VCAs as his groups, and he sends me basically four stereo groups. I have much more room to adjust than I've ever had before."

Newsham, who with partner Tony Andrews owns the loudspeaker manufacturer company Funktion-One, has known Underworld personally for nearly 20 years and has mixed FOH for them on numerous tours. For the San Francisco gig, Newsham utilized a Wavefront line array from Delicate Productions. The console for this particular date was a Midas XL3, and the outboard processors included Yamaha SPX-900s, a Lexicon 224, dbx 160s and BSS EQs.

"I usually use a compressor on the vocal and an XTA SIDD," Newsham continues, "but it's different every night depending on the system. On [Karl's] vocal, I also use a left-right Harmonizer, just to take it out of the center of the mix and make it a bit bigger. I also do the delay on the vocal. I doubt if I'll use any reverb in this room. I very rarely use reverb, unless it's for rooms that are very dark and I'll brighten it out a bit. I usually let the room provide the reverb.

"Since the beginning of the summer, we've done loads of festival gigs with loads of different P.A.s," Newsham concludes, "and I just turn up and use what's there. I really like working like that. You get to use all kinds of people's effects units; very often, you'll have a tech on a festival who has got stuff that you've never seen before that you can try." ■

FOH engineer John Newsham

Robert Hanson is Mix's assistant editor.

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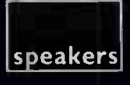

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World Radio History

HIROSHIMA

ALL PHOTOS BY STEVE JENNINGS

by Chris Michie

Founded in the late 1970s by saxophonist Dan Kuramoto, Hiroshima has had a long and successful career, and the band's 11 albums have sold more than 3 million copies. Currently promoting their latest CD on Heads Up Records, *Between Black and White*, Hiroshima recently came to Yoshi's, one of the San Francisco Bay Area's top jazz venues, for a four-night stand. *Mix* met with band sound engineer John McCourt and Yoshi's resident engineer, Dan Pettit, before the final show.

HOUSE MICS MEET EXPECTATIONS

Hiroshima does not typically carry sound equipment, so McCourt relies on whatever system the house provides. "It makes it challenging for me, but I enjoy it," he comments. "I see the job of the soundman as someone who goes in and does the best he can. You make it sound as good as you can with what you have to work with. I have certain standards—we send out a rider—and most of the time, I get what I want."

The house P.A. is made up of a flown center cluster of three Meyer Sound CQ2s supplemented by a CQ1 and a PSW-2 subwoofer flown on each side. Frontfill for the handful of audience members seated at the very lip of the stage is provided by four Meyer HM1s. Onstage monitors are Meyer PSM models, which, like all of the other Meyer speakers, are self-powered and contain onboard processing and limiting.

With eight bandmembers, four vocal mics and a full drum setup, Hiroshima requires many more mics than traditional jazz acts that make up the bulk of Yoshi's bookings. "I like to use 98s or 57s for the toms," says McCourt. "They've got to have my kick drum mic, too. I like a 421, I like a B52 and I like a 91—not the Beta 91, the regular SM91. If you've got one of those three for me, I'm fine with it. And, as long as they have some good condensers for overheads, I'm fine with that. Here [at Yoshi's], he's got great overhead mics—they're Neumann KM84s. They have a real nice mic selection."

McCourt typically uses about 28 inputs, which leaves him plenty of room on the 40-channel Crest X8. The 24/12 Spirit Monitor board easily generates the needed eight monitor mixes, which are distributed onstage through nine wedges. The band rarely uses sidefills, even on wide festival stages.

The Hiroshima stage plot includes two electronic keyboard positions, one at center stage for Kimo Cornwell and another at stage left for Dan Kuramoto, who also plays saxophone. At the back of the stage, drummer Danny Yamamoto is flanked by electric guitarist Fred Shreuders and Dean Cortez on electric bass, while vocalist Terry Steele works stage center and June Kuramoto sits with her koto downstage right.

"It's not like miking a rock band—there's a few nuances to cover," notes McCourt. For the zither-like koto, an acoustic instrument that sits on the floor, McCourt uses a two-pronged approach: A Barcus-Berry pickup inside the instrument runs into a DI and from there into a Conn strobotuner, which June Kuramoto uses to tune between numbers. McCourt uses some of the Barcus-Berry signal to add brightness, but mainly relies on a Shure SM91 in the koto's sound hole.

McCourt has tried a wide variety of mics on Dan Kuramoto's various woodwinds, including Beyer wireless mics and Shure SM98s. "I've now found a really good mic I just love," he enthuses. "SD Systems makes mics specifically for horns, so now I carry one of them. On the shakahachi, I use a real long reverb—about nine seconds, with a 100ms predelay," notes McCourt. Because he can usually achieve this effect on any modern digital reverb, McCourt is usually satisfied with whatever reverb units the house supplies.

Hiroshima sound engineer John McCourt

As far as levels go, Pettit can advise but not insist. "It's in the bands' contracts that they have control of the production. So as a venue, we don't have a lot of say in the volume level," he says. "We try to keep it at a comfortable level, and most bands adhere to that." ■

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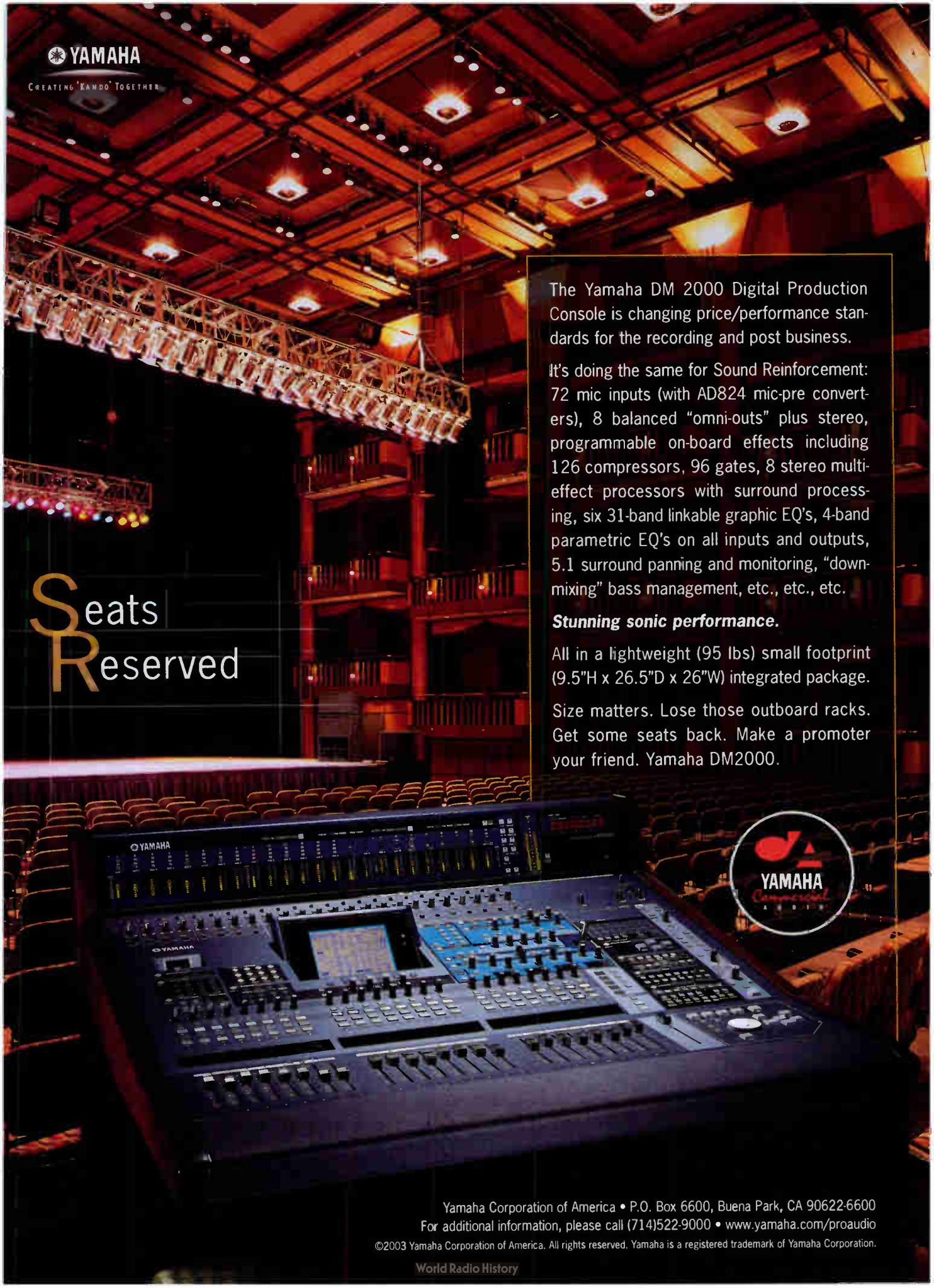

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PHOTOS AND TEXT BY
STEVE JENNINGS

Originally from New York, The Strokes first broke through in England and have since become an international success story. Touring almost nonstop since the 2001 release of their first full-length CD, *Is This It* (RCA Records), the band has appeared at the last two Reading Festivals and has toured Japan, Australia and much of Europe. This year brought extensive media coverage, an opening slot on the Rolling Stones tour and a nomination for Best New Act at the MTV Europe Music Awards. On the road for 10 months in 2002, the band has steadily progressed from the U.S. club circuit to theaters, ballrooms and outdoor sheds. *Mix* caught the band for its Halloween appearance at San Francisco's Bill Graham Civic Auditorium.

Julian Casablancas

The Strokes endorse Shure microphones; vocal mics are all Beta 58As. Drum mics include an SM57 on snare top, a Beta 57A on snare bottom, a Beta 52 on kick, a PG81 on hi-hat, and Beta 98s on rack and floor toms.

"Because Julian tends to trash mic stands, we have a deal going with Ultimate Support Systems," notes monitor engineer Chris Sherman. "He uses a single clutch M-77 B with a boom stand, so that's his to destroy."

FOH engineer James Gebhard is mixing on a Midas Heritage 3000 but uses only 15 inputs. "Very plain, basic and simple, which is how it should be for this band," he says. "The only really specific thing that I use in my rack is an Avalon 727-SP, which is a tube preamp, compressor and EQ all-in-one, which I use on Julian's [Casablancas] vocal. It's what they used on the album to give it a distorted effect." Other dynamic-control devices include dbx 160As and gates. "I don't use any effects at all, which people find strange," adds Gebhard.

Nikolai Fraiture

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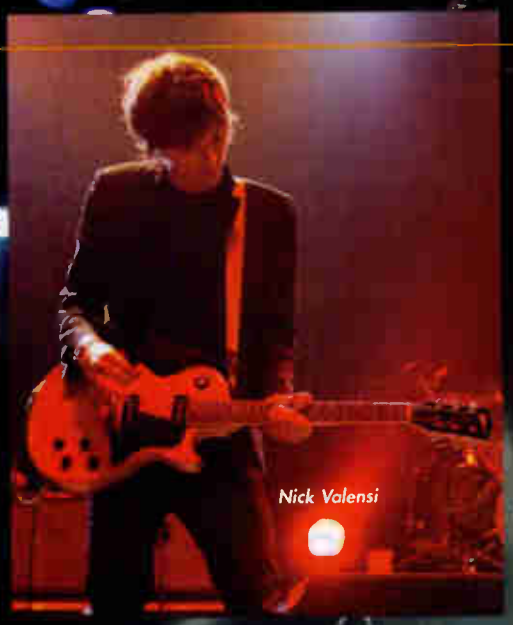
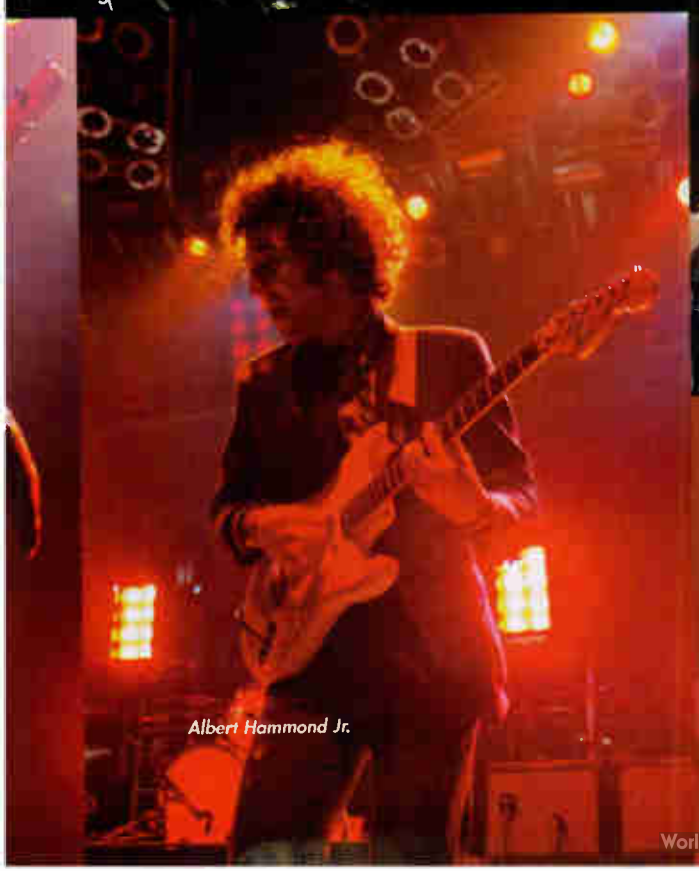
The Strokes



Nick Valensi

Fabrizio Moretti

Eighth Day Sound (Cleveland) supplied the sound system for the San Francisco show. "We did a bunch of shows with them before, and I think that they're really professional and have a great staff," says FOH engineer James Gebhard. "Also, they're the only company in the States that has the D&B P.A. system; that was a big factor."



Albert Hammond Jr.

Monitor engineer Chris Sherman mixes on a Yamaha PM4000 monitor console with no external processing. "These guys are easy to work with," says Sherman. "They just want to hear what they're putting out. I hardly use any EQ whatsoever, and everything's at a really low level."

Wedge monitors are all D&B models. "It's hard to find dual 12s, but D&B just put out a set that we're carrying—the M-2s—and they sound phenomenal," comments Sherman. The band uses wedge monitors except drummer Fabrizio Moretti, who listens to a Shure PSM 600 IEM system with the standard E-5 dual drivers.

World Radio History

back to BASICS

Every January, *Mix* turns the spotlight on Live Sound. In previous years, we have offered articles on such high-technology issues as in-ear monitors (IEMs) and wireless systems. But, however important these advanced technologies may be for the future of the industry, the reality is that most working sound engineers spend their formative years grappling with wedge monitors and club sound systems. So, this year, we offer a pair of articles that address these fundamentals. Mark Frink writes about getting the most out of wedge monitors, and Buck Moore offers his tips to cope with the unexpected in a club situation.

PHOTO BY STEVE JENNINGS

World Radio History

Techniques to Get the Most Out of Floor Monitors

by Mark Frink

Mixing monitors has its rewards, but the job rarely provides the ego gratification enjoyed by FOH engineers and seldom makes up for the frustrations of having to act as a stage manager. It's no wonder that seasoned wedge wranglers sometimes take on the personalities of *Snow White*'s seven dwarves. Here are some tips on floor monitor basics that can help you achieve inner peace and make sure that the band has a good night onstage. Though this article is intended to help the less-experienced engineer who is faced with an unfamiliar system, veterans may also find a few thought-provoking suggestions.

EQUALIZING WEDGES

After balancing the crossover, there are at least three ways to adjust floor monitors' frequency response. First is the time-honored method of repeating "check, one, two" into a vocal mic and adjusting the sliders on an outboard graphic EQ to maximize gain-before-feedback, while at the same time ensuring that the voice sounds natural; two goals that may sometimes conflict.

A second technique recognizes that, while graphic EQ filters offer a great amount of control, filters spaced at ⅓- or ½-octave intervals often don't line up with the exact frequencies that need correction. Parametric equalizers, which feature center-frequency sweep controls, allow you to place filters where they're needed. However, it can be frustrating to adjust a parametric equalizer by ear if you're not used to it, and neophytes often over-equalize, causing even more problems.

With a computer-based FFT measurement, such as Smaart Live, you can easily trace a speaker's response on-screen, which makes precise filter adjustment fast and easy. The computer's display typically shows that even the best speakers have a couple of response peaks that need to be smoothed out a bit; less linear speakers may have big bumps that need a lot of help.

Of course, while most monitor rigs will include graphic EQs on the outputs, not all are equipped with parametric EQs. However, some purpose-built monitor desks, like the Yamaha PM4000M, have built-in 4-band parametrics on each output, and most digital consoles allow you to assign parametrics to the outputs.

Another point in the signal chain where you can tailor EQ is in the "speaker processor." Many digital speaker processors, which are often used primarily as crossovers, also include filters for frequency correction. Most speaker manufacturers provide preferred settings for their own or third-party processors, and it's common for sound companies to store the crossover parameters in memory for their various speaker setups. Ideally, the system engineer

—CONTINUED ON PAGE 116

Tips to Cope with Speeches, DJs, Screenings and Cabarets

by Buck Moore

Most club sound engineers set up and operate sound equipment for bands, often several on any given night. But many clubs also host a range of events that require a different approach to sound system management and, equally important, client relations. Today's club sound engineer may be asked to handle speeches, DJ performance events, film and video screenings, slide show presentations and multi-act benefit shows that can feature a wide range of musical and non-musical acts. This article contains some helpful hints and procedures that should help the club sound engineer prepare for the unfamiliar and avoid audio pitfalls.

SPEECH, SPEECH

Setting up to project one or more voices through an existing and familiar sound system seems like child's play. However, speeches can present unusual problems for an

—CONTINUED ON PAGE 118

Fig. 1a

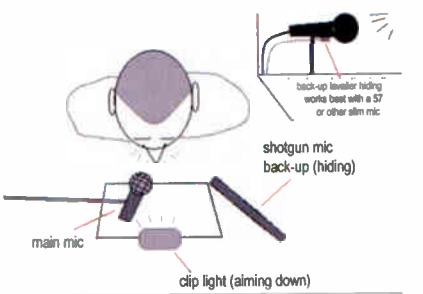
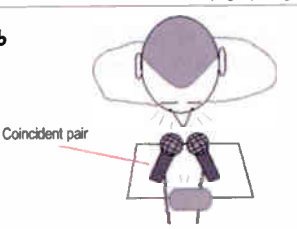


Fig. 1b



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—FROM PAGE 115, FLOOR MONITORS

can quickly recall the appropriate setting for a particular speaker, which provides a good starting point that may require little or no final EQ.

ONE EQ DOES IT ALL?

No matter the amount of EQ that is used on the monitor mix bus output when each new channel is added into a mix, it may become necessary to further tweak the channel EQ. We have already seen that there can be several different equalizers active in the monitor system, so one EQ stage may be fighting another. Is this bad? Not necessarily, but there's a simpler way to go if you're not fighting for every last dB of gain-before-feedback and you've got good wedges.

The third method of monitor EQ adjustment is neither widely recognized nor often used—at least by itself. It only works with dedicated monitor boards and a matched set of monitors, because the trick is to simply employ the input channels' equalizer sections. On rudimentary systems or systems where the outboard EQ is locked, this may be the only point where an engineer can equalize, often without the benefit of fully parametric 4-band EQ. Fixed-frequency, two-knob, sweep-only equalizers and shelving filters are not going to solve most problems. But a fully featured monitor console with parametric EQ on the inputs provides the engineer with a precise and comprehensive tool that can be adjusted while standing in the sweet spot, rather than while bending over with a flashlight clamped between the teeth.

As an experiment, the next time you equalize wedges, try just using the 4-band fully parametric channel EQ first. You may find that a few dB of parametric cut—notching the right frequencies in the low mids, high mids and highs—will get you where you want to be, leaving the lowest filter to adjust for proximity effect on a per-channel basis. You can always go back to the graphics if you get in a jam.

SLICE YOUR WEDGES

Despite the name, two-way floor monitors project sound in three different ways. The woofer and the HF driver both have their own characteristics, but in the crossover region, typically between 1 and 2 kHz, both the horn driver and the woofer are contributing. In coaxial designs, the transition can be remarkably smooth; otherwise, the two acoustic centers, each with its own axis, produce interference patterns that can't easily be corrected by time delay. Also, the crossover region is where the woofer beams and distorts, and the wedge's relatively small horn loses pattern control and HF coverage balloons out. There are different ways to deal with these problems. Some engineers add filters to one slope, others use asymmetrical crossovers and others don't even try for flat summing but allow a response gap instead.

High-frequency problems occur around the mass break point of the compression driver. This is in the region where they exhibit the most distortion and where the human ear is most sensitive, which is why 2.5 and 3.15 kHz may be the most exercised sliders on graphic EQs. Wedges with this characteristic nearly always sound better with a little less bite.

When a wedge sounds boxy, it is often blamed on the preponderance of room modes in a live performance space. These standing waves certainly contribute, but the boxy sound more often comes from the response peak (300 or 400 Hz) above the half-space transition, below which the woofer stops enjoying the extra gain of baffle loading.

READY, AIM...

I often see monitor engineers struggling to get their wedges to sound good by reaching for the EQ. A better approach is simply to adjust the speaker's aim. Because the horn's coverage narrows at its highest frequencies and the woofer also "beams" in the crossover region, the floor monitor should point right at the performer's ears if he or she is to hear the wedge at its fullest fidelity. If the speaker is not aimed correctly, the performer will be missing some of the mids and superhighs that are best heard directly on-axis. And misdirected highs will probably end up going somewhere else, like into the mic's back or side. Even worse, they may bounce off of the performer's chest or guitar and back into the front of the mic. One way to visualize the on-axis coverage of the floor monitors is to hold a Mini-Mag flashlight flat against the side of the wedge next to the horn. The light should beam on the point in space that will be occupied by the performer's ears.

Every floor monitor design is based around the designer's choice of vertical angle, which determines how that wedge addresses the performer. And one angle won't work for every performer: Some folks are tall, some are short and others perform sitting down. A simple way to improve a floor monitor's performance is to adjust the vertical angle with a short length of 2x4 lumber under the front or back. Spray-painted or covered with black gaffer's tape, "audio logs" can make the difference between your wedges sounding just okay and sounding great.

LESS IS MORE

Many performers (and some engineers) believe that two ears require two wedges. If one monitor is good, says the prevailing wisdom, then two will be better. However, when two equidistant sound sources point at a single microphone, comb filtering will cancel some high frequencies. If the mic moves, then the canceled frequencies shift. If the original signal source is the vocal mic itself, then getting its level up to near the point of feedback becomes dangerous, because there's a strong chance that the mic will move around. A better solution for vocalists is often a single wedge or, if it needs to get really loud, three wedges, with the center used only for that vocal mic and the outside ones for other vocals or instruments.

But, you say, my artist insists on two wedges on the same mix because it can get just a bit louder. It will certainly *look* louder to the performer. Here, the solution may lie in the difference between the polar patterns of cardioid and hypercardioid mics. A typical cardioid mic's best rejection is at 180° off-axis, while the hypercardioid usually has its best rejection at 135°, lending itself better to double wedges and loud stages. This doesn't necessarily mean that two monitors must be angled in at 90° to match the 135° rejection pattern of the hypercardioid. Angling them out a bit or spreading them apart can improve the way they sound and increase gain-before-feedback.

Finally, remember that adjustments made for one mix can only be copied onto other equalizers if the wedges are matched and sound exactly the same. This is rarely the case, and, even if all of the wedges sound identical, adjustments made for single-wedge mixes will always require additional EQ for double-wedge setups. ■

Mark Frink is Mix*'s sound reinforcement editor and a lifelong student of pointing speakers at musicians. Send any comments, suggestions or tips to wedges@markfrink.com.*

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and point a light at it from above; a clip-on light will suffice if there are no overhead spots. The reflected light will most likely flatter the speaker's appearance and make his or her face visible from a distance. Subtlety is the key, so avoid blinding the talker with bright side-wash lights or bottom lights. Because you have a blank sheet of paper already in place, why not write a note reminding the speaker to speak up and to stay close to the mic?

Once you have determined your mic technique, your levels are ideal and the talker's face is lit properly, you can concentrate on staying alert when the speakers start their presentations. If any speaker's amplified voice is too loud or too soft, adjust it immediately—there is no point in aiming for subtle level changes if the voice is inaudible or deafening. Similarly, EQ changes should be immediate and drastic if necessary. If you can get the voice sounding right by the end of the speaker's first two sentences, then no one will remember that it wasn't perfect to begin with. Bear in mind that an audience will adjust its own self-noise according to the ambient noise level: Set the sound system too loud, and the audience will become noisy and inattentive. On the other hand, if audience members have to strain to hear, they will quickly lose interest.

SETTING UP THE DJ

One may assume that a DJ can be left to his or her own devices, but a prudent venue owner will bring in a sound person to ensure that sound levels are reasonable and that the music sounds good. Most DJs now play back from a variety of sources in addition to turntables and may not have the monitoring setup (or hearing acuity) to compensate for differences among them. Leaving a DJ solely in charge of a sound system can be risky.

If the DJ sets up near the console, the DJ mixer's outputs can be patched into channel line inputs. Those outputs are typically unbalanced RCA connectors, though higher-quality mixers include balanced ¼-inch and XLR outputs. Whichever the case, chances are that the DJ doesn't have the right interconnect cables, so connecting the DJ mixer to the club sound mixer or crossover/amplifier inputs becomes the sound engineer's responsibility. A regular stereo RCA-to-RCA cable and a couple of RCA female-to-¼-inch male adapters will usually work.

Wherever the DJ sets up, he or she will commonly request one or more monitors; wedges on the floor or set at ear level on packing cases should suffice. Setting gain on the sound system mixer's inputs should be straightforward; make sure to leave enough headroom in the system so that sudden peaks from the DJ mixer's outputs won't overload the club mixer's inputs. If possible, have the DJ play a few representative tracks to determine overall levels and EQ. DJs typically drive the sub-bass and the tweeters much harder than a club band mixer, so you may have to adjust the system's overall EQ to match their expectations. Needless to say, if you have system limiters in the crossovers or across the main stereo bus, make sure that they're engaged and set at an appropriate threshold for system protection.

FILM AND VIDEO SCREENINGS

When setting up for a film or video screening, there are five things to keep in mind: equipment location, cable runs, output configurations, connections and output levels. For video playback, the projector should be relatively close to the screen,

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The S-Type is a compact, entry-level live mixer with Cadac's (www.cadac-sound.com) high standards for performance and reliability. The board is offered in 17, 25 and 33-slot frame sizes and can be easily expanded via optional bus connectors. Users can mix and match input/output modules to custom-configure the console; for example, a standard 25-slot frame can be configured with 16 mono inputs, eight mono or stereo group outs (which include aux outputs, matrix outs and DC master faders) and an oscillator/comm module. Input channels feature 4-band parametric EQ (pre/post-insert-switchable) and 100mm P&G faders. The eight aux sends (two are stereo) are pre/post-fade-switchable, and a stereo line input channel is available. A typically configured 25-slot console is priced around $25,000.

JBL PRO AE SERIES

JBL Professional's (www.jblpro.com) extensive Application Engineered (AE) Series of installation range loudspeakers are offered in several formats and power ranges. The AC2215 models are compact 15-inch, two-way loudspeakers available in three coverage patterns (90°x50°, 60°x40° and 100°x100°); all are bi-amp/passive-switchable. The three AC2212 models are compact 12-inch, two-way loudspeakers, also bi-amp/passive-switchable, with the same coverage patterns. These models incorporate JBL's new PT Series Progressive-Transition Waveguides for low distortion and uniform off-axis frequency response. U-brackets are standard, Speakon and CE-approved barrier strips are available, and all AE models feature JBL's exclusive DuraFlex finish.

MEDIAMATRIX OCTOPOWER 850

MediaMatrix, a division of Peavey Electronics (www.peavey.com), has introduced the Octopower 850, a cost-effective, multichannel commercial power amp for fixed installs. The versatile Octopower 850 features nine bridgeable channels, each with 50 watts of full-bandwidth power into a 4-ohm load. Any combination of two channels can be bridged, with the maximum bridged configuration providing one 50W amp at 4 ohms and four 100W amps at 8 ohms. High-current Form C Fault-Monitoring Contacts provide basic levels of amplifier redundancy and signaling for system-wide supervision and speaker-level switching. The front panel of this two-rackspace, fan-cooled package has fault status and audio level indicators for all nine channels; the rear panel includes removable I/O connections, recessed audio level controls and an IEC AC cable socket.

WESTONE IEMS

Westone Laboratories (www.westone.com) debuts two new Elite Series custom-fit in-ear monitors (IEMs): the ES1 ($375) and the dual-driver ES2 ($650). Westone can also provide customized Elite Series IEMs in users' chosen colors, finishes and shapes. All custom-fit monitors require impressions of the user's ears taken by a hearing healthcare professional. Visit Westone's Website for a nationwide directory, as well as crucial information on in-ear issues and how to get started with in-ear monitoring.

RADIAL JDV MK3 DI BOX

The Radial JDV Mk3 direct box from Radial Engineering (www.radialeng.com) combines multiple inputs/outputs with high-voltage, feed-forward, Class-A circuit topology and comprehensive user controls. A two-stage impedance-matching system provides the correct interface to piezo pickups; a Drag Control™ impedance-resistance network lets users set the proper loading between instrument and amp. The JDV's input panel has high/lowpass filters and two selectable inputs to connect two instruments at once. Four TRS outputs include a direct out, a tuner output and two Class-A instrument outs to drive alternate amps, effect boxes or stereo rigs. Also standard are a Class-A balanced XLR output to the console, polarity reverse and ground lift switches, -15/-30dB pads and a heavy 14-gauge steel chassis.

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- The high current 1000 watt DCM1000 power amp drives the 1584's with ease -without experiencing thermal shut-down no matter how hard they're driven. DCM1000 only $369.99.
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7422-1001 monitor system for the above system; $899.99

- DCM1001 1000W dual channel monitor power amp with 9 band EQ. High current design allows you to drive up to eight 8Ω monitors. DCM1001 only $469.99.
- Two 742 12" 300W monitor speakers offer big sound with lots of bass. Crystal clear sound can be heard under the most difficult monitoring situations. 15' cables for mixer to amp and 50' monitor speaker cables included. 742 only $199.99.

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optional PSS20 stands

optional MS13 stands

742 Monitors

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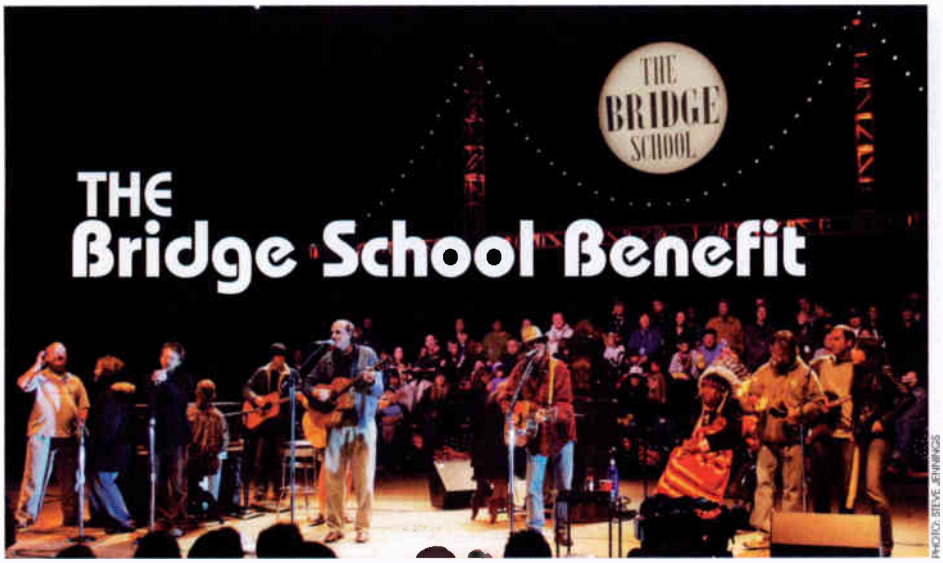

PHOTO: STEVE JENNINGS

The 16th Annual Bridge School Benefit, held over the weekend of October 26-27, 2002, at the Shoreline Amphitheater in Mountain View, Calif., featured a typically eclectic lineup: Neil Young, James Taylor, the Other Ones, the Foo Fighters, LeAnn Rimes, Thom Yorke of Radiohead, Jack Johnson, Ryan Adams, Tenacious D and Vanessa Carlton. Sound equipment for the two-day event, usually an all-acoustic show, was supplied by Sound on Stage, which has also been providing sound services for show producer Neil Young at various local venues.

The main P.A. consisted of two 13-cabinet V-DOSC line arrays for main L/R, each supplemented by an additional eight-cabinet dv-DOSC array, plus eight L-Acoustic SB 218s subwoofers and eight Proprietary Power Physics 222s, which are loaded with dual-concentric JBL drivers. Rather than use the traditional one-size-fits-all festival miking plan, Sound on Stage ran 245 mic lines and supplied a total of nine mixing consoles. Tim Mulligan mixed FOH for Neil Young on a Midas Heritage 3000, and Sound on Stage general manager George Edwards mixed for Taylor and Rimes on a Midas XL4.

—Steve Jennings

TOURING NOTES

Incubus picked an Electro-Voice X-Line line array system for their recent *Morning View* world tour. FOH engineer Greg Nelson had mixed on the X-Line system when Sugar Ray opened for the Rolling Stones, and he and production manager Eddie Kercher selected db Sound of Mount Prospect, Ill., for the Incubus tour. "The X-line is warm, in-your-face," notes Nelson. "The sound is loud, big and meaty but pleasant, not harsh." Other major acts on the db Sound roster include AC/DC, Metallica, Mark Knopfler, Pete Yorn and the Allman Brothers Band...**FOH engineer Cubby Colby chose Presonus CL44 4-channel comp/limiters** and GTX44 4-channel expander/gates for his FOH rack while out on Shakira's Mongoose world tour. Equipment supplied by Clair Bros. also included a Showconsole at FOH; a Midas H-300X monitor board; Crest, Carver and QSC amps; and Shure and A-T mics.

INSTALLATION NEWS

A total of 27 BSS FDS-366 Omnidrive Compact Plus units were installed at Ford Field, the new 65,000-seat stadium for the NFL's Detroit Lions. Distributed among eight equipment rooms, the Omnidrives provide time alignment, EQ and processing for the JBL Precision Directivity Series central cluster and assorted delay speakers. The system was installed by local contractor Sound Media based on a specification provided by WJHW of Dallas...**TOA Electronics Inc. has published an information-packed speaker guide** written for sound contractors and systems integrators. The comprehensive reference guide discusses the pros and cons that are involved in designing distributed speaker systems and includes easy-to-use layout patterns and spacing charts. To get your copy, visit www.toaelectronics.com/speakers.asp or call 800/733-7088. ■

AVRIL LAVIGNE PICKS EVOLUTION 565 WIRELESS

Touring to support her Platinum-selling debut album *Let Go*, 17-year-old Canadian skater-punk/pop artist Avril Lavigne is singing through a Sennheiser Evolution Wireless 565 microphone. "The 565 sounds really good with Avril," says production manager and FOH engineer Mark LeCorre. "It has a nice, sweet top end and is quite a fat-sounding microphone, which works for a woman's voice as it beefs it up a little bit." LeCorre reports that the entire band is using Sennheiser and Neumann wired and wireless microphones.

MEYER M1D ARRAY HITS BROADWAY

Sound designer Christopher Cronin selected a Meyer Sound M1D Ultra-Compact Curvilinear Array system for comedian Jackie Mason's one-man Broadway show, *Prune Danish*. Cronin specified an array of 10 M1Ds for the center cluster in the 1,068-seat Royale Theater, and also added single Meyer UPA-1P loudspeakers at each side of the proscenium. Six Meyer MM-4s mounted on the stage lip provide additional frontfill. John Petrafesa, manager of special projects for Pro Mix/Electrotec, coordinated the system installation and performed final alignment using a SIM® System II FFT Analyzer.

GEO SYSTEM FOR UK NATIONAL TV AWARDS

A Nexo GEO Tangent Array system was the primary sound system for the UK National Television Awards, which is held every year in London's Royal Albert Hall. Supplied by SSE Hire to audio contractor R.G.Jones, the GEO system was flown in two arrays, each comprising 16 S805s and one S830 cabinet, with four CD12 subs on each side. "I loved the cardioid nature of the system," says FOH engineer Simon Hodge. "The P.A. hang was behind the lecterns and stage mics, but I could still get plenty of gain. The directivity of the system worked really well, giving smooth, even coverage with plenty of level to all of the tiers of the hall."

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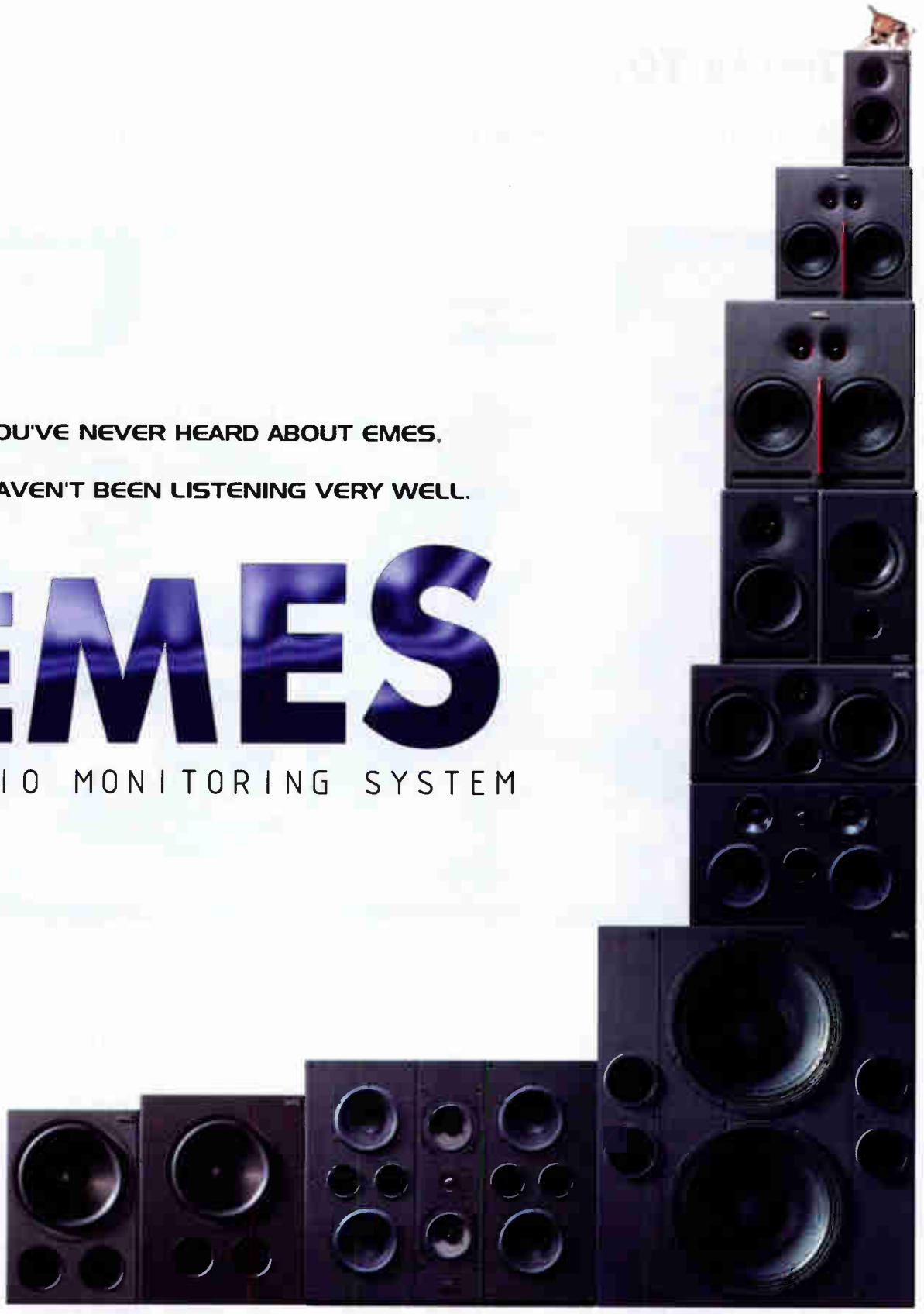

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BY OLIVER MASCIAROTTE

Toe to TOE

What Networked Storage Developments Can Do For You

ILLUSTRATION: ARTVILLE

This month, I'm going to revisit a technology that I think will eventually replace Fibre Channel-based networks and save us all money in the deal! Now, disk storage is something most of us need in this digital world, and networked storage is the way to go if you have more than one computer in your place. Imagine working on a project that you have to move files from one workstation to another. Rather than waiting for a file copy from one machine's drive to another to finish or physically sneakernetting the drive, you can hang the drives *themselves* on your network. So, rather than working off direct-attached drives, you can make your hefty investment in disks available on the network to your whole place, all without a huge cash outlay. Less time twiddling your thumbs, more time getting stuff done.

Cast your mind back to September 2001, when I last talked about iSCSI, the scheme that allows SCSI commands to travel via IP protocols. Sixteen months have passed, and vendors are beginning to provide board-level products that fill some of the gaps in the needed equipment roster. One specific item that most every installation requires is an HBA, or host bus adapter. HBAs are hardware devices—usually PCI boards—that provide an interface between the local host bus and some communication standard. A good example would be a $30 network interface card (NIC) that you plug into your CPU to add Ethernet ports. The reason Ethernet HBAs are so cheap these days is because they provide the minimum amount of hardware to get the job done. What it doesn't say on the box is that there's absolutely no smarts to increase efficiency. Indeed, a server burdened with a heavy amount of IP traffic will find most of its CPU cycles taken up when processing those network packets—one of the fundamental problems of IP storage.

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Baby HUI

Mackie Control LEXAN Overlays

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Software and operating system

Compatibility Matrix

	Mackie Control	HUI	Baby HUI	UAD-1*
MOTU Digital Performer	MAC	MAC	MAC	MAC
Steinberg Nuendo	PC / MAC	PC / MAC	PC / MAC	PC / MAC
Steinberg Cubase SX/SL	PC / MAC	-	-	PC / MAC
Mackie Soundscape 32	PC	PC	PC	-
Mackie Mixtreme	PC	PC	PC	-
Digidesign Pro Tools	-	PC / MAC	PC / MAC	-
Digidesign Digi 001	-	PC / MAC	PC / MAC	-
Cakewalk SONAR	PC	-	-	-
Emagic Logic Audio	-	-	-	PC / MAC
Magix Samplitude	PC	-	-	-
Syntrillium Cool Edit Pro	PC (Jan '03)**	-	-	-

Check www.mackie.com for latest compatibility information

* UAD-1 is compatible with any VST-supported software.

** Planned schedule

TOOLS FOR ARTISTS

tools for artists

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You see, if one of your computers is busy digesting a flurry of network traffic, it can hardly be called upon to pay sufficient attention to your host-based application that is trying to record an overdub in the foreground. Remember, I said you could configure your disks on different machines to appear on the network for everyone to use. Easy to do in either Win or Mac, but when you try to record to that network "volume" or disk, you may find the data throughput really sucks, with dropouts, or worse, as a result. This is especially true if you're doing higher-sample rate or multichannel work. Here's the thing: Most Ethernet hardware isn't up to the task of doing more than out-of-real-time transfers, like file copying and Web surfing, and that's where TOEs come in.

TOEs, or TCP offload engines, are chip-level hardware solutions that address the problem of interpreting the TCP/IP stack in software. Whoa, a *what* stack? TCP/IP, the transport-control protocol/Internet protocol, is the language that computers use to communicate over the Internet. TCP, also used by Ethernet, is responsible for setting up and maintaining the end points for a network-data transaction, while IP routes and delivers the data once it's arrived. The IEEE brewed up the complete scheme and decided that, rather than using a monolithic, all-inclusive approach to the complex task of communicating over a network, portions of the job would be given out to separate processes in a modular fashion. These processes are conceptualized as "layers" in a hierarchical "stack" that cooperatively get the job done.

Unfortunately, that job usually requires a good bit of heavy lifting on the CPU's part. At the very least, data-packet headers have to be read to glean the destination address. So, enterprising companies have baked the brains of a TCP software processor (that stack I mentioned earlier) into silicon, where it can sweat the gory details at "wire speed" (see sidebar), while the host's CPU runs wild and free, so to speak.

Earlier, I mentioned cost savings, of which I've identified several areas. First, skilled TDs (technical dweebs) are in short supply, but there are many more TDs who are fluent in TCP/IP than are knowledgeable about Fibre Channel, the de facto choice for networked storage. In addition, IP infrastructure, both hardware and services like metropolitan network connectivity, is inexpensive compared to FC, and IP networks are scalable without network interruption. All of these factors combined translate into lower overall support costs.

Fibre Channel will never be cheap, but if you've got the need and the bucks to feed that need, then FC slakes the thirst for high-performance networked storage. On the other hand, Ethernet and IP are scalable, universal technologies. Ethernet is a commodity technology these days, even at Gigabit speeds. So, building a storage network with switched 1000Base-T and iSCSI is way cheaper than with Fibre Channel. (By the way, the no-nonsense performance of Gigabit Ethernet provides darn good throughput when viewed against the highly tailored architecture of Fibre Channel.) This doesn't mean, however, that never the twain shall meet. In an early proof-of-performance demo, a server with an Alacritech Gigabit Ethernet HBA was connected to a Nishan IP storage switch via a single Gigabit Ethernet link. The Nishan switch was connected, in turn, to a Hitachi Freedom storage system, an enterprise-class FC product. The Alacritech accelerator maximized the sustained rate of iSCSI data at over 219 megabytes per second with less than 8% CPU utilization, while the Nishan switch provided wire-speed conversion from iSCSI to the Fibre Channel storage.

An important caveat: To many applications, different storage types are not equivalent. This has a great deal to do with the way that developers implement their applications. If an application makes "low-level calls," whereby the software communicates directly with hardware (an internal ATA drive, for instance), then NAS and SAN become second-class citizens as far as that application is concerned. This programming method was sometimes required in the Stone Age when computers were slow. On the other hand, if an application communicates via appropriate abstractions provided by the operating system, then any storage supported by the OS should be equivalent. A modern, well-behaved DAW shouldn't care what flavor of storage it's using: DAS, NAS or SAN. This is especially true for host-based DAWs, because many hardware-based products haven't quite caught up with state-of-the-art storage or networking technology. The upshot is, the more modern an application, the more likely it will seamlessly work with iSCSI storage.

PEDANT IN A BOX

Wire speed: This month's jargon, "wire speed," means that a process or algorithm runs *très rapidemente*, very fast. This is implied to also mean that it is, in fact, running in a hardware implementation, with the process designed into a chip-level device rather than some general-purpose CPU, DSP or FPLA doing the job in software.

A central processing unit (CPU) is the brains inside most computer-based devices. CPUs come in two basic varieties: CISC, or complex instruction-set computers, are old-school, general-purpose devices that are broadly capable in a brute force way, sort of like a Chevy Camaro. The other approach to CPU design, RISC, or reduced instruction-set computers, are only capable of a streamlined number of tasks, but they perform those select tasks with great alacrity. This is akin to BMW's Mini against that Camaro. Intel and AMD make CISC CPUs typically clocked close to 2 GHz, while Motorola, Sun and IBM make more efficient RISC CPUs clocked at around 1 GHz.

Digital signal processors take RISC one step further and limit their computational skills to only those used to transform a digitized signal, whether audio, video, RADAR, whatever. National Semiconductor's SHARC, Texas Instrument's TMS320 and Motorola's 56k families are all DSPs.

Field-programmable logic arrays and their brother FPGAs are chips that are so general purpose that they have no personality at all. FPLAs are also chip-level hardware collections of logic functions that can be electronically wired together in almost any combination, all in an instant. FPLAs are used to provide hardware versatility when a designer doesn't want to commit to a specific chip or some esoteric function cannot be realized with an off-the-shelf part. Xilinx and Altera are two FPLA vendors whose products show up all the time in digital audio gear.

—*OMas*

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A quick digression: DAS, or direct-attached storage, is the garden variety we all know and love, hardwired to a computer. The DAS label applies regardless of the attach method, whether it's IDE/ATA, SCSI or FireWire. NAS, or network-attached storage, is storage hanging on a LAN, almost always using Ethernet and TCP, and can only provide file-level access. SANs (storage-area networks) almost always use Fibre Channel protocols and provide block-level access, letting a read or write request go into individual logical "blocks" on a disk that comprises part of a file. For more gory details, check "Bitstream" from May 2000 at www.seneschal.net/papers/bitstream, when I first got into the subjects of SAN and NAS.

Late last year, SNIA, the Storage Networking Industry Association, submitted the iSCSI spec to the IETF, the Internet Engineering Task Force, which should freeze dry it into a RCF, its version of a standard. Once the standard comes down, the vendors that are shipping product may have to adjust their firmware to accommodate any changes.

The first company to wade into iSCSI waters, Alacritech, has been shipping a variety of TOE-equipped, 100- and 1000Base-T HBAs and is still the leader. Alacritech was started in 1997 by industry visionary and groovy guy Larry Boucher, who serves as president and CEO. In a prior life, he was founder and CEO of Adaptec. Before that, he was director of design services at Shugart Associates, where he conceived the idea of the SCSI interface and authored its initial spec.

Strangely enough, Adaptec has also been prepping product, and Intel has the PRO/ 1000 T, a transitional HBA that substitutes software running on a general-purpose processor for a hardwired TOE. While the PRO/1000 allows skeptics to experiment on the cheap, it doesn't have the wherewithal to do the job in a production environment.

So, will iSCSI be the savior of dweebkind? As if, but it *will* lead to a blurring of network and storage functions, all the while contributing to that seemingly inevitable decline in computing costs we've all come to expect. ■

This column was written while under the influence of Charlie Mingus' exuberant "Moanin,'" which was recorded by the late, great Tom Dowd. His exceptional talent and amicable demeanor will be sorely missed.

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- **PETER HAMILTON**, Producer, engineer.

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Tools of the Trade

HARRISON ST2 POST CONSOLE

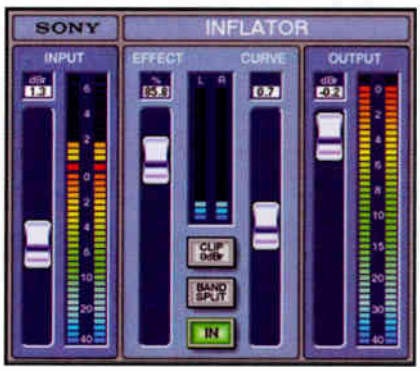
Harrison's (www.harrisonconsoles.com) ST2 digital film/post console is offered in various control surface options, with touch-sensitive knobs, motorized automated joystick panners, high-res digital meters, multi-operator capabilities and multiple input/output format options. Based on Harrison's digital.engine, the ST2 offers 40-bit DSP and a 2,240x2,240 digital-routing switcher. The system has up to 768 channels per digital core, with full processing on all buses on every channel. Also featured is Dynamic Profiling (any strip can control any channel) and a range of plug-ins, including De-esser, Camera Noise Cleaner and Bus Limiter. The IKIS automation platform offers 10 EQ shapes, ±30 dB of gain and expanded dynamics control. The 8-band EQ includes notch, high/lowpass and Find functions. AD/DA converters are 24-bit (48/96 kHz), and SRC can be bypassed on AES I/Os of groups of eight.

ABLETON LIVE 2.0

Ableton's Live 2.0 audio sequencer (dist. by M-Audio, www.m-audio.com) can apply time stretching of tempo and pitch to any kind of audio material. Incorporation of unlooped, unstretched audio allows linear tape-style recording with loop-based manipulation and playback. Live 2.0 allows the user to record unlimited audio takes with unlimited tracks; processing additions include effects presets, new gate and redux effect, and new filter modes for the auto filter. Other enhancements include Rewire support, improved automation, traditional solo and pre-fader listening, input gain settings, improved file management and multiport MIDI reception. Performance-related updates include refined MIDI and computer key mapping, assignable scene advance and track-launch buttons, and free assignment of all transport/tempo controls. MSRP: $399.

EVENT BI-AMPED MONITORS

The Tuned Reference 8 (TR8) and Tuned Reference 5 (TR5) Bi-Amplified Direct-Field Monitoring Systems from Event Electronics (www.eventelectronics.com) provide flat response and uncolored sound, combining a new high-efficiency amp with technology from Event's 20/20bas and Project Studio models. The TR8 has a shielded, 8-inch, mineral-filled woofer; a 1.5-inch diameter damped-rubber surround mid and a shielded, 1-inch natural silk-dome tweeter. The TR5 matches the same tweeter with a shielded 5.25-inch polypropylene woofer. Both feature a power-on LED, subsonic filter, output-current limiting and protection against RF interference, excessive temperature and turn-on/off transients. Inputs are RCAs and balanced XLR and ¼-inch TRS. The TR8s are $599/pair; the TR5s list at $399/pair.



SONY OXFORD INFLATOR PLUG-IN

Sony's (www.sonyproaudio.com) Oxford Inflator plug-in for Pro Tools|HD/TDM/Mix/RTAS systems provides an increase in the apparent loudness without obvious loss of quality or audible reduction of dynamic range, or damaging increases in peak signal level. The plug-in can be used to create effects ranging from subtle tube-like harmonic characteristics to saturation distortion-modeling; it offers "virtual headroom" above digital maximum to allow percussive peaks to pass without causing signal overload. Two modes of operation—direct and band split—allow maximum flexibility and artistic creativity, and ensure optimal DSP usage.

ORAM PRO-CHANNEL

Oram Pro Audio (www.oram.co.uk) is now shipping the Grand Master Series Al Schmitt Pro-channel, a rackmount channel strip that includes a mic pre, 6-band EQ and optical compressor. Designed by John Oram and Al Schmitt, the Pro-channel's precision-switched control of all parameters allows repeatable settings. The mic pre has transformer and transformerless paths, with gain to +70 dB in fine steps, selectable phantom power, phase reverse and VU

World Radio History

meter-level selection. The (switchable pre/post-EQ) compressor section's optical attenuator offers unobtrusive soft-knee dynamic control. Retail is $8,525; a stereo version is also available.

WAVES SURROUND FOR PRO TOOLS

The Waves (www.waves.com) 360° Toolkit is a suite of surround plug-ins for Pro Tools|HD and Mix systems. The set includes Surround Manager for setup and

bass management; a 6-channel Surround Reverb; Surround Imager (shown) for distance panning; Surround Limiter, a 6-channel implementation of the L2; Surround Compressor, which combines dynamic compression and channel grouping; Surround Mixdown to derive quad, LCR, stereo and mono mixes directly from the surround mix; and a Surround Panner.

AVIOM PERSONAL MONITOR MIXING SYSTEM

The Aviom (www.aviominc.com) A-16 Personal Mixing and Distribution System lets performers adjust their own stereo monitor mixes over the first LAN optimized for real-time multichannel digital audio transmission. Its 24-bit/96kHz A/D converters packetize 16 audio channels in the rackmount A-16T transmitter and

on to any number of 16-channel A-16 mixer units connected via readily available Cat 5 cable with up to 330 feet between components. The mixer's stereo output can drive in-ear monitors (IEMs), amp/wedge combos or studio headphones. The A-16T transmitter is $749.95; the A-16 personal mixers are $439.95/each.

GLYPH TRIP2

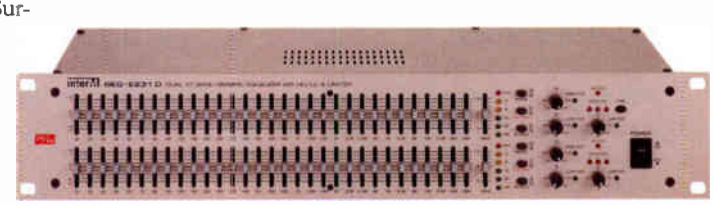
Glyph's (www.glyphtech.com) Trip2 FireWire storage system is built for high-res audio/video storage needs. The system is based on technologies introduced in the Companion, and features multiple Oxford 911 chips, QuietMetal construction to eliminate external noise and S.M.A.R.T. Manager diagnostic software with predictive failure analysis. Trip2 is available in two- to six-drive configurations; drives are hot-swappable, 7,200 rpm and available in capacities of 60, 120 and 180 GB. The system is SAN-ready.

SONIC FOUNDRY SURROUND FOR ACID

Sonic Foundry's 5.1 Surround Plug-In pack for ACID Pro 4.0 allows users to encode ACID mixes to 5.1 multichannel surround or stereo Dolby Digital AC-3 files and burn them to CD. The plug-in ships with two components: The AC-3 Encoder plug-in features optimized templates to create DVD-compliant AC-3 files (5.1 surround or stereo) with various customization options. Also included are input filtering, channel processing, RF overmodulation protection and dynamic range compression. The AC-3 DVD Burner lets users burn 5.1 or stereo AC-3 files to DVD (DVD-R, DVD+R, DVD-RW and DVD+RW). The 5.1 Pack is priced at MSRP $399, and will be available as a download only at www.sonicfoundry.com/surroundpack.

CEDAR CAMBRIDGE

CEDAR's (dist. by www.Independent Audio.com) Cambridge noise-reduction system is a suite of new CEDAR algorithms said to remove more noise and more types of noise than before without damaging the desired audio or introducing unwanted side effects and artifacts. The scalable, modular system handles 96kHz audio, with 64-bit floating-point processing at all times; operations are real time and automatable. Other features include a dedicated rackmount timecode reader/generator; many channel, metering and dithering options; and a wide range of I/O formats. Cambridge is designed to be used on a 2.0GHz or faster Dell Precision 530 Xeon; development for other PCs is underway.



INTER-M DIGITAL GRAPHIC EQS

Inter-M (www.inter-m.net) offers two new graphic EQs that combine familiar analog controls with the precision and quality of digital performance. Built in conjunction with Algorithmix, a German digital audio development company, both the dual-channel GEQ-2231D ($825) and the single-channel GEQ-1231D ($600) feature front panel analog-style faders to control 31 bands per

World Radio History

channel. The DSP-based units include premium AD/DA converters for 24-bit/64kHz resolution, and also feature peak limiting, low- and high-cut filters, an extended bandwidth of 10-30.5k Hz and a dynamic range greater than 100 dB. I/Os are balanced XLRs.

BEHRINGER DYNAMICS PROCESSORS

Behringer (www.behringer.com) upgrades three of its dynamics processors: The $109.99 Autocom Pro-XL1600, Composer Pro-XL2600 ($139.99) and $159.99 Multicom Pro-XL4600 offer improved audio performance and new features, including an dynamic enhancer that makes up for compression-induced HF energy loss. Also featured is an Interactive Knee Adaptation function, blending hard/soft-knee characteristics, an automatic ratio control and an interactive gain control, which provides the peak protection of a clipper and a program limiter. The Autocom Pro-XL and Composer Pro-XL also have a switchable voice-adaptive de-esser that differentiates between male and female voices. The Composer Pro-XL adds tube-simulation circuitry for added warmth. The Multicom Pro-XL has been upgraded with an enhancer and an expander/noise gate.

adds track arming on-the-fly, "gapless" punch-out, faster manual punch-ins, increased maximum parts (to 16,384), improved overload handling when working with multiple EQ elements in a single mixer column, auto track-output assignment, global Move/Copy function, video-file player support and a new M-S-decoder mixer element. New Console Manager V. 1.5 software offers Mackie Control/Mackie Control Extender/Baby HUI controller support, optical touch-sensitive faders and comprehensive editing control.

GENELEC ACTIVE SUB

The 7073A Active Subwoofer from Genelec (www.genelec.com) features four 12-inch, long-throw woofers, full onboard 6.1-capable bass-management system and 1 kW of internal amps offering 124dB SPLs down to 19 Hz. The bass management features six I/Os (LCR front and LCR rear), plus LFE input and summed signal-output connectors. Additional features include an 85Hz test generator to help crossover alignment, bass roll-off adjustable in 2dB steps and four-position phase-matching controls (from 0° to -270°). The 7073A's wide, low-profile, 56.75x22.6x22-inch (WxHxD) cabinet is ideal for placement under projection screens or studio windows. Price: $6,500.

JOEMEEK VC6QCS RECORDING CHANNEL

Distributed by PMI Audio (www.pmiaudio.com), the Joemeek VC6Qcs combines the Joemeek CurrentSense preamp, photo compressor and Meequalizer channel into a single studio tracking/mixdown channel. In the studio, the VC6Qcs is suitable for recording instruments or vocals. In live applications, the VC6Qcs can be inserted between an instrument or mic and the FOH/monitor console for precise dynamic processing and EQ.

MACKIE SOUNDSCAPE UPDATES

Mackie Designs (www.mackie.com) announces software upgrades for its Soundscape 32 DAW. Version 3.7 software

GEFEN DVI SWITCHER

A 2x2 DVI Switcher from Gefen (www.gefen.com) acts as the controlling interface between two cross-platform computers using two digital flat-panel displays. Users simply switch between the two computers, with each displaying its information on a dual-screen extended desktop. The DVI Switcher supports all digital displays, and supports Macs and PCs—used separately or in combination, provided each has a DVI or ADC display port. (Apple-brand flat-panel displays require a DVI-to-ADC converter.) Computer access is controlled via the Switcher unit or optional remote control. The Switcher is priced at $799, including DVI, USB and audio cabling.

DPA INSTRUMENT MIC KIT

DPA's (www.dpamicrophones.com) Instrument Microphone Kit (IMK4061) includes the popular DPA 4061 miniature mic and XLR adapter, together with a selection of unique mounting accessories for stringed instruments such as violin and cello, universal surface mounts with double-sided tape for guitars, wind instruments, drums and percussion, a magnet holder to attach the mic to drum rims or piano frames, and foam windscreens. The DPA 4061 handles 144dB peaks for close placement near snares, trumpets, speaker cabinets or other high-SPL sound sources. The DPA 4061 can also be used with any pro wireless system.

MICROTECH GEFELL CONDENSERS

Microtech Gefell (dist. by Cabletek Electronics, www.cabletek.ca) offers three new condensers: the M294 and M295 cardioids, and the M296 omnidirectional. All three 48-volt phantom-powered mics feature a nickel diaphragm less than 0.9-microns thick, and include 10dB pads and highpass filters. The M294 has a natural presence rise at 8 kHz, while the M295 has a flat upper end with a low-frequency roll. The omni M296 has a flat 20-20k Hz response. Also offered is the M930 XY Stereo Pack, a stereo kit that packages two matched M930 large-diaphragm cardioids, an innovative X/Y stand adapter and low-noise transformerless electronics.

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The New **RØDE NT1-A** is one of the world's quietest microphones.
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No other studio microphone in its class, or indeed costing many times more can claim this!

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1) Multi award winning, and the world's biggest selling studio microphone, the NT1 is now a legend. The New **NT1-A** continues this tradition while improving specifications and tonal qualities.

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3) **Built to last** with a new computer controlled machining process. The body is then satin nickel-plated. The NT1-A is designed to last you a lifetime.

4) **No PAD or Filters.** Some microphone manufacturers include these in their budget products, but at what cost?

The NT1-A can be used with very high sound pressure levels without perceptible distortion. Most people never use a high pass filter on their microphones. Why pay for features you don't want or need at the cost of what is really important, true performance!

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MERCURY 66 LIMITING AMPLIFIER
Now shipping, the Mercury 66 Limiting Amplifier from Mercury Recording Equipment (www.mercury-rec.com) recreates the sound of the classic Fairchild 660 comp/limiter using similar circuitry, tubes and custom-transformer I/O. The mono (stereo-linkable) unit features a fast 50µs attack time; release time varies from 0.3 to 25 seconds, and the 1:1-to-20:1 ratio controls allow use as a compressor or limiter. Construction features no ICs or PC boards, with hand-wired, point-to-point connections. Retail is $6,995.

SPEAKEASY ORGAN PREAMPS
Speakeasy Vintage Music (www.speakeasyvintagemusic.com) has a line of studio-grade tube preamps designed to interface today's virtual and hardware-based B3 organ clones with consoles, P.A. rigs or amp/cabinets—rotary or otherwise. Offered in stereo/mono rackmount or pedal versions, the hand-built preamps feature vintage-design tube circuitry and a Class-A output. All are available with appropriate Leslie connectors and/or ¼-inch outputs.

SHURE TURNTABLIST PHONO CART
Shure's (www.shure.com) M44-7-H Turntablist Cartridge is now offered premounted on a Technics headshell, thereby eliminating setup time. Shure's premium scratch needle, the M44-7, offers high output, skip resistance and minimal record wear.

UPGRADES AND UPDATES

The new PQ1 Power-Quality Relay signals power line disturbances that could damage or disrupt signal processors, digital consoles and other sensitive electronics. The UL-listed, CE-marked, TUV-certified relay is priced at $276. Download more information at www.PQRelay.com...**The Buzz Feiten Tuning System** retrofits to any electric guitar or bass, offering vastly improved intonation (with every note and chord in tune across the entire fretboard) without changing a guitar's look or feel. Visit www.buzzfeiten.com...**Argosy's new *Online Studio Furnishings Guide*** offers pictures, pricing and detailed dimensions of the complete line of Argosy studio furnishings. Call 800/315-0878 or 573/348-3333, or visit www.ArgosyConsole.com...**Cakewalk's** (www.cakewalk.com) 2.1 update for the Sonar digital multitrack recording system is a free download to registered users, and includes OMFI, Broadcast Wave, Windows Media 9 and Mackie Control support...**SFX Search, Gefen's sound effects search software, has migrated to www.sfxsearch.com.** Sporting a new Web interface and additional libraries, sfxsearch.com offers an extensive selection of sound effects, production music and element libraries, easily searched by category or library name...**Carillon Audio Systems USA** (www.carillonusa.com) added the new **dual-Intel Xeon Digidesign Pro Tools|HD system for Windows XP** to its line of PC-based multitrack recording systems developed specifically for audio/music recording...**M-Audio's Record Now Series of free guidebooks** help musicians make informed choices about music technology. The first title, *Choosing and Using Microphones*, is available free from M-Audio dealers and may be downloaded in PDF format from www.mic-guide.com...**Digigram** (www.digigram.com) **released Mac OS X drivers** for its VXpocket Version 2, VXpocket 440 and VX222 sound cards. The drivers are fully compliant with both Mac OS X V. 10.1 and V. 10.2 (Jaguar)...**Waves is now bundling its Renaissance Collection with the Digidesign 002 LE system.** Visit www.waves.com for more....**Wizoo's massive *Claudius Bruese Orchestra* sampling project** is available as separate orchestral string sections or bundles for HALion, EXS-24 and GigaSampler. The multitrack drum grooves of Steinberg's best-selling *VST Drum Sessions* are available online in Cubase VST and SX formats. Demos and downloads are at www.wizoosounds.com...**WebsterAudio's SampleMove lets users transfer patches/samples** from any MIDI-equipped keyboard, module or sampler to a hardware or software sampler; any user with a hardware or software sampler that is capable of reading/loading .WAV/.AIFF files can easily transfer sounds to a laptop or hardware sampler. Visit www.samplemove.com...**Mackie and Universal Audio released** Version 2.3 Mac software for the **UAD-1 Powered Plug-Ins,** with dual-processor mode support for MAS and VST. The software is a free update from www.mackie.com or www.uaudio.com...**HHB** offers new **DVD+R media**; visit www.hhbusa.com for details...**Amphenol T-Series ¼-inch plugs feature** eye-catching, ergonomically designed shells, with Jaws™ cable clamping for no-pullout operation. Available in stereo or mono, in nickel or black finishes, with optional silver or gold contacts. Visit www.amphenol.com.au...**Native Instruments** announces **Reaktor Electronic Instruments Vol. 1,** a set of seven new instruments for REAKTOR 3, including three synths, three effects and a drum machine. List is $69; www.nativeinstruments.com...**AKG's free *Mic Check* CD** has recordings of various instruments using different AKG mics so users can compare the products on any monitoring system. Bonus CD-ROM files have product info and commentary by the project's producer/engineers. Get yours at www.akgusa.com. ■

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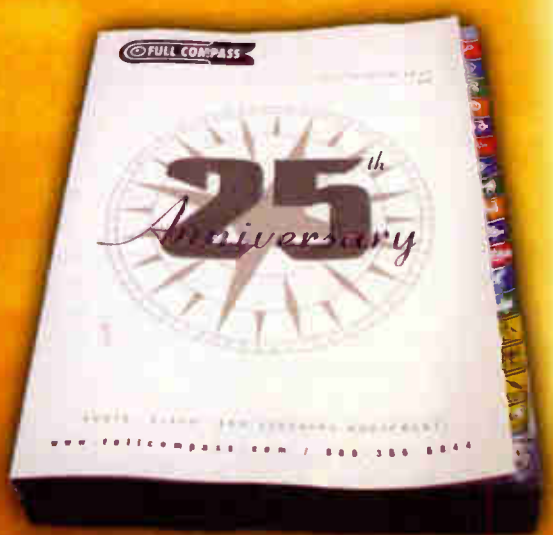

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BY BARRY RUDOLPH

Akai Professional DPS24

24-Track Digital Personal Studio

Akai Professional's DPS24 builds on the company's DPS12 and DPS16 workstations with a lot of genetic material borrowed from its high-end post-production DAWs. The DPS24 is a stand-alone 24-track/24-bit recording/editing system with an intuitive interface specifically designed to produce and master music projects. Fully 96kHz native, the DPS covers all production steps from live multitrack recording to overdubs, editing, mixdown, mastering and final CD burning.

Amenities include professional analog and digital I/O; a fully automated, layer-switched, 46-channel digital mixer; a hard disk recorder/editor using uncompressed 16/24-bit linear resolution with up to 96kHz sampling (the number of tracks is halved at 96 kHz); and an adjustable, tilt-up 320x240 grayscale LCD screen to monitor/control all functions. The current Version 1.3 operating system accommodates an external PC to display a large color main screen with full metering, track/waveform view and more.

Software revisions slated for future release include enhanced PC/Mac connectivity. Also announced is .WAV file import and export to support file sharing with other systems. At press time, Akai had released Version 1.40 software, which adds dedicated SRC and dithered bit reduction and enhanced ak.sys support with on-screen editing. A V. 2.0 upgrade for 2003 will support 5.1 surround mixing using the main, near-field and stereo outputs.

THE PACKAGE

The steel-cased DPS24 is solidly built and sized perfectly for desktops, with a compact 28x22-inch footprint. The machine runs slightly warm to the touch (no fan required) and, with internal 60GB hard drive, the DPS24 is quiet enough for acoustical recording right alongside it.

Rear panels are good places to assess the potential of pro audio gear. The DPS24 has 24 analog inputs available to the 12-fader mixer, each with an A/B switch to select between XLR combo jacks and line-only TRS jacks. All inputs/outputs are balanced; channel 12 also includes a ¼-inch unbalanced 1-Meg-ohm input for direct guitar recording. The first four inputs have 48-volt phantom powering and balanced send/returns to patch external EQs or compressors. I used my own mic pre/EQ/compressor chain (going directly to the A/D converter inputs) with good results, although I also liked the onboard mic preamps, which offer up to 70 dB of gain.

Besides the balanced stereo bus outs, there are +4/-10dB 2-track tape returns, an assignable aux input TRS pair to play stereo sources directly into the mix and four assignable external aux send outs. The DPS has a digital patchbay, so any standard default configurations can be changed and stored with each session or project. Comprehensive monitoring has outputs for main or near-field studio monitors. Plugging in my JBL LSR-28Ps powered monitors, I was set to go. Self-recording musicians will like the ADAT/LRC-compatible, configurable footswitch jack that offers hands-free transport operation.

The DPS can record 20 tracks by using the 24-track Transfer mode and connecting an outboard 8-channel A/D converter to the ADAT Lightpipe in/out ports. MIDI In/Out/Thru, a single wordclock BNC connector (software-configurable as input or output) and S/PDIF (co-ax and optical) ports are also provided, as are a PS2 ASCII keyboard jack for faster data entry and USB port for computer interfacing and/or transferring project files.

Four expansion slots handle various interface options: Combine the IB-24ADT 16-channel ADAT I/O card with the onboard ADAT port for a total of 24 ADAT channels. Other cards include the IB-24LTC SMPTE reader/generator and the IB-24SCSI Ultra-Wide SCSI interface.

THE 46-CHANNEL MIXER

The DPS24's 12 faders and stereo master fader—all 100mm, touch-sensitive motorized units—are recessed so that their chromed finger rests lie slightly above the console's surface. The faders' feel and spacing were easy to move with my average-sized hands. There are four main layers: 12 mic/line input faders, HD tracks 1 through 12, tracks 13 through 24, and a fourth layer that is divided between eight group masters and four stereo effects returns. A fifth user layer provides access to effects sends to external devices, aux bus levels, stereo aux return to the L/R bus and three faders for MIDI control, but can be reassigned by the user.

The top panel has mic/line switches and trim controls with signal presence and clip LEDs. All are analog, so these settings aren't saved with your project. Below these are 24 record/edit keys to select tracks for recording and editing. A quick scan of these buttons prevents you from recording over or editing the wrong tracks.

In all, there are 20 buses: eight groups (recording buses), four FX sends, four external FX sends, the main stereo bus and stereo solo-in-place monitoring bus. The Assign button routes fader inputs to buses that are hard-wired to hard disk recording track inputs. At first, I was a little confused about setting up fader-to-bus assignments, but then I discovered the helpful Mixer page, which traces and displays all signal levels from input to output.

CHANNEL TWEAKING

In order to engage EQ/dynamics or automation processes, simply press any channel's Select button below the channel ro-

World Radio History

tary encoder. This knob is used for either panning or FX send levels toggled by the master pan or aux 1 through 4 Send buttons. A cool addition would be a Flip function, where the rotary encoder's function is flipped with the channel fader's for easier and more precise control when automating FX sends or panning. Maybe in the next software rev.

In the DPS24's Q-Channel mode, any selected channel gets a row of 12 rotary controllers: pan pot, 3-band EQ knobs and four FX send controls. Q-Channel also offers an efficient means to quickly scan and adjust the EQ, pan and send levels of any channel in a mix. Every audio channel has a compressor or expander, followed by a noise gate. The EQ-comp/exp-gate order is always the same and can't be changed.

Activate Q-Channel mode and the LCD screen immediately shows track or channel number, pan pot position, recording source, attenuation, phase, fader level, gain reduction, EQ curves, compressor/expander and noise gate with their settings, all levels of the four FX sends and more. Stereo-linked channel settings are automatically duplicated, and all settings can be easily copied from one channel to another. With the current OS, snapshot pan position and fader level are also copied.

The 3-band EQ has two identical shelving bands and a parametric section, all with a 20 to 20k Hz range and 24 dB of boost/cut; the parametric section has variable Q from 0.1 to 10. The overlapping frequencies and Q ranges were great for radical sound twisting, yet gentle enough to brush up individual tracks. I was less impressed with the performance of the compressor, expander and gate. While they work as advertised, they sound fairly generic, leading me to rely more on my old outboard faves.

THE INTERFACE

A tilt-up LCD screen shows stereo bus LED meters and a large timecode/bars and beats readout. Akai's years of experience in designing samplers, drum machines and DD Series post-production units result in a smart and logical layout. The LCD surrounded by six soft keys and six Q-Link rotary controllers is a winner.

Parameter changes, track naming, etc., on the LCD are via Q-Link navigation controls, which include velocity-sensitive controllers (these change values more quickly as the knob is turned faster), soft keys that change function for each selected screen and eight lighted buttons on the console surface for fast access to all main DPS functions.

The Main screen is a split-screen overview showing all input, track, bus, send and FX levels on the top with a tiny 24-track display beneath. The external display running on a USB-attached PC would come to the rescue here! On a bigger screen and in color, it shows all of this plus track names, counter times, edit points, disk space, time remaining, large VU meter bridge and more. This is a must for serious DPS24 users.

The Edit screen offers access to cut/copy/paste/move paste and offline DSP functions, such as time stretch, pitch shift, varispeed, bpm match, reverse and normalizing. Editing on the DPS is like using Pro Tools: Define a region and do what you will. You can edit over any number of tracks and then copy and use tracks from other projects. Although you can define a song tempo map with different time signature changes, there isn't a "snap-to-grid" editing feature. All editing is nondestructive, even if you erase audio. A Disk Cleanup "housekeeping" feature can delete unused audio later. The DPS24 constantly auto-saves any time a setup parameter is changed and cannot

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play. With the timecode/bars-beats display main or edit screens showing exactly where you are, I don't see the need to hear anything at all, unless you are actually slowly scrubbing across a waveform with the jog wheel.

DIVING IN!

Without first reading the manual (my own self-imposed test), after I was accustomed to Akai's "screen conventions," I was off to becoming a DPS24 whiz by using the soft keys, Q-Link, the channel-select buttons and the tape deck-like transport controls.

Recording with the DPS24 is wonderful: clear, noise-free with seamless punch in/out even during sustained notes. There is no diminution of processing features when using 96 kHz. The solid-feeling controls don't get in the way of hectic creative moments, and I liked the bulletproof reliability—everything always played back just as it went in. Any problems I had were *always* due to pilot errors. I never felt I was using a glitchy system; the DPS24 is rock-solid. Once I had a good recording level using the input faders in the first layer, I would simply flip back and forth between layers 2 and 3 to adjust mix and effects, etc. Keeping the input-record levels away—back on layer 1—is a good design.

The DPS24 provides a total of 256 virtual tracks available across all 24 physical tracks. This is a completely different approach from other workstations I've used where a defined number (usually eight) of virtual tracks are allowed for each track. With the DPS, I could use two, 12 or 100 virtual tracks for my singer and only require a couple for my great guitar player.

From the FX page, I could select, edit, customize and store any of the 50 different effects from the 56-bit FX processor. Most sound good, although not quite as top-flight as what is available from dedicated external processors. There is even a well-featured pitch corrector that works to fix bad notes here and there.

You can mix to an external deck or to tracks 1/2 on the hard drive in a new project. Projects recorded at 96 kHz are mixed at 96 kHz with your choice of sample-rate conversion when you get ready to burn a CD copy; although with this OS, it is not possible to mix directly to the CD burner. Set up and name your new mix project or let it default to the project name plus "mix." Just locate to the top of the song and push Play/Record (with no multitracks selected!) and you're recording your mix.

For mastering, the DPS24 has a multiband compressor/expander (MBCX) that uses the same algorithm as Akai's QuadComp VST plug-in. Because MBCX requires all of the FX DSP to be available, there is no way to keep the four mixdown effects running and use MBCX at the same time—too bad. MBCX reminds me a little of the early TC Electronic Finalizers with four separate processors—LF, LMF, HMF and HF—each with their own adjustable crossover, threshold, ratio, attack, release and output settings. Applied to your stored, finished mix file, MBCX is a good tool with many useful presets to modify and rename. Like recording another mix to the hard drive, the same process happens; only this time, you recall and play your mix, set up MBCX and record it again. You'll have stored both the original mix and the mastered version—sweet!

Under the Setup page, the CD-Recorder page defines how a blank CD-R or CD-RW will be burned from your mastered mix. From the Project page, just select the order of mixes you'd like burned. The 40x-read/16x-write CD burner is also useful to back up project files. Future OS updates will allow, in addition to the SCSI or the USB ports, import/export of .WAV files. I used the burner for all of these tasks perfectly the first time—no cocktail coasters here! Strangely, there is no way to play a CD out through the DPS; you have to check your CD copies somewhere else or, as the manual sheepishly suggests, use the little headphone jack on the CD drive.

The culmination of years of experience manufacturing workstations and MPCs, Akai's DPS24 is noteworthy for its combination of excellent design, superior sound and modern features. Although still maturing in its software development, the DPS24 is a stable platform now and, with its open-end design, ready for a long, useful future with many free software/firmware updates coming all of the time. I liked the compact, self-contained design, the pro features and—after a short learning curve—the intuitive, logical operation. As tested here, the standard DPS24 retails at $5,499.

Akai Professional, 4710 Mercantile Dr., Ft. Worth, TX 76137; 817/831-9203; www.akaipro.com. ■

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

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World Radio History

BY ERIK HAWKINS

Antares Kantos Plug-In

Audio-Controlled Synthesis, Sci-Fi Effects

From the company that brought us Auto-Tune and Mic Modeler comes a brand-new mind-warping, sound-bending plug-in, Kantos. The basic function of this sci-fi-looking plug-in is to convert audio into synthesized sounds. (For example, feed it a dry lead vocal and output a warped synth line.) Kantos is different from your typical pitch-to-MIDI converter and sound module combination because its integrated synth engine actually derives its sound from the incoming audio signal's harmonic and formant content. The effects you can cook up range from simple earthbound sounds to out-of-this-world resonations.

At the time of this field test, Kantos was available as a MAS, VST and RTAS plug-in for Mac; the PC versions should be available by the time you are reading this and will also include DirectX. All of the different plug-in formats ship on the same CD-ROM, which is especially appreciated if you regularly employ different digital audio-host applications. Copy protection is via challenge and response. (If you'd like to try out Kantos before buying it, the software will run for a 10-day trial period and can be downloaded directly from the Antares Website, www.antarestech.com.) Suggested MSRP is $299.

Kantos' interface looks like a control panel from a Borg ship on *Star Trek*. Its black surface is covered with glowing sliders and indicators, and interwoven between these controls are what look like green-plasma veins. The interface is certainly entertaining to stare at, but because the design is busy, understanding the plug-in's many parameters and signal flow are difficult to grasp at first glance. Many of the parameter labels are tough to read because of their size; making them a tad larger would be a big improvement.

Kantos operates as a typical effects plug-in: Insert it on an audio channel and send it some signal. An input-level control is immediately followed by the Gate Generator, a combination noise gate and trigger generator. Setting the control's threshold, hold, note on and off values determines when and how the plug-in's oscillators are triggered. A real-time waveform display shows the gate and trigger parameters as overlaid dashed lines that can be freely moved about. This set up is a great visual aid to adjust trigger and gate values in relation to the incoming signal's waveform. If you don't like the incoming waveform's envelope, an ADSR-type amplitude envelope (the Amp envelope) can be set to open at your trigger points.

Kantos' sci-fi interface hosts all parameters and displays signal flow.

Two wavetable oscillators make up the synthesizer's tone generators. A good selection of wavetables comes with Kantos, and Antares has promised that more will be available for download from its Website, or you can concoct your own using standard .AIFF and .WAV audio files. Each oscillator has its own fine-tuned, keyboard-style pitch-constrain control, a filter and chorus effect. The pitch-constrain feature is perfect for tuning an out-of-key input or creating vocoder-like effects. The filter is solid with a choice of two- and four-pole settings of the lowpass, bandpass and highpass varieties. Chorus rate and depth are adjustable.

Both oscillators, along with a noise generator, are routed to the heart of Kantos, a module dubbed the Articulator. Here, the incoming signals' formant information and harmonic content are used to shape the oscilattor's and the noise's sound. A bi-axial control lets you adjust Q and amount parameters simultaneously to affect the harmonic processing's depth and character. A formant offset control and a 3-band graphic EQ are also part of this section. The Articulator, I found, is powerful, innovative and darn fun.

An 8x8 modulation matrix allows any one of seven different sources to be routed to any one of 35 destinations. Input sources include dynamics, timbre, pitch, envelopes and LFOs. Destinations include filters, fine-tune, articulation, formant offset, chorus, delay and the modulation matrix' own modulation amount settings. There are two LFOs that are designed to be used with the modulation matrix. You can choose from a variety of periodic waves for each LFO, and rates can be locked to your project's tempo. An ADSR-type envelope (the Mod envelope) is also available as a modulation source, independent of the Amp envelope. The modulation matrix is deep and offers a lot of options for serious sound tweakers.

A submixer and mixer head up the final output stage. The submixer lets you mix each oscillator output with its own unprocessed sine wave that's based on the input signal's fundamental frequency. This is a valuable feature to anchor pitch or the bottom end of highly processed sounds. The noise generator's output has a level control in the submixer, as well. The mixer lets you set the plug-in's overall synth level in relation to a simple delay and your dry input signal. Both mixers have handy Mute and Solo buttons for each element, and the mixer's channels also include panning. A final aggregate level control falls after the mixer.

Kantos is no lightweight plug-in; it requires some serious processing power to work its magic. Three mono-to-stereo VST instances on my G4 400MHz machine peaked the CPU. If you have a superfast dual-processor computer, the plug-in's processing requirements won't

World Radio History

be that big of a deal, but beware if you have something slower, like the minimum-recommended Mac G3 233MHz machine. A nice solution to the processing problem would be to offer an offline version of the plug-in, *á la* Digidesign's Audio Suite.

I found that because Kantos' algorithm is so complex, there is a significant delay introduced to its processed signal. For example, a bass line generated from a kick drum ends up sounding like it's really dragging behind the beat. Luckily, with today's digital audio host applications, it's a snap to nudge the input audio forward in time and compensate for any processing delays. Or, you can always bounce the effect to disk and then manually line up the resulting audio file for a really tight sync.

Kantos produces wonderfully organic-sounding tones and textures—the types of sounds that make you ask, "What instrument is that?" I had a blast running my guitar through the plug-in and creating new types of aboriginal wind instruments and never-before-heard tribal percussion sounds. Hitting Kantos with voice and drum loops can be equally exciting. Sing the melody lines you hear in your head directly into Kantos, constrain the oscillators' outputs to whole notes and it's possible to concoct amazing synth leads. A drum loop's harmonic content can even be used to generate viable musical parts. For sound-design innovation, Kantos is tops. It also packs over 50 great-sounding presets if parameter tweaking is not your forte. And, of course, the plug-in can be automated for even more twisted control.

Kantos is fun and useful, always a good combination. However, it's not necessarily one of those plug-ins that pumps out perfect sounds right out of the box. It does require some experimenting to really appreciate its potential. The synth engine is amazingly cool-sounding. I just wish I could play it from my keyboard, which would give it more sex appeal, making it a no-brainer for musicians and sound designer alike. I mentioned this feature to Antares and they reminded me that this is only Version 1.0, hinting that such a feature was planned for the future—I can't wait.

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John Karpowich on location, MATRIX SEQUEL

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BY MARK FRINK

EarQ Technologies Reference Hearing Analyzer

How's Your Hearing...Today?

Audio pros often make statements such as: "My ears are fine," "My ears are shot" or "I don't want to know what my hearing is like." The conventional method of determining the truth about such statements is to take a hearing test. Unfortunately, most standard hearing exams require both an office visit to an audiologist or physician and the ability to directly confront the fear of the unknown. For most musicians and sound pros, a trip to the dentist is preferable. Also, standard hearing tests typically only measure octave bands in the 125 to 8,000Hz speech range.

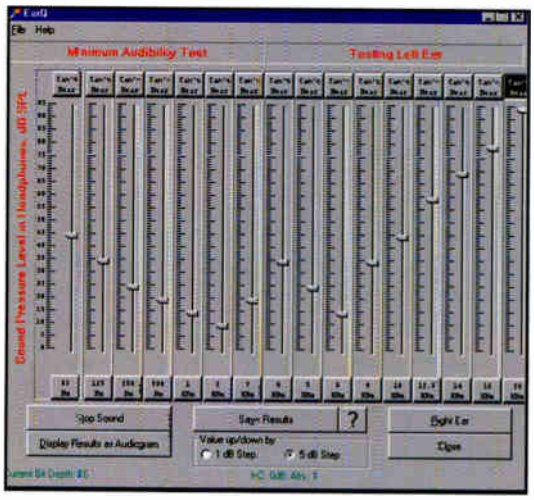
The EarQ Hearing Analyzer is a personal hearing self-test application that functions on most desktop and laptop PCs. The software ships with a pager-sized calibrator that is used before each test to set the computer's headphone output via a 1kHz tone and a three-LED "stoplight" arrangement.

A $199 package is supplied with Sennheiser's TEC Award-winning HD 280 Pro headphones (reviewed in *Mix*, November 2002), which are comfortable and rugged, while providing the high isolation helpful for hearing exams (and live gigs). Other supported models include Sony MDR 7506 (same as the V6), Sennheiser HD 25 SP, Beyerdynamic DT 770, Audio-Technica ATH-M40fs and several by Koss. The software and calibrator alone are $99, so the Sennheiser bundle is a good value.

A third method is using EarQ with in-ear monitors (IEMs), and files are also included to calibrate it to several popular models, such as the Shure E-1 and E-5, Sensaphonic ProPhonic 2000, Future Sonics Ears and Etymotic ER-4 and ER-6.

The testing window has 16 faders that represent frequencies from 63 to 20k Hz. Below 2k, they're at octave intervals; above 3k, they're spaced at ⅓-octave intervals, providing greater resolution where hearing is most often impaired. Minimum audibility self-testing is performed one ear at a time by pushing each fader until its intermittent, slightly warbled tone is barely heard. Results are then converted to a hearing-response audiogram, which compares them to those of young adults with normal hearing. These can be saved and easily compared to previous tests. The Audiogram window also has an option for suggested EQ settings, recommending slight boosts depending on the measured deficiencies, with different settings for listening levels of very soft (65 dB), comfortable (80 dB) or comfortably loud (95 dB). However, only the last is meaningful for most audio professionals.

The entire process takes less than 15 minutes. Because it's a self-test, a degree of honesty is required for meaningful results: You can easily convince yourself you heard a tone that you'd like to be able to hear.



The EarQ software's interface is simple to use: Click on a frequency band, move the slider until the tone is audible and move on to the next band. The software then calculates your hearing-response graph.

Making tests over several days, it's clear that hearing ability changes, depending on factors such as exposure, stress, medication and rest. Results obtained following a good night's sleep are better than after a long day of loud music or travel. In fact, this temporary threshold shift is the very mechanism by which hearing loss occurs over time, and EarQ's ability to monitor this makes it an excellent tool for hearing conservation. EarQ can't replace a visit to the audiologist, but it's relatively simple to make before-and-after comparisons of your hearing levels at rock concerts or studio sessions.

EarQ was initially conceived as a means to identify tweaks to control room monitors that would provide better studio results for older or abused ears, because the lack of certain frequencies tends to make an engineer push them in the mix. It's also an invaluable tool for monitor engineers who are responsible for mixing IEMs. Though many performers (or engineers) may not want a hearing test, offering it demonstrates professional responsibility.

EarQ's EQ suggestions can also provide a guide to tweak individual mix EQ so that compensation can be made with console-output EQ, outboard graphics or with the EQ on the more sophisticated mastering processors used as safety limiters with better IEM rigs. Investigating mix or "mastering" EQ with individual musicians may provide them with an improved performing experience, as well as showing them you care about their hearing. More importantly, EarQ lets users check their own hearing on the road daily and in privacy to monitor the temporary threshold shifts that can turn into hearing loss over time.

The average 40-year-old has already lost some high-frequency hearing, so it's no surprise that the typical result of two decades in the music business is a permanent notch in the highs. That the EarQ software may recommend a boost of a few dB at those frequencies should not be surprising. Though exaggerated losses cannot be compensated for by large-frequency boosts, the careful monitoring of personal hearing can allow professionals to mitigate further damage, while helping improve their listening experience.

Set your browser to www.earq.net for an uncalibrated, simple 4-band demo of the EarQ software. When was the last time *your* hearing was checked?

EarQ Technologies, Box 6654, San Rafael, CA 94903; 415/479-7339; fax 415/329-3303; www.earq.net. ■

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Lynx L22 PCI Audio Card

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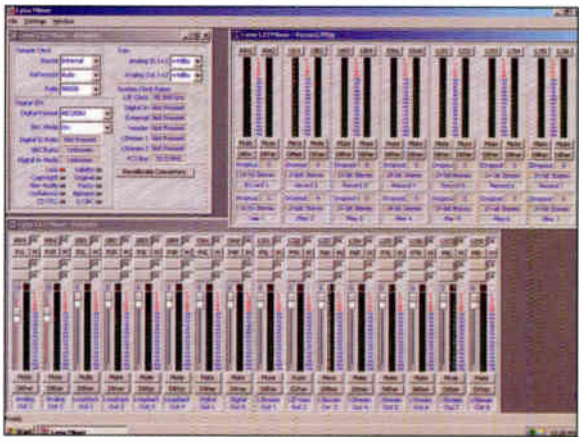

The L22's mixer GUI has Adapter, Record/Play and Outputs windows.

For high-end applications, conventional wisdom has always dictated that an installed interface simply can't approach stand-alone converters' sonic performances. Lynx appears to have done away with that conventional wisdom.

The L22 PCI audio card is the latest in a line of high-end audio cards from Lynx. Based on LynxTWO technology, it supports sample rates of up to 215 kHz, with a 100kHz analog bandwidth and a dynamic range of 117 dB. The L22 shares much of the LynxTWO's feature set, with a distinction in the analog I/O (2-in, 2-out) and the absence of a SMPTE reader/generator.

OUT OF THE BOX

The first thing I noticed while unpacking the card is its solid construction, with high-quality surface-mount components: Analog Devices op amps and AKM AK5394 and Crystal CS4396 converters, plus ground planes, power supply filtering and precision resistors.

Breakout cables are similarly well made. The analog audio cable is a sturdy 25-pin D-sub with four XLR I/Os. The sync cable, a 15-pin D-sub, carries sync in and clock out on BNC connectors, as well as digital I/O (software-configurable as AES/EBU or S/PDIF) on XLRs. An AES-to-S/PDIF adapter is also included.

INTO THE BOX

Installation under XP was straightforward and pleasantly free of surprises. Curiously, the manual does not offer documentation on Mac installation, though Mac ASIO 2.0 is supported under OS 9.x.

In fact, if the L22 falls short anywhere, it's in its documentation. The 30-plus-page installation and users guide is well written but sketchy and short on fine detail. Lynx says that it is working on updating its support materials.

Minor quibbles aside, the sonic quality and dynamic range of this card are nothing short of striking. Background noise is almost nonexistent: Listening to masters I'm intimately familiar with, I was able to pick out inflections and nuances I'd long ago forgotten. Audio performance in Cubase SX and Nuendo was stellar, and even with buffer sizes as small as 128 samples, playback of 20-plus tracks was glitch-free, with minimal CPU load and latency reporting 2.6 ms. Performance in Cakewalk's Sonar and Syntrillium's Cool Edit Pro was equally impressive—even with MME drivers. (WDM and GSIF drivers should be available soon; Mac OS X support is planned for early 2003.) With 16 dB of headroom, the L22's output is quite hot; make sure that your equipment can handle the output level without damage.

GROWING FROM WITHIN

The L22/LynxTWO family's architecture is based on Lynx's LStream protocol with expansion options. Each card is seen by the host application as 16 inputs and outputs, and multiple L22/LynxTWO cards can be synched via internal ports for larger multichannel systems. Another internal port can accommodate the LS-ADAT or LS-AES daughterboards: The LS-ADAT provides 16 channels of 48kHz ADAT I/O, eight channels of 96kHz or four of 192kHz. The LS-AES provides eight channels of AES/EBU at rates up to 96 kHz or four channels at 192 kHz. These daughterboards use an additional card bay, but not the associated PCI slot. Lynx is also working on external versions of these interfaces that will connect between card and sync cable.

THE MATRIX

Lynx's internal mixer is feature-rich, though I'm not fond of the layout. The arrangement of three different-sized windows within a larger window feels cramped and unyielding. Nonetheless, it's intuitive enough after only minimal mousing around.

The Adapter window controls most system settings, including digital I/O and sample clock, dither type, analog I/O level and sample rate conversion. There's also a panel showing clock rate readout for every available source. Another nice touch is a converter recalibrate button, which compensates for drift caused by temperature changes as the computer warms up.

The Record/Play window provides meters and input selection for each of the card's 16 channels, as well as mutes and dithering options; word length info and dropout tallies are also displayed.

The Outputs window offers very flexible source selection, with up to four inputs per channel possible. Metering and faders for analog and digital I/O pairs, eight channels of LStream (more if additional LStream sources are connected) and four channels of loopback are provided. Mute and dither types are also individually selected here. With such a deep degree of routing complexity, it's a bit disappointing that there's no way to save snapshots, but the mixer does at least open to the last setting, even after a reboot. (Lynx says a snapshot feature is in the works.)

IS IT WORTH IT?

At an MSRP of $749, the L22 is certainly not for everyone. But with performance that truly rivals stand-alone converters, which cost far more, the L22 is an excellent and affordable choice for mastering, DVD authoring and other applications that don't require synchronization. Now, if only the rest of my system could support 192 kHz.

Lynx Studio Technology Inc., 1048 Irvine Ave. #468, Newport Beach, CA 92660-4602; 949/515-8265 x205; fax 949/645-8470; www.lynxstudio.com. ■

Daniel Keller spends his waking hours caught between music and technology, mercilessly coaxing computers to be creative.

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World Radio History

Snapshot Product Reviews

MILLENNIA LPE-2 ANALOG LEGACY Archival Playback Equalizer

It's rare, but every now and then, someone makes something totally from the heart, out of a pure love for audio. That someone is Millennia's founder John La Grou, and that something is the LPE-2.

Referred to as a "playback environment," the LPE-2 is intended for restoration pros, mastering engineers and audiophiles seeking a no-compromise front end for the playback of 33⅓ (RIAA), 45 and 78 rpm records. Behind the 29-pound chassis' thick slab front panel, Class-A J-FET and bipolar amps are combined with Grayhill mil-spec switches; Neglex OFC wiring; and passive components from Vishay, Roederstein/MELF, Wima and others. But the LPE-2 goes far beyond simply being a high-end stereo phono preamp.

The LPE-2 combines a preamp circuit (based on Millennia's acclaimed HV-3 mic preamp) with equalization-compensation circuitry designed for serious archivists. Two independently controllable channels of low-frequency compensation (boost) and 10kHz HF roll-off allow users to quickly find a playback curve that matches any disk format. A preset for modern RIAA (essentially, post-1950) records is also provided. As a phono preamp for LPs, using either Shure V15 or Audio-Technica AT150MLX cartridges, the LPE-2 offered unparalleled performance, with an absolute purity, clarity and solid channel separation (channels are gain-matched within 0.08 dB!) that would satisfy any audiophile, especially with its 200kHz bandwidth.

There are a number of fine RIAA preamps on the market. The real challenge stems from the playback of early recordings, when various pre-equalization curves (or none at all) were applied to releases from different labels. For example, if you play an acoustic 78 (mostly pre-1925) recording with a modern RIAA preamp, the result is bass heavy, with a noticeable loss of high frequencies. As a starting point, the LPE-2's well-written manual includes a chart of suggested pre-equalization settings from dozens of labels. From there, users can select from 49 preset compensation combinations. A custom user preset can also be created by swapping several fixed internal capacitors—a useful touch for anyone archiving a large catalog from one particular source.

Inputs and outputs are via gold-plated XLRs and RCA connectors, and the wide-ranging input stage handles line- or phono-level signals, including a balanced feed from a phono cartridge. Designer La Grou recommends the latter, and because the coils in a cartridge act like a transformer feed, modifying your turntable to add balanced XLR outs is fairly simple. I, however, stuck with the traditional RCA connections from my Esoteric Sound 78 disc player, equipped with an Audio-Technica AT-MONO3/SP moving-coil cart (unfortunately unavailable in the U.S.). The LPE-2 had no problem handling the cart's MC output.

After the preamp section, the LPE-2 offers versatile, peak/shelving-switchable, 2-band low (20 to 260 Hz) and high (1k to 12k Hz) filters with a ±10dB range to isolate or correct rumble, groove degradation and surface-noise problems. For pure "transfer-it-now/fix-it-later" applications, the filter use is optional—with hard-wire bypasses—but the filter action is so smooth, subtle and musical that I used them on almost everything I archived. Also, the LPE-2's line I/Os provide access to the filter section for tape mastering or any application that requires a sweet HF/LF program EQ, mixing drums, vocals, strings—just about anything—making the LPE-2 useful for everyday studio chores, even when you're not archiving.

Working on numerous projects over several months, I couldn't find anything to fault about the LPE-2, other than its $9,500 retail. However, the LPE-2 is an absolutely first-class unit that provides functions no other box can deliver, with impeccable performance and a feel and build (inside and out) that's stellar. For reference playbacks in mastering houses, audio preservationists or anyone else working with recording's legacy, the LPE-2 is bargain-priced indeed.

Millennia Music & Media Systems, 530/647-0750, www.mil-media.com.

—George Petersen

KORG BX-3 Dual-Manual Combo Organ

It's ironic, but with all of our amazing synth sounds and elaborate outboard effects, songs often need organ, which

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has kept the unmistakable touch of the classic tone-wheel organs—such as the Hammond B3 family—as a regular staple on rock, jazz, blues, R&B and pop albums over the past 50 years. To be sure, the original Bs are amazing, but the upkeep and maintenance on a 400-plus-pound vintage instrument can put a serious dent in one's wallet.

Korg successfully captured the nuances of a tone-wheel organ in 1979, with its first series of CX-3 (single-manual) and BX-3 (dual-manual) keyboards. These provided very good tone recreations for their time, but lacked MIDI, programmable presets and amp emulations, and advanced control of nuances such as key click and (on the BX-3 only) assignable pitch/mod wheels. Now, Korg offers totally new versions of its long-discontinued CX-3 and BX-3. The new CX-3 is the single-manual version in a compact chassis; the new BX-3 (tested here) includes a matching wooden floor stand. Both new products are quite different from their predecessors, yet share the same name.

The BX-3 has dual manuals with 61 keys each, full polyphony and a very natural feel. Two sets of nine drawbars can be assigned to either manual; these do a super job of recreating the touch and effect of real drawbars, while a Key Scaling feature can quickly alter the drawbar setting's tonality, offering quick variations. The drawbars, vibrato/chorus and percussion switches are in the same familiar positions as the original.

Onboard REMS speaker/amp/reverb-modeling technology includes a credible rotary speaker sound (including full control of rotor speeds, ramp up/down times and simulated mic positioning), along with four reverbs and a Dynamic Overdrive mode, which distorts more as the volume goes up. Alternatively, users can select a tube amp/rotary speaker effect or preamp out to connect to a Motion Sound rotary cabinet or real Leslie (¼-inch only—no 6/9/11-pin jacks).

The best part of the BX-3 is its sound. Korg's Tone Wheel Organ-Modeling Generator builds on the B3 sound, adding vintage and clean tone wheel sounds, while mimicking the tone wheel's overtone levels, "leakage" and key-click (dirty key contact) effects, which vary from slight to sledgehammer. An EX Mode links all 18 drawbars for a full 13 tonal harmonics and up to five variable percussion harmonics on the upper manual, with two software drawbars available on the lower.

Standard are 128 (user-editable) programs—most are excellent, particularly the jazz, R&B and gospel settings. Some are uneven, such as "Whyter Shade," a rendition of the sound used on "A Whiter Shade of Pale." Yet this classic "knuckle preset" is easy: Put a fist in front of each drawbar set, pull them down around your hand to form curves and you've got that sound. Creating, editing and saving presets to memory is a snap, and the BX-3's deep MIDI implementation not only allows layering notes to other instruments, but also transmits the movements of all drawbars and controls as MIDI data for storage and offline editing via a sequencer.

The BX-3 retails at $4,000, including an expression pedal and wooden stand. The organ removes easily from the stand via a few thumbscrews, although the 40-pound stand isn't really built for road life. Gigging players should get a separate folding stand for one-nighters. But onstage or in the studio, the BX-3 offers that classic tone-wheel sound with less weight, less hassle and more fun than the original.

Korg, 516/333-9100, www.korg.com.

—George Petersen

RØDE NT1-A Cardioid Studio Mic

To celebrate its parent company's 35th year in pro audio, Australia's RØDE Microphones has issued an improved version of its best-selling microphone, the NT1. The new NT1-A (the "A" stands for "anniversary model") comes from pairing the true condenser (externally polarized), 1-inch-diameter, gold-sputtered capsule from the original NT1 with J-FET surface-mount electronics modeled on RØDE's NT1000 for an entirely new creation, with a personality of its own, an impressive 5dBA self-noise spec and a new nickel-finish body.

The mic retails at a low $349 and includes an effective shockmount and vinyl pouch in a cardboard box. There's no fancy wood coffin or "flight case" here: The purchase price goes into components that affect performance. One unexpected—but appreciated—touch was an extra set of elastic cording for the shockmount. The NT1-A is versatile for many studio applications and will get a lot of use, and somewhere down the road—or on the road—you'll need spare elastics, so it's nice that RØDE provides these up front. A few frills eliminated from the NT1-A include pads and roll-off filters, but the mic handles 137 dB—enough for most sources where a large-diaphragm mic is normally used.

I began testing the NT1-A about three feet back from a Gibson J160 acoustic with an Aphex 1100 preamp and was impressed by the mic's natural, uncolored sound and seemingly total lack of noise. I'm sure the 1100's -135dB EIN spec contributed to this, but the combo of the two was quite nice. Unlike many condensers, the NT1-A has a mostly flat response, without exaggerated presence boosts; it peaks at 4 dB around 12 kHz and then very gradually rolls off to 2.5 dB at 20 kHz. With the NT1-A, what you hear in the room is very close to what the mic captures: There were no timbre shifts at all, even on grand piano.

On vocals, I switched to a Groove Tubes VIPRE preamp, which has plenty of personality and a larger-than-life sound that vocalists love. The combo was great—on male or female lead vocals—although on female background voices, I reached for a bit of high boost to add more of an "airy" feel. The plosives control from the mesh grille is very good—you may not even need a pop filter if your vocalist stays back six inches. The NT1-A has a very controlled proximity effect that adds fullness, but is not overbearing until the lips are two to three inches from the mic. Narrators and radio voices will also love the NT1-A, especially if they know how to "work" the mic.

The NT1-A is a versatile, all-around studio mic that's ideal for the novice or pro, and at $349, there are few reasons not to get one—or a pair—for your mic cabinet.

RØDE Microphones, 310/328-7456, www.rodemic.com.

—George Petersen

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DISC MAKERS ELITEPRO Desktop CD-R Publisher

Duplicating and printing bulk batches of CD-Rs has never been easier. The new ElitePro from Disc Makers is a complete stand-alone system that can be configured to handle a multitude of CD-R copy, burn and print chores. The unit ships with an Intel-based CPU, Plextor 48x CD-R (Pioneer AO5 DVD-R and DVD+R versions are also available), color printer and the company's "Center-Pick" autoloading mechanism. The system arrives preloaded with Windows XP, Padus DiscJuggler software and Sure Thing CD Labeler. The CD-R version is $4,690, and the DVD-R version is $5,290. (Units without CPU, monitor and keyboard are $3,790 and $4,290, respectively.)

Setting up the unit is a breeze. All of the mouse, keyboard, monitor and other connections are totally standard and self-explanatory. The printer slides into a recessed area atop the CPU, and the articulating arm that moves the CD-Rs from the duplicator to the printer installs in seconds, requiring only one wired connection.

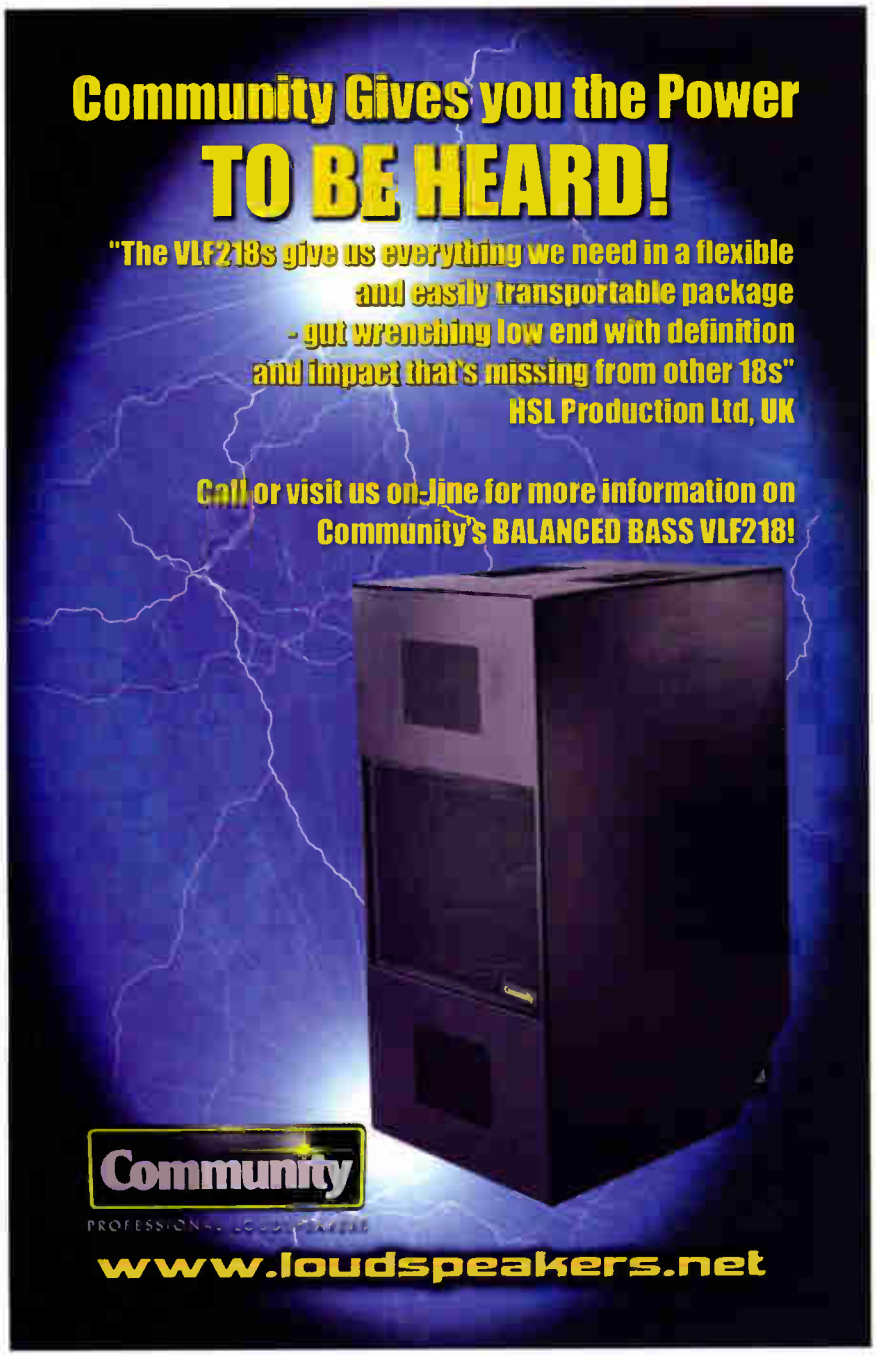
After powering up, the icons for DiscJuggler and Sure Thing appear onscreen. The DiscJuggler software is simple to use: First-timers are led through a series of prompts that remove any guesswork from the procedure. There are several copy-and-burn options available that range from simple duplication of an existing CD to burning files stored on another drive. The software includes controls for the overall number of discs to be burned, quality-control safeguards and label-printing controls. Pre-existing labels can be imported into the program, allowing the burning and printing processes to work in tandem. Anyone with even a cursory knowledge of Microsoft Word or Publisher will have no problem using the Sure Thing application to create custom labels or navigate through its myriad templates.

The ElitePro takes about 12 minutes to copy the contents of a CD into its cache memory and churn out the first CD. From there, the process picks up considerably. For a full run of 125 CD-Rs, most users will want to set the unit in motion and leave it to complete the task over the course of an evening or workday. The 20 CD-Rs/hour stated speed is right on the mark. The quality-control safeguards worked well, immediately recognizing damaged CD-Rs and setting them aside. As a Mac user, I only had difficulty configuring the printer, but a quick glance through the manual had me up and running in minutes.

The ElitePro would be a great investment for any professional studio, A&R department or independent musician who needs to turn around bulk CD-Rs or press kits. Best of all, the system's cost will pay for itself after just a few print runs.

Disc Makers, 800/468-9353, www.discmakers.com/duplication.

—Robert Hanson ■



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World Radio History

BY EDDIE CILETTI

How Loud Can You Go?

The Helpful Science of Bass Management

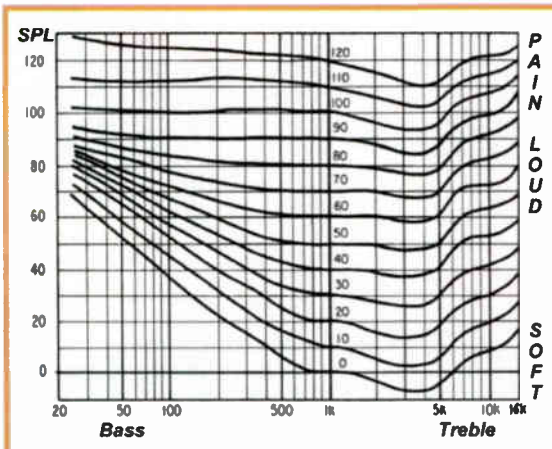

Figure 1a: The Fletcher-Munson Equal Loudness Curve (1933)

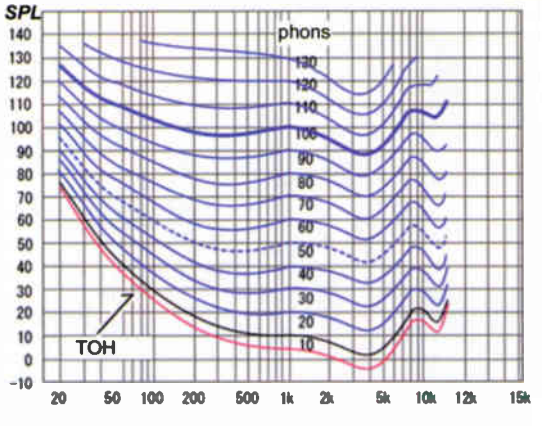

Figure 1b: The Robinson-Dadson Equal Loudness Curve (1956)

This month, I'll examine how understanding and applying loudness-perception curves relates to room bass management. Our perception of loudness varies with frequency and level, as originally detailed by Fletcher and Munson (Fig. 1a) in their landmark "ear search" at Bell Labs in 1933, which generated the Equal Loudness Curve. Figure 1b illustrates the results of a later study by Robinson and Dadson in 1956. Many others have contributed to a body of work that also crosses over into the science of perception (and masking) known as psychoacoustics and its application to such algorithms as AC-3 and MP3. Figure 2 is the response curve required to make all frequencies appear equally loud, all the way down to the ear's threshold of hearing (TOH)—the basis for the loudness controls found on consumer-audio systems.

MIC PROXIMITY EFFECT AND OTHER CAUSES OF LF MUCK

My research identifies several sources of added bass energy that are likely to detour engineers-in-training. (Much of this is equally applicable to those who have "treble issues.")

To start, all unidirectional (cardioid) microphones are only "flat" at one meter from the sound source. Move them in close and the low-frequency proximity effect makes things warm and intimate. (This topic, using the Sennheiser e-609 as an example, was covered in the October 2002 "Tech's Files.")

Professional gear does not include "loudness-compensation" switches. At minimum, it helps to have an alternate system in the control room, defined not just as speakers but as a *system*, which includes the amp that powers them. It does not help to turn off the loudness button because this does not reflect the consumer environment. Loudness for automotive systems is typically a default boost that is reduced as the volume control is increased.

When working in a typical control room environment—on systems without loudness compensation—always remember that Fig. 2 represents what the ear *wants* to hear at the threshold of hearing. Using cardioid mics at close range *without* bass rolloff, combined with loudness compensation on consumer equipment, results in a double bass boost. It is helpful to understand why the proximity effect's complementary bass boost might be misleading because it feels right, though it isn't necessarily the correct solution.

I suggest incorporating the loudness curve's LF portion into your listening environment. As Figs. 1a and 1b indicate, the curve is a bit of a moving target based on the level at which you like to monitor. As the level increases, the need to hear bottom decreases. But, as a health consideration, monitoring at excessive levels over longer periods of time causes hearing fatigue and damage.

Note: It was once acceptable to tune a room solely using equalization. I am not talking about graphic equalizer abuse—as was too often the case—but a simple, gentle curve. If you don't feel comfortable incorporating EQ, then part of the solution is to address acoustic issues that might be robbing your room of low-frequency response.

ACOUSTI-FIX

Any discussion of acoustics must include the subject of accuracy vs. reality. A truly accurate room would be a large space with large monitors working in a com-

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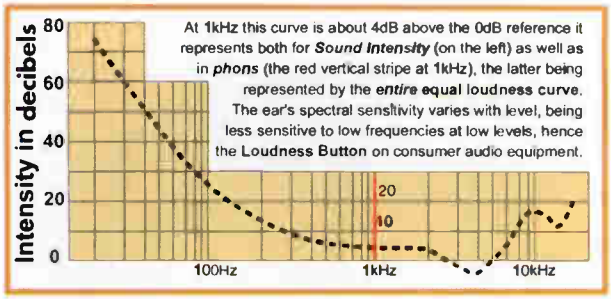

Figure 2: At the threshold of hearing, this is what the ear wants to hear. Image courtesy of (and permission to use and modify given by) Rod Nave from the Department of Physics and Astronomy, Georgia State University.

fortable range to fill the space. Such an optimal sonic environment might not divulge the problem areas for consumer systems (aka reality), because consumer systems are anything but flat. But bigger rooms with the accepted "magical" dimensions (such as a rectangular room with a length-by-width-by-height ratio that's approximately 2x1.5x1) are inherently more fixable. Untreated, all rooms exhibit some amount of low-frequency buildup in the corners that's reflected back to the listening area, causing destructive cancellation. These areas can be treated to trap and absorb, reducing cancellation and improving bass response at the listening position.

Smaller rooms create bigger challenges, along with their proportionally smaller monitoring systems. Those with 6-inch or smaller woofers can't move enough air to create effective low-frequency impact, and a subwoofer doesn't help in the critical frequency range of 120 to 240 Hz—the two octaves that are well represented in car audio systems, especially with the loudness boost in effect.

Because I prefer to listen at low levels, the decision to go for a "curve" in my room seemed logical and necessary, rather than attempt to achieve a flat response or use an equalizer to create a curve I chose.

AUGMENTATION

Figure 3 shows a "pedestal" that I built for my Fostex NF-1A monitors in order to place the tweeter at ear level. Because I built a cabinet and not just a stand, the idea quickly evolved into adding an extra woofer to extend and augment the low-frequency response. The crossover options were either active or passive: I opted for the latter for simplicity's sake, because adding an inductor in series created a simple first-order crossover at 150 Hz. (Adding a second speaker in parallel would have boosted the level 6 dB up to the crossover point with the tweeter.) If all goes as planned, I expect to measure as much as a 6dB boost somewhere below 150 Hz.

After augmentation, the low-frequency response is emphasized—yet remarkably cohesive—instead of the disembodied bottom that is often associated with subwoofers that are crossed over too high. Regardless of whether this solution is applicable beyond my own personal needs, the point here is to raise awareness about

Figure 3: The Fostex NF-1A on its custom pedestal/bass extender

the loudness curve and offer a possible solution. It is important to maintain consistent, safe monitoring levels because an increase or decrease can skew a track's or a mix's spectral perception. Higher levels can diminish the need for loudness compensation but cause ear fatigue or worse, permanent damage.

With this particular solution, I split the difference between accuracy and reality, choosing a bass boost through augmentation rather than attempting EQ and potentially overdriving the 6-inch woofers—or my ears. In a future column, I'll document the "before and after" response of the room and monitors, attempting to correlate the augmented response with Fletcher, Munson, Robinson, Dadson, et al. ■

Visit Eddie at www.tangible-technology.com for additional data on the NF-1A (including simple internal modifications) and other interesting readings.

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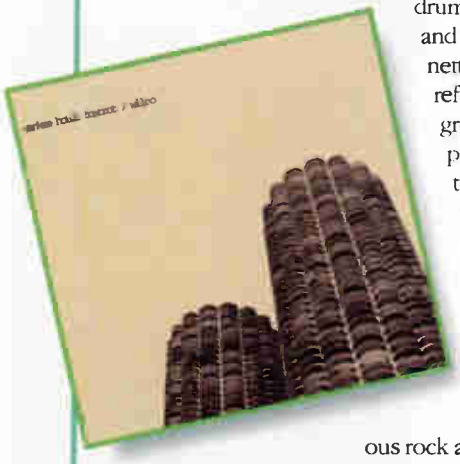
PHOTO: SAM JONES

Wilco (L-R): Leroy Bach, Jeff Tweedy, Glen Kotche and John Stirratt

WILCO'S SONIC ADVENTURE

by Gaby Alter

It was a hard road to completion for Wilco on their latest album, *Yankee Hotel Foxtrot*. The seminal alt-country band, which had previously collaborated with Billy Bragg on two *Mermaid Avenue* albums (featuring Woody Guthrie songs), spent a year-and-a-half recording *YHF*. During that period, drummer Ken Coomer left the group and was followed by guitarist Jay Bennett. Reprise, the band's label, initially refused to release the album on the grounds that it lacked commercial potential. Finally, however, the tide turned. Wilco's decision to keep the album as it was, rather than remix it to please their label, was rewarded with a release on Nonesuch and became their biggest commercial success to date, as well as garnering widespread critical acclaim for one of the most sonically adventurous rock albums to come out in recent years. The band's struggles and the making of the album were even captured in a black-and-white documentary film released last fall called *I Am Trying to Break Your Heart*.



The sound of *Yankee Hotel Foxtrot* seems to echo the emotions of the struggle it took to finish the album. It's a ragged glory of rock and country guitars, filtered pianos, and electronic and analog noises that form dense textures behind singer Jeff Tweedy's simple folk/rock melodies. Wilco's core sound—a live rock band—is there, but it is often accompanied by white noise, the inside of a piano being played and other hard-to-identify sounds that surface and submerge in the mix. There are straightforward rockers—"Kamera" and "I'm the Man Who Loves You"—but in almost all of the songs, there are unusually tweaked sections. Sometimes, the rock band breaks down or disappears—as on the end of "Ashes of American Flags," leaving a "Revolution #9"-style sound collage—or dissolves into feedback and white noise. At other times, the sound texture colors the background more subtly.

Tweedy's weathered voice and acoustic guitar strumming are the constants in this shifting sonic landscape, and his lyrics reach for hope in dark places. "Our love is all we have," he sings on "Jesus, etc.," and on another track, "War on War," the chorus goes: "You have to learn how to die/If you want to be alive." The tracks are pervaded by this sense of loss that is accompanied by a will to survive.

The band recorded the album in its own Chicago-area studio, a 2,000-square-foot space

—CONTINUED ON PAGE 162

World Radio History

SILVERCHAIR

OUT OF THE GRUNGE, INTO A NEW WORLD

by David John Farinella

For Daniel Johns, linchpin of the popular Australian band Silverchair, the successful consummation of the band's fourth release, *Diorama*, started way before the amps were powered up and the tape machines started to whirl. As Johns explains, the first step was finding a producer who understood where he wanted to go. "This was the first time I've ever done meetings with producers, because I knew that this was the kind of record that people were either going to be into or were really going to hate," Johns says. "The majority of the people that I met prior to meeting David [Bottrill] either didn't understand it, or understood it and didn't like it and wanted to change it. They were all really supportive and nice, but I didn't feel like I was on the same page with anyone."

From left: drummer Ben Gillies, guitarist/vocalist Daniel Johns and bassist Chris Joannou

In David Bottrill—who has produced such acts as Tool, King Crimson, Peter Gabriel and Paul Oakenfold, and has en-

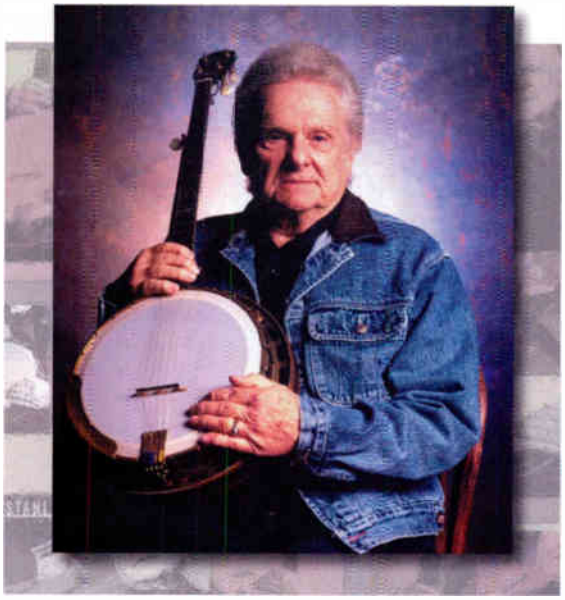
—CONTINUED ON PAGE 166

RALPH STANLEY

MAN OF CONSTANT SESSIONS

by Elianne Halbersberg

Ralph Stanley is known for his quiet demeanor. Of course, when you're a "man of constant sorrow," perhaps it's best to let the music do the talking, which is exactly what the legendary bluegrass and old-time singer does on his latest self-titled release. The project finds Stanley weaving his trademark voice around age-old traditionals and gospel songs in a stark, 11-track package produced by T Bone Burnett and recorded by his longtime engineer, Mike Piersante—the same team who worked on the multi-Platinum soundtrack album to *O Brother, Where Art Thou?*.



"That was the first time we ever worked together," says Stanley of the *O Brother* album, which showcased his distinctive wail on "O Death" and also featured a version of "Angel Band" from his days performing with his brother Carter. "And after that did good, T Bone said he'd like me to do a CD with him with a lot of old-time songs on it. So I told him okay, and he sent me a letter with [a list of] old-time songs and I picked out a lot of them for us to record. I really didn't know that much about [Burnett], but I knew he'd done a good job with *O Brother*, so I was willing to take his judgment on one for me."

Stanley and Burnett went into the project with a specific goal in mind: to reintroduce traditional songs, some over 300 years old, to a new audience—particularly the audience that snapped up copies of the *O Brother* soundtrack and packed venues on last year's Down From the Mountain tour, which Stanley closed every night.

"This particular album was all about live performance [in the studio]," says en-

—CONTINUED ON PAGE 168

World Radio History

JIMMY BUFFETT'S "MARGARITAVILLE"

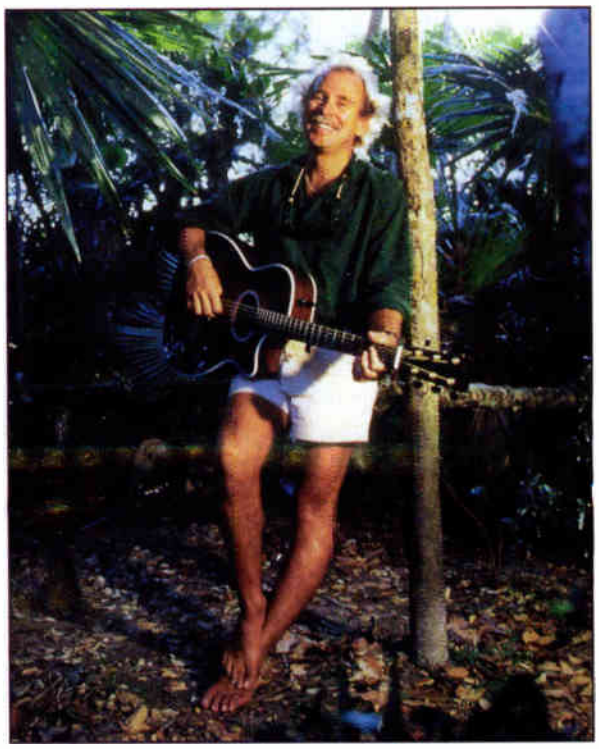
by Dan Daley

Few other songs have defined an artist, an era, a place in time and space, and an attitude like Jimmy Buffett's "Margaritaville." The song, released in January 1977, continues to be the national anthem for generations of college kids on spring break, burnt-out stockbrokers and wishful thinkers who long to leave careers behind and let their biggest worry be which beach to sleep on that night. Buffet himself has turned the song into a kind of theme park—the day-in-the-life-of-a-beach-bum chronicle has been the cornerstone of an empire that now includes bars, books, T-shirts and other "Parrot-head" paraphernalia always clearly in evidence at the Mardi Gras-like concerts that Buffett continues to sell out every year coast to coast.

Maybe Buffett had an inkling of what the song would come to mean for him and others. It took him several days to write, much longer than his usual musical gestation period. "He'd often write a song in the morning and we were recording it in the afternoon," recalls Norbert Putnam, producer for *Margaritaville* and several other Buffett albums, as well as a huge discography of other artists including Dan Fogelberg, Joan Baez and New Riders of the Purple Sage. "He had this one kicking around for a while. He'd tell me about it, that it was a day in his life, and I'm thinking, 'Oh, like The Beatles—'A Day In the Life.' I didn't know what to expect."

Putnam met Buffett in 1976 in Nashville, where Putnam and David Briggs, who had both traveled north from Muscle Shoals years earlier to become part of the city's '70s iteration of the A-team musicians, owned Quadrafonic Recording Studios. Quadrafonic had been a pop oasis in Nashville, hosting records for the likes of Linda Ronstadt and Paul Simon, allowing Putnam to establish his credentials as a pop producer with artists such as Joan Baez, whose "The Night They Drove Old Dixie Down" gave artist and producer their first Top 10 pop single.

Buffett migrated to Nashville in the 1960s to pursue a record deal. His second solo record earned him some notoriety for the song "Why Don't We Get Drunk," because



that title question continues in the chorus "...and screw"; a little extreme for Music Row tastes. By the early 1970s, Buffett was living in Key West, a place better suited to his personality and artistry, signed to ABC/Dunhill Records and working with his Coral Reefer Band. Putnam recalls that it was a label executive who suggested pairing him and Buffett, whom Putnam recalls having first met when the singer was working a second job as a freelancer, writing concert reviews for *Billboard* in Nashville. "He came into Quadrafonic to do an interview with Jerry Jeff Walker, I think," says Putnam. "He had been working with [producer] Don Gant in Nashville, and they kind of had a hit with 'Come Monday.' They made that in Nashville with Nashville session guys and The Jordanaires. But it wasn't who Jimmy really was. So one night, he approached me at Julian's [a legendary upscale Nashville watering hole during the era] and we talked. He said that the Coral Reefer Band was more like the Rolling Stones than the Grand Ole Opry, and after I went to a concert of his, I knew he was right. Actually, they were like the Stones on acid. They were playing 'Come Monday,' which was a ballad, with power rock chords."

Putnam decided that Miami's Criteria Studios was the place to bring Buffett, given the singer's proclivity for the seashore and the studio's elevated presence as home to the Bee Gees and records for Eric Clapton, The Eagles and many other top artists and producers. When they arrived, along with Buffett's band, in Miami that summer, Putnam and Buffett quickly agreed on a work schedule: In the studio at 11 a.m., work on whatever song Buffett had finished that morning, out at 5 p.m., head to Buffett's new 33-foot sailboat, pop in a cassette of the day's work and listen. "For that album, we were trying to get the rhythms and the vibe to match the rhythm of the ocean waves

World Radio History

against the boat," says Putnam. "Sounds crazy, but it was working. We were getting a vibe for the record."

What Putnam was less sure about was a single. He was pleased with Buffett's songs and liked his choice of covers, such as Steve Goodman's "Banana Republic," but he still hadn't heard the song that would put the album over the top. Then, during the second week of recording, Buffett walked into the large tracking room at Criteria and announced to Putnam that he had finished the day-in-the-life song. "It was called 'Margaritaville,' and I wasn't crazy about the title," says Putnam. "I was thinking that it had these sort of jazz-hipster overtones like 'coolsville' or something like that. But when he played it, me and the band knew instantly that *this* was the song. This was the single. This was it. It wasn't a song—it was a three-minute screenplay."

Putnam and engineer Marty Lewis recorded the track just as they had the others: drums, bass, guitars and keyboards all set up as an ensemble, with Buffett singing his lead vocals live into a Neumann U87. (Most of those live vocals were kept for the finished version, too.) The recording was through an MCI 500 Series console to an MCI JH-24 multitrack deck running at 30 ips and no noise reduction, because, as Putnam notes, "Marty really liked to push the tape a lot." However, Putnam, knowing how critical "Margaritaville" was to the project, felt that he wasn't getting the groove from the band drummer, Michael Gardner. He asked Kenny Buttrey, one of Nashville's premier session players, whom Putnam had ostensibly brought down to play percussion (but also as a backup in case just this kind of situation arose), to fill in on drums.

"Jimmy loved working with his own band and I understood and respected that," says Putnam. "But I knew I wanted a few seasoned session guys there, too. Road drummers almost never work as well with headphones as experienced studio guys." The switch assured that "Margaritaville" was nailed in three takes. Most of the musical moves on the track, such as Mike Utley's little clavichord filigree that sets up Buffett's first vocal entry, were made up on the spot. And there were few overdubs; Utley was surrounded by a grand piano, a clavichord and a Fender Rhodes electric piano, and switched between them on-the-fly, as he did in concert. "I would say that we had cut the track, virtually complete, within 30 minutes of Jimmy playing the song for us," says Putnam.

The tapes were taken back to Quadrafonic in Nashville for sweetening, fixing and mixing. Putnam and Utley wrote the string parts for the album's tracks, as well as "Margaritaville"'s flute and recorder parts played by Billy Puett using, as he recalls, a bottle of Cristal champagne as a muse. Several overdubs had also been done in Miami, such as a marimba on "Margaritaville"—part of Putnam's attempt to give Buffett a distinctive sound. "I was

Cool Spins

The Mix Staff Members Pick Their Current Favorites

***The Grant Green Retrospective* (Blue Note)**

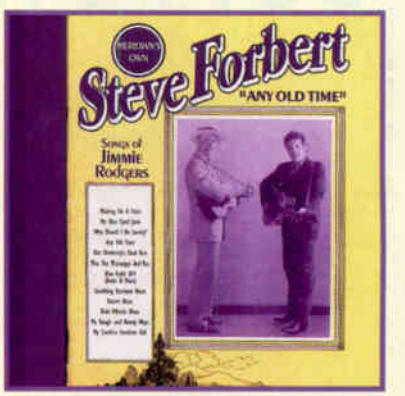
One of the truly underrated figures in jazz history, pioneering electric guitarist Grant Green (1931-1979) was a great technician *and* full of soul and imagination; for my money, he's much more exciting than contemporaries such as Wes Montgomery and Kenny Burrell. Though jazz was his idiom, Green was steeped in blues, which seeped into just about everything he played, whether it was a proto-funk outing with an organ trio or his take on pop and jazz standards. His adventurous approach to melody and his occasionally edgy tone made him a hero to some late '60s rock guitarists, and it's easy to see why: Green was ahead of his time. This fine four-CD set collects 39 tracks from Green's first stint as a leader (and sideman) at Blue Note Records, 1961-1964. The collection finds Green improvising in many different styles and settings and with some of the greatest players of that era, including organists Jack McDuff, Jimmy Smith and Larry Young; reed players such as Sam Rivers, Hank Mobley, Joe Henderson and Wayne Shorter; drummers Elvin Jones, Philly Joe Jones, Art Blakey and Billy Higgins; pianists Herbie Hancock, McCoy Tyner and Wynton Kelly; bassists Paul Chambers and Reggie Workman; and many more. My favorite of the discs (so far) is number 3, which includes romps through the jazz classics "'Round Midnight," "So What" and "My Favorite Things," a smoky reading of Don Gibson's country tear-jerker "I Can't Stop Loving You," a Latin take on Charlie Parker's "My Little Suede Shoes," the traditional gospel tunes "Joshua Fit the Battle of Jericho" and "Go Down Moses," and, best of all, an incredible workout on The Gershwins' "It Ain't Necessarily So." What an expansive range he had! Alas, Green was plagued by drug problems for much of his career and died in relative obscurity, having never quite captured the magic of these inspired (and commercially successful) early outings. A great set!

Compilation produced by Michael Cuscuna. Original producer: Alfred Lion. Engineer: Rudy Van Gelder. Studio: Van Gelder Studio (Englewood Cliffs, N.J.). Remastering engineer: Ron McMaster.

—Blair Jackson

Steve Forbert: *Any Old Time (Songs of Jimmie Rodgers)* (Koch Records)

The resurgence of Americana? The infatuation with bluegrass on the heels of *O Brother*? The reissue craze in old country? Any discussion of old-time music must include "The Singing Brakeman," by Jimmie Rodgers, who so seamlessly blended early 20th-century country, blues and pop styles



into a distinctive body of work that encompassed more than 100 songs. Nobody ever made us feel so good about feeling blue. There have been plenty of Rodgers tributes

—CONTINUED ON PAGE 170

World Radio History

trying to come up with the sounds that would define him, and all my ideas were all Hollywood clichés—marimbas, congas, a ship's bell. But you know what? They worked. It might have seemed a little corny, but that's what Jimmy was about: creating characters the same way Hollywood does."

There were a few vocal punches done at Quadrafonic by Buffett, but not on "Margaritaville," following Putnam's desire to keep the take's emotion dominant over an occasional pitch squib. Buffett did his harmony vocal overdubs there. To get around the singer's aversion to headphones, Putnam set up a pair of Big Red monitors loaded with 15-inch Altec speakers about a foot apart and just behind Buffett's ears. "It's an interesting trick," he says. "You can really have the singer feel like he hears it all perfectly without headphones but you have to place them carefully, and sometimes we'd put the bass out of phase to avoid that blowing back into the microphone." The vocal passed through an LA-2A compressor and little else in the way of processing.

The mix was also done at Quadrafonic, on the studio's MCI 500 Series console, which had an early version of MCI chief Jeep Harned's first automation system onboard. Putnam, like everyone else at the time, was fascinated by the prospect of automation. But he also missed the warmth of the studio's previous Quadrafonic 8 console. So he asked Paul Buff, then of Allison Research and forerunner to gate-maker Kepex, for advice. Buff suggested that a 1940s Bell Labs design for a transformerless mic pre might warm it up and still allow the automation to not affect transient response. The solution worked so well that Putnam says Harned incorporated it into future versions of the console.

The mix was done over Big Reds with Mastering Lab crossovers and loaded with Altec 604E speakers, which Putnam describes as "awful, but if you could make it sound good on those—and good was the best you'd ever get—then you knew it would sound great on record."

"Margaritaville" was a supririse hit in the spring of 1977, making it all the way to Number 8 on the *Billboard* Singles chart and propelling the *Changes In Latitudes, Changes In Attitudes* album to Number 12. When you factor in many compilation and live releases through the years, "Margaritaville" has now sold close to 50 million copies—not bad! But as Putnam noted, the song's longevity can be attributed to its accessible narrative as much as anything else: "As I've told Jimmy more than a few times, he and I made good records together, but we would have made even better movies." ■

WILCO'S SONIC ADVENTURE

FROM PAGE 158

made of cinder block—the same room they used to record the second *Mermaid Avenue* album. "We didn't really have any separation," says Chris Brickley, the group's engineer. "The basic tracks—drums, bass, guitars and vocals—were pretty much recorded in the same room. Jeff was in a little isolation-type booth, but it wasn't closed off to the rest of the room." Most takes were chosen based on how the band played as a whole, because it was difficult to re-record any one track due to leakage.

A particular challenge was that Tweedy liked to lay down his lead vocal

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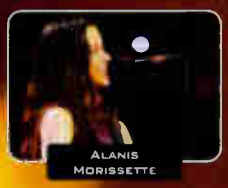
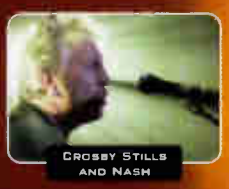
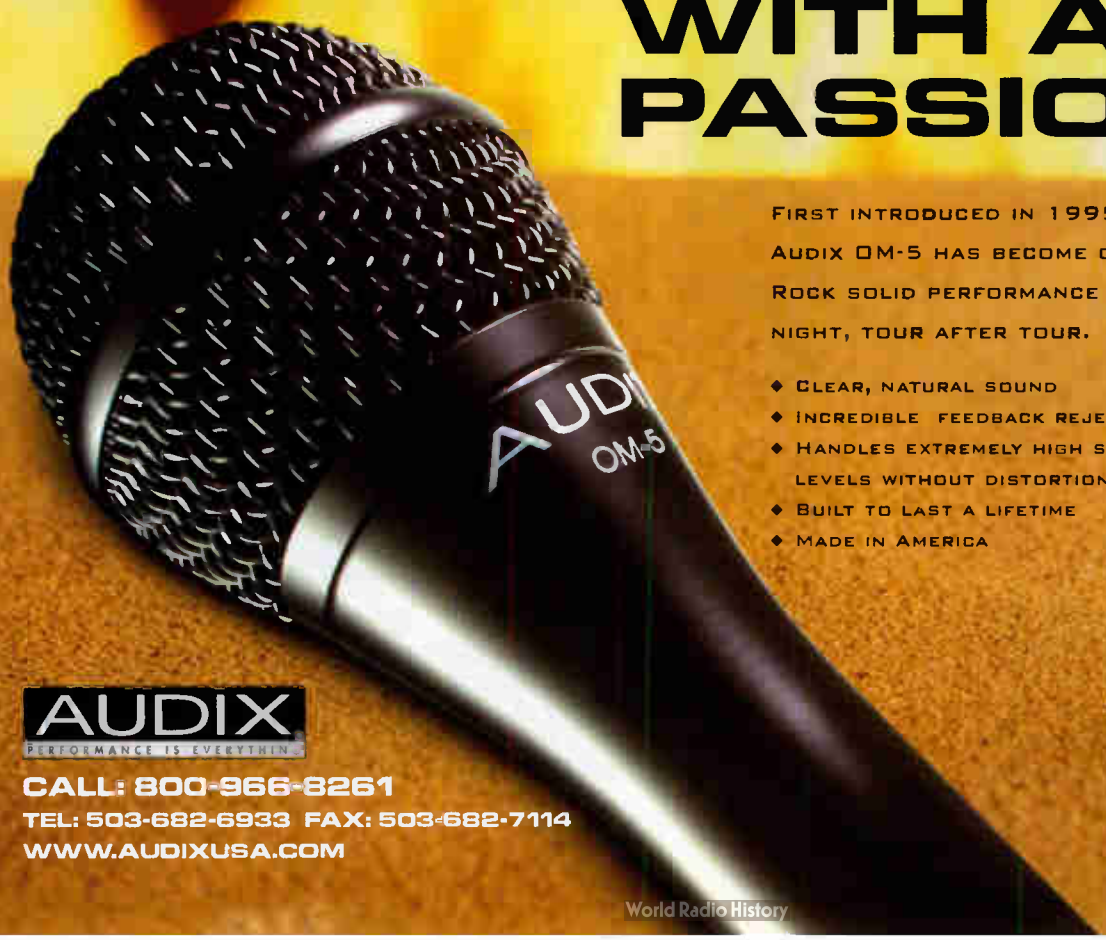




VOCALS WITH A PASSION



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while playing acoustic guitar and keep both tracks. Brickley's mic choices in this case came down to which would provide the highest rejection and therefore the least bleeding between tracks. "I used a lot of hypercardioids, like the [AKG] 414 and the Blue Mouse," Brickley says.

The album's unusual sonics gave Brickley a chance to be creative with mic choices, too. He explains that for some of the bizarre piano sounds, "We would use microphones ripped out of old tape recorders—nasty, cheesy condenser mics, almost like you'd find at a drive-through window. We'd combine those with a decent mic signal. A lot of times, we had a mic that ran to a Leslie speaker and we blended that in."

Brickley also had to deal with the fact that the studio lacked a separate control room. "It was the toughest gig I've ever done," Brickley admits. "I was using headphones. It was a lot of trial and error, a lot of listening back and adjusting until we got dialed in, because I really couldn't hear what was going to tape. Once we did [get dialed in], we were able to keep everything how it was, which was pretty reliable.

"I learned a lot of things from the obstacles at the loft," he continues. "We didn't have any EQ either. I learned a lot about microphone techniques—moving microphones to get what I was looking for—where usually I would just grab an EQ and kind of tweak it to where I wanted it."

Another surprise for an album with so many simultaneous sounds is that the band recorded mostly to 24-track analog tape. Given this track limitation, Brickley took a minimalist approach to drum miking, keeping them to six or eight tracks at most; he also miked the pianos in mono rather than stereo. The band did have an ADAT with an additional 24 tracks on it, but they were careful about when and how they used it. "We tried to stay away from ADATs—no drums, bass, vocals or guitar," Brickley says. "Maybe some Moog synthesizers or click tracks, things like that. It was such a difference between digital and analog."

A key contributor to the album's textures was Glen Kotche, who came in to replace departing drummer Ken Coomer. Kotche, also an instrument builder, added a host of never-before-heard sounds to *YHF*. On "Kamera," for instance, Kotche created a marimba-like sound from floor tiles. "He'd go to shops and play all of the floor tiles in the shop," says Jim O'Rourke, who mixed the album. "He'd tune them and build instruments out of that."

Kotche played on another track, "Radio Cure," a moody folk number that opens with a static-like white-noise sound behind Tweedy's vocal and acoustic guitar. The white noise, as it turns out, is actually Kotche playing his snare head. "He'll split the heads of his drums into different textures and has contact mics on them," O'Rourke explains. "Some of the filtering that sounds like it is going on is because he's got different textures on his snare head, and he's slowly moving from a darker texture—say, a triangle of sandpaper—to a lighter sandpaper."

O'Rourke also added some sounds to the album. On "Poor Places," Tweedy was unhappy with the piano on the opening section. To replace it, O'Rourke created a billowing, sitar-like drone by unorthodox means: "I took an electric guitar and strung it up with all of the same string. I went through [the section] and wrote down what chords it was. I would tune it to one note in one of the chords. Then I took a speaker coil, mounted a magnet to the back of the

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World Radio History

headstock and drove the coil with a really high-ohm/watt output amp so that the speaker would actually drive the body of the guitar. So whenever that note went by, the guitar would resonate. I did that with every note in every chord. That whole section is just resonating guitar."

"It was the best year-and-a-half I'd ever had in the studio," Brickley enthuses. "When you're not paying by the hour, you could try anybody's idea because what have you got to lose? So no ideas were ever shot down before they were done."

That process' byproduct, however, was a mix too dense to be usable. At this point, Tweedy called in O'Rourke, whose background in avant-garde tape music and work with bands like Sonic Youth and Stereolab made him a good match for *YHF*'s experimental textures. However, O'Rourke's job was not to increase the noise quotient, but rather to salvage the songs beneath the sounds. "Most people thought I added all of the noise on the album, but I was actually the one taking it all off," he explains.

Partly because they had so much recorded material, the mixing on *YHF* often involved radical restructuring or reshaping of the songs. According to O'Rourke, "Some of them really were from the ground up, completely new tracks, not based on the usual mentality of, 'Here's a song, mix it.' It was more like, 'Here's the source material. Make a song out of it.'" He and Tweedy moved parts of songs around, tried changing choruses to bridges and, in one instance, sang the verse of a song over the chords to the chorus.

O'Rourke used minimal outboard gear and effects to mix the album: "When sounds need to be changed, I prefer to do it with actual organic sounds." He did, however, have two essential pieces of outboard gear: a Manley Variable-Mu limiter/compressor and a Manley Massive Passive mastering EQ. "I call them the solid-gold machines," he says. "The Massive Passive shapes things the way you want it. It's very accurate, but it's musical. It doesn't sound surgical to me."

The final product, a combination of Wilco's live rock band sound and carefully sculpted textures of instruments and noise, reveals Tweedy's songs once again. The textures serve to heighten the emotional arc of Tweedy's lyrics instead of burying them. "That was one of the reasons Jeff got me involved," O'Rourke says. "He knew that my attitude is that the song is the most important thing, not the dressing on it." ■

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SILVERCHAIR

FROM PAGE 159

gineered and/or mixed for many others—Johns found someone who was open-minded enough to see what the songwriter was trying to do. "As soon as we started talking, straightaway I thought that this was the guy. I knew he could get things to sound amazing, because the things that he'd recorded always sounded brilliant," Johns says. "It was just a question of whether or not he was into the record and into what I was trying to do. As soon as I knew he was into it, I wanted him to do it because I knew that he makes things sound like gold."

Silverchair first leaped into the spotlight with their 1995 release *Frogstomp*, which was recorded when the trio—guitarist/singer Johns, bassist Chris Joannou, drummer Ben Gillies—were just 15 years old. Subsequent albums *Freak Show* and *Neon Ballroom* found the group mining similar alternative-rock territory. With *Diorama*, they've moved into a completely new realm, using strings and horns and more complex song structures; it's quite a radical shift. "I was more comfortable stretching that far than I would have been taking a small step," Johns says. "In order for me to regain my passion for what I did, I had to take that kind of step. It was a big step, but it was definitely the most enjoyment I've ever had writing music."

Bottrill was only vaguely familiar with Silverchair: When he got the initial call from the band's management, he went back to listen to their catalog. "I heard that they were moving forward, they were doing something different on every record," the producer says. When Bottrill and Johns met, the songwriter explained that he had a vision of where he wanted the album to go. "He was really experimenting with different instrumentation. It sounded like he wanted to do his *Pet Sounds* or his *Sgt. Pepper's* or something that was more experimental, really stretching his musical knowledge and his compositional capability."

Johns agrees that he took special care with song arrangements while he was writing. "I didn't want them to be arranged generically; I wanted something special and different about them," he says. "So there was a lot of time spent arranging them, and then David got to Australia and we polished them up. A lot of songs we didn't really change. That was also one of David's strengths: He didn't change things because he felt like he needed to put his stamp on them. He changed things when he felt like he could make it more exciting and make it better."

Of the album's 11 songs, Bottrill and Johns worked most on "Without You" and "The Greatest View." On "The Greatest View" sessions, Johns explains, "The way that I had it arranged was quite different from how it turned out. I knew the record company would gravitate toward that for the first single, but I didn't want it to be generic; I wanted it to be challenging. But I think I had too much trust that the melody would catch people. David came in and helped me arrange it in a way that was palatable, yet still different. Before, it wasn't palatable, but it was definitely different."

From Bottrill's seat, some of the songs were more realized than others were, but a major reconstruction was not needed throughout. "We nipped and tucked here and there and did a lot of pre-production work on tightening things up and rearranging melodic structure in a couple places," he says. "The songs are Daniel's; I'm not going to take any credit for songwriting. He writes the songs, we did a little arrangement work on them, and talked about instrumentation and how we were going to approach 'em."

Two songs weren't touched at all: "Tuna In the Brine" and "Across the Night." "We had a lot of discussions prior to working together, and he knew those songs were my babies and I didn't want them to be messed with," Johns explains. Bottrill didn't see anything to change in "Tuna": "That was pretty much arranged in its structure," he says. "That came straight out of Daniel's head. It's like a 'Bohemian Rhapsody' for him. He just had this thing in his head and he did it, and it's just amazing. I can't take any arrangement credit for that—it was all him." However, during the pre-production dates, Bottrill made tempo maps for the rhythm section in Pro Tools.

Once the preliminary ideas were worked out, the band and producer retired to Studios 301 in Sydney, Australia, where the bulk of the recording was done. Johns had one last mission before the sessions began. "It was really important for this record to have a really positive atmosphere in the studio, and everyone I chose to work on this record had to have an almost naive enthusiasm about them," he says. "I think that when you're recording something, the atmosphere in the room is also captured on the tape. If the intention of the record for me was to make a record that was uplifting and motivating,

World Radio History

then it needed to be a motivational, uplifting atmosphere in the room. I was constantly trying to keep the vibe up because there needed to be that enthusiastic approach to it in order to get the record to sound how I wanted it to sound."

The tracking sessions were recorded analog to a pair of Studer A800 24-tracks through Studio A's Neve 88R console with Encore Automation; then, it was transferred to Pro Tools for editing. "But these guys are good players, so I didn't need to do much nipping and tucking of their stuff," reports Bottrill.

Bottrill has a standard drum miking setup, which includes a Neumann 47 FET outside the kick and an AKG D-112 inside. "Then, I'll use a lot of dynamics on the toms, sometimes [Shure] 57s on top and [Sennheiser] 421s underneath, and mix them together," he says. "I like to make sure all of the cymbals are going, so I'll often use four mics on the cymbals and an extra on the ride. They are usually directional condensers." He also likes to put up a couple of big capsule room mics—a Neumann U87 or a U47—and run them through an SPL Transient Designer. "It gives me a big, boomy room sound," he explains. "So, if you need a section that is really kind of huge and kicking, you can just pull them up and away they go. It's super-compression. You can also make it quite tight and attack-y."

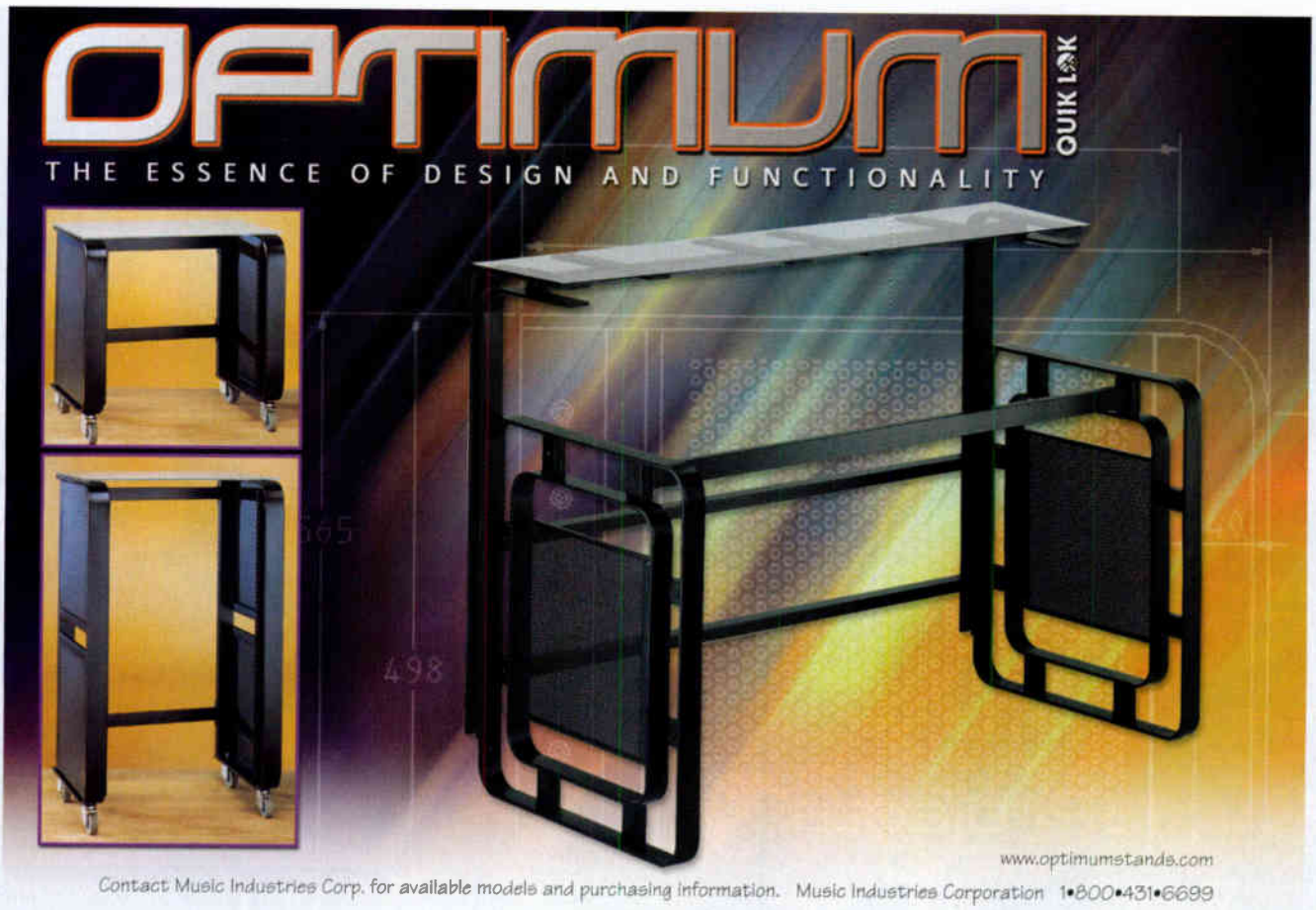
Johns' guitar setup and Joannou's bass rig were kept simple. Johns played through a Soldano amp into a Marshall 4x12, while Joannou used an Ampeg SVT and PortaFlex along with a DI. When Bottrill was looking for a grungier sound from the bass—as in the songs "Lever" and "One Way Mule"—Bottrill threw some Amp Farm across the DI.

The final sessions at Studios 301 were orchestral, with noted composer/arranger Van Dyke Parks. Johns, who composed the orchestral parts, is still shocked that Parks would lend his talents to the songs "Across the Night," "Tuna In the Brine" and "Luv Your Life." "When you've written a song and put so much work into it and you've got a vision in your head, and then someone like Van Dyke Parks comes in and is into it and really likes it, that is the ultimate compliment," he says. "We spoke about the three songs that he worked on and I told him the kind of feeling that I wanted and the kind of instrumentation that I wanted. He didn't change anything, he didn't alter the path of anything, but he definitely exceeded my expectations on every track."

Parks warned Johns and Bottrill that he might do too much in the way of orchestration, but that was fine with them, because it gave them more choices to work with. "If we used everything that he arranged, there was so much going on that you couldn't distinguish anything," Johns remembers. "So, we just had to pick what we thought were the most important moments and use those."

Parks originally sent over some rough MIDI mixes for Johns and Bottrill to work with. "We were trying to listen to all of the parts that he'd written as they were trying to record them, and I'd have to run in there and say, 'Okay, this part of this bar, we don't want this much movement from the cellos,' or something like that," Bottrill says. "It was a great experience, and it was a lot of fun. There's pictures with me and Van Dyke and Daniel pouring over the score and I felt like, 'Yeah, it's like Sinatra. I'm a real producer,'" he says with a laugh.

Like the tracking sessions for the basics, the orchestral dates were recorded



World Radio History

on tape, but to digital—a Sony 3348 48-track machine—and then dumped into Pro Tools for editing. Bottrill did some premixing in Pro Tools, but the album was ultimately mixed at Larrabee North Studios on an SSL 9000.

Diorama's final recording dates for vocals were done at Mangrove Recording Studios, owned by INXS bassist Gary Beers, a couple of hours north of Sydney. Bottrill did not do much treatment to the singer's tracks. "For the most part, it was really subtle delays and reverbs on the voice and really nice compression," Johns recalls. "I think on 'One Way Mule,' David put my voice through a SansAmp to give it that aggressive quality."

Johns and Bottrill completed *Diorama* with the same determination and purpose that characterized the initial writing sessions. "I knew the world that I wanted to create musically, and I knew that in order to create that accurately, I had to be there mentally," Johns explains. "I was really focused and my mind never strayed from that path. In order to feel good about myself, I knew that I had to prove to myself that I was more than what I've been in the past." ■

RALPH STANLEY

FROM PAGE 159

gineer Piersante, "not only sonically but from a musical standpoint. The gut feeling you get from the music, the players and playing live together.

"Mixing it was a lot of just balancing the instruments out and putting them at the right level. These musicians are used to performing on a single mic onstage, where the singer moves back and the guitarist moves up. We used this approach on the record. They were all together in the room: [Stanley] was right there and could reach out and touch the guitar and mandolin players."

The approach was a change of pace even for Stanley. "We were close together where we could hear each other, no monitors, and that's the way I did it when I first started recording," Stanley says. "A lot of us ganged around one mic, but now the studio has little rooms and one musician is in one room and a couple in another, and you need earphones to hear everybody. That's how I've recorded for the last several years. It was T Bone's idea to go back to basics."

Working on such a bare-bones project, says Piersante, "takes you to a new level because the less you record, the more important each individual thing becomes. Usually, if one thing is not stellar, you can bury or hide it under 20 other things. But when all you've got is six mics live, you've got to make sure that you're getting back what you need; otherwise, you're dead in the water."

The album was recorded at Sound Emporium in Nashville, which Piersante describes as "a great-sounding live room for acoustic instruments, one of the great rooms in the country." The project took a mere three weeks to cut, although, Stanley notes, "I have done an album in one day. T Bone takes his time. Where I'll go in, sing one song and I'm ready to do another, he takes a break and talks over the songs and arrangements."

"We took a couple of trips back to Nashville, a week at a time," says Piersante. "Maybe tried songs a few different ways with instrumentation and keys, got a master tape of that, and then it took five or six days to mix." In the end, they were looking for the best and most emotional performances rather than attempt to

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patch together songs from multiple takes.

"Producers nowadays want a lot of overdubs so that they can take a word or half of a word out," Stanley says. "The reason for that is, they might find a verse in the first cut and another verse in the fifth cut to match it with that's better than the original one. A record used to sound just like it did when you finished recording it. This record, that's pretty much the way we did it. The new way makes it easier on the artist, I guess, because instead of singing one song 10 times to get it every bit right, you can sing it three times and have enough words or verses to match up if needed."

That's not necessarily easy to do with a singer who admits, "I never sing [a song] the same twice. Maybe I do one verse and another and something different, and maybe they will match. I do my best to keep everybody on their toes. I just sing like Ralph Stanley, and I'm the only entertainer I know that does that and sings the way I feel. I'm a little bit further back, as I call it—back in time than most people. I couldn't be more further back than some of these songs, but nobody in the business has got the voice I have, or the crooks and turns and winding around that I do. That makes it harder for the engineer or another singer, but I did mostly solo on this one, with the exception of three songs."

In fact, Piersante found working with Stanley to be "fun, absolutely fun. We had a lot of great players doing what they do best, and it was great to be able to document the occasion."

Piersante is reticent to discuss specific equipment and recording techniques, noting, "I certainly have some favorites when it comes to gear, but nothing is absolutely necessary. Tube amps are integral, but not any specific kind. The same with ribbon mics. I experiment a lot and often don't do the same thing twice.

"On this album, ribbon mics were the key factor. The whole flavor of the thing boils down to beautiful music and great musicians in the environment that was created. We used a lot of outboard gear, good solid Class-A preamps, natural reverb. There's a Neve 81 Series board at Sound Emporium, but we didn't cut tracks through that as much as using outboard gear.

"Ribbon mics are great," he continues. "I love them because they sound very natural, and when you say that this album sounds like they just set up and played in your living room, that's the quality of great ribbon mics. The musicians found themselves a comfortable spot in the room. I have eight to 12 mics—Neumann tube mics, RCA ribbon mics. I line them up on the wall and the musicians come in and gravitate somewhere—in this case, a circle in the far back of the room in Sound Emporium—so I pulled a few mics over there, made a few minor adjustments and away they went.

"This room has a live echo chamber built into the wall of the studio, and a small door opens to access the mics you would put in for reverb. T Bone decided it was a nice, natural ambience, and he opened the door and I put a mic near the opening. That's the ambience you hear on the album—a natural room sound.

"On Ralph, we used 80-percent old-school ribbon mics. Our favorites, which would all have been involved, are API preamps, Neumann tubes and RCA mics. The reality is, it isn't so much what I do; it's what they do.

"These musicians were in a circle, each had a spot mic, and ribbon mics can turn so the sides face the musicians and they reject on the sides so much that you can get good separation without a lot of leak-

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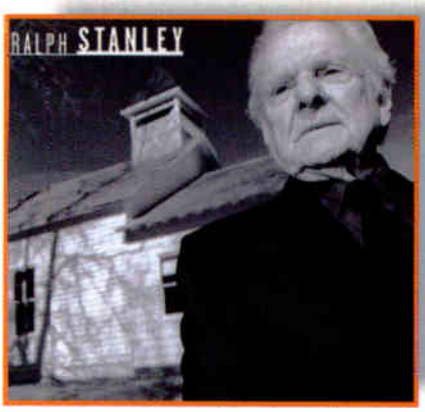
age. Everyone was facing each other, they could hear each other real well, and those kinds of players make your job easy—there's not a lot I have to do other than put a mic in front of them and hit the Record button. Ralph is standing at the point of the circle, facing them, so they can hear each other, and everyone got spot-miked at the right place and right distance. Technically, as long as the signal path is clean, you're ready to go."

The album was mixed at Sunset Sound in L.A. "Everything was cut to a Studer 827 2-inch machine to BASF 900 tape and mixed to an ATR 100 in Studio 1, where they have a custom console with API EQs that you won't find anywhere in the world," says Piersante. "It's a big thing to take someone's tracks to mix. You're getting the signature of that console, its sound imprint is on everything, and that's a big deal to me since it affects every track. That board is a one-of-a-kind and it doesn't get any better.

"A lot of people use half-inch [for mixing], but I've done a lot of blind listening tests and T Bone and I always pick the quarter-inch machine. It defies logic, but it sounds great."

With dozens of albums under his belt, making records could just be another routine part of the job for Ralph Stanley. But, in fact, he still enjoys the process, although it has changed considerably since the first time he walked into a studio. "I was scared to death when I made my first record," he says. "But now it doesn't bother me a bit. It's hard work getting everything down, but I don't mind." Factor in a couple hundred live dates per year, a six-year/six-album deal with Columbia, another project with Burnett in the works, his recent Grammy Award, a part in an upcoming movie, a Ralph Stanley museum on its way, coverage in every major magazine and many TV appearances, and it's obvious that Stanley is one busy guy. And at 75, the hippest cat on the block. Piersante admits that the biggest surprise about working with the man that *Newsweek* called "the mountain-music patriarch" is "his unbelievable stamina and enthusiasm for doing what he's been doing for so long."

Not long ago, Stanley remarked that he's "been through it all" in the music business. This, he says, is precisely what enables him to keep going. "I know what



it's all about and what to expect, and I don't know how many musicians today would have hung on if I hadn't hung on. I say I helped pave the road for them. They stepped into a good job, and I had to go through years of digging." ■

Cool Spins, *FROM PAGE 161*

over the years; one about five years back featured Dylan, Bono and other high-profile stars. In *Any Old Time*, however, we have a love poem performed by a single voice, and the intimacy and affection permeates the disc, right down to the spare, single-mic feel of the

World Radio History

recording. Steve Forbert, a native of Meridian, Miss., same as Rodgers, grew up with these songs, which shaped his development as a singer-songwriter. He combed the Rodgers archives and picked his 12 favorites; some selections are obvious, some are not. But you can't beat the opening foursome of "Waiting on a Train," "My Blue-Eyed Jane," "Why Should I Be Lonely?" and "Any Old Time." Then hang on for "My Rough and Rowdy Ways." Tremendous. Put the disc on Repeat.

Producers: Garry Tallent, Steve Forbert, Tim Coats. Engineers: Tim Coats. Studio: Moondog Music Studio (Nashville). Mastering: Robby Turner/Turner Up Recording (Hermitage, Tenn.).

—Tom Kenny

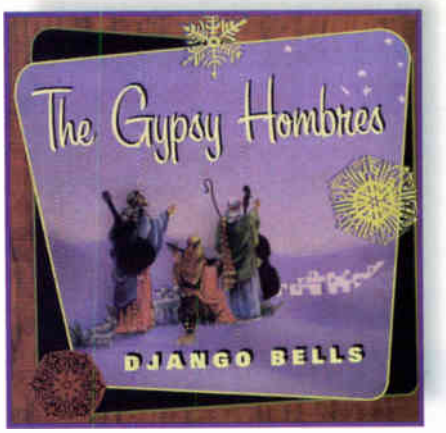
Jackson Browne: *The Naked Ride Home* (Elektra)

In his younger days, Jackson Browne was what you might call an "old soul": wise beyond his years and loaded with the sorts of insights and perspectives that usually come with age. Remarkably, now that he is well into his middle age, his basic themes and world view have not really changed at all, only broadened. His "relationship" songs alternately glow with the

promise and wonder of blooming love or the painful recognition of hearts irrevocably moving away from each other. The realities and responsibilities of adulthood trample our youthful innocence and exuberance. As a society, we've traded the optimistic glow of the '60s for selfishness and cynicism. The voice is undiminished by the years, and the musical settings for Browne's poetic musings will sound familiar: a couple of rockers, lots of mid-tempo ballads, some reggae and R&B flashes; at this point, his is a very particular and distinctive oeuvre, still warm and inviting, even as it speaks of uncertainty, disillusionment and moral indecision. Browne has assembled a highly versatile band for this outing—including guitarist Mark Goldenberg, keyboardist Jeff Young, drummer Mauricio Litwack and bassist Kevin McCormick—and they effortlessly navigate through the many styles that Browne tackles in his songs. My experience with his songs is that different ones speak to me at different times through the years; in the first few listenings here, the ones that grabbed me the most are the moody title track, the rockin' "The Night Inside Me," the introspective "About My Imagination," and the real stand-out, "Don't You Want to Be There," which finds Browne still asking the Big Questions of himself and all of us. Wonderful sonics, great arrangements; this is definitely top-drawer Jackson Browne.

Producers: Jackson Browne, Kevin McCormick. Tracking engineer: Paul Dieter. Mix engineer: Bob Clearmountain. Studio: Groove Masters (Santa Monica, Calif.). Mastering: Bob Ludwig (Gateway Mastering, Portland, Maine).

—Blair Jackson



The Gypsy Hombres: *Django Bells* (Memphis International)

Well, there are Christmas records in every other musical genre, so why not the gypsy jazz of Django Reinhardt and company? This doesn't *exactly* sound like the reincarnation of Django and Stephane Grappelli, but it's definitely a kick to hear guitarist Justin Thompson, violinist (and mandolinist and accordionist) Peter Hyrka and bassist David Spicher breeze through 10 holiday favorites in the style of the Quintet of the Hot Club of France. There's some wonderful, jazzy jamming on this disc, and the arrangements, by and large, are fresh and inventive—are you ready for "Rudolph the Red-Nosed Reindeer" done as a gypsy tango? I'm not sure the world needed this version of "You're a Mean One, Mr. Grinch," but the rest of the tunes are handled with deftness and spirit. Besides, how often is *every* present you get at Christmas worth keeping? A charming addition to your holiday music library.

Producer: Peter Hyrka. Engineer: David Spicher. Studio: The Fiddle House (Nashville).

—Blair Jackson ■

World Radio History

L.A. GRAPEVINE

by Maureen Droney

ARTISTdirect Records, spawned as a cutting-edge Internet company, has morphed into an ambitious and innovative bricks-and-mortar business, as well. Some industry heavy hitters have come onboard at AdR; working out of the company's Miracle Mile offices, along with ARTISTdirect founder Marc Geiger, are Ted Field, co-founder of Interscope Records, respected A&R man Tony Berg (Virgin, Geffen) and Mary Hogan, former senior director of A&R administration for Virgin Records L.A. After a tour of the company's offices and its new recording studio, I sat down for chats with Berg and Geiger to get the scoop.

PHOTO: MAUREEN DRONEY

Musician/producer John Fields inside his studio. *See page 176.*

"What's going on here? I wish there was a simple response to that," laughs Berg, who garners some of his unique A&R viewpoint from his skill as a musician and producer. "ARTISTdirect began as an Internet-oriented company, and many people still have that perception of it. But what it is now, first and foremost, is Ted Fields' independent record company, distributed by BMG. Ted's previous experience in starting Interscope clearly signals what the ambitions are for this label: a varied roster that's on the cutting-edge side of what's commercial. That's Ted's orientation, and I think his signings and hirings manifest that. The mission here is to find young artists who speak with an original point of view and get them out to a broad audience."

Besides the main ARTISTdirect label, whose roster already includes Badly Drawn Boy, Custom, Poverty and Mellowdrone, there are two additional imprints under the company's umbrella, iMUSIC and Ineffable. "iMUSIC is a different contract model," Berg explains. "It's more of a joint venture between the company and the artists, where projects can be done as a 'one-off.' On iMUSIC, we have John Doe, Berlin, Tre Hardson from the Pharcyde—obviously, it's another very diverse roster. With Ineffable, I've been given the opportunity to start my own imprint. Ineffable's contract model closely resembles iMUSIC's, but there's an added plus in that we're building a co-op situation: Each artist on Ineffable participates in the profits of everyone's records, with the goal of building camaraderie and a community of musicians."

"iMUSIC's philosophy is dictated by criteria that includes sales, track history,

—CONTINUED ON PAGE 176

NASHVILLE SKYLINE

by Rick Clark

During the past year, it's become clear that certain major labels on Music Row are taking more of a chance on new production talent, and many of the resulting projects have become "bona-fied" (as they say in *O Brother, Where Art Thou?*) successes. In fact, six labels (Universal South, Lyric Street, Mercury, RCA, Capitol and Arista) have benefited greatly from stepping out and rolling the dice with new or unproven producers. Over the next couple of months, we will hear from these producers and the labels that worked with them.

Several of the biggest country music success stories this past year have been on Disney's Lyric Street label, including Aaron Tippin, Kevin Denny and, most notably, Rascal Flatts. All of these were with first-time major-label producers.

Doug Howard, Lyric Street's senior VP of A&R, remembers what it was like to start out doing entry-level gigs and the importance of having someone give him a chance. When Howard left his gig as VP and general manager of Polygram Music Nashville to help Lyric Street president Randy Goodman get the label up and running, they felt it was important to marry artists with production talent that was fresh with ideas and hungry to do whatever necessary to make a project work.

"In the same manner that someone hired me at a publishing company and gave me a job as a plugger and provided me the opportunity to prove myself, I really feel that when someone walks in the door with a viable act they've been developing, they deserve that first shot, unless they prove to me that they just can't do it," says Howard. "I think with that comes a loyalty, a hunger and a work ethic. I've felt that so many of the new producers, in trying to establish themselves, are hungry. They see an opportunity, and they really step up to the plate."

Rascal Flatts, which was developed by accomplished session engineer Marty Williams and co-produced by Williams

World Radio History

and Mark Bright, went Platinum with their self-titled debut album and generated multiple hits ("Prayin' for Daylight" and "This Everyday Love"), while their latest album, *Melt*, has gone to the top of the charts. The first single, "These Days," peaked at Number 2.

Prior to Rascal Flatts, Williams had never produced a project for a label, but his instinct and willingness to initially develop the band on his own paid off. Bright, on the other hand, scored big as producer for Blackhawk's big records a few years ago, and his experience helped Williams with some of the production gig's nuances.

"After about nine months of working with the band, I decided I wanted to bring in Mark Bright, who was my publishing partner and who I had been engineering for a lot in the past," says Williams. "Mark worked through Tim Dubois getting Blackhawk signed and getting those records out, so I was really appreciative of his leadership role, showing me the ropes about how to interact

—CONTINUED ON PAGE 179

NEW YORK METRO

by Paul Verna

Tommy Uzzo is the first to admit that times have been hard for recording studios. As the principal owner of Mirror Image Recorders—a four-room complex with three locations in the New York metro area—Uzzo wishes that he could turn back the clock to a time when artists did all of their recording in commercial facilities and labels were willing to pay studios' rates. However, Uzzo refuses to join the chorus of doomsayers who think the studio industry itself is on the verge of extinction.

"Ever since I've been doing this, there's always been some hot new product that you could have in your bedroom that's going to put every recording studio out of business," says Uzzo. "Obviously, that hasn't happened, and I don't think it's going to happen. We offer things that you can't get at home, like great recording spaces, maintenance and the best equipment. Most of our clients are looking for that last five percent or 10 percent in the recording quality of their projects, which you can only get from an SSL console; you just can't do it with a little internal mixer in your computer. As great a tool as it is, a personal workstation has its limitations."

Uzzo may walk and talk like a big-studio owner, but he hasn't forgotten his own humble

—CONTINUED ON PAGE 180

PHOTO BY DAVE KING

Studio owner/engineer Tommy Uzzo (left) and studio manager Amy Serrago inside Mirror Image Recorders' Studio D.

PHOTO: CHRIS ASHBURN

L-R: engineer Derek Bason, artist Brian McComas and producer Leigh Reynolds inside Lyric Street.

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SESSIONS & STUDIO NEWS

SOUTHWEST

Joe Sample recently stopped in at SugarHill Recording Studios (Houston) to work with independent engineer Paul Mitchell. Sample was in to track material for his new band called Creole Joe. Staff engineers Steve Christensen and John Griffin were utilized as second engineers. Also at

Joe Sample cooks up some Creole Joe inside Sugar Hill. (L-R) Keith Frank, Brian Jack, Sample and Yvanne Washington (seated).

Sugarhill, Texas band Joseph Miranda & The Wildcatters were with engineer Christensen on a new CD entitled *Straight Ahead*. Miranda also produced the project. Guest musicians included saxophonist Bobby Keys (Rolling Stones), guitarist David Holt (Storyville), pianist Riley Osbourne and San Antonio's West Side Horns.

NORTHEAST

Producer/engineer Bob Power has been busy at Sony Music Studios (NYC), where he was producing and mixing Warner Bros.' artist Bonnie McKee.

SOUTHEAST

Curb Records artist Presence recently finished mixing their next release with producer/engineer Michael Barbiero at Ardent Studios (Memphis, TN).

NORTHWEST

San Francisco act Ing recently completed a new full-length release at The Plant Studios (Sausalito, CA). The band shared production duties with engineer Justin Phelps. Andy Chapman worked as the pre-production engineer, and house engineer April Itzaina assisted the sessions.

SOUTHERN CALIFORNIA

Phil Collins teamed up with engineer Allen Sides and producer Rob Cavallo for his latest album, *Testify*. Much of the new record was cut at Record One Recording Studios (Los Angeles). Sides also remixed several classic Collins albums for possible 5.1 releases.

Genesis who? (L-R) Producer Rob Cavallo, Phil Collins and engineer Allen Sides during the sessions for Testify.

STUDIO NEWS

Sony Music Studios (NYC) has upgraded Studio B with the installation of an 84-channel Neve 88R analog console. The room will be available for surround mixing, music recording and feature film mixing...Last fall, Glenwood Place Studios (Burbank, CA) upgraded one of its rooms with the installation of a 68-channel custom Neve 8068 MKII. The board had received an extensive retrofit and will eventually be paired with a new Pro Tools|HD rig. ■

Please submit your sessions and studio news for "Coast to Coast" to Robert Hanson. Submissions can be sent via e-mail to RHanson@primediabusiness.com. Photo submissions (JPEG at 300 dpi) are always encouraged, and please include the name(s) of the artists, producers and engineers on the project, and the location of the studio.

San Froncisca's Ing stapped in at The Plant Studios' Studia B. Back row, L-R: engineer Andy Chapman, guitarist Mark Smotroff, drummer Liam Hart and bassist Ty Gerhardt. Front row, L-R: assistant engineer April Itzaina, engineer/co-producer Justin Phelps and vocalist Sean Mylett.

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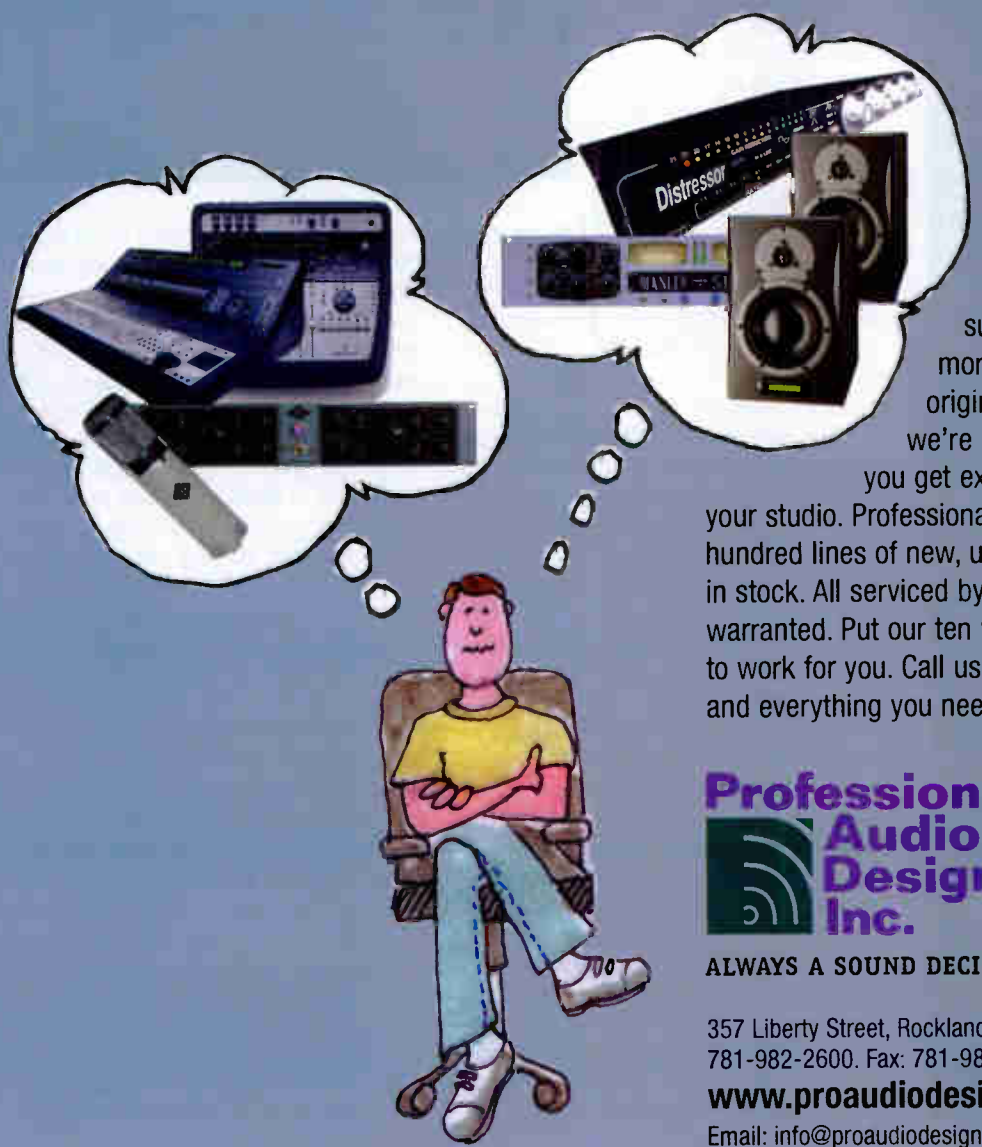

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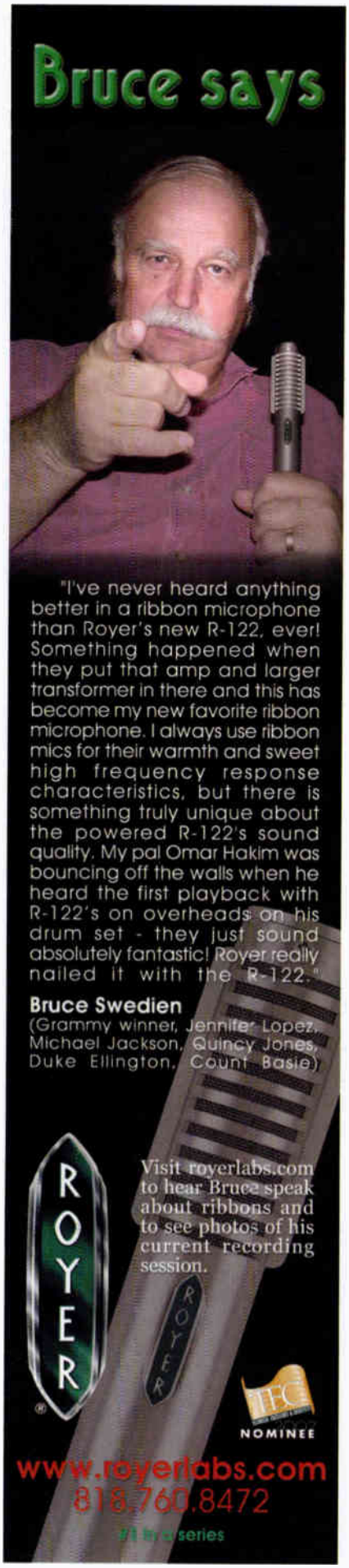

L.A. GRAPEVINE FROM PAGE 172

touring ability and strength of brand, rather than by any specific music identity," adds Geiger. "It's A&R agnostic. It's a platform that includes distribution, marketing and a little bit of finance for established acts who know they can sell a certain amount of records."

ARTISTdirect's studio, dubbed Spot, as in "my dog Spot," is on a floor above the offices with its own separate entrance, and is available to outside clients. It's outfitted with a Frank Dimedio-modified API console that started life at Wally Heider Studios and for the past few years was owned by producer Tom Rothrock, who used it on projects for Beck and Elliot Smith.

Originally built as a soundstage for E Television, the studio features a good-sized live room, complete with stage and backdrops, and, according to Berg, has "accidentally" excellent acoustics. The TV lighting grid and fixtures remain, so the facility can double as a video-shooting stage. It's already been the site of numerous fan conferences (interview, fan call-in and performance sessions) for such acts as Metallica, Cher, No Doubt and Incubus.

"The ultimate goal," states Berg, "is to have a recording studio conducive to both audio and visuals. I'm more interested in combining old and new technologies than I am in building a state-of-the-art studio. What attracts me is the combination of vintage mics, API mic pre's and Pro Tools|HD. I like the coloration and character of vintage gear mixed with the relative neutrality of digital.

"However, it's not about having the perfect U47 or the perfect 1176. It's all down to talent and taste and what you do with what you've got. That said," Berg adds with a laugh, "it is nice to have that right 47 or 1176, or whatever. We've got a lot of good equipment. But mainly, the ARTISTdirect studio is just a good creative environment, with the advantage that it's still equipped for filming."

Geiger, whose diverse background includes stints as a concert promoter, talent agent, record company exec, computer geek and, of course, Internet pioneer, obviously brings a wealth of knowledge about online issues to the business. The ARTISTdirect Internet site (www.artistdirectrecords.com), which he started six years ago, was envisioned as a direct link between artists and consumers. The site continues to operate as its own entity, promoting and selling music and music merchandise. "Actually, since everyone else went out of business, our traffic is up 45 percent," says Geiger, "But it's a promotional site, a music-information resource.

"Everything I predicted 10 years ago, and shaped in the original incarnation of ARTISTdirect, is, in a macro sense, totally right," he continues. "In any kind of business or micro sense, it's completely up the creek. The current bottom line is that it's impossible to build a business in an illegal market, no matter how huge the consumer demand. It's like sex and drugs: You can buy all of the ancillaries to do them, but you can't buy the product. There's a huge consumer demand for digital music. You can buy iPODs, burners, blanks—you name it. But with everything—from artists' rights to advertising to doing efficient transactions—you're trying to do business with two hands behind your back while standing on quicksand. In my opinion, it's impossible for anybody, at this point, to be successful [making money solely on the Internet], no matter how much traffic they have. At ARTISTdirect, we're not casting around for how to make that work. We've made one big jump: to do what we want to do with a new business model."

It's hard to keep up with musician/producer John Fields. Since he transplant-

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ed to L.A. from that bastion of bands known as Minneapolis, Fields has been juggling a plethora of projects. From producing albums for Switchfoot and Bleu, to co-producing an album for Andrew W.K., to mixing tracks for new acts such as Mackenzie B.C. and Lillix, to recording and mixing for Puffy Amiyumi in Japan with producer Andy Sturmer and playing live with a variety of side projects, it's been pretty much nonstop. I caught up with him at his home studio, in a guitar-filled, 1920s-vintage Hollywood cottage, the day after he'd returned from Minneapolis, where he was recording tracks for an upcoming Mandy Moore album.

If there's a common denominator in Fields' work, it's his band orientation; a player's point of view underscores all of his productions. "I like playing live, I like jamming, all that stuff," he says. "I'm a band guy, not a computer guy—well, actually, I *am* a geeky computer guy also. My roles change depending on the project. But I'm definitely not just a gearhead. I'm not a 'four days for drum sounds' kind of guy. I'm into productivity, working fast and making sure, each day, that everyone feels like we're moving forward. Since I come from the background of never having any money for projects, I've always felt on the band's side when it comes to making budget decisions. Rather than, 'Let's stay at a five-star hotel,' I'm like, 'Why don't you guys sleep at my house, save the money and then we'll be able to get a string quartet.' I'm working with bigger budgets now, but I still feel that way about what's important."

In keeping with that, Fields juggles a diverse roster of recording environments, from Pro Tools in the basement of neighbor Matt Mahaffey (of the band Self) to trading digital files with long-distance collaborators like drummer Jordan Zadorozny, based four hours north of Montreal. "He's got a high-speed Internet connection," Fields explains, "so I send him an MP3 of the song and give him some direction. He lays down a drum track and sends it back to me as an MP3. Once I agree that it's great, he sends me the multitracks at 33 megs. It takes an hour or two, but it's full-fi, full-level, as good as if he gave me a CD of it.

"A lot of the people I work with are friends who are all on an Internet server where we each have a drop box. I'll have people in New York City play guitar solos and send them to me. I like that method: letting people work at home in their own environment. This afternoon, I needed a tambourine track. My friend Dorian is doing it right now; he'll e-mail it over when he's finished. I still love working with bands live in the studio; for me, either way is cool."

Vocals are often done at the cottage. Fields favors an Audio-Technica 4060 tube mic with API, Avalon or Neve preamps, along with a Distressor for compression. Other gear includes a '70s Sansui home-stereo spring reverb and an Ibanez analog delay, "made in about 1980. It's definitely part of my sound. I print vocals through it for slappy, regenerative kinds of things, then print it back to Pro Tools."

Other favorites: The "Richard Dodd trick"—a Dolby 361 with Cat 22 cards for vocal processing: "A little on lead vocal," and a MicroKorg with built-in Vocoder and "Burger King" mic. You get the feeling Fields would be bored if his life didn't include so many different kinds of projects. "It's true," he admits. "I can't stand doing all of the same kind of work. Album projects are awesome, but they can take months. Sometimes, it's nice to do a couple of songs in a week."

Not much chance of being bored. Fields is off to Australia to work with Delta Goodrem, then on to Japan for

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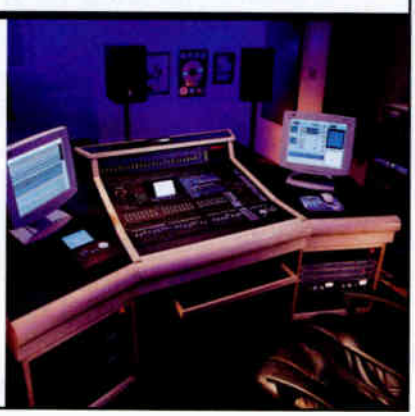


World Radio History

more cuts with Sturmer and Puffy—the "super-hipster Tokyo ladies." Then there are those frequent trips back to Minneapolis. "It was great to live there," he says. "The talent base of musicians is unbelievable. What's great about Minneapolis is that there are lots of good musicians just playing, not thinking about making it. If you're a bass player, you can get a gig every night. Not every band in Minneapolis is great, but the fact that they are out doing it is great. They're not getting shut down by people saying, 'You're no good, your lead singer is too fat,' those kind of comments. And they're making records on their own. It's like a dose of reality to go there. But I feel really positive about being in L.A. Right now, I'm living in Hollywood and loving it." ■

Got L.A. news? E-mail MsMDK@aol.com.

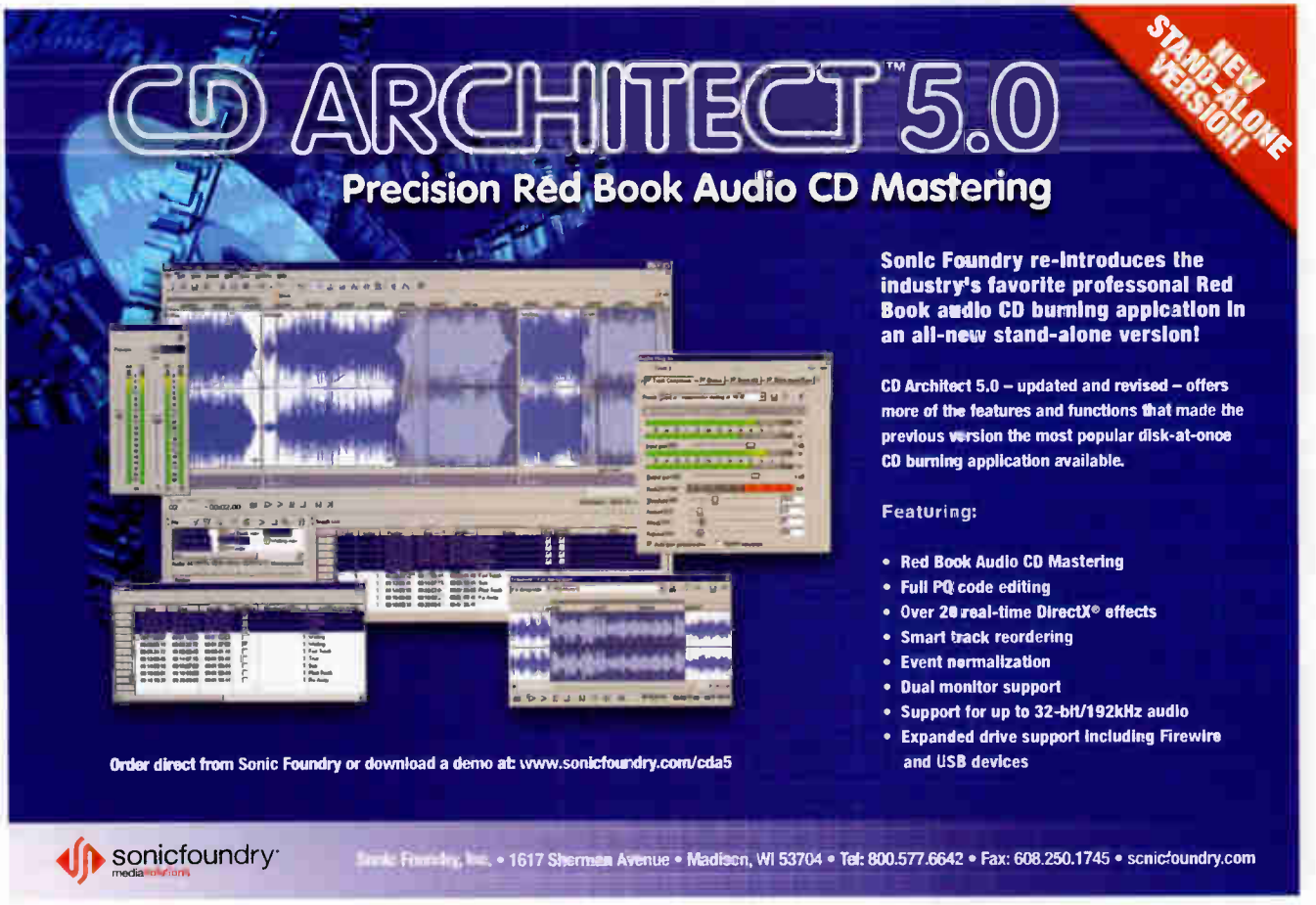
Producer/engineer Michael Barbiero (Mick Jagger, Guns 'N Roses) recently mixed the new album by Curb Records' Presence at Ardent Studios in Memphis. (L-R) producer Paul Ebersold, Nick Wells, Dan Fulmer, DJ Stange, Barbiero, engineer Skidd Mills and Jay Slim.

NASHVILLE SKYLINE *FROM PAGE 173*

with record labels as a producer."

For Williams, whose previous project perspective has been that of an engineer, the responsibility of producing has taken on a new meaning. "I think producing is a lot harder work than a lot of people who don't do it think it is," he says. "There's a lot of down-in-the-grind kind of work, working with budgets and picking out the right songs. I really have learned to appreciate great writers and songs much more."

Biff Watson has long been one of Nashville's top A-list acoustic guitar session players. Lyric Street gave Watson a crack at producing Aaron Tippin and the result was the Number One smash, "Kiss This," which he co-produced with engi-



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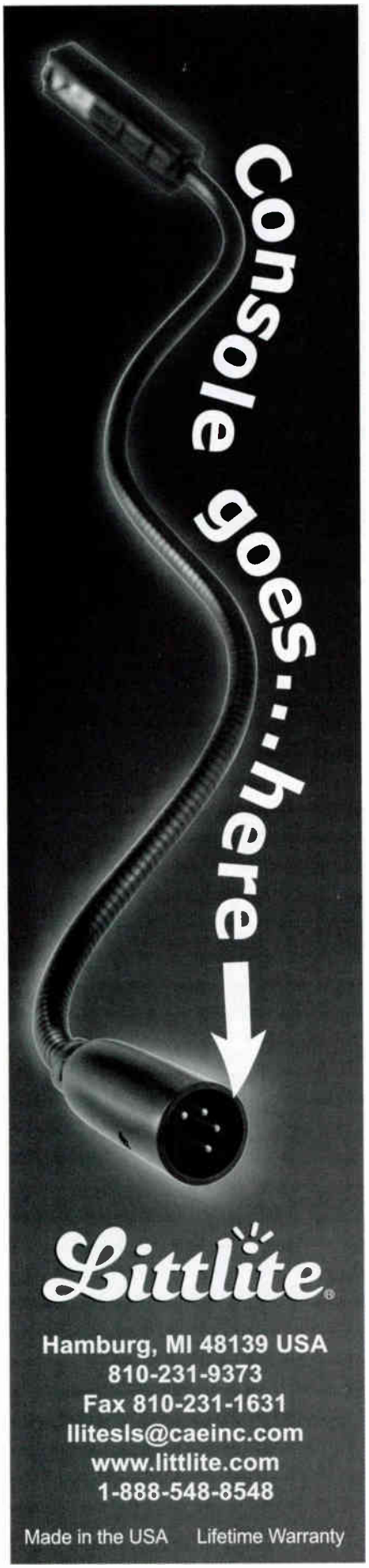

neer Mike Bradley. "I had played on most of Aaron's albums," Watson says. "I had expressed my real desire to get into production full time to him, and he obviously took it back to the label. I'm really happy that happened.

"I was going more with just my gut about how the album and that particular song needed to sound," he continues. "I knew Aaron was so country to begin with that we could rock up a track and the country essence of it was still going to come through. I had in my mind a Springsteen/Mellancamp-ish kind of approach on Aaron. I also wanted to bring him down from that higher vocal register that he had been doing in the past and getting down to more of the meat of his voice, which we accomplished.

"Mike [Bradley] is a great engineer, and he has a good sense of song, as well. I've worked with him quite a bit as a player in the studio, and we always have had a good rapport with each other."

Watson is already working with Lyric Street on more projects, including Sonya Isaacs and the brother/sister team Joshua and Shi-anne.

Leigh Reynolds worked on the road with Connie Smith and Reba McEntire, as well as working for years doing sessions. Reynolds initially got interested in production while he was with McEntire back in the late '70s. But it wasn't until recently that Reynolds finally got his production break with an artist named Kevin Denny. Denny's debut CD has earned critical raves and commercial success, even yielding a couple of hit singles ("That's Just Jesse" and "Cadillac Tears").

Reynolds happened upon Denny about three years ago at a singer/songwriter "guitar pull" that took place in a friend's barn outside of Nashville. "I heard him sing about eight bars and I was on the floor," he says. "It was like, 'My God, where did you come from?' And the thing that really nails me with Kevin is that there was so much heart and soul. That night, I said to him, 'Man, if you want to go after this, trust me and I won't stop until we're there.' And that's kind of where it started."

As a result of Denny's success, Lyric Street signed Reynolds to produce another new artist, Brian McComas.

"I started trying to produce just a few years after I got to Nashville, but it was a slow go," says Reynolds. "People say that Nashville is a tight club, but I don't think that anyone is shutting a door, as much as everyone has their blinders on just trying to do their best work. People have families to take care of, and you find yourself reaching a point in this business where you let work consume you, and all of a sudden, you're never looking up—you're just working. Meanwhile, labels get comfortable with certain producers, just like certain producers get comfortable with certain engineers and musicians. I think it's just a process that happens."

Doug Howard knows that Nashville is full of talented people who could do great things if given a chance, and so far, his instincts about creating opportunities for new producers have paid off beautifully. One experience that fueled his resolve in that area happened while he was running Polygram Music in Nashville.

"I had a couple of experiences where a record was made and when I talked to the artist after the fact, I said, 'Not to butt in, but this really doesn't sound like it was inspired.' This artist said, 'Well, it really wasn't.' I said, 'Well, what exactly happened?' And the artist said that the guy who was involved producing the record basically slept through half of the tracking sessions and, at one point, when the artist made a suggestion, the producer hit the talkback button and said, 'How many records have you made? Maybe you need to read my bio. Why don't you stay out there and do what you do and let me do what I do.' It was the artist's first record and it totally broke his heart. From that point on, it didn't feel like it was his record anymore. That made such an impression on me that when I got here at Lyric Street, I said, 'This is not how it is going to be done. This is not why I came to Nashville.'" ■

Send your Nashville news to MrBlurge@aol.com.

NEW YORK METRO FROM PAGE 173

roots. A bassist and recording engineer, he opened his first Mirror Image studio in 1978 in his garage in Huntington, N.Y., with a Teac 3340 4-track and a Tapco mixer. Guided by his ears and his mixing talent, Uzzo gravitated toward dance music and Latin freestyle in the early '80s, scoring hits with Monet and George Lamond. His success as both an engineer and studio owner allowed him to upgrade his facility, and by 1989, he had installed an SSL E Series console—among the first on Long Island—and other top-notch gear.

The next wave of success for Uzzo and his studio occurred in 1994, when a fledgling hip hop artist named Erick Sermon

World Radio History

walked through the door. Uzzo recalls, "He came in, looked around, and said, 'Are you guys free tomorrow?' And he never really left. For a long time, he was booking a couple hundred days a year. Now, it's a little more diverse. He's got a home setup and he usually comes in to mix." If Sermon delivered a motherlode of his own business to Mirror Image, his referrals were equally valuable to the studio. "Eric brought many of our biggest clients to us," says Uzzo, citing Redman, Keith Murray and Rockwilder (of *Moulin Rouge* fame).

Mirror Image house engineer/facilities manager Mike Hogan (left) and artist/producer Erick Sermon take a break from tracking Sermon's new album inside Studio D.

By 1996, Uzzo's Long Island neighbors began complaining. It seemed time to move on to bigger and better digs, and the city was the next logical place. Uzzo found space at the historic Film Center building, where he built Studio B, a Francis Manzella-designed space that features an SSL 4048 G+ console with Total Recall, Studer A827 recorders and Hot House monitors.

The move to Manhattan was so successful that Uzzo quickly needed to expand the facility. He lucked into the old Hit Factory Times Square space on 42nd Street and built Mirror Image Studios C and D.

In the control room, Studio C—which opened in January 1998—features a similar setup to the Film Center room: an SSL 4056 G with Total Recall, Studer A820s and Hot House speakers. However, Studio C's biggest selling point is its huge tracking space, which can accommodate up to 60 musicians and has recently hosted film scoring and jingle dates. Mirror Image engineer/facility manager Mike Hogan jokes that, despite Studio C's enormous size, it is often booked by clients who amass all of their MIDI and computer gear in one of the iso booths and use the large tracking area as "common space."

Recently, Mirror Image opened a second room at Times Square, Studio D, which is now its flagship mixing suite, equipped with an SSL 9080 J with Total Recall and Ultimation, Studer A800s and a museum-worthy collection of vintage instruments and guitar amps.

All three of Mirror Image's Manhattan rooms feature Ampex and Otari half-inch mastering decks and Power Macintoshes with Pro Tools MIXPlus, Mix3 and HD systems. Although Mirror Image's original location in Long Island, Studio A is no longer open to commercial clients, Uzzo still uses it for MIDI production work.

A look inside Mirror Image Recorders' Studio D, which features a 64-channel SSL 9000 J console.

Despite a tough economic climate for commercial facilities, Mirror Image is holding its own, servicing its core clients and acquiring new ones on a steady basis. Recent sessions have featured engineers Ray Bardani and Josiah Gluck, as well as opera singer Denise Graves, who recorded vocals for a September 11 tribute project in Studio D.

It doesn't hurt that Uzzo himself is a

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frequent client of his own studio. An in-demand engineer and mixer, Uzzo has dozens of major credits, including Sermon, EPMD, Method Man, Redman, Coolio, Gloria Estefan, Funkmaster Flex & Big Kap, Celine Dion, LL Cool J, Michael Jackson, Janet Jackson, Selena, George Michael and Tina Arena. Mirror Image's Gold- and Platinum-adorned walls are a testament not only to the studio's track record but also to Uzzo's discography.

"I work in these rooms, and I think that helps keep the maintenance up," says Uzzo. "If you have outside clients coming in and you don't know the intricacies of your own equipment, you get into trouble. Here, when something's broken, we test it, see what's wrong and fix it right away."

If Mirror Image is not the first name that comes to mind when one thinks of top-echelon studios, it's not because the studio does not deserve to be mentioned in the same company as, say, Right Track, Quad, Hit Factory or Sound on Sound. Mirror Image's low profile is probably a result of Uzzo and Hogan's dedication to the tasks of engineering records and running the facility, sometimes at the expense of self-promotion and publicity.

"We've always been one of the best-kept secrets in town," says Hogan. Uzzo adds, "People would come to the studio and say, 'We didn't know you were here.' I thought that was a little funny because when you're sitting in a place you don't think that—especially having a large room, which there aren't too many of in Manhattan."

Even if the masses have yet to catch on to them, Uzzo and Hogan take pride in their hands-on approach. "We do a lot of the work ourselves," says Hogan. "We handle all of the contractors and put on the tool belts ourselves. But it's really Tommy's knowledge that allows the rooms to function in a pro environment."

Uzzo's greatest gratification is seeing Mirror Image grow from a hobby to a professional endeavor. "This entire business was built on my 4-track," he says. "I started out with a 3340 and a Tapco mixer. Everything we've bought since then was based on that. It's been a slow build, but I don't have investors and I don't have to report to a board of directors. It's just us. We figure out what to do, and we do it." ■

Send your New York City-area news to pverna@vernacularmusic.com.

World Radio History

—FROM PAGE 24, LEST WE FORGET

motivation. Could be revenge or insanity, as well, but greed clearly leads the list.

And the relatively recent proliferation of cheap, powerful mediocre-sounding synths and samplers provides the opportunity.

Add in the fact that virtually anyone can sort of play several different instruments, and what they can't play, they can fake with synths and samplers.

But there's even more. Today's extensive fix-it-in-the-mix technologies are like defense lawyers spinning the facts and smoothing out the details to make them appear less horrendous and more acceptable.

And this has brought us well into a thoroughly boring, yet deeply disturbing age.

This new Easy-Bake Oven Era allows an approach that has changed what happens and *who* happens to pursue the Dangerous Game: one-man music.

Is this what music is destined to become? Musicianless, budget-driven, egomaniacal technical renderings? At least this will stop all of that trading your soul to the devil to make the charts stuff. No soul? No devil shows up to trade.

When Les Paul "built" his first hit, he skillfully brought together his technical and musical chops to produce a new type of novel, popular production and a new type of internally focused music. But even then, as legitimate as he was, he tempered these efforts with the voice of Mary Ford; the many overdubbed voices, actually.

And what does Les do now? He plays live in a New York dive. A bar stool and a little echo, and he and the boys kick it onstage *sans* Vanilli.

But you know, it's sad to think that while Les is playing more, more are playing *less*.

Yup, the New Musical Illuminati—jacks of all trades, masters of none—are happily and ruthlessly assembling unskilled, stiff, cost-effective, third-class drek for your unsuspecting consumption—a sort of "music lite" with less of damned near everything that we have come to look for in music. And they are proudly doing it *all by themselves*. Just...like...Les.

You know who you are. And I know that there are those of you who actually have mastered the instruments you play and have chosen to combine your musicianship with your recording skills. But you are the tiniest minority.

No, I speak today of those, who perpetrate this half-baked music upon us. I have one simple request, made in earnest. Though I no longer listen to radio in any form, I have friends who do. And it is for their health and well being that I make this request: *Pick one damned instrument and learn to play it!*

Just because Easy-Bake Ovens exist doesn't make it okay to actually try to cook with them. I no more want to hear one guy plod along on 13 different instruments than I want to eat a seven-course meal made by a light bulb.

There. I've said it. And I can just switch a few words around and sell this column again to *Cordon Bleu* magazine and get paid twice. After all, isn't that the new way to judge art? By the total it can earn against the hours it took to create?

Well, now that I have said that, I suddenly see the error in my thinking. That's exactly what these guys *are* doing. Creating better art for less, from less and with less.

Silly me. I had hoped for more. ■

I gave this bio to Les, who is a very strange and a very cool guy. And what does he think? He doesn't care. He's far too busy making real music.

World Radio History

—FROM PAGE 28, WAR STORIES

is to sing for several reasons, not the least of which is that it was written for a woman's voice and that there are no drums during the whole first half of the tune. I was already starting to get a chill up my spine when she casually mentioned that her husband had never done this sort of thing before. Oops!

Well, I won't bore you with the gory details of how the session progressed. Suffice to say, my wife took the boys out somewhere in the car, the dog howled at the door until I let him escape, as well, and the cat threw up a hairball right on top of the console. To this day, I will never hear that song again without breaking out into a cold sweat. I hope the ceremony survived the playing of that tape. I plan to be on vacation on their 50th.

DON'T TOUCH THAT BUTTON: Multitrack recording direct to the computer, running Cubase. Band in the studio. Several takes, many hours' work. Had to eject a floppy that was used a few hours earlier to print a lyric for the band. Floppy-eject button? Nope. PC POWER SWITCH—Thump!! Off it goes!

WHY THEY INVENTED SOUNDCHECK

GOD, ARE YOU THERE?: Back in the early '90s, we were hired to do a rock/blues festival at the local music school here in our little town in Mexico. One of the headliners was a group who were all in their mid-40s, and none of them had ever used a monitor system before. We did our soundcheck, and the guitarist was the last one to set up. We asked him to play, which he did with his eyes closed: It seemed he had just smoked some hash before setting up, so he was pretty inspired and getting into a Clapton vibe. After a couple of minutes, I called his name through the monitors: "Luis...Luis..." He started to slow down his playing and opened his eyes and looked around, not knowing what was happening. He closed his eyes again and kept playing. Again I called: "Luis...Luis..." Again, he opened his eyes and this time started to look up toward the sky. Finally, he stopped playing and raised his arms up and said, "God!!" So I answered, "No, you dork, it's Antonio, and I'm in front of you!"

STAIRMASTER: I was mixing FOH sound for a college production of *Hair*, the musical. There wasn't anyplace in the house that they could put me, so they decided to put me above the house—in the catwalk. Things were a little awkward and a bit cramped up there, with the college's two 24-channel consoles, the ton-and-a-half of wireless mic receivers, the FX processors and other assorted outboard gear. The power supplies for the consoles were right at knee level under the consoles.

Well, you can guess what happened when I got comfortable during a run-through. I shifted my leg, and all of a sudden, I had no power to the console. I had to run back down to the booth and turn everything off in order, run back up to the catwalk, turn on the power supplies and then run back downstairs to the booth to turn everything back on again. It was not fun, but the rehearsal just kept going as if nothing happened.

It wasn't until the second time that it happened that I became angry and so did the tech director. But, hey, I got in shape with running around, and I learned a valuable lesson: Never get comfortable while running sound!

WHAT'S THAT SMELL?: I had just started working for a band doing FOH sound. It was only the second night of what promised to be a six-year run with these guys, and I was eager to please. It was supposed to be an off night, but we got a call to fill in for another group that had cancelled.

I went to the club, laid out the gear and tied my power into a convenient breaker panel. When I turned on the first monitors, I realized I had nothing! No power. I checked all of the gear; none of it was on, but the six-ways (indicator lights) were all on. And then I started to hear these repeated "pops" and smelled the telltale burning of insulation, plastic, etc.

I rechecked the breaker box and, to my horror, realized it was a three-phase panel, and, yes, I had tapped onto a 240VAC branch. I pulled power just in time to prevent flames from erupting out of the racks. A local country group was gracious enough to bring in their gear from down the street so that we could do the gig, but we never played there again.

DOUBLE-CHECK THE BOOKING: A friend of mine is in a thrash-metal-meets-percussion-ensemble band: raging bass and double-bass-drum ostinatos over which xylophone, vibes or steel drums play very loudly. The "vocal" portion consists of someone yelling one word on one pitch, sometimes for an entire song. Their whole set is nothing but their own music. Being fairly new to the performing scene, they tend to take any gig that is offered to them. Someone booked them for a party held annually at a local Elks club, most of whose members are retirees and older yuppies with children.

Confused about this and concerned that the Elks club wasn't going to get the type of music they thought they were going to get, I approached the man who hired them. "Did they give you a demo tape?" I asked. "Yes," he replied. I paused a bit and then asked, "And you listened to it?" Again, he said, "Yes." Well I had to know, so I asked, "Why on Earth did you book *this* band?"

He smiled and explained, "There are eight of us on the board. Every year, the responsibility to hire a band for this event shifts to one of us. This was my first year, and after looking for weeks, I was so frustrated that I finally gave up and hired these guys, because I know they'll never ask me to do this again!"

The engineer had done his best to help me get ready for the overdub. While I had been out moving the mic, he had kindly rewound the tape to the beginning of the song. He had even more helpfully re-zeroed the counter for me. Only he didn't tell me he'd done it.

EVEN ASSISTANTS GET THE BLUES

NOT SO HELPFUL HELP: We were laying album tracks with an extremely well-known band and had successfully completed the second number, getting the basic tracks on to our trusty 3M 16-track. I was terribly efficient, and as soon as I heard the band approve the take after playback, I immediately leadered it up as I had the previous number. I even zeroed the big fluorescent SelecTake digital tape counter so that it was ready for the next song. But then, the producer had a quick word in the engineer's ear, and he said to me, "We just need to do a quick guitar overdub.

World Radio History

Go and put an 87 on the amp and bring it up on 28." I was off like a shot to move the mic and repatch it.

It only took a short time to do it, but by the time I was back in my seat next to the tape machine, they had changed their minds. "We'll just go on to the next number," I was told, so I had to go out and move the mic back to its original position and channel. The band went back into the studio, and being well-rehearsed as people were in those days, they were ready for a take in a little more than 15 minutes.

Not only were they ready, their first take sounded like it was going to be the master. The last chords faded away, and everyone was smiling. But as I turned to stop the machine, I was overcome by sheer horror as I saw a piece of leader tape run past the heads. I had just wiped the previous song! I dutifully admitted my mistake to the engineer, and he was kind enough to give the band some technical reason why they had to do the previous number all over again.

The engineer, it turned out, had done his best to help *me* get ready for the overdub. While I had been out moving the mic, he had kindly rewound the tape to the beginning of the song. He had even more helpfully re-zeroed the counter for me. Only he didn't tell me he'd done it—so we had now wiped the basic tracks of what was destined to be the band's next single. Luckily, we rerecorded the number in a couple of takes. And, luckily, it made the charts.

A REGIONAL SITUATION: A couple of years ago, I was the Pro Tools engineer for a composer on a low-budget feature film. As this was my first gig as a Pro Tools engineer, I wanted to do everything perfectly, so I stayed up all night with the composer making sure that everything was set up right, complete with guide tracks, click tracks, etc.

When the clock struck 9 a.m., we rushed to the studio, set up the mics and prepared for the orchestra. Everything went perfectly for the next six hours as the composer conducted all of the cues. Then, around 4 in the afternoon, we finally got to the last music cue of the film. We were running low on hard disk space, and the take we had just recorded was no good, so I used the Delete Selected Regions command in Pro Tools to free up space.

When we went to record the next take, there was suddenly no click track, because I had inadvertently selected the click track to delete when I deleted the last take! It was the most complicated tempo map of the entire film, with meter or tempo changes about every 12 bars. Even after scouring the disk with Norton we couldn't recover the click, so the orchestra had to wing it with the composer (who is no conductor) waving his arms without benefit of a click.

The session finished three hours late, and we spent three extra days of editing trying get the track to sync to what was supposed to be the right tempo and meter. After all that, it still didn't sound quite right.

Moral of the story: *Never* use the Delete Selected Regions command in Pro Tools!

There are plenty more where these came from, and I invite you to come over to mixforums.com, join our merry band and read as many of these as you can stomach. And then add your own. ■

A tip o' the "Insider Audio" toupee to Prince Charles Alexander, Richard Elen, Mike Petit, Noel Quinlan and those who wish to remain anonymous.

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AKG Acoustics (C 900)	www.akgusa.com	59
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ALTO	www.alto@artproaudio.com	53
Amphenol	www.amphenol.com.au	141
Apogee Electronics	www.apogeedigital.com	95
Applied Research & Technology	www.artproaudio.com	49
Argosy Console	www.argosyconsole.com	164
Audio-Technica	www.audio-technica.com	11
Audix	www.audixusa.com	163
Auralex	www.auralex.com	130
Aviom	www.aviominc.com	37
B&H Photo-Video	www.bhphotovideo.com	211
Bellari	www.bellari.com	92
Broadcast Supply Worldwide	www.bswusa.com	177
Brook Mays Music Corp.	www.professionalrecording.com	178
Bryston	www.bryston.ca	9
Burlington/BASF	www.burlington-av.com	56
Caig Laboratories	www.caig.com	183
Carvin	www.carvin.com	125
Community	www.loudspeakers.net	154
Conservatory of Recording Arts & Sciences	www.audiorecordingschool.com	90
Crest Audio	www.crestaudio.com	109
DB Sound	www.dbsound.com	101
DB Sound	www.dbsound.com	103
dbx Professional Products	www.dbxpro.com	4
Denon	www.denon.com	IBC
DiGiCo	www.digiconsoles.com	89
Digidesign	www.digidesign.com	41
Disc Makers	www.discmakers.com	54
Disc Makers	www.discmakers.com	169
Discrete Drums	www.discretedrums.com	74
Dolby Labs Inc.	www.dolby.com	IFC
DPA Microphones	www.dpamicrophones.com	118
Dreamhire	www.dreamhire.com	130
Eastern Acoustic Works	www.eaw.com	107
Emagic	www.emagic.de	35
ESI-Pro	www.esi-pro.com	171
Eventide	www.eventide.com	23
EVI Audio (Agility Control)	www.electrovoice.com	100
EVI Audio/Helix	www.klarkteknik.com	119
Ex'pression Center for New Media	www.expression.edu	61
Focusrite	www.focusrite.com	50
Full Compass	www.fullcompass.com	139
Full Sail	www.fullsail.com	51
Future Sonics	www.futuresonics.com	88
Gefell	www.gefell-mics.com	143
Genelec	www.genelec.com	13
Guitar Center Pro	www.GCPRO.com	160 a-f
HHB (Fatman)	www.hhbusa.com	64
HHB (TLAudio)	www.hhbusa.com	142
Hosa	www.hosatech.com	170

ADVERTISER	WEBSITE	PAGE
Ilio	www.ilio.com	57
innovaSON	www.innovason.com	19
Institute of Audio Research	www.audioschool.com	144
J L Cooper	www.jlcooper.com	36
JBL Professional	www.jblpro.com	121
KDS USA	www.cdoarchive.com	91
KRK Systems	www.krksys.com	149
Kurzweil Music Systems	www.ksp8.com	17
L & M Music	www.lmmusic.com	181
Lawson, Inc.	www.lawsonmicrophones.com	157
Lexicon	www.lexicon.com	83
Littlite	www.littlite.com	180
Mackie	www.mackie.com	76-77
M-Audio	www.m-audio.com	85
Merging Technologies	www.merging.com	102
Mesa Boogie	www.mesaboogie.com	132-133
Mogami Cable	www.mogamicable.com	21
MOTU	www.motu.com	BC
Music Industries Corp.	www.musicindustries.com	167
Musician's Friend	www.musiciansfriend.com	155
NAB Broadcasters	www.nab.org	192
Neumann/USA	www.neumannusa.com	24
New York DV Conference & Expo	www.nydvshow.com	185
Norh American Pro Audio	www.zone.co.uk	44-45
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Royer Labs	www.royerlabs.com	176
Sabine	www.sabine.com	120
SADiE Inc.	www.sadie.com	29
SAE Institute of Technology	www.sae.edu	71
SAE Institute of Technology	www.sae.edu	93
Schoeps	www.schoeps.de	56
SE Electronics	www.seelectronicsusa.com	166
Sennheiser	www.sennheiserusa.com	106
Shure	www.shure.com	67
Simon Systems	www.skeng.com	182
Solid State Logic Ltd.	www.solid-state-logic.com	1
Sonic Foundry	www.sonicfoundry.com	179
Sony Professional Audio	www.sony.com	39
Soundminer	www.soundminer.com	182
SPL	www.spl-usa.com	10
Steinberg	www.steinberg.net	5
Studer	www.studer.ch	55
Studio Consultants	www.studioconsultants.com	165
Studio Network Solutions	www.studionetworksolutions.com	81
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SurgeX	www.surgex.com	63
Sweetwater Sound	www.sweetwater.com	27
Sweetwater Sound	www.sweetwater.com	188-189
Sweetwater Sound	www.sweetwater.com	212-213

World Radio History

ADVERTISER	WEBSITE	PAGE
Sweetwater Sound	www.sweetwater.com	214-215
Tannoy North America Inc.	www.tannoy.com	3
Tascam (MX2424)	www.tascam.com	25
Tascam (DM-24 v2.0)	www.tascam.com	117
Tascam	www.tascam.com	146
TC Electronic	www.tcelectronic.com	97
TEC Awards	www.tecawards.org	162
Telefunken NA	www.telefunkenusa.com	38
The Toy Specialists	www.toyspecialists.com	36
TransAmerica Audio Group	www.transaudiogroup.com	94
Ultimate Ears	www.ultimateears.com	70
Universal Audio	www.uaudio.com	33
Waves Ltd.	www.waves.com	43
West L.A. Music	www.westlamusic.com	146
Westlake Audio	www.westlakeaudio.com	42
X Vision Audio	www.xvisionaudio.com	127
Yamaha (DM2000)	www.yamaha.com/proaudio	111
Yamaha	www.yamaha.com/proaudio	123
Yorkville Sound	www.yorkville.com	131
Z-Systems Audio Engineering	www.z-sys.com	28

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ADVERTISER	WEBSITE	PAGE
ARIA Photographic Imaging	www.ariaphotos.com	195
American Duplication Supply	www.superdups.com	198
Artist Development Associates	www.artistdevelopment.com	200
Audio Dynamix	www.cdxdvd.com	197
Boutique Audio	www.boutiqueaudio.com	200

ADVERTISER	WEBSITE	PAGE
Biomorph Desk	www.biomorphdesk.com	200
C & C Music	www.candcmusic.com	195
CSP	http://usa.cspla.com	193
Clearsonic	www.clearsonic.com	197
Crystal Clear Sound	www.crystalclearcds.com	196
D.W. Fearn	www.dwfearn.com	198
Digital Domain	www.digido.com	193
Dupco	www.dupco.com	196
Eastco Pro	www.eastcopro.com	194
Lonely Records	www.lonelyrecords.com	195
Marathon Computer	www.marathoncomputer.com	198
Markertek	www.markertek.com	194
Marquette Audio Labs	www.marquetteaudiolabs.com	194
Media Services	www.mediaomaha.com	197
Neato	www.neato.com	196
Odyssey Pro Sound	www.odysseyprosound.com	198
Omnirax	www.omniraxdirect.com	199
Pendulum Audio	www.pendulumaudio.com	193
Professional Audio Design	www.proaudiodesign.com	196
Progressive Music	www.progressivecds.com	196
Rainbo Records	www.rainborecords.com	193
Shreve Audio	www.shreveaudio.com	198
Sonic Circus	www.soniccircus.com	195
Sound Anchors	www.soundanchors.com	194
Sound Technology	www.soundtechnology.com	197
The Gate	www.gatemedia.com	197
University Of Denver	www.du.edu/lamont/EngPost.htm	194
Vancouver Film School	www.vfs.com	199
Voyager Sound	www.voyagersound.com	200
WACOM	www.touchscreenstore.com	197

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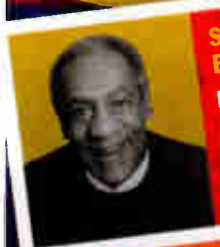

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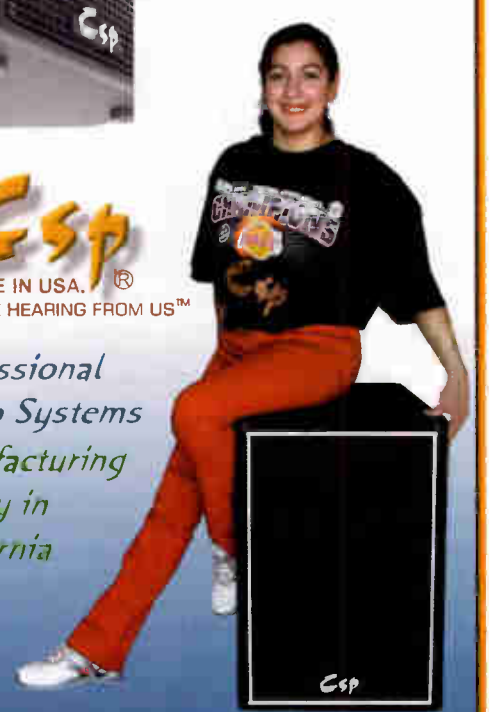

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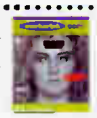

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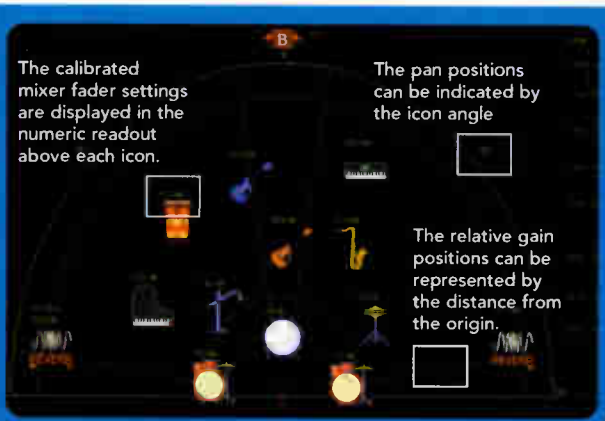

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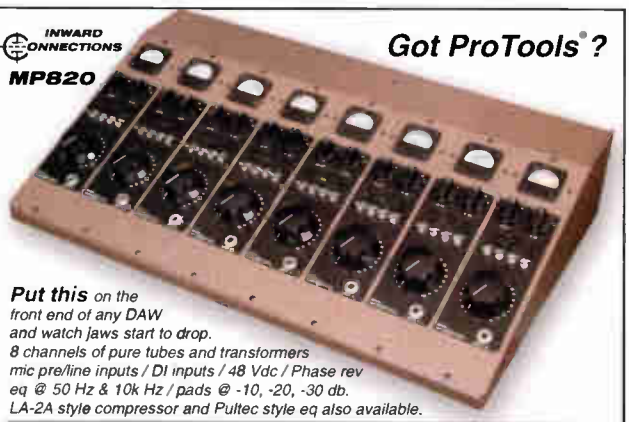

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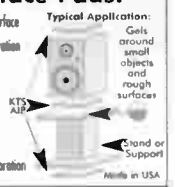

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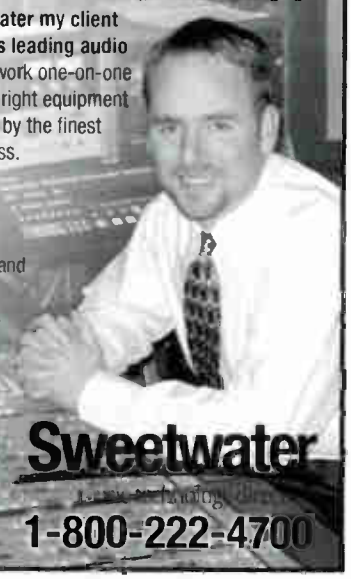

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Assistant Professor, Radio Production

The Department of Visual & Media Arts at Emerson College seeks an Assistant Professor for a tenure track position in Radio Production starting in Fall 2003. Candidates are required to have demonstrable proficiency in at least one of the following areas: basic radio production, radio documentary production, and radio performance. Demonstrable proficiency in one or more of the following areas is preferred: non-linear editing, audio story telling, radio drama, and webcasting. The ideal candidate will have the ability to teach a cross-media introductory production course and will be responsible for working to develop a forward looking radio curriculum that will integrate with other media art areas within the department and across the School of the Arts.

Candidates must have teaching experience, and demonstrate an approach to radio as a creative form within a critical context. MA and extensive professional experience required, MFA or Ph.D. preferred. Interested applicants should submit a c.v. with references and CD samples of creative work by January 15, 2002 to: **Chair, Search Committee, Department of Visual & Media Arts, Emerson College, 120 Boylston Street, Boston, MA 02116.**

Review of applications is ongoing until the position is filled. Emerson College is an equal opportunity, affirmative action employer and is strongly committed to increasing the diversity of its faculty. Women and minorities are encouraged to apply.

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BY NICK BATZSDORF

Waves Restoration Bundle

Simple Processing Tips

x-Noise intelligently learns from a section of noise and then applies a broadband noise reduction to eliminate background noise from a source.

Waves' Restoration Bundle is a collection of four DSP plug-ins that is notable both for its quality and its ease of use; the processors do their work with a minimum of user interaction. With only a handful of parameters to tweak and a full complement of presets, you certainly don't have to be a techo-weenie to obtain quite usable results from the Restoration Bundle. But there are a few simple pointers that can help you get the most out of these tools.

VIVA LA DIFFERENCE

The key to successful single-ended noise reduction is deciding how far to go. No matter how optimally you've set the parameters, no matter how good these processors are at avoiding artifacts, if you get too aggressive, you'll eventually start filtering out good audio along with the bad. In addition, the filters used in these processors are extremely sharp by design, and steep filters ring more than gentle ones.

That's where the Difference monitoring switch found in all but x-Hum is helpful. This wonderful feature lets you "solo" the audio you're removing; if you hear program along with the noise, then you're probably throwing out the baby with the bathwater. I'd go as far as to suggest that Difference should be the default monitoring mode, because it's much easier to adjust these processors while you're listening to what's being removed.

X-HUM IS JUST AN X-AMPLE

There's nothing that dictates that precise, programmable filters like these must be used to filter out "noise"; they can also be used quite successfully to remove or at least reduce levels of things like wrong notes. x-Hum is much better than simple EQ at removing wrong notes in that it's designed to track the harmonics of the AC line's fundamental frequency of 60 Hz (50 Hz in some parts of the world) up the series.

But you can set the fundamental frequency as high as 400 Hz, and it can even work on sounds an octave higher (although less effectively, because the harmonics are displaced). The less clangorous the sound, i.e., the closer its harmonics fall in line up the series, the better x-Hum works in this application.

Instead of the Difference monitoring mode found in the other plug-ins, x-Hum has a Reverse button. This is just like boosting an EQ while you sweep its frequency to home in on the problem areas you're going to cut.

But there's an interesting off-label application for the other Restoration plug-ins' Difference monitoring mode: extraction. Because you can solo what you're removing, you can use this feature to grab a sound you want out of the mix. Again, this isn't a perfect technique, but you can often peel off enough of the background to use sounds that you've extracted in unexposed settings.

INTERACTION

The high-shelf control in x-Noise is an important parameter. Those who don't read manuals carefully might not realize that this control doesn't affect the program directly but rather the Noise Profile filter that is applied to the program. Again, the effects are easy to hear in Difference monitoring mode; it can be surprising how much more gain reduction you can get away with—or how much less you need—when the high shelf is adjusted optimally.

That applies equally to the time-constant settings (attack and release). Transient passages in the program are going to want the filter to kick in more slowly so that they're not removed by mistake. If you're using a host program that can automate plug-in parameters, then the attack time is likely to be the leading candidate for dynamic automation, followed closely by the threshold and/or bypass controls.

Clearly, the Restoration parameters are all highly interactive, and different sections of audio often require different settings. Even if plug-in automation is available, sometimes it's easier to work section-by-section using a file-based format than to try and catch everything in real time. As a practical matter, it can save the step of having to re-import audio that you've bounced to disk through the Restoration plug-ins.

WHEN LOW-RES IS GOOD

So the idea is to use Difference mode and focus on the transients as you tweak. Along those lines, x-Noise has an interesting three-position parameter called Resolution. As explained in the manual, the highest resolution setting uses more DSP than the other two, but it also acts slower and can smear transients.

The subtext here is that "high resolution" means "more filter bands." And that means that there are more filters with the potential to ring. If you start hearing chirps, then try processing the audio once at low or medium res before running it through again to fine-tune the program at the high-res setting.

With that said, we want to be careful not to dis the high-res setting. All things being equal, having more filters in the learned noise profile translates to more targeted noise removal. Just know that the resolution control isn't only there to accommodate lower-powered computers.

NOISE: DON'T LEAVE WITHOUT IT

Sometimes it's hard to find a clear section of steady-state noise for x-Noise to learn and build its filter. If you're running a recording session with unavoidable noise, for example, when there are hard drives and fans that have to be on, you can borrow a trick from film location recordists who always make sure to record some ambience after the actors are done: The idea is to record some "silence" through all of the open mics in the studio. If an amp isn't buzzing, odds are that you'll pick up some hard drives or fans whirring away.

[Eds.: For more Waves Restoration Bundle tips, visit www.mixonline.com.] ■

Nick Batzsdorf was the editor of Recording *for more than 10 years.*

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