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JUNE 1999, VOLUME 23, NUMBER 6

AUDIO

20 **The Fast Lane:** More Abusing the Art of Recording Electric Guitars *by Stephen St.Croix*

24 **Insider Audio:** Fuss and Bother Over Internet Audio—The Day the Music Died? *by Paul D. Lehrman*

42 **Digital Multi-Effects Processors:** What's New in the Family For '98/'99 *by Randy Alberts*

70 **1999 TEC Awards Nominees**

72 **Mix Masters:** Mike Shipley *by Maureen Droney*

94 **Pacific Microsonics' HDCD:** Looking Beyond the Compact Disc *by Philip De Lancie*

102 **Producer's Desk:** Howie B. *by Blair Jackson*

172 **Recording Notes**
- Tom Petty Keeps It Real in the Studio *by Rick Clark*
- Ivo Watts-Russell and 4AD *by Bryan Reesman*
- King Crimson DVD *by Chris Walker*
- Cool Spins: The Mix Staff Picks Some Favorite CDs

PAGE 20

PAGE 32

FACILITY DESIGN AND ACOUSTICS

32 **The Class of '99:** A Look at 22 of the Year's New Rooms

50 **The Mix Interview:** John Storyk *by Dan Daley*

60 **Wiring for Digital in Music, Broadcast and Film** *by Philip De Lancie*

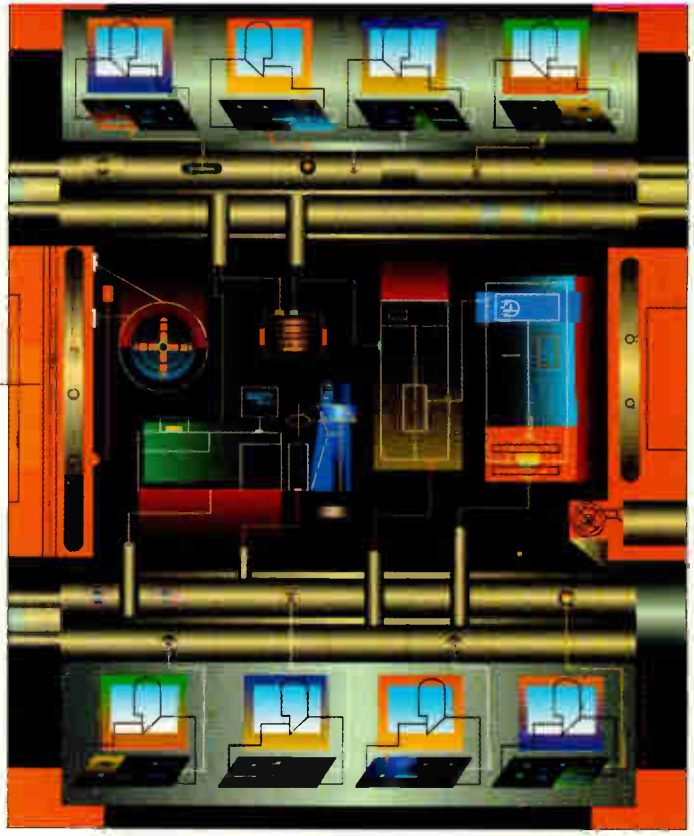
84 **The Project Studio:** Studio B Digital Recording—An Insider's View of Foam and Concrete *by Mike Castronovo*

86 **Recording Architecture:** Change Soho, Then the World *by Dan Daley*

142 **Field Test:** RPG Room Optimizer Software *by Chris Pelonis*

SOUND FOR PICTURE

126 **Post Script**
- Sound for Film: Film Sound Glossary, Part III *by Larry Blake*
- Chace Productions Turns Mono Into Surround *by Tom Kenny*
- Facility Spotlight: Enterprise Post *by Maureen Droney*



PAGE 60

PRODUCTS

110 Report From the NAB Convention
by Sarah Jones

116 New Equipment at AES Europe
by George Petersen

118 Product Hits at NSCA *by Mark Frink*

120 Preview/Hot Off the Shelf

124 New Hardware/Software for Audio Production

140 Technology Spotlight: Audio-Technica AT895 DSP-Controlled, Adaptive-Array System Microphones *by George Petersen*

144 Field Test: NHTPro Model A-20 Studio Reference Monitor System *by George Petersen*

148 Field Test: Hollywood Edge "Apocalypse Now" Sound Effects Collection *by George Petersen*

150 Field Test: Otari RADAR II Multitrack Hard Disk Recorder *by Michael Denten*

152 Technology Spotlight: Aphex 1788 Remote-Controlled Multichannel Mic Preamp *by Mark Frink*

153 Field Test: Soundelux U95S Multipattern Tube Condenser Microphone *by John Monforte*

LIVE SOUND

156 Equalizer Inequality: Choosing the Right EQ *by Bob McCarthy*

164 Getting Your Room in Tune: Ears + EQ + RTA + FFT *by Mark Frink*

165 All Access: Alanis Morissette *by Steve Jennings*

170 New Sound Reinforcement Products

240 Power Tools: SIA SMAART Pro—Smart Ideas for Live Sound Tweaking *by Alexander "Thorny" Yuill-Thornton II*

DEPARTMENTS

8 From the Editor

10 Feedback

12 Current

16 Industry Notes

188 Coast to Coast (Includes L.A. Grapevine, NY Metro Report, Nashville Skyline, Sessions & Studio News)

202 Studio Showcase

208 Ad Index/Product Information Card

216 Marketplace

221 Classifieds

Cover: Designed by the Russ Berger Design Group, the Media Resource Group (Cleveland, Ohio) is part of *Mix*'s "Class of '99," our annual design feature focusing on many of the year's new and refurbished facilities. For more on this studio and other members of the Class, see page 32. **Photo:** James F. Wilson. **Inset Photo:** Steve Jennings.

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FROM THE EDITOR

TOOL TIME!

Whether at the studio, in the field or on the road, we depend on tools to keep equipment at peak performance. Audio essentials include basics such as soldering irons, desoldering bulb, needlenose pliers, nut drivers, Philips and slothead screwdrivers, Allen wrenches, VOMs, scopes, Sharpies, wire strippers/crimpers, cable tester (a must when wiggling cords while checking for intermittents) and the ever-popular Swiss Army knives and Leathermen. Soon, even a simple toolbox can get expensive.

However, some items are downright cheap: Radio Shack's $5.99 AC analyzer (#22-101) tells you whether an outlet is live and indicates bad grounds, hot/neutral reverses etc. It's a must on the road. Rolls of multicolored PVC tape go a long way in ID'ing snake/multitrack fanouts or marking vocal mic bodies, especially with multiple wireless units. Don't forget your basic 110VAC trouble light—the $9.99 version with the cage lampshade and accessory outlet in its tapered handle. Mine slides firm into a mic clip, so with a boom stand, I can focus light wherever I need it. Looking beyond a Mini MagLite? Laser Products' SureFire 6P has the output of a five D-cell MagLite in a 5-inch package. Nice, but pricey—especially for replacement Xenon bulbs and lithium batteries. But no such problems with Rapco's $39.95 Blox Series Phantom Powered Flashlight—its only limitation is the length of the mic cable you connect it to.

Some audio gadgets can be fun: Gold Line's $39.95 GLIK mic input tester (built into an XLR shell) lights to indicate when phantom power is active and outputs a 1kHz tone. Neutrik's $139 MR1 pocket Minirator generates sine/square waves and white/pink noise to XLR and RCA outputs. Sescom has a huge array of in-line tricks, but nothing stops hum like its $63 ISO-1 line-matching transformer. Whirlwind's $189 Qbox® combo mic/line tester has a 440Hz generator, phantom/intercom-present LEDs and internal speaker and headphone jack that lets you actually *hear* the source under test. It also doubles as an intercom monitor. Audio-Technica's Unitools® line includes the AT8682 UniGate, a gate/voice-operated mic switch, and the AT8686 UniLim mic limiter. Both are $75 and have phantom powering (!), adjustable threshold and a stomp box-sized chassis.

DIY can stretch the tool budget. Anyone can cut pin 1 on a short XLR cable to create a ground lifter, or swap pins 2 and 3 to make a phase-reverse adapter. Work with drummers *and* musicians? Throw a drum key into your toolbox or cut the handle off a drum key and keep the shank with your Makita for fast pre-session head removal/replacement. Have a CD-R drive? Burn a couple CD-R compilations with the music you use in evaluating monitors or sound systems. This puts all those tracks on one disc and prevents your original CDs from being left in the player you used on that one-off last week.

But the most important tools are on your head, so invest in a set of quality ear plugs before the touring season. After all, an ear is a terrible thing to waste.

Take care,

George Petersen

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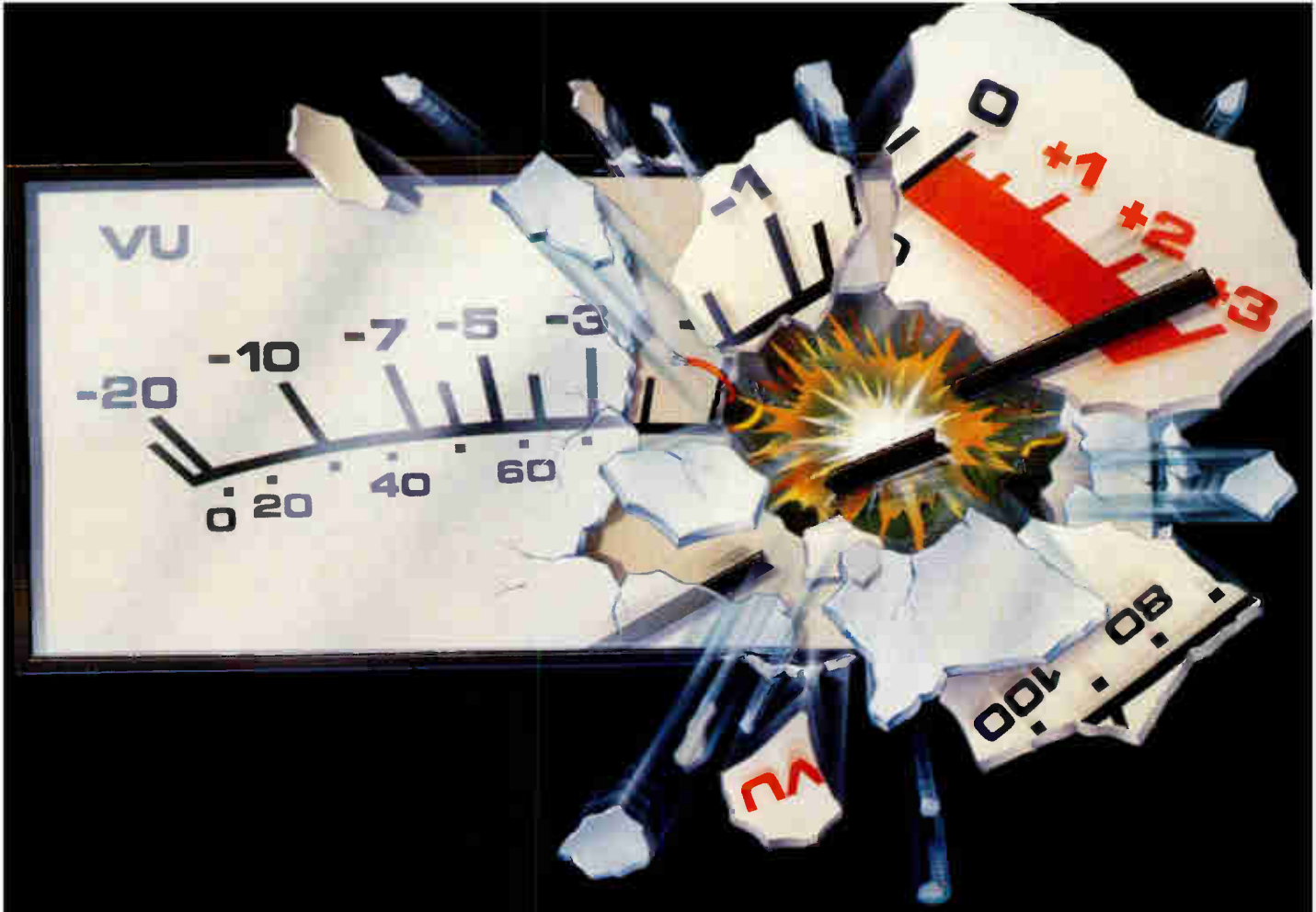

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FEEDBACK

FROM THE CRAY CAMP

I find the articles in *Mix* very informative and cutting-edge in content and clarity. But what really made me feel great was the Cool Spin picks in the Recording Notes section for April—in particular, the review of Robert Cray's CD *Take Your Shoes Off*. Yes!

I had the pleasure of writing the song "Love Gone to Waste" for the CD. It was co-written by my mentor of 22 years, the great Willie Mitchell. In a time when session gigs are few in Memphis, your review gave me a much needed shot in the arm, as I haven't yet had that "mega hit."

I also co-wrote a song for guitar great Otis Rush, "You Fired Yourself," which is on the Grammy-winning CD *Any Place I'm Going* (House of Blues). It is very tough in this business, and sometimes any credit is a blessing. Believe it or not, that review in your magazine gave me quite a thrill. Thanks.

Thomas A. Bingham
Memphis, Tenn.

MORE ON SIR GEORGE

Paul Lehrman's article on Sir George Martin [Insider Audio, May] was lovely. It was unfortunate that Lehrman saw Martin at Berklee; he was very correct in saying that his presentation would have come off better in smaller environs. I was fortunate enough to see his talk at The Birchmere in Alexandria, Va., and the intimacy of that venue really enhanced Sir George's charisma. I loved it.

I've studied Sir George's work as if it were the Holy Grail of production and am very familiar with many of his stories. I don't know about [Lehrman], but I much prefer to record with classic, vintage tools in small-format (four to eight tracks) and let the "constraints" and "limitations" help focus the creative and musical juices. I almost always print effects with the tracks. When I see (and hear) what comes out of studios today and I reflect upon the work of this giant on the limited tools provided at Abbey Road in those days, I am incredulous and completely humbled. I still use *Sgt. Pepper* and *Abbey Road* as benchmarks.

By the way, all those pipe organs from "For the Benefit of Mr. Kite" can be found in their entirety on the BBC sound effects library, which I had the pleasure of using during my Boston studio days. Also, I noticed that you didn't mention Sir George's second book, *With a Little Help From My Friends* (originally released as *Summer Of Love*). It is an excellent primer on using limited tools to achieve fabulous results.

Jeff Bragg
via e-mail

IN DEFENSE OF PIRATES

I would like to comment on your letter regarding piracy (From the Editor: "Pirates Among Us," April '99). First and foremost, all I can say is that I agree with you. I would most like to comment about CDs rather than computer software.

Given, I believe, the astronomical debt that the major labels have incurred through the buying and selling of companies, single CDs in retail stores can cost up to $18.00. Illegal piracy is wrong, but the drive for people to own the music they love could very well be driving a bit of the piracy engine.

A few years ago in London, I was astonished to hear that the prices for CDs in South Africa were around $30; in Australia they are $25, and so on. I never thought that this would happen to the U.S.

As you know the retail distribution in the U.S. is all sewn-up. Well, it was until the Internet. Remember the hoopla over cassette duping? I do believe the industry survived. It will probably be controlled on the Internet in time.

Sasha Zand

For more on the issues concerning Internet music distribution, see Paul D. Lehrman's Insider Audio column in this issue, page 24. —Eds.

ANOTHER GALAXY HEARD FROM

I thoroughly enjoyed your extensive coverage of the post-production for *Stars Wars, Episode I* (May '99). Larry Blake did an excellent job bringing to light the many aspects of the film's post-production and the many talented people who worked on the project.

I couldn't help but notice, however, a glaring lack of mention of the contributions that the engineering staff at Skywalker Sound brought to *Episode I*. As the Dolby sound consultant to *Episode I*, the support I received from stage engineers Steve Morris and Dusty Jermier was invaluable. Their extensive knowledge of the inner workings of the mix stage made the introduction of the Dolby Digital Surround EX format a smooth and painless process.

Steve and Dusty had to jump through many hoops to keep up with the many demanding aspects of post-production on a film of this magnitude—sometimes having to change the mix stage over from pre-dub mode to final mix mode to printmastering mode, and back again, several times in the same day. The stage was able to printmaster to five different recorders using three different sound formats and play them all back at the press of a button.

These gentlemen, along with Jerry Steckling, the engineering department's acoustical and B chain specialist, certainly helped make the *Episode I* mix the successful and incredible project it is. It couldn't have been so without them.

Dan Sperry
Dolby Laboratories
San Francisco, Calif.

Thanks for your letter, Dan. We would have had more material devoted to the behind-the-scenes (but way up on the screen!) work of Skywalker's technical department, but space limitations interceded. In addition to Steve, Dusty and Jerry, mention should be made of Skywalker chief engineer Tim McGovern and, I'm sure, many others. —Larry Blake

Send Feedback to Mix, *6400 Hollis St. #12, Emeryville, CA 94608; fax 510/653-5142; or mixeditorial@intertec.com.*

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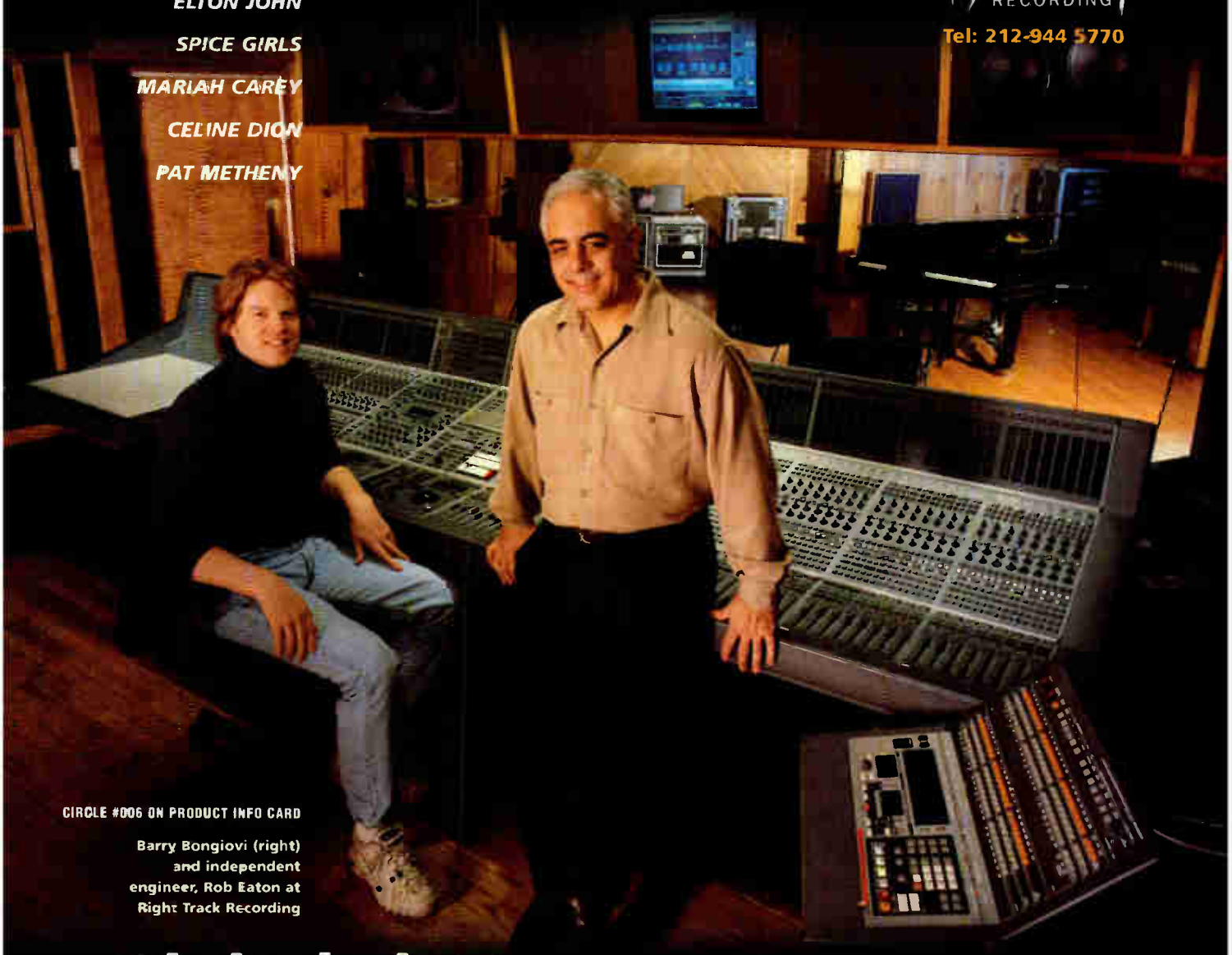

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Barry Bongiovi (right) and independent engineer, Rob Eaton at Right Track Recording

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CURRENT

SHURE LAWSUIT

Shure Brothers filed a civil lawsuit in the United States District Court for the Northern District of Illinois to enforce the firm's intellectual property rights.

Shure alleges that the defendants, Pro DJ Inc. of Saratoga, Calif., Taky Electronics Co. of Taichung, Taiwan, SHS Musical Wholesale of Indianapolis, Ind. and Music Go Round of Orland Park, Ill., violated federal and state law by copying the unique physical appearance of Shure's premium line of Beta microphones, as well as the promotional materials associated with the line. The counts forming the basis for the action include trade dress infringement, trademark infringement, unfair competition, deceptive practices and copyright infringement. Shure asked the court for monetary and injunctive relief.

GLOBAL MUSIC MARKET UP IN 1998

The International Federation of the Phonographic Industry reported that global music sales climbed 3% in 1998 to $38.7 billion, while growth of CD sales worldwide doubled from the previous year with a rise of 6%. However, worldwide unit sales of recorded music slipped 1% to 4.1 billion as cassettes continued to be replaced by CDs.

Music sales in the United States showed the strongest growth in four years, rising 11% in value and 7% in units due to high CD sales and growth in the clubs and special markets sector. The IFPI, which represents over 1,300 record producers in 70 countries, said the CD now accounts for 65% of all albums sold.

UPCOMING SHOWS

MusicBiz 2005 takes place October 15-17 at Ex'pression Center for New Media in Emeryville, Calif. Billed as a "futurist music conference," the event will include panel discussions, hands-on demonstrations, workshops and special events. The focus is aimed five years down the road, when many of today's developments and controversial issues will have been resolved. Topics to be addressed are MP3 downloading and intellectual property rights, connecting the artist and fan in cyberspace, redefining the record company, Internet radio, emerging technologies (DVD multichannel audio, high-resolution recording/playback formats and advanced recording systems). Attendance is limited to 250 people. For more information contact Keith Hatschek and Associates at 415/227-0894 or info@hatschek.com.

The Fourth National Entertainment Industry conference, sponsored by Apple Computer Australia, will be held August 6-7 at the ABC Radio Centre in Sydney, Australia. There will be 50 speakers in eight seminar sessions, plus a TechXpo music technology and online music exhibition. Produced by IMMEDIA! every two years, this year's theme is "The Technology, Art & Business of Music." Brochures and registration information are available by calling Danielle at 612/9557-7766 or e-mailing staff@immedia.com.au.

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—CONTINUED ON PAGE 16

TEC AWARDS TO HONOR TOM DOWD AND STING

Producer Tom Dowd will be inducted into the TEC Awards Hall of Fame and Sting will receive the Les Paul Award at the 15th Annual Technical Excellence & Creativity Awards, to be held September 24 at the Marriott Marquis in New York City.

The TEC Awards Hall of Fame was created to recognize individuals whose careers have exemplified the spirit of creative and technical excellence in professional audio. Tom Dowd was a staff engineer for Atlantic Records in the '50s and '60s, working on classic sessions with everyone from John Coltrane and Ornette Coleman to Aretha Franklin and Otis Redding. Later, he became a highly successful producer, cutting albums with the Allman Brothers, Eric Clapton, Aretha Franklin, Lynyrd Skynyrd and many others.

The Les Paul Award recognizes individuals who have set the highest standards in the creative application of technology. From his groundbreaking work with The Police in the late '70s, through a succession of brilliant solo albums, Sting has proven to be a master singer, songwriter, producer, musician and bandleader—an innovator as well as a superb collaborator. Working with the likes of engineers Hugh Padgham and Neil Dorfsman, he's had an enormous impact on the sound of pop records in the latter part of this century.

For a complete list of the 1999 TEC Awards nominees, please see page 70. For tickets or information about the TEC Awards, call Karen Dunn at 925/939-6149. ■

MIX L.A. OPEN APPROACHES SELL-OUT

The Mix L.A. Open, set for Monday, June 21, at the Malibu Country Club, is filling up fast. Proceeds from the tournament will be distributed to the Hearing Is Priceless (HIP) campaign, founded by the House Ear Institute and *Mix* magazine, and other programs of the Mix Foundation for Excellence in Audio.

Confirmed sponsors at press-time include Alesis Corporation, Audio-Technica, BASF/Emtec Pro Media, Fairlight, JBL Professional, Ocean Way, Otari Corporation, QSC, Record Plant, Sony Pro Audio and Tape Specialty (TSI). A limited number of sponsorships and individual tickets are still available. For more information, call Terry Lowe, tournament director, at 310/207-8222. ■

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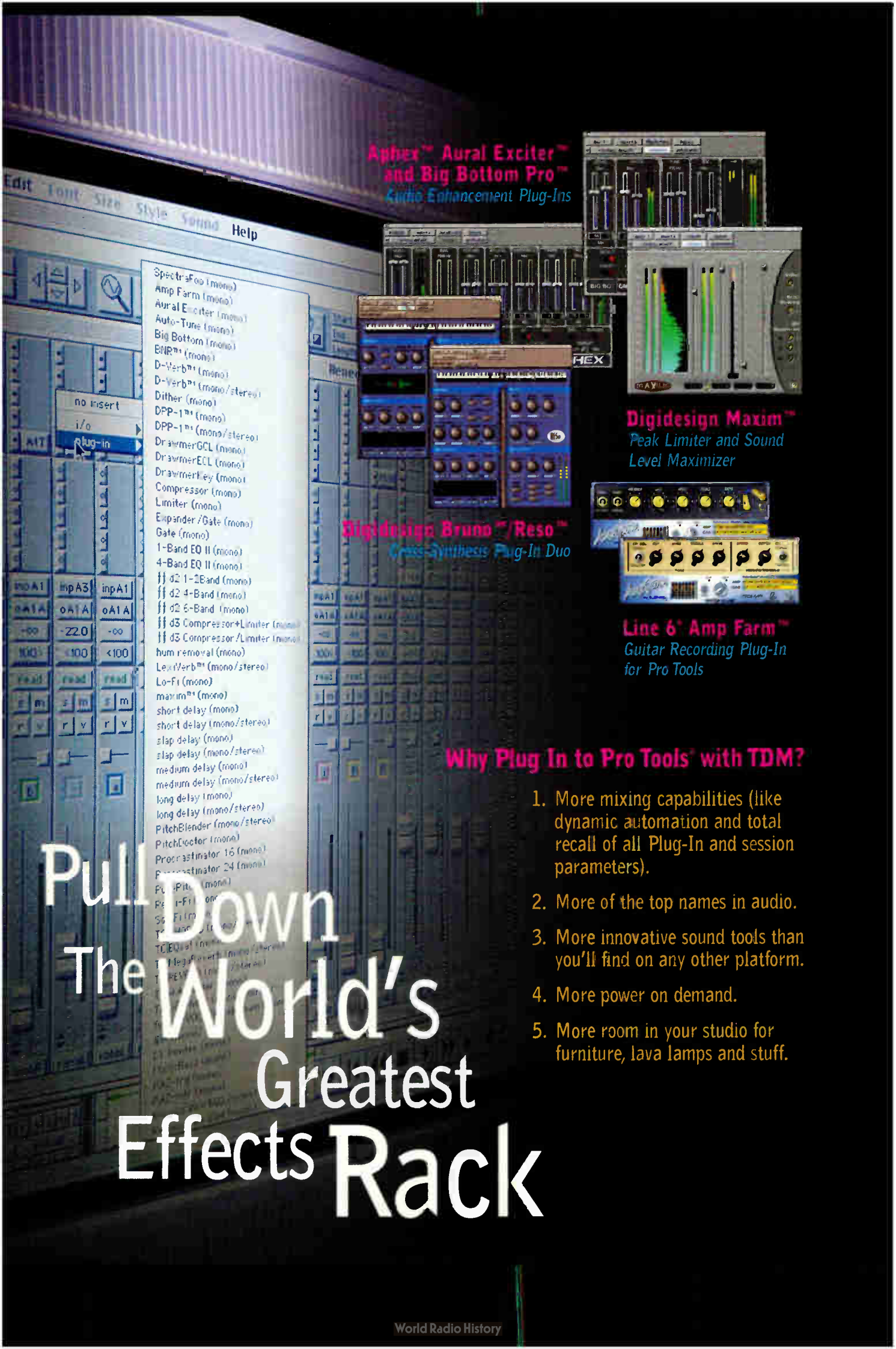

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INDUSTRY NOTES

Studio Audio & Video Ltd., (Cambridge, England), designers and manufacturers of the SADiE range of disk editors, announced a worldwide distribution agreement with **Daikin U.S. Comtec Laboratories** for Daikin's Scenarist DVD authoring systems...**Mackie Designs** (Woodinville, WA) announced the formation of Mackie Industrial, a new division dedicated to designing families of products specifically for the needs of the installed contractor market. Headed by director **Costa Lakoumentas**, Mackie Industrial will create high-quality sound systems for installation in small to large venues. Much of the technology required for development of these products was acquired by Mackie with the purchase of Radio Cine Forniture S.P.A. in 1998...**Music Annex** (San Francisco) has added sound designer/mixer **David "Dr. Dave" Marcus** to its staff. Marcus logged more than 30,000 hours during his ten-year stint at Margarita Mix in Hollywood before making the move north...Multiple Grammy and TEC Award-winner **George Massenburg** recently formed a new company, **Massenburg Design Works LLC**. The electronic design group will be headed by Massenburg and will provide software and hardware tools for GML and other companies... **Telex/EVI** (Buchanan, MI) appointed industry veteran **Alan B. Shirley** vice president of marketing for the speakers and microphone group. Shirley recently served as managing director and founder of ABS Consulting LLP...**Sony Electronics Inc.** (Teaneck, NJ) created a new organization for its recording media sales and marketing operations to better meet the needs of its customers in the digital network world. **Media Solutions Company** (MSC) will be headed by **Martin Homlish**, president. **Takayasu Hirano** was named senior vice president and will manage all of Sony's branded retail and OEM recording media products. **Mike Fasulo** was named senior vice president of sales and operations and will manage national sales for MSC's branded products...**NEXO USA** (Cotati, CA) announced that **Mainline Marketing** will focus on the professional and commercial audio opportunities for the company in Florida; **JMS Marketing** will cover the Midwest and Southwest...**Jim Bass** was brought onboard at **Nelson Sound** (Burbank, CA) as part of the sales/design team. Bass came to Nelson Sound from Hughes Sound Engineering, where he served for 13 years, specializing primarily in the church market...Middleton, WI-based **Full Compass** announced that 15-year veteran **Mark Nash** was promoted to general manager. **Robert Sheffield** was promoted to vice president of sales and **Michael Wild** was hired as business office manager... **Greg Duckett** joined **Rane Corporation** (Mukilteo, WA) as director of R&D engineering. Duckett was previously senior design engineer at IVL Technologies. **Meyer Marketing** was recently appointed to represent Rane Corp. in Florida...**Guitar Center** announced the opening of its first systems contracting location in Southern California: **GC Systems**, 8010 Wheatland, Unit G, Sun Valley, CA 91352; 818/252-3388. Focusing on houses of worship markets, the company offers consultation, system design and installation contracting...**Don and Carolyn Davis**, founders of SynAudCon, were presented with the 1999 **Heyser Award** by the TEF Advisory Committee at the NSCA show. The award recognizes their creativity in transforming the vision of TEF into a usable technology...Farmingdale, NY-based **Group One Ltd.** was appointed exclusive United States sales representative by **Miller & Kreisel Professional**...**Waves Ltd.** (Knoxville, TN) tapped **Bob Reardon** as European sales manager. Reardon was formerly director of product marketing at Lexicon. ■

—FROM PAGE 12, CURRENT

pany, launched the beta version of its Media Sharehouse (http://sharehouse.xoom.com), a free online service that allows members to store, share or showcase virtually any type of digital file, from MP3 audio files to streaming video clips. XOOM.com also announced the Lilith Fair Online Talent Search. The contest will showcase talented women in music, encouraging them to submit songs on CD, audio tape or over the Net as MP3 files. XOOM.com will digitize the songs and showcase them in the Media Sharehouse, where visitors can download the tracks and vote for their favorites. On August 1, the ten songs with the most votes will be put before a panel of judges. The winner will be announced on August 10.

Yamaha Pro Audio's site at www.yamaha.com/proaudio contains product descriptions, reprints of product reviews, press releases and more. There's also a section allowing dealers special password access to downloadable images and specialized sales literature.

Ultimedia launched www.rpmdirect.com, a site featuring industry forums allowing producers, executives, studio owners and pro audio personnel to trade information in an industry-only environment. The site is currently free to producers, mixers, engineers, techs, etc., who submit their discography information. Music supervisors and A&R executives can subscribe to the site.

Radian Audio Engineering's site at www.radianaudio.com includes descriptions and specifications for their systems, components and replacement diaphragms. Information on installations and new products is also available.

Sweetwater Sound's site has been updated and redesigned. The site features "inSync," the industry's first Internet daily. Check out www.sweetwater.com.

CORRECTION

In the article "Vocal Recording Masters in Their Own Words" (April '99) we referred to recording engineer Chris Fogel as Chris Vogel, and misspelled the names of producer Glen Ballard and artist John Hiatt. Our sincere apologies. ■

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"Suddenly, features that were the sole purview of companies like SADIE and Sonic Solutions have become standard issue for Cakewalk."

—AudioMedia

"Incredible price/performance ratio."

—Game Developer

"The addition of non-destructive gain and pan envelopes, non-destructive MIDI effects, flexible mixer console and 24-bit/96 kHz sampling rate make Cakewalk Pro Audio a bona fide production powerhouse."

—Pro Audio Review Magazine

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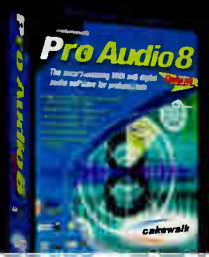

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THE GENTLE ART OF BIT-SPLITTING

How an Apogee converter makes your digital recorder even more versatile.

AN APOGEE CONVERTER does a great deal more than give your recordings an incredible sound. Multiple interface capability, format conversion and Apogee Bit-Splitting are just some of the features.

Apogee Bit-Splitting (ABS) provides your existing digital multitrack recorder with a wealth of additional possibilities. Make your existing 16-bit recorder handle 24-bit, for example, or even record at 96 kHz on a 48 kHz machine! Here's an overview of the capabilities of ABS.

ABS works by recording high-resolution (20 or 24-bit) signals on more than one 16-bit track of your tape machine. It'll work on any machine with bit-accurate recording across the tracks—and that means any digital tape machine or MDM, as well as many other systems.

Bob Clearmountain's rack of AD-8000 systems enables him to record full 24-bit audio on his 3348HR DASH recorder. But ABS on the AD-8000 allows everyone with a DASH multi-track to benefit from high resolution recording—without having to buy a whole new machine.

Apogee's AD-8000.

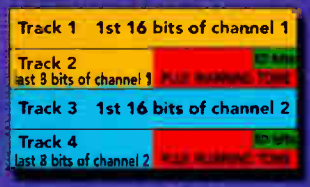
For example:

- 3348HR—48 tracks of 24-bit audio (no bit-splitting);
- 3348—36 tracks of 20-bit or 24 tracks of 24-bit;
- 3324—18 tracks of 20-bit or 12 tracks of 24-bit.

In addition, the AD-8000 can be used in conjunction with a 16-bit modular digital multitrack—such as an ADAT or Tascam machine—to record 20- or 24-bit signals:

- Six channels of 20-bit on an 8-track 16-bit machine (ideal for surround sound);
- Four channels of 24-bit on an 8-track 16-bit recorder. (see diagram).

With Apogee's 2-channel PSX-100 A/D-D/A, you can go one better: in addition to capturing two 24-bit channels on four MDM tracks, you can even record two channels of 24-bit audio sampled at 88.2 or 96 kHz on all eight tracks of your 16-bit, 44.1/48 KHz MDM, using any of the built-in interfaces!



Apogee Bit-Splitting's 4:24 mode records two 24-bit channels on four tracks of a 16-bit recorder.

For more details on Apogee's high-quality converters and what you can do with them, visit your authorized Apogee dealer today—and see our Web site.

The PSX-100: a two channel 24-bit A/D and D/A offering full 44.1–96 kHz sampling capability and all the most common digital I/O formats.

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BOB CLEARMOUNTAIN'S HIGH RESOLUTION SOLUTION

"As good as it gets is pretty damn amazing!" —Bob Clearmountain

WHEN IT CAME TO UPGRADING to a Sony 3348HR digital multitrack, award-winning mixer Bob Clearmountain wanted to take full advantage of the machine's 24-bit capabilities.

He chose Apogee – a rack of six AD-8000 8-channel 24-bit converters, fitted with SDIF-II cards to interface with DASH machines. SDIF-II is just one of the many interfaces available for the AD-8000*.

World leaders in professional recording choose Apogee – and so can you. See your Apogee authorized dealer today.

*Interfaces and interface cards currently available for the AD-8000 include: Pro Tools, AES/EBU, SSL HiWay, S/PDIF, ADAT Optical, TDIF(Tascam) and FiberDX ST Optical.

48 HR

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MORE ABUSING THE ART

OF RECORDING ELECTRIC GUITARS

ILLUSTRATION: ANDREW SHACHAT

Well...It's been a month since you read Part One. Maybe you should take a fast look again before you hit Part Two.

PART TWO

Okay, we have now knowingly set up the world's most reactive guitar pickup to guitar amp audio path. And as I have no intention of trying to tell you how to use your amp, we will go directly to some Xtreme tube amp tricks.

These amps are like violins. Sound is generated with the help of a *very* reactive wooden box.

When I was a kid touring with my black Twin, I had *no* appreciation of the incredible number of variables that determine what a guitar amp sounds like.

As it turns out, my brother has had a guitar amp company, THD, for some time now. When he first started it, I used to spend a good deal of time there, watching him test and modify design after design. He would alter power supplies and audio circuits, and it would produce the dramatic changes that I would expect. But then he would alter esoteric details like the type of plywood, the amount of glue or joint construction, and amazingly, I could clearly hear significant changes as a result. He would rotate the position of the speaker's mounting screws around the cutout on the front panel, by one little inch, and the world would sound different. He would change the number of screws, and it would be a different amp. And damn if black vinyl doesn't sound different from tweed! Really.

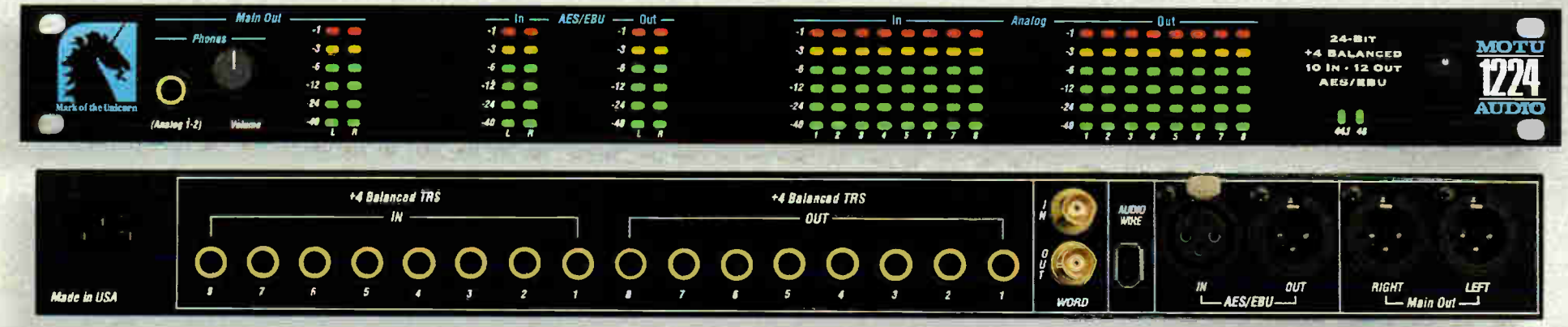
So with that in mind, I went back into the world (and the studio) with a new appreciation and a growing understanding of why certain tricks that I had learned decades before actually worked, and a renewed interest in optimizing those tricks. And now I offer a few of the highest-yield ones (least effort for most results) for your enjoyment.

1) Try sticking that microphone places that you haven't tried before, places that seemed too stupid to consider. Try anywhere you can get it. Choose a mic that can take crazed high levels and shove it

BY STEPHEN ST.CROIX

—CONTINUED ON PAGE 233

Introducing the 1224.



24-bit balanced +4 analog I/O - with 116 dB dynamic range - for your Mac or PC

- The 1224 is a 24-bit hard disk recording system for Mac OS and Windows 95/98.
- 10 independent inputs and 12 independent outputs.
- 24-bit A/D and D/A Converters for 24-bit recording and playback at 44.1 or 48 KHz.
- 116 dB dynamic range (A-weighted) on inputs and main outputs.
- 8 balanced +4 dB TRS analog inputs and outputs.
- Stereo balanced +4 dB XLR main outputs.
- Stereo AES/EBU digital I/O (24-bit).
- Word Clock In and Out.
- Available as a stand-alone system or as an expander for the 2408 system.
- Expandable — connect extra 1224 & 2408 expansion I/Os. Add up to 48 additional inputs and outputs to a core 1224 system.
- Includes AudioDesk™ sample-accurate workstation software for Macintosh with recording, editing, mixing, real-time 32-bit effects processing & sample-accurate sync.
- Compatible with all major Macintosh and Windows audio software applications.

1224 stand-alone core system: $1295

Everything you need for 12 channels of 24-bit audio, including the 1224 19-inch rack I/O shown above, PCI-324 audio card for Mac & PC, AudioDesk workstation software for Mac with plug-ins, and drivers for today's leading Mac and PC audio software.

1224 expansion I/O for the 2408 system: $995

The 1224 I/O shown above plugs right into your 2408 system and adds eight 24-bit balanced +4 analog inputs, ten balanced +4 analog outputs and 24-bit stereo AES/EBU digital I/O.

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- Windows: SoundDiver Autolink, AMT, 64 MIDI Ports
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FUSS AND BOTHER OVER INTERNET AUDIO

THE DAY THE MUSIC DIED?

ILLUSTRATION: RICHARD DOWNS

BY PAUL D. LEHRMAN

Audio on the Internet. Does that intrigue you or scare you? If you work for a large record company, or your business depends on major-label work, then it would seem you have a right to be scared. After all, your long-established way of doing business is suddenly facing competition from an uncontrolled, unregulated, unlicensed, unruly and, most importantly, sometimes-unremunerative distribution channel. The World Wide Web, and especially the new MP3 protocol, the fearmongers say, will allow anyone to obtain any piece of music at any time for free, and once that cat's out of the bag, no one's going to want to pay for CDs and cassettes.

The major labels—and the news media that are in many cases owned by the same media conglomerates—have made substantial amounts of noise about this potential threat to the American Way of Life. But what is really going to happen?

In case you've been hiding in your Y2K shelter for the past year or so, MP3 (formally known as the Motion Picture Experts Group Audio Layer 3) is a very clever compression scheme that allows audio files to be squeezed down to tiny size—typically 10:1 or better—so that a three-minute song, which as an uncompressed 16-bit PCM file would occupy 30 megabytes, requires only 3 megabytes in MP3 format. This has lots of ramifications for the Internet, where space equals time equals money. An album track can be posted by anyone with a 56k connection to a newsgroup or home page in a few minutes, and downloaded by anyone else, anywhere in the world, in the same amount of time. Thus, a Jewel fan can create her own online Greatest Hits album and make it available to anyone at no cost—

It was a great box even before we added the screens.

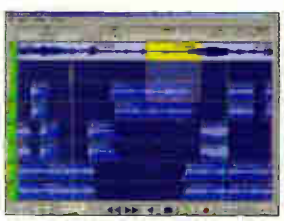
The OMR-8 Family— Disk Recorders *with Screens.*

OMR-8MR Master Recorder

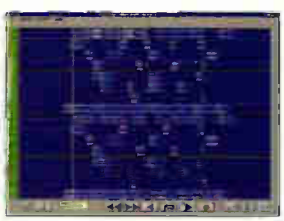
OMR-8D Digital Dubber

OMR-8P Post/ Production

Digital Audio Research introduces the only Hard Disk Recorder/ Players that also let you see and manipulate your audio projects down to true sample based waveforms. The OMR-8's ingenious design offers "tape replacement" simplicity with extended functionality. Unlike any other disk recorder, the self contained OMR-8 can be transformed into a competent audio workstation by simply plugging in a standard SVGA monitor, along with a mouse and keyboard.



Built-in segment, region, and waveform editing



SAM software shows multiple machines

The OMR-8 can be configured with any SCSI recording media (Hard disk, Jaz, MO). At the heart of its design, DAR's powerful and efficient Genesis™ file management system works with native WAV files and allows import and export compatibility with major industry audio file formats.

The OMR-8 is available in versions configured for specific audio tasks and can also be easily customized to suit any application. The **OMR-8MR Master Recorder** offers the highest resolution audio performance available today with a choice of internal 24-bit, 96k or 48k converters. And with support for sampling rates of 192k, and higher (using external converters) it's already set for the future! With its screens, you can edit, crossfade and sequence right in the box.

The OMR-8D Digital Dubber is the more complete digital dubber replacement. It delivers full mag emulation, sample accurate punch-in across all tracks and full audio networking. And with DAR's revolutionary SAM (Scalable Audio Multitrack) software you can control and edit up to 1024 tracks as if they were one machine—all on a single screen!

The **OMR-8P Production/Broadcast Recorder's** random access offers dramatically enhanced capabilities and greater speed and reliability over tape. Add a mouse, keyboard and SVGA, and you've got a powerful, cost-effective appliance that will cut, edit and manipulate your audio without having to make a transfer.

So get more from your box with the OMR-8... The Disk Recorders *with Screens.*

DAR products are proudly distributed and supported in North America by Studer. Call us and see this brilliant technology in action.

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DIGITAL AUDIO RESEARCH

DAR

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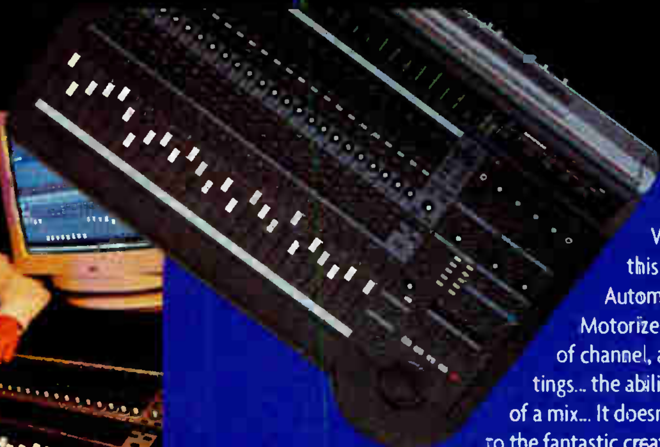

MICHAEL DeLORENZO

Double threat **Michael DeLorenzo**'s acting credits won him a role on "NY Undercover"... his musical gifts landed a recording deal. "The sound of this console is as good as any big analog console I've worked on," he says, adding "My producer **Peter Michael** and I were so surprised by the quality of the onboard dynamics and reverbs that we plan to mix the whole album without outboard gear."

WHY GO DIGITAL?

Virtually everybody in this ad has worked on a Big Automated Analog Console. Motorized faders... instant recall of channel, aux, EQ and effects settings... the ability to polish every facet of a mix... It doesn't take long to get used to the fantastic creative benefits of automation. Now, at a tiny fraction of the cost of those Mega-Consoles, a whole new breed of affordable digital consoles promises the same automation convenience. Our Digital 8•Bus not only delivers better-than-big-console automation, but it's intuitively easy to use and it has a warm natural sound—while maintaining the pristine sonics of 24-bit digital. **CALL OR E-MAIL FOR A FREE VIDEO AND THE NAME OF YOUR NEAREST DEALER... AND FIND OUT WHY YOU SHOULD GO DIGITAL WITH MACKIE.**

LEE ROY PARNELL

Lee Roy Parnell's upcoming Arista album may start a new trend in artist-producer-label communication. At every stage of each song's progress, mixes get modemed between Parnell's studio, producer **Ed Cherney** in Los Angeles, and Arista-Nashville president **Tim Dubois**' Nashville office on Music Row. (This won't make the airline industry too happy.)

POKE

Poke (above) and co-creator **Tone**'s credits include "Allure," Will Smith's "Big Willie Style" album, and NAS' "It Was Written." Their opinion of our new digital mixer? "Making records on the D8B is for real. Tight mixes and we love not having to give up the bread it used to cost to get great sound."

MAD JEF

Mad Jef's platinum credits include engineering and programming for the likes of Michael Jackson, Janet, Jam & Lewis, and Grammy winners Sounds of Blackness. Jef didn't expect much from the D8B's processing. His opinion after several mixes? "The onboard effects are so good I'm getting rid of a bunch of outboard gear."

NAUGHTY BY NATURE

Naughty By Nature cut and mixed the platinum album "Next" on their analog 8•Bus, so buying a D8B to mix their new release "19 Naughty IX" was a no-brainer. NBN's KG says the band avoided other digital mixers because they "mess with your sound."

TAL CONTROL. TOTAL CREATIVITY. AND DID WE MENTION...

SUPERB SOUND

ounds as good as an expensive analog console." We hear it over and over. From seasoned recording terans. From new, emerging talent. Though musically diverse, the folks in this ad all have one thing common: highly-tuned BS filters. If the Digital 8•Bus didn't deliver, they wouldn't be using it. l or e-mail for a free video and the name of your nearest Mackie Digital Systems dealer. Get an depth D8B demo and prove it to yourself: Mackie's Digital 8•Bus simply sounds superb.

WALTER AFANASIEFF

'd think with more than 100 million album sales to his credit, could have treated pop producer **Walter Afanasieff** better. But n his dazzling production credits and deposit at a local retailer dn't land him a D8B until recently. Was the 9-month wait worth As Walter's engineer **David Gleason** says (in his inimitable Brit- accent): "Walter and I both really love this desk."

JIMMY JOHNSON

Few know the evolution of recording better than Muscle Shoals legend **Jimmy Johnson**. He engineered hits for Otis Redding on a big-knob mono console, did the Stones' "Brown Sugar" on the first 8-track, produced Lynyrd Skynyrd on 24-track, and is now one of the first to own a Mackie D8B. Johnson says, "The sound I'm getting out of this console is phenomenal. Why did I have to wait so long to get it?"

ARROWHEAD STUDIOS

n/Nashville President/CEO **Scott Hendricks** has produced over y #1 records. His newest commercial recording facility is built nd a pair of Mackie D8Bs. With a 48-track Sony®, 24-track RADAR®, es of outboard gear, and Pro Tools® 24 on hand, Arrowhead Studios' ble-D8B 144-channel Mackie rig gets a serious digital workout.

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but neither Jewel nor anyone else in the food chain ever gets a dime.

There's a story going around, earnestly repeated by usually respectable sources, that "MP3" is the second-most-common search word on Internet engines, after "sex." Personally, I think this is bogus (I'm sure there's still a whole lot more call for "Monica + cigar," and similarly weighty topics), but it does indicate that the music industry, at least, thinks this stuff is very serious indeed.

There's a story going around that "MP3" is the second-most-common search word on Internet engines, after "sex."

I don't claim to be an expert on either the technical or political issues surrounding MP3, and I'm certainly not going to try to cover the whole spectrum of opinion in this column (there are plenty of other places you can do that, such as the Web sites for mp3.com and the RIAA), but allow me to offer some perspectives that might help you dig out from under the avalanche of partisan press releases and scare headlines.

For one thing, it's important to remember that this is hardly the first time the entertainment industry has decided that a new consumer technology will bring about The End of The World. In the early 1980s, a bunch of major labels declared war on record stores who sold blank cassettes. The labels threatened to pull their co-op advertising dollars (money that helps stores buy newspaper ads, in exchange for promoting specific titles) from any store that also advertised blank tape, claiming that the stores were promoting piracy. They backed up these claims with a study, commissioned by Warner/Elektra (as it was then known), that "proved" billions of dollars of record revenue were being lost to home taping.

The study turned out to be a load of

—CONTINUED ON PAGE 209

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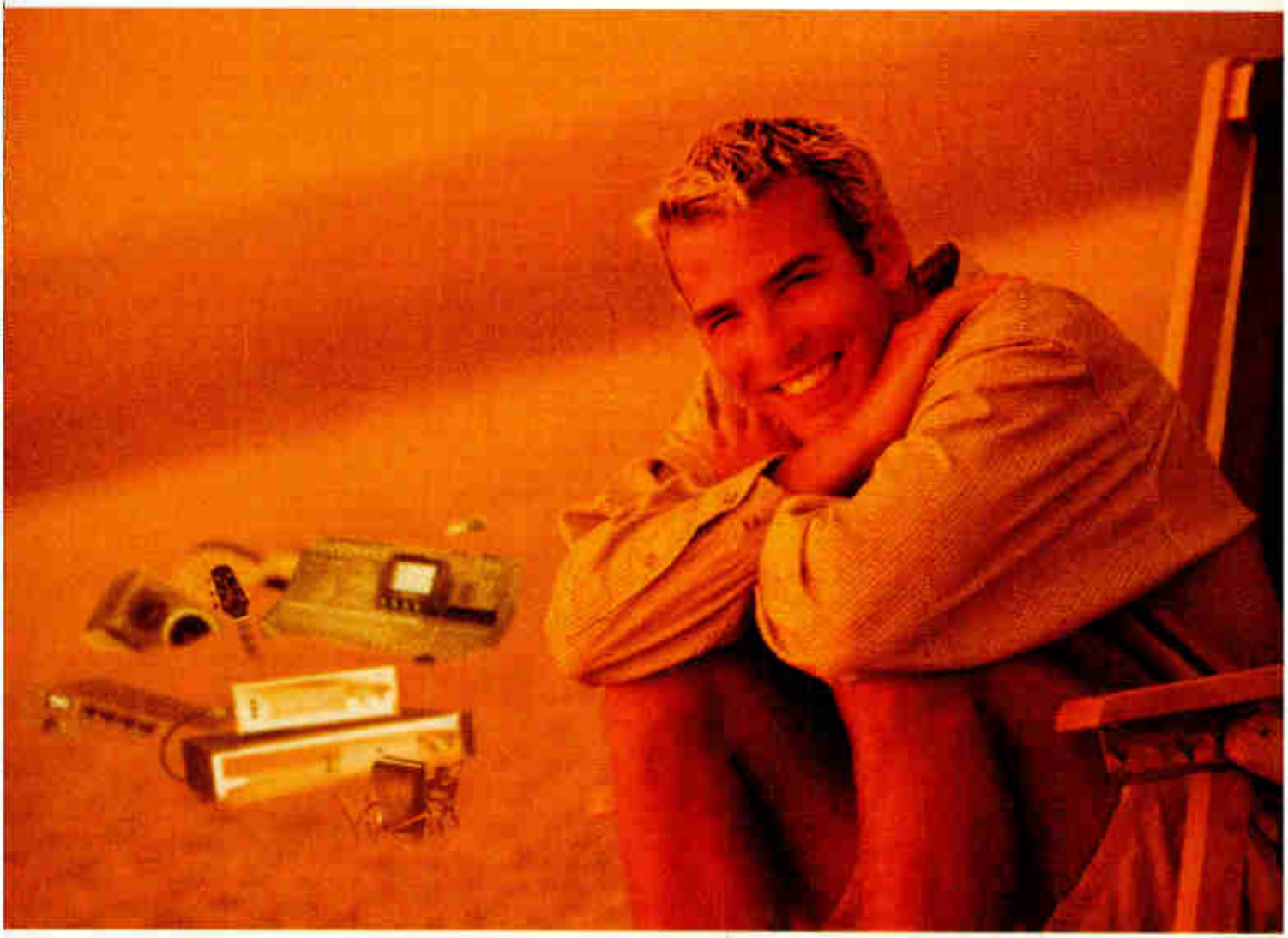

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The Class of '99

A LOOK AT 22 OF THE YEAR'S NEW ROOMS

PHOTO: JAMES F. WILSON

▲ *On Mix's cover this month, the Media Resource Group (Cleveland, Ohio) is an A/V complex designed by the Russ Berger Design Group (Dallas). Included in this 30,000-square-foot facility are the studio pictured here, four video edit suites, two graphics rooms, a Digital Betacam-based control room and a 3,500-square-foot soundstage. There is also a MIDI production studio with digital multitrack recording, an Avid AudioVision room and eight Pro Tools editing suites. The project involved renovation of an existing building, and project architect Robert Traub says, "To achieve the necessary acoustics for the sound-critical areas, we had to cut the slabs. The complications that ensued were similar to those encountered when building a facility from the ground up." Featured equipment in the room pictured includes a Euphonix CS3000 console and 5.1 surround monitoring via Genelec 1037s and a Bag End ELF subwoofer. The facility opened in November 1998.*

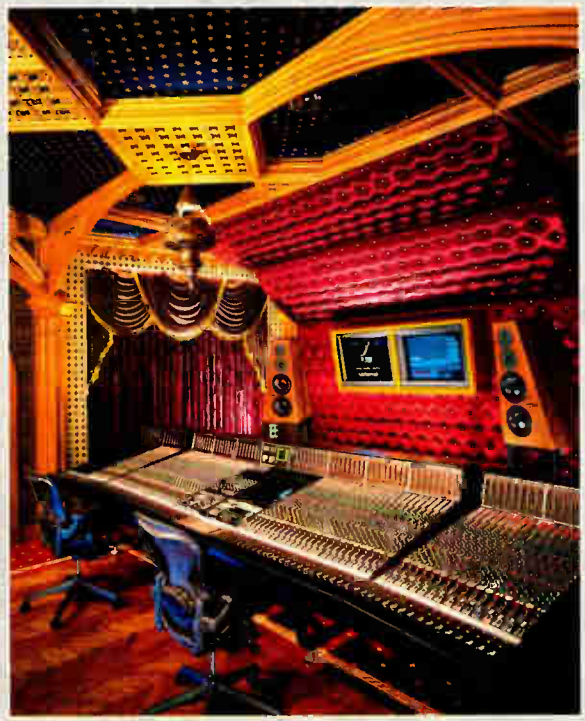

PHOTO: ED FREEMAN

▲ *This past fall NRG Recording Services (North Hollywood, Calif.) opened Studio C, designed by Los Angeles firm Studio 440. The Gothic-revival-styled room has a private lounge and offers a 72-channel SSL 9080 J Series console with Total Recall and Ultimation. Monitors are Dynaudio C-4 mains, and recorders include a Studer A827 24-track. Beck was recently recording in Studio C.*

PHOTO: DERRICK RATH

◀ *BOTO Design Architects (Venice, Calif.) designed commercial music facility Ad Music, a ground-up project completed when the studio followed many of SoCal's ad agencies from Burbank to Santa Monica. It includes offices and a lounge area above the studio, connected by a catwalk that looks down onto the studio ceiling and skylights. Equipment includes a DDA AMR 24 console, and Westlake 8.1, Yamaha NS10 and Auratone monitors.*

The Walters-Storyk Design Group of Highland, N.Y., designed this demonstration facility for the Sony OXF-R3 ("Oxford") console. The studio is part of Sony's corporate facilities in Teaneck, N.J., and so also offers a complement of other Sony gear, including a 24-bit PCM3348HR digital multitrack, PCM 9000 2-track 24-bit magneto-optical recorder and DVD player. The monitors are Dynaudio's BM15As plus subwoofer, arranged for 5.1 surround monitoring. This studio went online in September '98. For more about the WSDG, see page 50. ▼

PHOTO: ROBERT WOLSCH DESIGNS

PHOTO: BETSY ANNAS

▲ The Bakery's (North Hollywood) Studio D is centered around the new Amek DMS digital console, which includes 56 digital channels and 24 analog inputs; with use of Amek's UVS-1 switching matrix, more than 200 automated input possibilities are offered. Studio D, which opened in December 1998, was designed by Carl and Chris Yanchar of Wave:Space. Surround monitoring is via M&K MPS Series monitors and subwoofer.

Trans Continental Records hitmakers such as the Backstreet Boys and N'Sync have recorded at the label's Trans Continental Studios (Orlando, Fla.), which opened in March 1998. The three-room facility features this 80-channel SSL 9000 J Series console with the SL 959J 8-channel monitoring system option and a 5.1 monitor system consisting of Quested 210s and UD1s. The 9000 room (christened The Zone) was designed by Ross Alexander of Synergistic Services and Niels Kastor of NK Engineering. ▼

PHOTO: BARRY WHITE

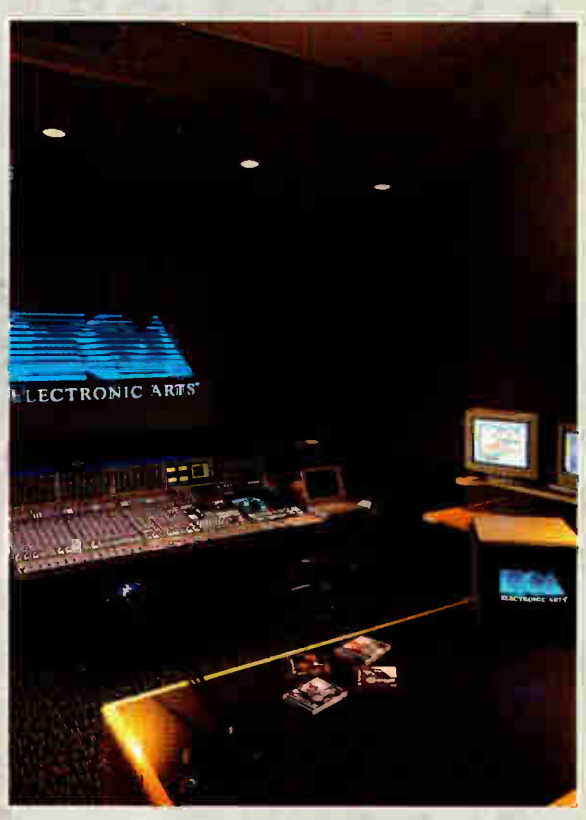

PHOTO: STEVE JENNINGS

▲ The new headquarters of game and multimedia company Electronic Arts opened for business in mid-January. The three-building complex incorporates new studios, totally encased in concrete, designed by director of post-production Murray Allen. Featured gear in this studio includes a new 96-channel SSL Avant digital console, and Genelec 1038 and 1032 monitoring, plus 32 tracks of Pro Tools 24. All of the CPUs in this facility are located remotely to eliminate fan noise.

PHOTO: ANDREA CIMINI

◀ *Los Angeles scoring facility The RecRoom employs The Frontwall, a modular acoustic shell, designed by Vincent van Haaff's Waterland Design Group, that integrates recording and playback spaces in one open area. A 56-fader Euphonix CS2000/3000 (2000 frame, 3000 electronics) is the room's centerpiece; other gear includes Waterland main monitors and a Pro Tools 24 system. Partners Giorgio Bertuccelli and Michael Skloff opened the studio in April '98.*

New production facility Studio 880 in Oakland, Calif., was designed by owner John Lucasey and includes two studios and a Foley stage. Studio A, pictured, is equipped with an 80-input Otari Concept 1 console (with moving fader automation and built-in dynamics), 5.1 monitoring including tri-amped active Genelec 1038As, Pro Tools 24, two Otari MTR-90II 24-tracks and a large collection of mics and outboard, both new and vintage. ▼

PHOTOS: JOHN CHIARA

PHOTO: GEORGE ROOS

▲ *Sound designer/editor/past-production mixer Joe Miuccio's new Studio D at The Mix Place (New York City) was designed by Francis Manzella Design Ltd. (Yorktown Heights, N.Y.) and was completed last June. It features a wrap-around work area including a Fairlight FAME console and Miuccio's collection of outboard gear. The LCR main monitors are Spendor SA300s.*

Designed by Chris Pelonis, the personal studio of actor Jeff Bridges in Santa Barbara, Calif., was equipped with a Mackie 32•8 when it came online late last year, but Bridges now has a D8B. Other gear includes 24 tracks of Sony and Tascam MDMs, a 5.1 monitoring system (Tannoy AMS 12s LCR, with Tannoy 8000s for surrounds) and a complete MIDI setup. Bridges uses the room for music tracking and mixing, as well as film screening. ▶

PHOTO: EDWARD COLVER

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No-compromise stereo reverb in combination with as many as 4 additional stereo effects, 200 superbly crafted presets, database sorting, and complete flexibility of routing and effect order in every program make the MPX 1 an indispensable recording and performance tool.

Powered by two separate DSP processors, the MPX 1 is loaded with 56 Pitch, Chorus, EQ, Modulation, Delay and world-class Reverb effects – each with the audio quality and control flexibility you'd expect in a dedicated processor. The 200 presets, designed for a wide variety of performance, sound design and production applications, exploit the unique characteristics of each effect – and a built-in database function makes it easy to find the right program fast.

An interactive front panel gives you instant access to each effect and its essential parameters, as well as push-button control over tempo, morphing, and mix and level settings of any or all effects. Whether you're looking for a rotary cabinet, a 4-Band Parameteric EQ, Ducking Delay, Pitch Shifting, or virtual rooms of any size and description, the MPX 1 is the right tool for the job.

For studio effects on the road, put an MPX 1 in the effects loop of your stage rig and an MPX R1 on the floor. A single cable provides stomp-box control of MPX 1 effects.

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CIRCLE #018 ON PRODUCT INFO CARD

Owner Tom Maydeck redesigned and remodeled this room at Monterey Post (Toluca Lake, Calif.), which came back online in December '98. The studio's front "mass wall" consists of ASC Tube Traps, and the ceiling features an RPG Skyline as treatment. Equipment includes a Euphonix CS2000 console, 5.1 monitoring using an M&K THX 150 Pro system, as well as Tascam MMR-8s and MMP-16s. At present, the studio is mixing long-format feature film and televison animation. ▶

PHOTO: EDWARD COLVER

PHOTO: JEROME MCCAVITT

▲ Skylights allow the sun to shine into the control room at Long Island, N.Y., facility Cloud 9 Recording. The studio, designed, owned and operated by brothers Jack and Joe Napoli (who, along with their father, also built it) opened in the fall of '98. The floated control room houses a D&R Orion-X console, a Sony JH-24 analog recorder, Pro Tools and 24-tracks of ADAT. Monitoring is via Genelec mains, and the studio offers a large selection of outboard and vintage mics, guitars and amps.

In business since 1987, Eastern Sky Media Services (Casselberry, Fla.) opened this new room this past January. Owner David Brown needed a room that could do double duty as a film and video editing suite and a music recording and mixing room, and he brought in Rosati Acoustics to handle the design. Audio equipment includes monitors by Genelec (1038s and 1031s, with 1092 and 1094 subs), a digitally controlled Tactile Technologies M4000 console with moving fader automation, DA-88s and ADATs, and Pro Tools 24. ▼

PHOTOS: RAYMOND MARTINOT

PHOTO: EDWARD COLVER

◀ The renovated Studio A at Los Angeles facility One On One Recording North reopened in March of this year. Newly installed in the control room is a 104-input SSL 9000 J console and Genelec 1035B monitoring. Gary Starr handled the acoustic redesign of the room, which was implemented by construction company Peterson/LaTouf. The studio is owned by Japanese recording artist/producer Yoshiki.

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CIRCLE #060 ON PRODUCT INFO CARD

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PHOTOS: YU-KUANG

◀ *Plantain Films & Recording (opened in February '99) is a private facility built into 8,000 square feet of a loft in New York City's West Village. It includes a suite of audio recording and mixing studios. Architect and acoustic isolation designer on the project was DOMA Architecture, which developed a new, patent-pending isolated wall system for the facility. Consulting were Jim Maher (of Soundhouse), Manhattan Audio and Gavi Inc. Equipment includes an Oram BEQ24 console, 3M M79 16- and 24-tracks, Pro Tools 24, and Stage Accompany M47 and Genelec S30 monitors.*

PHOTO: EDWARD COLVER

◀ *Sound Services Inc. (Hollywood) opened its second post facility in September. SSI on Sunset features a multiformat surround mixing room with a 96-fader Euphonix CS3000 console, Audio Cube and 32 tracks of Avid AudioVision. Apogee's THX-approved MPTS-1s and JBL 8340s provide the surround monitoring. This studio was designed and constructed by Scott Putnam Associates (Van Nuys, Calif.).*

Chicago's Colossal Mastering opened its doors in December '98. The facility's 4,000-cubic-foot mastering suite was designed by owners Dan Stout (chief engineer) and Barbara Noshold (CEO). It is equipped with a Sonic Solutions DAW with PQ encoding, extended filters and NoNoise; custom Legacy Audio Focus main monitors; an Ampex ATR-102 ½-inch with Flux Magnetics heads; as well as EQs and converters by Manley, Avalon and Apogee. ▶

PHOTO: YORK XU

Let the "critics" tell you how easy the Spirit Digital 328 mixer is to use...

Spirit's Digital 328 represents a new way of thinking in digital console design—it bridges the gap between analog ease-of-use and digital sound quality and features.

George Petersen of Mix says: "There are more than a dozen entries in the 'low cost' category of digital consoles, but in terms of pricing, performance and fast, logical interface, the Digital 328 clearly sets itself apart from the pack."

Take a few moments to read what he and other "critics" say about the Digital 328. Then, go to *www.spiritbysoundcraft.com* on the web for more information. If you're in the market for an *affordable* digital console, you need look no further.

On 328's user interface:

"The 328 is a real console interface that immediately feels as close to your comfortable old analog board as you could want... the consideration that has gone into every single button, knob and interconnect is striking." – Recording

"I liked the user interface a lot, and given that the most-requested features and digital interfaces are all included, the price is excellent." – Electronic Musician

"I like this board. It has a logical interface and enough knobs for fast operation (as such it could be ideal in a live performance or broadcast situation) while its audio performance is clean enough for any recording application." – Mix

On 328's E-Strip:

"The invention of the E-Strip is a stroke of genius, [giving] instant access to all controls at once on the selected channel." – Audio Media

"The 328 is fast and intuitive, thanks in large part to its 'E-Strip' interface. There are no subroutines or hidden pages; anyone familiar with an analog console can sit down at a 328 and be working in a matter of minutes." – Mix

"With Spirit's clever E-Strip design, this digital desk has the feel of an analogue." – The Mix (UK)

On 328's equalization:

"...To my ears, this is one of the most musical sounding digital EQs I've ever heard." – Recording

"[One] of the best features of the desk: carefully tailored to provide control ranges similar to those on a top-notch analogue console, it is (dare I say) very musical." – Audio Media

On 328's effects:

"A strong selling point for this unit is the pair of built-in stereo Lexicon effects... Having quality effects in the digital domain makes for clean sounds." – Electronic Musician

On 328's automation:

"The automation is straightforward to set up and works well." – Audio Media

"Between the user setups, snapshots and dynamic automation, the 328 remembers everything except the line-input trims and 100Hz rolloff switches. It's easy to get used to this way of working." – Electronic Musician

On 328's connectability:

"Clearly, the Digital 328 provides a multitude of configuration options suitable for project studios, post-production facilities, radio stations and even live applications." – Electronic Musician

"The 328 interfaces to practically anything digital." – Recording

On 328's unbeatable value:

"All in all, the British have indeed landed with a winner. The more you use this board, the more you will discover its depth and power. With one of these consoles, you could start a musical revolution of your own." – Electronic Musician

"This mixer packs a mighty punch for $5,000 [suggested list price]. It sounds excellent, does an excellent job of untangling all the various digital formats in use, and has an excellent interface. A bold step forward in digital console design." – Recording

"I like this desk! There's nothing better out there right now than the 328." – The Mix (UK)

On 328's mic preamps:

"The mic preamps have plenty of headroom... I was surprised at the clarity of the most subtle nuances of the percussion, including the last hint of sound from the bell trees and chimes." – Electronic Musician

"All in all, it is a delight to use—a real peach!"
– Audio Media

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SPIRIT BY SOUNDCRAFT

CIRCLE #019 ON PRODUCT INFO CARD

Elysian Fields, a 2,400-square-foot recording/mixing facility in Boca Raton, Fla., was originally constructed in 1993. In January '99, an extensive acoustical and system redesign was completed by the John Arthur Design Group (Miami). John Arthur also co-designed the custom monitor system (with Matt Dobson), using TAD components. Other equipment includes the 60-input Neve V3 console pictured here, as well as Studer A827 and D827 machines. ▶

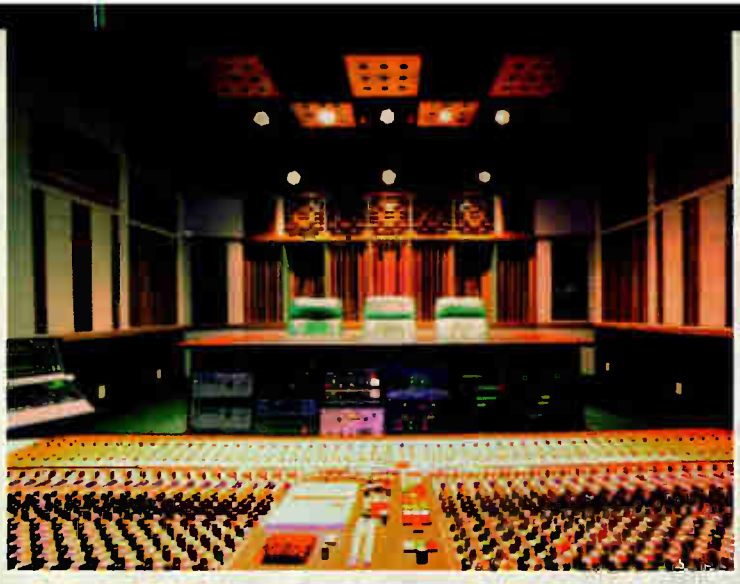


PHOTO: PETER LOHBER

Designed by studio bau:ton, O'Henry Sound Studios' (Burbank, Calif.) Studio B opened in September '98. Studio B was built to meet expanding client demand for multiformat recording and mixing; the room is equipped for music recording as well as film and TV scoring. The control room houses an 80-input SSL 9080 J Series console (with 956J 64x12 extended monitor matrix), 5.1 custom TAD/Bryston monitoring system with M&K subwoofers, two Studer A827 24-tracks and a Sony 3348 digital 48-track. ▼

PHOTO: JAMES MILSON

▲ Four Seasons Media Productions is a full-service, ground-up facility designed by the Russ Berger Design Group. This 8,500-square-foot complex includes three control rooms and two recording spaces, with natural light throughout. Featured equipment includes API Legacy, Yamaha 02R and SSL 4000G+ consoles, with a Pro Tools system in each control room. Each room offers Quested Q410 monitoring, and studios 1 and 2 are set up for surround.

PHOTO: EDWARD CELVER

PHOTO: GEORGE D. HALLOWELL

◀ BART Creative Audio's new post facility in Seattle was designed by Studio Pacifica Ltd, also of Seattle. Most of the talent recording this studio handles is done remotely from New York or L.A. and patched in via ISDN lines, so the Soundcraft Ghost console (with Mackie HUI controlling Pro Tools 24) is mainly used for monitoring. The monitors are Genelec 1032 mains and Yamaha NS-10 near-fields. BART opened for business in February 1999.

Perfect Pitch in a Box

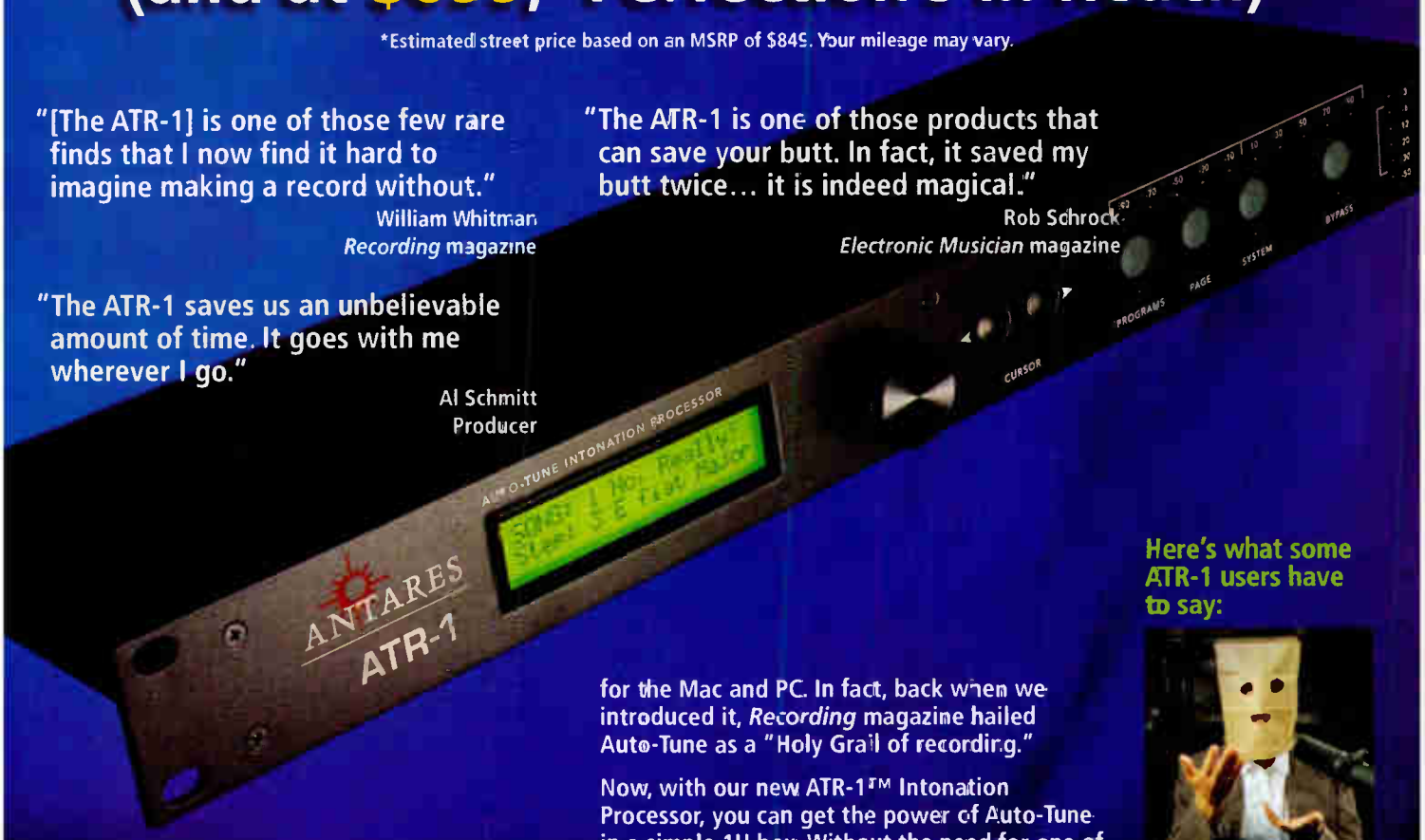
(and at $699,* Perfection's in Reach)

*Estimated street price based on an MSRP of $849. Your mileage may vary.

"[The ATR-1] is one of those few rare finds that I now find it hard to imagine making a record without."
William Whitman
Recording magazine

"The ATR-1 is one of those products that can save your butt. In fact, it saved my butt twice… it is indeed magical."
Rob Schrock
Electronic Musician magazine

"The ATR-1 saves us an unbelievable amount of time. It goes with me wherever I go."
Al Schmitt
Producer



OK, let's be honest. For most of you, "Perfect Pitch in a Box" is right up there on the credibility scale with Elvis sightings and miracle three-day weightloss. Unless, of course, you happen to be one of the thousands of audio professionals who already depend on Antares's amazing Auto-Tune™ pitch-correcting software for the Mac and PC. In fact, back when we introduced it, *Recording* magazine hailed Auto-Tune as a "Holy Grail of recording."

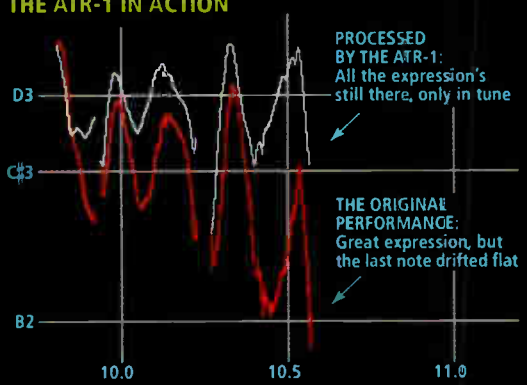
Now, with our new ATR-1™ Intonation Processor, you can get the power of Auto-Tune in a simple 1U box. Without the need for one of those pesky computers.

Simply stated, the ATR-1 corrects the pitch of a vocal or solo instrument, **in real time,** without distortion or artifacts, while preserving all of the expressive nuance of the original performance. Really. All the rest is just details.

Naturally, even those details are cool. Like the ability to eliminate vibrato from a performance. Or add it. Like being able to provide target pitches in real time via MIDI. Like a Song Mode that makes the ATR-1 as easy to use live as it is in the studio. Or a pristine data path with 56-bit internal processing, so the only difference between what goes in and what comes out is the intonation.

Of course, words are cheap (well, actually, when printed in a magazine ad like this they're fairly expensive). But hearing is believing. Try out the ATR-1 at your local Antares dealer or call us for a free demo CD. Either way, we're confident you'll be convinced. Really.

THE ATR-1 IN ACTION



Here's what some ATR-1 users have to say:

"With the ATR-1, vocal sessions can focus on attitude, not intonation."
~MADAME MARIE CURIE*

"Nothing helps your peace of mind on tour like an ATR-1 in the rack."
~FRANZ KAFKA*

*not their real names

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DIGITAL Multi-Effects PROCESSORS

WHAT'S NEW IN THE FAMILY FOR '98/'99

From cost-conscious table-toppers to multi-thousand-dollar mainframes, effects manufacturers have added at least 25 new units in the 18 months since Winter NAMM 1998. Loads of software plug-in, multidynamic, live sound and guitar-oriented processors with control room applications were also released, but for space considerations, just studio-based digital multi-effects processors with at least five algorithms each are included in this '98/'99 effects family tree.

The Alesis family has roots way back to the first Midiverb, circa 1985, and the Q20 ($999) now replaces the Q2 as their best-of-breed unit. Representing 14 years of multi-effects evolution, the Q20's ADAT, XLR, ¼-inch and optical and coaxial S/PDIF back-panel I/Os are internally complemented by a laundry list of 300 programs to control auto-pan, reverb, delay, Doppler fx, distortion and numerous other algorithms. Maximum reverb and delay times are 32 and five seconds, respectively, and up to eight effects can be used simultaneously. The Q20 routes signals in true stereo, series and parallel modes, and includes stereo sampling.

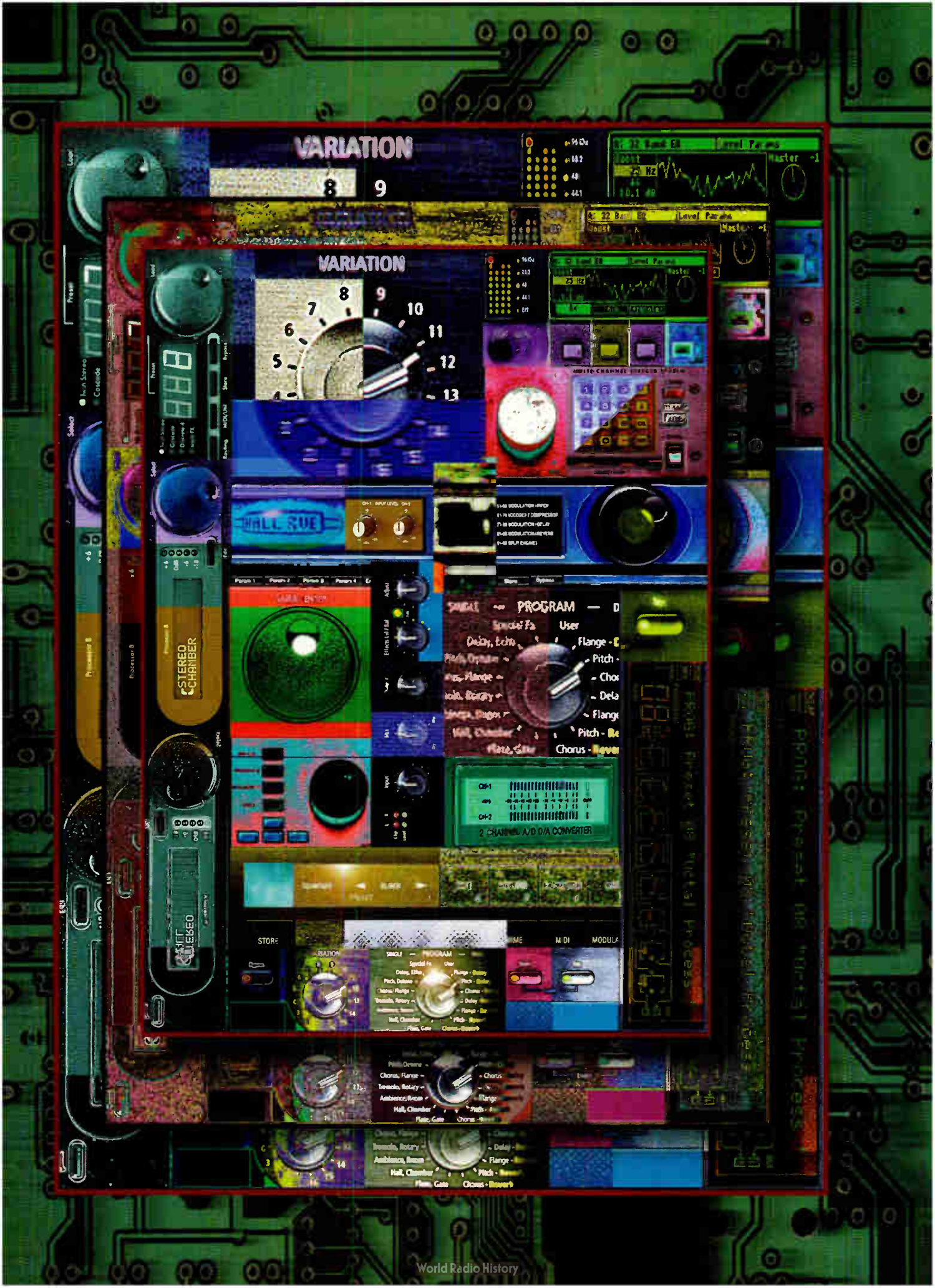
From Applied Research & Technology comes the DMV-Pro ($499). Each of the DMV's dual discrete stereo channels has its own large data knob and edit display window, and can manage three simultaneous effects. A whopping 72 algorithms include reverbs, choruses, flanges, tremolos, delays and pitch programs, each of which has up to 12 parameters available, and a dynamic signal controller adjusts to levels present at the Pro's ¼-inch unbalanced inputs.

The Quadra/Fx ($249) operates as two true-stereo multi-effects processors that use ART's proprietary Dynamic Allocation engine. Reverb tails can last up to 20 seconds, and delay times of up to five seconds are possible; there are two simultaneous MIDI controllers per program, and the Quadra boasts 24-bit internal and 20-bit A/D-D/A converters. Rounding out ART's '98/'99 units is the tabletop FX-1 ($134), which includes dual pitch-shifting among eight other effects types.

Behringer International's new kids for '99 include the Virtualizer Pro DSP1000P ($249) and Modulizer Pro DSP1200P ($249). Virtualizer is a dual-processor with 32 reverb algorithms and 512 effect variations

by Randy Alberts

PHOTO MONTAGE: TIM GLEASON



DIGITAL Multi-Effects PROCESSORS

that include delays, EQs, vocoding and rotary speakers, with internal 24-bit processing and 20-bit A/D-D/A audio streams through balanced XLR and ¼-inch I/Os. Modulizer's best subject is modulation effects, such as chorusing, phaser and 3-D processing, but it also has filtering, compression and bass enhancement. Also able to convert audio at 24-bit internal and 20-bit A/D-D/A, Modulizer and Virtualizer carry a suggested retail price of $250 each.

No two companies were more prolific on the multi-effects front over the last year-and-a-half than **DigiTech** and DOD. DigiTech's Studio S-200 ($339) sports a huge custom display and true-stereo dual processors and includes 15 effects algorithms that can be patched in any order. Its smaller brother (S-100, $219) does everything the S-200 can *sans* the large display, but they both aspire to be as big as the Studio Quad4 ($479) when they grow up. Four discrete effects processors are configurable as either four independent mono or two true-stereo processors in the Quad4, and nifty effects like vocoder, reverse delay and spring reverb are standard equipment. With each unit having the same cool blue face, it's not hard to see that these three come from the same family.

Also new since Winter NAMM '98 are DOD's Dimension 3 ($169) and VoTec ($199). The Dimension 3 includes reverbs, choruses, flanges and delays, each adjustable with two parameter data knobs; and as its name implies, the VoTec's delay, EQ, compression, distortion and telephone simulator effects are great for processing vocals.

DOD VoTec effects processor

Picture a *wünderkind* genius that can belt a baseball out of Yankee Stadium, and you get an idea of **Eventide**'s latest addition, Orville. For $5,695 you could adopt ten medium-priced multi-effectors, but it's unlikely they'd out-muscle the Orville Harmonizer's pure power stroke. A massive range of multi-effects and dynamics processors are included, and 87 seconds of stereo sampling (174 seconds mono) can outdistance many a RAM-gorged rackmount sampler. Twenty-four-bit/96kHz capabilities, formant-correct vocal processing and 8x8 digital/analog simultaneous "anything-to-anything" I/O routing round out Orville's report card.

If mere 87-second mono samples (43.5 stereo) that can be fed back into onboard effects will do, the DSP4500 Ultra-Harmonizer ($4,995) is another notable newbie from Eventide. It sports 24-bit converters inside and out and has all the software and features of the company's venerable 4000 Series multi-effects processors, plus the custom Alchemy 101 Preset Library.

Korg is well-known for its line of guitar multi-effects that include the belt-strapable Pandora, but the AM8000 Ambience Multi Effect processor ($600) sports its own healthy audio tool belt that any studio can use. Eleven delay and reverb types are among 40 algorithms that include chorus, phase shift, modulation, tape delay, ring modulator and Doppler effects. There's also 3-band EQ, compression and limiting; everything is processed with 18-bit resolution and AD 128x-oversampled at 48 kHz, and even Mr. Magoo could read the unit's pleasantly oversized blue LED display.

Continuing the tradition of the legendary PCM 80 and PCM 90, **Lexicon** now offers the PCM 81 ($2,995) and PCM 91. Though not multi-effect by nature, the 91's reverb-specific algorithms rate mention for working hand-in-hand with the 81's new and improved selection of reverb, flange, chorus, delay, pitch shift and EQ programs. In addition to improved algorithms, the PCM 81 offers all the features of the PCM 80, as well as AES/EBU digital I/O.

The 480L Digital Effects System ($9,899) still remains the leader of the Lexi pack with new Version 4.0 software that includes room sizes as small as two square meters.

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DIGITAL Multi-Effects PROCESSORS

More than 450 classic Lexicon halls, choruses and multiband delays abound, and the 480's multimachine architecture is wide open for even more brainpower expansion. The Model 300 Digital Effects System ($4,995) offers an affordable subset of the 480's algorithms and features timecode controls capable of translating formats internally, such as turning AES input to S/PDIF output. Full dynamic MIDI implementation is possible with any SysEx-savvy sequencer or automation program, and the Model 300L ($3,995) is a blank front-panel version of the 300 that's controlled by the optional LARC remote control.

The MPX 100 ($299) uses an updated version of the Lexichip and offers coaxial digital S/PDIF output. This dual-channel true-stereo processor has nine algorithms including reverbs, pitch shifts and rotary speaker, and enough mental capacity to calculate six-second delays. Twenty-four-bit internal and 20-bit A/D-D/A converters, 240 presets, 16 user programs and tap-tempo control round out this new unit.

Long on family tradition is Peavey, whose Deltafex ($139), Deltafex Twin ($279) and Addverb III ($349) were all added to the roster since last year. The Deltafex is a cost-wise multi-effector that dropped another $20 in price recently, and its Deltafex Twin brother is twice as strong, packing two completely functional Deltafexes into a single 1U chassis. The Twin and the Addverb each have 16 effects types, including reverb and delay tails that finish even when changing programs, and there are two assignable parameter controls per algorithm. In addition, the Addverb III now features dual data wheels and true-stereo operation and fully comprehends and speaks MIDI.

Though not your typical multi-effects box, the RTSP-1600 ($789) from Pefftronics does include five effects that include flanging, chorus and delay programs. But the 1600's best talent is randomly generating wild time-shift, doubling and modulation effects. This SIMM RAM-upgradeable unit uses triangle and sine waves to emulate manual flanging and other staples, and even if its Gaussian pseudo-random noise sequencer had to write "I will generate random effects" on the school chalk-

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☐ -20dB ☐ -22dB (if you insist)

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(all selections are linear PCM, no data compression)
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Sample rate:
☐ 32kHz ☐ 44.1kHz ☐ 48kHz
☐ 38.2kHz ☐ 96kHz
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Maintain constant sample rate even playing off-speed/varispeed:
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Frame rate:
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☐ 24 -4% ☐ 25 +4.17%
☐ 29.97 nd ☐ 30 nd
☐ 29.97 drop ☐ 30 drop

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DIGITAL Multi-Effects PROCESSORS

board for 76 years, it wouldn't once repeat the same effect.

Carrying on Sony's multi-effects tradition is the DPS-V77's follow-up, the DPS-V55 ($550). With the same DSP brains as the 77, the 55 offers up an impressive list of effects and bonus features that include an effects search tool and tap-tempo input control. Forty-five effects include reverbs, delays, modulation, pitch-shifts, filters, vocal cancel, vocoder, compression, 3-D sound and 4-channel surround algorithms, and the two-space rackmount unit boasts 20-bit A/D-D/A converters and 52-bit internal audio processing. The DPS-V55's ¼-inch analog connectors can be configured as 4x4 mono or two simultaneous true-stereo I/Os; there's 200 custom producer-designed programs and 200 user slots available, and owners can download a free PC-based editor/librarian software program from Sony's Web site.

TC Electronic has also brought new multi-effects units to market over the past 18 months, including the M5000 Digital Audio Mainframe ($4,100 to $8,550, depending on configuration). The M5000 has plenty of room to grow into its expansive open-system brain and boasts an endless array of sophisticated reverb, pitch-shift, multiband dynamic, delay, EQ, flanger and sampling algorithms. The unit speaks SMPTE and offers 20-bit A/D-D/A; an optional ATAC remote controller can control multiple M5000s.

TC's M3000 Studio Effects Processor ($2,499) can reverberate, delay, pitch-shift, phase, compress, limit, expand and dynamically EQ the most savage signal with its dual-engine processors and proprietary Virtual Space Simulator technology. If *your* multi-effects kids can calculate AES/EBU, S/PDIF, TOS Optical, ADAT, MIDI and 24-bit true-stereo signals over simultaneous digital outputs, maybe they belong in the same Mensa class as the M3000. ■

Randy Alberts is a writer, musician and recordist in San Francisco who has been on staff with Mix, Keyboard, Electronic Musician, EQ *and* Radio & Records.

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JOHN STORYK

THIRTY YEARS OF STUDIO DESIGN

John Storyk has been a fixture in studio design almost since there were studios to design. At 53, he can trace his professional lineage back to the days when recording studios began evolving from utilitarian boxes into actual musical instruments, a time when the term "design" began to precede the word "build" when it came to places in which people made serious sounds.

Storyk's professional career began in 1969, the year of Woodstock—which both he and this writer attended—and the year in which the music business crossed a line from cottage industry to mega-industry. A native of Long Island, Storyk had attended Princeton University and played in the marching band and in weekend rock bands as a keyboardist and saxophonist while studying architecture. The convergence of those two passions is now imprinted on over 650 facilities of various types, from recording studios to post facilities to corporate board rooms.

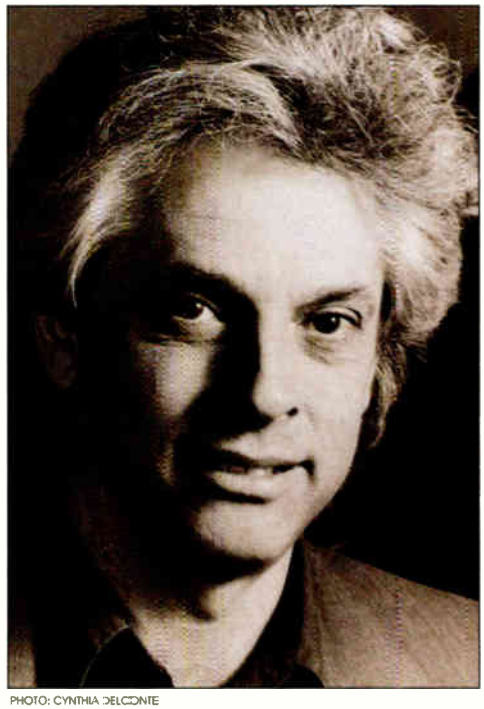

PHOTO: CYNTHIA DELCONTE

Storyk lives in a small town near Poughkeepsie, N.Y., with his wife and partner of eight years, Beth Walters, and their two children. Walters, whom Storyk describes as "my partner in every way imaginable," is an F.I.T. graduate who specialized in fabric design and whose interior design aesthetic creates a synergy with Storyk's command of time, space and physics. Numerous projects are currently under way at the Walters-Storyk Design Group (WSDG), including a third studio at New York's Sound On Sound as well as studios in Europe and South America. (WSDG opened associate offices in Basel, Switzerland, and Buenos Aires, Argentina, last year, and Storyk supervises an increasingly global domain that has stretched from Reykjavik to Kuala Lumpur via e-mail and video conferencing.) As a result, Storyk suffers from the same sort of syndrome that any harried executive in the '90s does, when jet lag can manifest itself without one ever having stepped onto a plane.

Storyk's long relationship with studios goes back to some of the seminal facilities in rock 'n' roll, including two of the most famous: Jimi Hendrix's Electric Lady Studios and Albert Grossman's Bearsville, two facilities for which he has a special fondness—particularly the latter, which was originally conceived as a studio for Grossman's record label of the same name. Storyk sketched out the basic design for the first room at Bearsville on a cocktail napkin, and Grossman ended up giving Storyk office space for over a decade as Storyk built his business. (Grossman, who is buried near the studio, also managed Bob Dylan. "He invented artist management as we know the term today," Storyk observes of his mentor.)

Today Storyk's studio design firm is headquartered about 30 miles away on the east bank of the Hudson River. Cocktail napkins have given way to TEF analyzers and CAD programs. But despite all the changes in the technology and the business, Storyk maintains that the essence of designing for sound still comes down to the space between the speakers and the human being.

How did you get into this business?

I had those two loves, music and architecture. I came out of school, and in the summer of '68, due to some strange and accidental events, I found myself designing and actually building a very small club in SoHo—this was before the word "SoHo" existed—called Cerebrum. It was tiny and had a life of only nine months. This club was one of the new hot spots in town along with Dionysus and Electric Circus. All of a sudden at the age of 23 we're in Life and Time magazines. Then one night Jimi Hendrix and his manager, Michael Jefferies, come in. They had decided to buy a club on Eighth Street in the basement of a theater. Jimi was playing there so much and running up such a tab that they just decided to buy the club. Jimi turns to Michael and says why don't we get the guy who designed that club? I got a call the next day from Jefferies to design the club. I had a meeting with both of them and started designing a club, Electric Ladyland. At the last minute, the club gets scrapped due to the efforts of Eddie Kramer, who produced and engineered Jimi's records. The next thing you know, I'm designing a studio. I took two months off my job and took a crash course in the world of studio de-

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sign, which in 1968 was not a particularly big world, and started designing and building Electric Lady, which opened a year later.

Electric Lady is an amazing place that's perhaps as well known for the Minneta River as for the records that got made there.

The studio is on top of a river, like a high flood table now, which ran through the Village. To get the isolation in the B studio, the only way we could do it as the ceiling sloped down was to build sloped walls to support the isolation system. To do that we had to dig down for the footings. But one day we went down one shovelful too much. The next thing you know we had Old Faithful in the basement. We covered it up and shifted the design from a heavy black wall solution to a lighter drywall solution and installed on a permanent basis two water pumping systems, one to back up the other. Several times over the years both pumps have failed and they have had water in there.

A more common urban problem would be something like a subway. How has design changed to accommodate urban noise over the years?

In the most general sense, not much has changed fundamentally. You still measure the bothering noise, which in this case was the community environment. Electric Lady had two real bothersome neighbors—one was the theater above and the other was the subway about 100 yards away. Today, it's the same process: You measure how much they bother you by. What has changed is that studios have to be quieter than they were 30 years ago because of digital recording. But the process is the same. If I had that same studio to do over again, I wouldn't [approach the noise problem] differently. We did not design for the subway. We decided it was impossible to completely eliminate the subway noise. There wasn't enough height to build practical isolation. So once every ten minutes there's a tiny little rumble in there. They just accept it. It's been going on for 30 years.

You did Blue Rock and other new studios around that same time. This was a kind of new age of independent studios.

That's exactly right. Like I said, when I went around to learn about studios, it was not a particularly big universe.

So you caught a wave. Your entry into the design business coincided with the rise of new studios to feed the growing rock monster.

I would be the first to admit that. The 1966 to 1975 period was exactly that. People ask me how they get started in the studio design business, but I'm 53; what I did has little to do with what you'd do now. It was a totally different time. People were okay with experimenting. People accepted studios whose equipment was much better than the [studio] environments, and that's because in 1969 the entire studio world was totally driven by equipment. Since then, there's been an entire world of literature and people discussing what can be done. You had more opportunity to be wrong and more opportunity to be right. You could experiment and sometimes hit the nail on the head. It was more fun. Now, the level of expectation is extremely high. People bring you on, and if you make 980 of 1,000 little decisions right, you get fired. If you make 990 right, you get a "thank you."

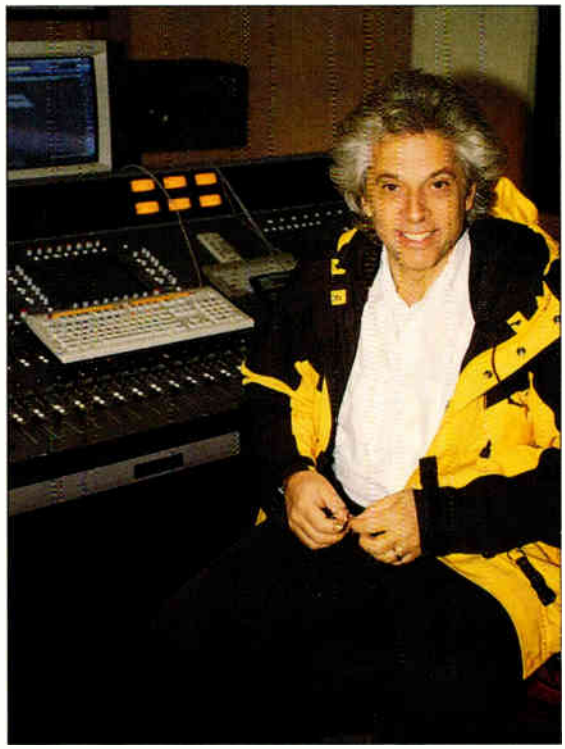

PHOTO: HOWARD SHERMAN

Storyk inside the recently completed Lower East Side Studio B (NYC).

Bearsville was one of the first project studios, really, dedicated to one company's or person's projects.

I met Albert in 1969 not because of Electric Lady, though Michael Jefferies lived about a quarter-mile away from him in Woodstock. I met Albert because the guy who was the line manager for The Band, John Taplin (who went on to become a successful Hollywood producer), and I were friends from Princeton. He was working with Albert, and when he found out that Albert wanted a studio, he introduced me. The original intent was to be an in-house recording studio. I don't think Albert ever thought it would become a money-making studio, much less the only thing left of his empire. His real interest was management and publishing. The studio was an adjunct. Within about 18 months, as that studio got built, we became friends, and I came back and did more projects for him. After I came back from Colorado in 1974, I wanted a weekend place in Woodstock and Albert offered me a space on his estate. That started a relationship that lasted 15 years.

The whole building was built as a block building, but Studio B was outfitted first, with a Ted Rothstein Quad 8 console; Studio A was like a rehearsal studio and had no equipment. The Band kind of parked themselves there for a while. There was a time when Albert was the largest builder in Woodstock, and only building for himself.

Studio B has a lot of history, from The Band to Peter Tosh to Van Morrison. What made it so special?

At the time there was no destination recording studio that was like a resort. The only one like it really was James Guercio's Caribou Ranch in Colorado. The location made it special. The rooms were very bright, though. It was definitely conceived as a place where a group could park and make it feel like a rehearsal studio.

At the time, that was a relatively new concept, vs. a place where you went in for a few hours at a time.

Right. It was oriented like a rehearsal studio. It wasn't funky, but it was rustic.

Control rooms were fairly small then.

They were. We were just at the point where they began getting bigger. Studio B's control room was a little larger than most at the time. What I realized was that in this design I had to have a place that was big enough not just for the producer and engineer but also for a six-piece band that would want to roll up chairs and light a cigarette and listen together.

The larger sweet spot that came about as a result didn't come about

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from Bearsville, though. It came about from Bob Margouleff, who worked a lot at Electric Lady. The original Electric Lady A control room wasn't that deep. If I had it to do all over again, I would have made the control room bigger and the studio smaller, but there was pressure from Eddie Kramer because of how he liked to record, and we were limited in terms of space, so as one got bigger, the other got smaller. So the sweet spot there was not that big. At Bearsville it was much bigger. Margouleff had done a lot of work at Electric Lady with Stevie Wonder, and he pushed me toward a wider sweet spot.

What did you have to choose from in terms of monitors at the time?

Not much. The decision at Bearsville was not mine, but we used the state-of-the-art Westlakes with the big horns. But I was one of the first to mount them upside down, with the big horns on the top. People thought it was because it made it look like a little bear logo, but the reason was to get the high-frequency driver lower to get rid of reflections off the console. That was a very intentional move and helped get a better imaging focus. But Westlake was one of the three or four good off-the-shelf speakers we could choose from in those days.

PHOTO: CYNTHIA DELCONTE

John Storyk and Beth Walters, Cotton Hill Studios, Albany, N.Y.

You lived in Colorado for a few years in the early '70s, but you were still designing studios in New York, including Generation for Howard Stern's father, Ben. And Joe Tarsia, who owned Sigma in Philadelphia, wanted to build a facility in New York and contacted you.

That was my first turnkey project where we also built the studio. I've gone through one or two other attempts at that, but now I don't. Some people have had success at being turnkey, but I now find that to be a bit of a conflict, and it's not my best skill set. What made that studio interesting was that Joe came into New York with music experience with producers like Gamble & Huff, but he knew he needed advertis-

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ing work in Manhattan. So we made a very bright studio even though we had a low ceiling to work with.

There were a limited number of off-the-shelf acoustical solutions you had to work with then, but now that's completely changed. What else has changed over that period of time?

The biggest single thing is industry awareness that [design] is important. In 1972, allocating space and demanding height and digging down for studios, these were uphill battles. Just having a designer on board before the equipment was chosen was radical. Ironically, the biggest thing was not a diffusor manufacturer but rather the idea that the environment counts. Everyone now knows that the environment is the most important aspect. How did that come about? Articles and things like that. Also cheap and easy-to-use measuring equipment has a lot to do with where we are today. Today, anyone can measure a room with $2,000 worth of equipment. That's part of what helps raise awareness. Consoles got bigger, and there was a moment when some of these behemoth consoles were a nightmare. So in some cases the rooms got bigger, at least when the space was available. But now more studios are desktop. Over time, studios have actually gotten more compact. Today, no one puts tape machines in the control room. I'm working on a studio in Italy that doesn't even have a console. I think the equipment situation is settled down to where it's smaller and smaller.

You said in an interview in* Mix *[Aug., 1997] that "the age of the giant studio is waning and it's being replaced with desktop audio." Do you still feel that way?

Yes, although there are some very large studios that keep getting contemplated, and there will always be a reason for them. But in the ratio between large and small, there are more smaller ones. But that's for me. I don't think my workload is the barometer of the industry.

Has digital sound pushed the limits of what a control room can actually accomplish? Is the media getting to the point where it challenges the physics of acoustics?

I don't think so. Things like the noise floor have changed, and the equipment has changed in size. But what goes on in the control room—the tracking, the monitoring—has not changed.

You work closely with your wife, Beth, who handles interior design. Has there been a change in the balance between style and substance in studio design? How much more important has the aesthetic become?

It was always important. My guess is that 30 years ago it was more important because they didn't have the collective knowledge we have now [about physics]. I see most things in terms of volume and how they sound, and then how they move through those spaces. But I don't think we could have gone where we went in the last ten years [on that alone]. In addition to her design eye, she runs the show here. I'm not the world's best businessman.

PHOTO: HOWARD SHERMAN

John Storyk and engineer/producer Eddie Kramer outside Electric Lady Studios, NYC, 1996.

How is surround changing things at this point? There seem to be few hard-and-fast rules.

This is one of our current frontiers, and it's not being equipment-driven. It's definitely a pure environmental issue. Most people are a little hesitant to commit [to certain designs]. There is a lack of agreement as to how this thing should settle down. There are fundamental social issues...

Social issues?

Yeah. Do we really have the right to make a technology that's based exactly on where the speakers are? Are we really going to tell people how to set up their living rooms? It's one thing to tell people where two speakers should be set up. You can do that on a beach with a boom box. But it's much more complex in 5.1. You wake up, and there's five people with five different formats; this guy wants 6.1, this guy wants 7.1, half of it's marketing crap. Stereo will not go away. There are a lot of technical issues that translate to the environment, which is what I'm interested in. There are some rules that we are following. But what I want to do is build 15 of them—and I'm just about there—and then survey them; then I want to come to my peers with my report. I'm not in any rush to write any rules.

Is multichannel sound perhaps promising more to recording studios than it can really offer? Are they looking to it in the hope of raising rates?

I haven't seen that yet, but I'm not disagreeing with it. I'm lucky that I don't have to touch that. But I can tell you that I haven't seen anyone in the last two years discuss a project that's not 5.1. It's like discussing a project without speakers. I get some insight into that from repeat customers, and if I had to make a conclusion—and it's not gospel—I believe that studio owners are almost being forced to do it. It's like, if you don't have a 5.1 room, you're going to lose customers. I get the impression that [studio owners] feel that they have to put a 5.1 room in or customers are going to go elsewhere.

Is studio design becoming less ideologically driven, perhaps as a result?

Some ideology plays a role, but we're still a service provider. I personally didn't wake up one day and say everyone should listen on five speakers and a sub. Now it's being handed to us, and we're told to go solve it. But there's still plenty of room for individuality. Every studio still has ample room to put its own signature on it. I don't find it a challenge to keep that, not for me. That's a passionate answer; that's what keeps it interesting for me.

There's so many more kinds of facilities that use design now, from project studios to boardrooms, etc.

That's crossed my mind. There have been periods where I wake up and wonder, "Can I do another control room?" It's not about making money. Deli owners make more money than designers and architects. A lot of different kinds of spaces is what makes it challenging. I remember when Don Davis brought the first TEF machine to Bearsville—Ted Rothstein and I brought him to his first studio—and it was the

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first time I ever got to see a time domain measurement, to see on a graph what I had been told engineers were hearing. I'm not an engineer by training, and I can't hear a lot of the stuff I talk about. But once I could see it, I got another two years in my career.

But this has certainly broadened the range of your business.

Right now studios are only about a third of our business. But I'm probably doing the same number of studios I did years ago. Our business got bigger. We don't have four people anymore, we have 14, eight of whom do nothing but draw.

The design business is changing. There are more people out there calling themselves designers than ever before. How is that changing the business?

It's not doing anything to me. Let's just say ten years ago there were ten guys doing it at a certain high level. Let's say those same people are still playing, and there's another 20 more. The aggregate bar is getting raised, because across the board there's more work. The bar is still being raised. Even the guy at the bottom will do better work than the guy putting Sonex up in a garage. It's easier for people to represent themselves as designers but not easier to represent themselves as people who can really go to the end of the line on complex solutions. I don't see my field as having become more competitive. I have as much work as I want. We always seem to get called by people who have done their research. They check the Web site and then they call.

PHOTO: HOWARD SHERMAN

Storyk in 1976

Are designers marketing themselves more aggressively now?

I think collectively they are. We haven't changed our marketing program in years. We've done the same thing for eight years. The same number of ads, the same number of articles, [our public relations person] does the same thing. We had a newsletter that was replaced with a postcard. We go to the same one trade show a year. But there are more people throwing ads in. I don't think about it, but I see it.

When you look over the horizon in terms of technology and design for studios, what do you see?

Things may change in a lot of ways, like virtual linkages between studios, but one thing will not change: Sound will keep moving at 1,130 feet per second in air into your ear. Unless they're going to go into our brains or some other neurological kind of way. Maybe someday we'll eat a pill and hear something. But as long as we're sitting in a room expecting to listen to something, we're going to have to obey the basic law of physics in the environment. They haven't changed. ■

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

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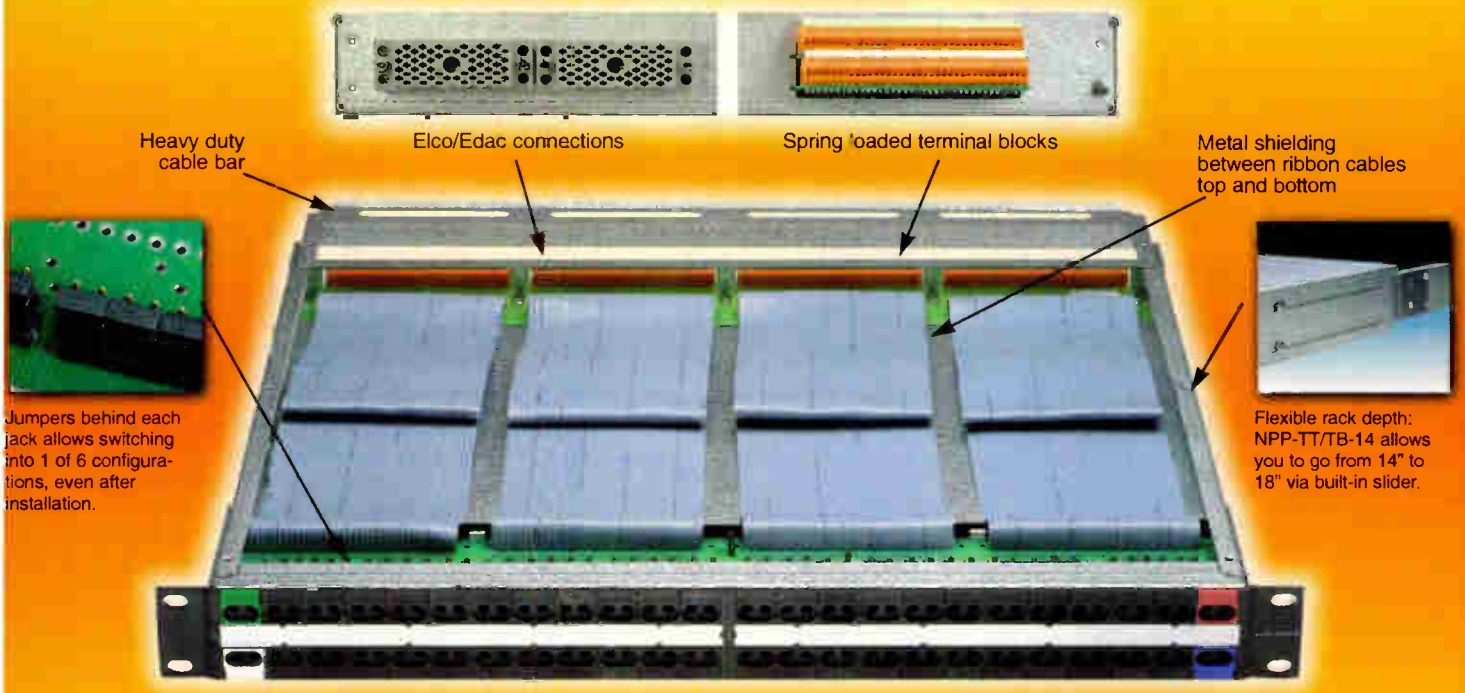
Two choices to "wire up" Easy Patch for fast termination.



The Easy Patch series of easy to use patchbays eliminates signal degradation and offers excellent crosstalk performance required in today's broadcast facilities, mobile trucks, recording studios and audio installations.

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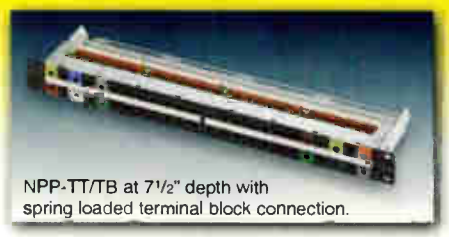
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CIRCLE #032 ON PRODUCT INFO CARD

Studio Wiring Options

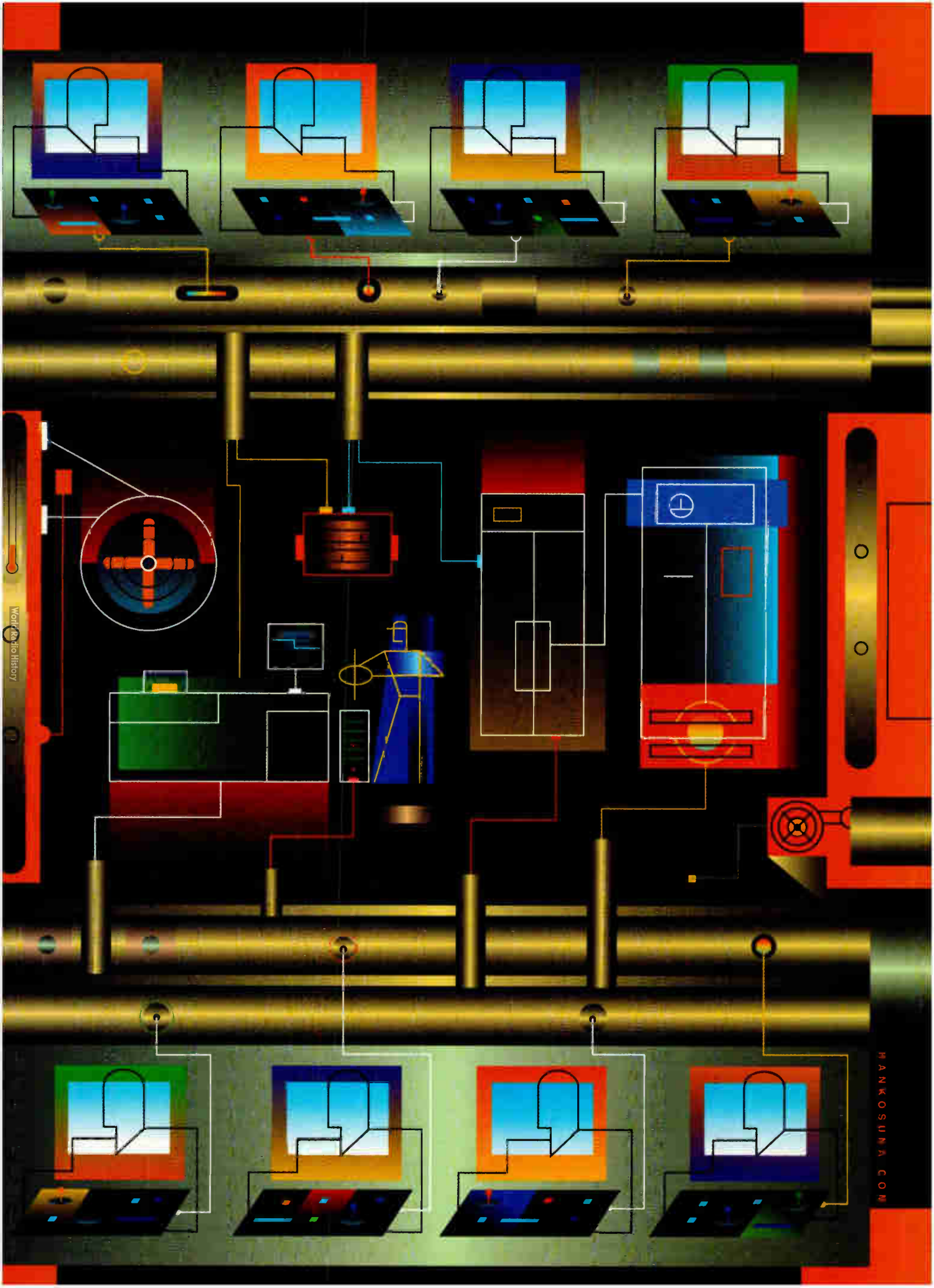
BY PHILIP DE LANCIE

If audio signals are the lifeblood of an audio production facility, then wiring is the circulatory system through which those signals move. Once installed, wiring is both out of sight and out of mind. But the increasing digitization of audio production means that a facility's existing wiring systems can't be taken for granted. The wire itself, the routing and patching systems, the connectors and interfaces and even the conduits or troughs (the "wire management system") are all subject to re-evaluation as analog systems are supplemented with or superseded by digital audio tools.

"Digital audio systems may represent a global change in the architecture of a facility's wiring," says Russ Berger of Russ Berger Design Group in Dallas. "Systems that were previously standalone are now more likely to be networked among multiple rooms. Systems that had their processing capability located in each individual studio are now more likely to be centralized. Audio signals that used to be impractical to share from room to room are now likely to be routed throughout the facility. And wiring paths may become much less direct, stopping off at several interconnect nodes along the way."

PREPARING FOR DIGITAL IN MUSIC, BROADCAST AND FILM

ILLUSTRATION BY HANK OSUNA


World Radio History
HANKOSUNA CON

To complicate the picture even further—and raise the stakes in studio wiring decisions—digital audio technology is constantly evolving. "Studios moving more into digital must now allow for the reality of nearly constant upgrading and change," says Berger's colleague, Richard Schrag. "That means hardware systems and wire interconnect systems must be flexible. It puts a tremendous burden on the wire management system as well as on the power and grounding system. Facility design should foresee the kinds of changes that digital audio systems represent, to avoid big surprises down the road. If a facility requires massive renovation to accommodate new technology, it can be devastating to the bottom line."

STUDIOS MOVING MORE INTO DIGITAL MUST NOW ALLOW FOR THE REALITY OF NEARLY CONSTANT UPGRADING. THAT MEANS HARDWARE SYSTEMS AND WIRE INTERCONNECT SYSTEMS MUST BE FLEXIBLE. —*RICHARD SCHRAG*

THE RIGHT PIPE

One of the most important examples of how today's decisions can either avert or invite trouble down the road is the choice between copper or fiber as the primary cable for digital audio signals. It's more than simply a matter of which cable is best for a facility's present applications, because the wire management systems required for copper may not serve well if a decision is made to switch to fiber tomorrow. This is a problem many older facilities encounter when trying to run fiber in existing conduit.

"Fiber is quite a bit more fragile than copper, and you have to be pretty careful with it," says Dave Van Hoy of Advanced Systems Group in Emeryville, Calif. Van Hoy is a designer, integrator and installer of audio, video and DVD production systems. "For the most part, old existing conduit is problematic. You have to design your conduit systems differently for fiber, with long bend radii and no hard angles at drop boxes. And pull boxes have to be larger, because you can't bend at the same rate, or you can break the cable. Physically, we find the best existing applications for fiber

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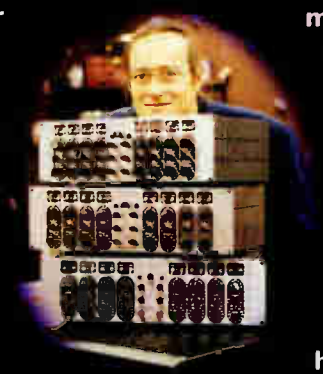

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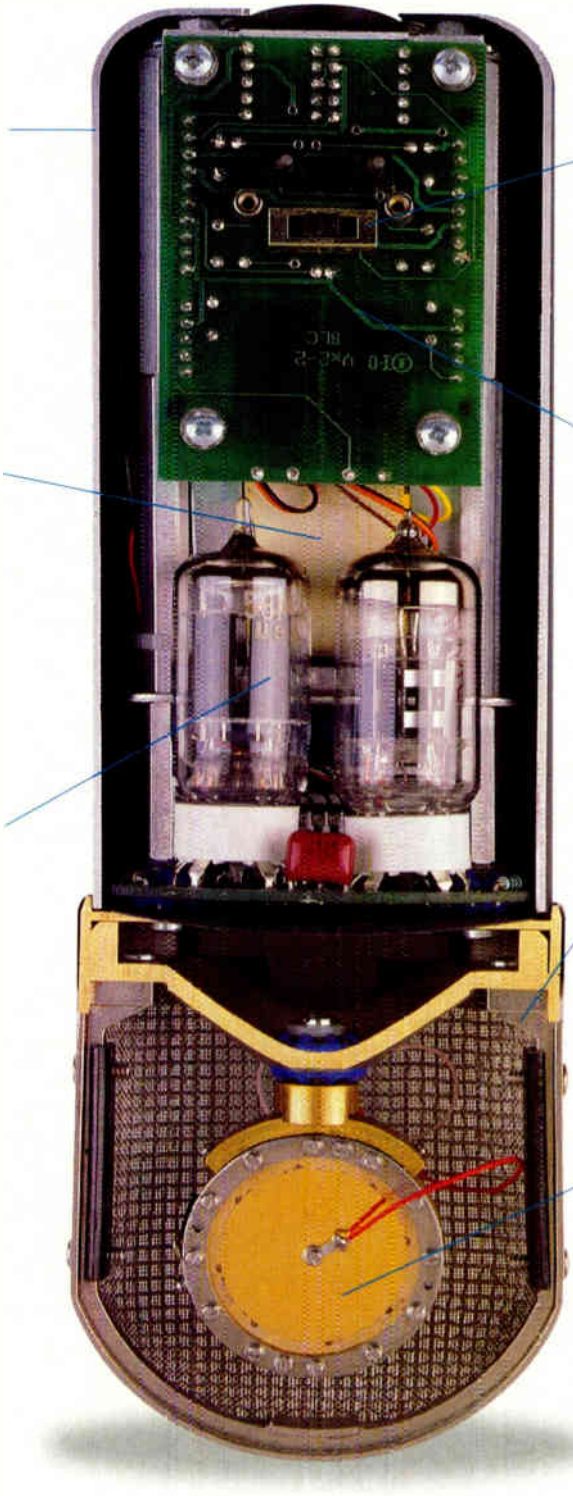
CAD Reveals All!



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are trough systems, because you have greater control over how it lays in. Overhead trays are also an excellent option."

Of course, the difference between the two materials goes far beyond the wire management systems they require. "We install both fiber and copper," Van Hoy says. "Fiber is a great pipe and wins on throughput every time. And once you are past a few hundred feet, fiber is the only way to go. So the places where we see fiber in large quantities are the very largest production facilities, like Lucasfilm."

On the other hand, Van Hoy points out, "not many facilities can afford to pay for a complete fiber network. Copper is much less expensive to install. Category-5 copper is roughly in the ten to 15 cents-per-foot range, whereas the cheapest fiber today that is good quality still costs 80 to 90 cents per foot. And it's not only the cable, but also the cost of all the other gear. To terminate fiber, for instance, you pay at least ten dollars for an ST connector instead of ten cents for a standard RJ-45 connector. And you'll need a $200 to $300 media converter to interface with a network interface card in a computer. So it really is a big cost issue at this time."

Even leaving cost aside, however, not everyone is enthusiastic about fiber. Allen Hale, technical manager at film sound specialists Sound One in New York City, says fiber is appropriate "where very high bandwidth, long distances or ground isolation is required. But we use co-ax or Category 5 wire whenever possible because the cable, connectors and patchbays are much easier to work with. It's easier to install and more robust. We've only had a few uses for fiber-optic cables, and they've all been trouble at one time or another. So when we upgraded our Sonic Media Net system, we replaced our FDDI [Fiber Distributed Data Interface] network with CDDI [copper]. MediaNet only requires a bandwidth of 100 Megabits per second, and CDDI concentrators were available, so we used Cat-5 the second time around."

"Category 5" is a popular twisted-pair alternative to co-ax for copper wire. "There is some very expensive, high-bandwidth co-ax available for specialized point-to-point video applications," Van Hoy says. "But as far as networks that handle digital audio data, nobody runs co-ax anymore. Thin-net, which is Ethernet on co-ax, is limited to 10 Mbps, best case, and has length limitations. So today you are either going to run fiber or Cat-5, which will handle 100base-T Ethernet. It's solid-core, with a specific twist ratio, and it's optimized for 100 ohms for Ethernet or CDDI applications. It's also easier to install than co-ax."

At Burbank, Calif., recording studio The Enterprise, technical director Dan Shimiaei agrees. "Our approach, he says, "has been to use Mogami twisted-pair 110-ohm digital wire for everything. It is very easy to work with, and the cost is not that prohibitive. So we have even replaced our analog lines with digital wire, and we haven't had any problems at all."

Co-ax is used at Sound One, however, for Akai-Net, which handles controller information (rather than audio). The network allows remote access to the company's Akai dubbers. "We have a lot of Akai magneto-optical machines,

mostly DD-8s, which we use as recorders and dubbers," Hale says. "They mostly reside in the central machine room. All nine of our studios and all transfer rooms are hooked up with Akai-Net, so you can put a controller in any one of those rooms and control up to 16 of those machines for waveform editing and transfers."

PATCHING, ROUTING AND SYNC

At The Enterprise, the biggest concentration of digital audio systems is found in a pair of rooms recently refurbished and upgraded with the installation of Capricorn digital consoles from AMS Neve. "Within each control room," Shimiaei says, "we have the control surface and a large complement of outboard effects processing equipment that is AES-capable, such as the Lexicon and TC Electronic devices. AMS Neve has been a big supporter of using MADI for communicating multichannel digital audio, and it has made format-converter breakout boxes that allow you to integrate MADI with different standards. All the I/Os of the outboard devices are brought into a typical Switchcraft TT patchbay, normaled to a proprietary rack system which converts the MADI information from the Capricorn 48-channel I/O to AES-format pairs. We also have a number of A/D and D/A racks that convert analog to and from MADI."

The alternative to a digital patchbay is a digital router, a matrix that works like an electronic patchbay to connect any input to any output. AES routers are available in sizes ranging from 16 channels of I/O all the way up to 1024 by 1024. Shimiaei says a patchbay was chosen over a router "partly because of the cost factor, but also because we think it is a lot easier for the assistant engineer to relate to the patchbay than to operate a big AES router. Also, most routers operate at only one sampling frequency, which is a limiting factor when two rooms or projects have to operate at different sampling frequencies."

At Sound One, Hale says, "We have

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SR 1 Remotes control Group attenuation Levels. Assuming Outputs are assigned to Groups as above, this screen allows Remote 1 to control Outputs 1 & 2 and Remote 2 to control Outputs 4 & 5.

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analog routers used for monitoring in every machine and transfer room, but we use twin-ax patchbays for all our digital program routing. Because of the number of sources and destinations, and the channel width of all of our recorders and workstations, we haven't found a cost-effective program router. And with or without a router, patchbays are necessary for troubleshooting and non-standard routing applications."

Van Hoy says that digital audio patchbays may work for some applications, but in general, routers are a much safer approach for digital. "We encourage clients to go with routers for digital signals as much as possible, because a router not only passes the signal from place to place, but also reshapes it and makes sure the signal is clean.

"If you are going to use a digital patchbay," Van Hoy continues, "you need to think very carefully about the design and what impedance you run at. The 110-ohm variant of AES is not very robust and has real length limitations, even if you are using the correct wire, which two-thirds of the world doesn't seem to be using—they just use mic cable or whatever they have lying around. That makes patchbays a great source of screwed-up AES because of impedance-matching issues and line loss."

Van Hoy's biggest concerns about digital patchbays are related to sync-signal issues. "In the world of AES," he says, "the record machine is always the slave. So if you just want to link DAT machines together to make dubs, a patchbay will probably work fine. But as soon as you introduce a digital mixer, it's a whole new ballgame, because you might have several play sources, such as DA-88s, DASH machines, ADATs, Pro Tools, WaveFrame, Sonic Solutions and all the rest. The system won't work if your source machines are each synched internally, because you can't mix asynchronous signals," Van Hoy warns. "To make it all work together, all the sources have to be able to sync to one common source, either a word clock generator or an AES sync source generator, like an Aardvark or an NVision. When you start patching the audio through different paths without having a router in there that keeps track of the sync, you can end up with systems that have ticks or pops, or don't even work at all."

Video facilities are used to the concept of providing a "house black" signal as a sync source to all machines, and the same approach is taken at Sound One to avoid the problems Van Hoy describes. "Every room is locked to house sync to avoid any problems with transfers between rooms," Hale says. "We've had to provide house AES/EBU black and word clock references for all of our normal sample frequencies, and AES/EBU, SDIF-2 and word clock I/O patching for all our digital devices. This made us install both AES/EBU and custom-built word clock distribution amplifiers to provide enough reference signals. A video reference, which allows us to reference to NTSC or PAL as needed, is also run to any machine that can make use of it."

Meanwhile, at The Enterprise, Shimiaei says, "We use an NVision master sync generator because it generates both NTSC and PAL video sync,

—CONTINUED ON PAGE 212

Our Patchbays Have Just Rounded A New Corner

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15TH ANNUAL TEC AWARDS NOMINEES

Listed below are the nominees chosen by the Nominating Panel of the 15th Annual Technical Excellence & Creativity Awards. A special TEC Awards nominees supplement and voting ballot will appear in the August issue of *Mix*.

The TEC Awards will be held Saturday, September 24, at the Marriott Marquis in New York City. For more information, contact Karen Dunn at (925) 939-6149, or e-mail KarenTEC@aol.com.

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Pelonis Sound & Acoustics, Santa Barbara, CA
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Sound Reinforcement Company
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Clair Brothers, Lititz, PA
db Sound, Des Plaines, IL
Showco, Dallas, TX
Ultra Sound, San Rafael, CA

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Bernie Grundman Mastering, Hollywood, CA
Masterdisk, New York City
Sony Music Studios, New York City
Sterling Sound, New York City

Audio Post-Production Facility
Howard Schwartz Recording, New York City
Soundelux, Hollywood, CA
Sync Sound Inc., New York City
Todd-AO Studios, Hollywood, CA
Warner Bros., Burbank, CA

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Le Mobile Remote, Vista, CA
Record Plant Remote, Ringwood, NJ
Remote Recording Services, Lahaska, PA
Sheffield Audio-Video Productions, Phoenix, MD
Westwood One Entertainment, Culver City, CA

Recording Studio
Capitol Studios, Hollywood, CA
Electric Lady, New York City
Ocean Way, LA, Los Angeles
Right Track Recording, New York City
The Village, Los Angeles

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Chris Jenkins, Todd-AO Studios
Shawn Murphy
Sue Pelino, Sony Music Studios
Gary Rydstrom, Skywalker Sound

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Ed Greene
John Harris, Effanel Music
David Hewitt, Remote Recording Services
Kooster McAllister, Record Plant Remote

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Dennis Savage

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Ted Jensen, Sterling Sound
Bob Ludwig, Gateway Mastering
Denny Purcell, Georgetown Masters

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Tchad Blake
Rob Cavallo
Sheryl Crow
David Foster

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Amplifier Technology
Bryston 9B-ST Pro
Chevin Research Q6
Crown CP-660
Demeter VTHF300M
Mackie M2600
QSC PowerLight 9.0 PFC

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Roland JP-8080
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TC Electronic M3000

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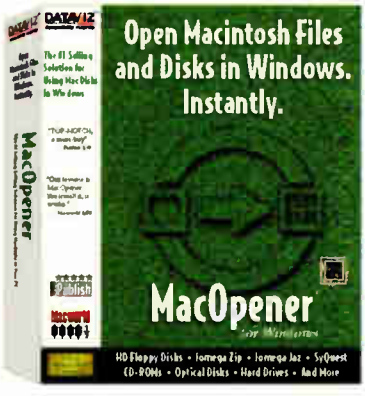

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MIKE SHIPLEY

HAVING TOO MUCH FUN TO STOP

Mike Shipley's work is practically a fixture on the *Billboard* charts. His credits include a wide range of successful artists, such as Def Leppard, The Cars, Shania Twain, Joni Mitchell, Aerosmith, Shawn Colvin, Lene Lovich, the Black Crowes, Tom Petty and Green Day. Although his engineering style cuts across the board, and he's equally at home with rock, alternative, punk, pop and country, one of Shipley's defining traits is surely that he's a master of The Big Hook—and the big sound—a talent that translates well to a variety of music. The week that this interview took place, Shipley had four "most addeds" in *Radio & Records*: Shania Twain's "That Don't Impress Me Much" at AC and CHR/Pop; the Black Crowes' "Only a Fool" on Adult Alternative, Blondie's "Maria" on Hot AC and Sponge's "Live Here Without You" on Alternative.

In the past, Shipley has worked on legendary albums that took legendary amounts of time to record and mix, and although he still signs on with Mutt Lange for those impeccably crafted Shania blockbusters, lately he's being called upon more and more to put that big-hook talent to work on singles for both established artists and up-and-comers.

At this stage of his game, you'd expect that he'd be taking it a bit easy, but the youthful Shipley is a true workhorse of an engineer, and these days he's busier than ever. *Mix* hooked up with him at L.A.'s Record Plant, where he'd been at home in SSL One for a month, working on as many as three albums at a time with producer Patrick Leonard, among others. Getting him to sit down and chat wasn't easy, but I finally dragged him away from the console, where he was finishing a mix for new Sony artist Nikki Hall. We settled into the lounge, and I attempted to pry from this very down-to-earth fellow the secrets of his success.

PHOTO: LISA ROY

Shipley at Emerald Entertainment's Mix Room in Nashville, mixing for new MCA Nashville artist Alecia Elliott

You're a bit of a mystery, I think. At least there's not much information to be found about you in the audio trades.

I've tended to avoid interviews, because I don't think that I have that much to say. I'm just sort of a backroom boy.

BY MAUREEN DRONEY

We'd better begin at the beginning—how you started in the business.

I got started by walking into a studio. I'm Australian, but my family went to England with my dad's business for a couple of years. One of my teachers at grammar school there was a musician who asked me to come down and sing on a record he was making. I walked into this thing called the recording studio, and it just blew my mind. It was, "This is home," and I knew instantly and from that point on that all I wanted to do was to work there.

I went back to Australia and finished high school, all the time knowing that I wanted to go back to England and work in studios. My favorite bands were mostly English. At that stage in Australia, you'd listen to records that were being made there and know that something was horribly wrong with both the production and the sound. So, after a pretense at art school, I just

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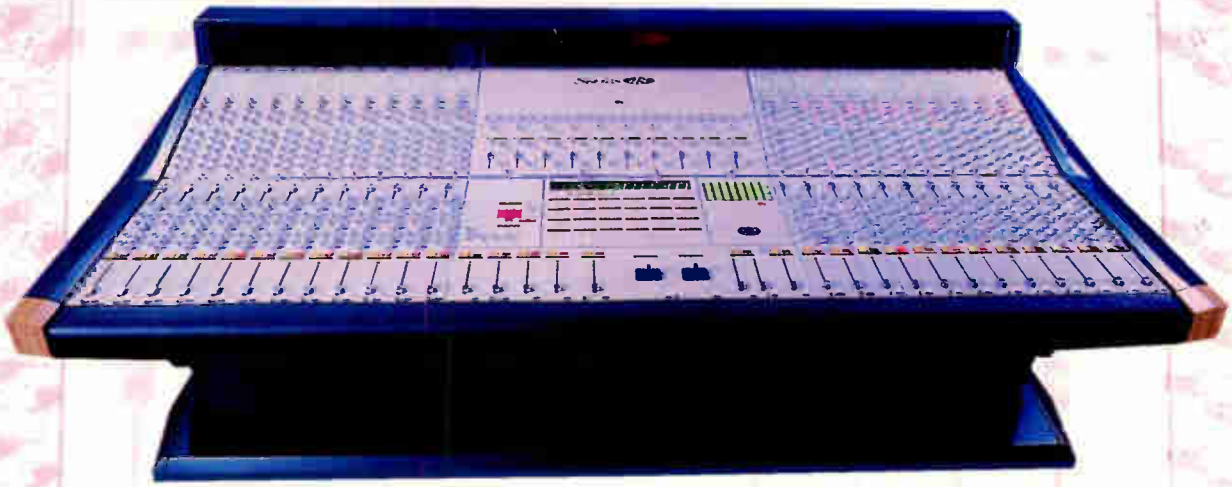

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packed up a bag and went. I could get an English passport because my dad was English, so I could go back there and work, and, naive as I was, I figured I'd just knock on the doors of recording studios and see what happened.

I ended up, fortunately for me, at a place called Wessex, which, without me really knowing about it, was one of the hottest places in town. It was in London, in an old church hall, and a lot of records were being done there that I really liked, Queen and so forth.

You got lucky.

It's one of those things. Really, it's the most unqualified business to get into. The studio manageress liked my voice, so I got the job, as opposed to someone who was probably in some way or other more qualified than me. And, in those days, you'd get thrown in the deep end. It wasn't a matter of being a runner for a couple of years while they tentatively show you how to work the room. It was, "Okay you're in." You'd get a brief excursion 'round the studio, and you'd be on a session.

The first session I worked on was a Sex Pistols record. I got thrown straight in on this punk scene, which wasn't even a concept yet in Australia, so I was pretty green. I wasn't there for the start of that record, which took quite a long time and went through lots of permutations to become *Never Mind the Bollocks*, but at the time I started at Wessex it was the Sex Pistols in one studio and Queen in the other. You had this incredible dichotomy of the young tearaways, with safety pins in their noses and gobbing on the floor in the front room, and Roy Thomas Baker and the absolute studio wizards in the other room.

PHOTO: LISA ROY

It was a pretty incredible time. The Pretenders did their first records there; there were Clash records, all this really pivotal punk stuff. There was a full-on scene happening, because Bill Price, one of the house engineers, did a lot of work for Chris Thomas, and we got known for being a punk-oriented studio. A lot of the bands don't mean that much now, but at the time it was just incredibly, incredibly exciting.

That's where I met Mutt Lange, who was a relatively newish producer on the scene, carving out his name producing interesting younger bands.

So you were thrown into the session to do what? Be a tea boy?

No, we had tea ladies. Sometimes you'd make the tea, but mostly it was figuring out straightaway how to run the tape machines. If you couldn't hack the pace you were out of there, so you had to be able to get it really quick. It was incredibly fast-paced and really inventive, and there was great rivalry about who could get onto the best sessions.

You had to be able to punch.

Yes. On all records you had to punch. These days, it seems mostly the engineer takes care of it from what I can see, but in those days the assistant was very involved. Running the machines, doing the editing. You had to get up and hack the tape—no Pro Tools, of course. It was just mighty good fun.

I jumped in and learned, assisted for a while, then started engineering pretty quickly. One of the engineers on a record I was assisting was getting drunk, so I was next in line to take over. It was one of those things. After a relatively few months assisting, I was engineering on bits and pieces—fly by the seat of your pants and somehow get through it.

Working in England at that time and at that studio, you could get taught by the most amazing people. Tim Friese-Greene was Mutt's engineer at the time; I assisted him, and there was such inventive engineering. It was a great foundation, and you learned the ropes really well.

I remember at that time there was a sort of mystique about the "English sound." English engineers, English consoles, English artists—somehow it just seemed to be a bigger, more exciting, sexier scene.

I remember when I first came out to L.A. to work, everything in recording was much more natural—people had perfect textbook ways of miking things, and it

MIKE SHIPLEY SELECTED MIXING CREDITS

Sponge
"Live Here Without You"

The Black Crowes
"Only a Fool"

Neve
"It's Over Now"

Splendor
Halfway Down the Sky

Blondie
No Exit (several tracks)

Shania Twain
Come on Over

Aerosmith
"I Don't Want to Miss a Thing"

Guster
Goldfly (four tracks)

Green Day
Foot in Mouth (five tracks)

Joni Mitchell
Night Ride Home, Dog Eat Dog, Chalkmark in a Rainstorm

Def Leppard
Adrenalize, Hysteria, Pyromania

The Cars
Heartbeat City

Tom Petty
Let Me Up, I've Had Enough

Shawn Colvin
"Tennessee," "Orion in the Sky"

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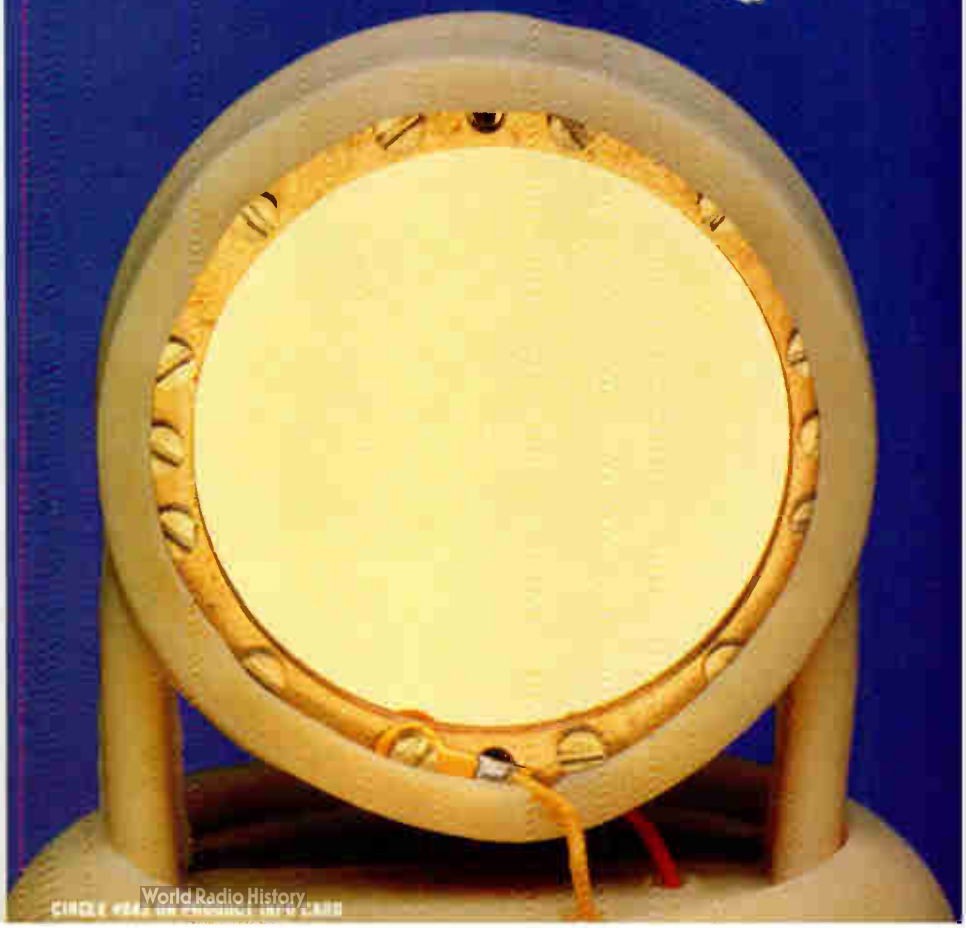

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was more about being a purist. In England the approach was different: it was more about giving the sound more or different character. It was almost a matter of messing with it as much as you could. Especially with certain producers, the idea was to be as unnatural as you could and to not be afraid to screw the crap out of the EQ—to do things that were as "unpurist" as you could get. Also at that time, everyone was into SSL consoles over there, and over here they were frowned upon because they were not a pure signal path.

What kind of consoles were at Wessex?

They were by a company called Cadac. They never really got over in this country [in the recording industry] but they were actually fantastic consoles. So we had Cadac until we got SSL.

I was still pretty much a kid and flying by the seat of my pants when Mutt asked me to come and help him setup Battery Studios. I remember we were looking at consoles and his manager wanted to get something cheap and cheerful like an MCI, a good workhorse. I'd read in a magazine about a Solid State Logic console, so I got Colin Sanders to bring a module down. He brought in a Safeway shopping bag with the module hanging out the bottom of the bag. It was the prototype for a console that had these things on it like parametric EQ and noise gates and compressors, and I was like, "Oh my goodness, this is what we've got to have!" So I convinced them to spend a lot more money than what they'd intended. It was one of the first SSL consoles in the country, and the investment paid off pretty quick.

In England it was more about giving the sound more or different character. It was almost a matter of messing with it as much as you could.

Do you think there's a "Mike Shipley" sound?

I don't really know. There was a sound of the records in the Def Leppard era that was conceptualized between Mutt and myself. We'd have to invent types of drum sounds, because his thing was always, "Let's do something different. It can't ever be the same, it can't ever be just a boring drum sound, it has to be *Star Wars*! Everyone is watching *Star Wars* films and seeing things that are very three dimensional, so let's not just have this little honky drum sound that everyone goes for. Let's make it big, different, larger than life."

Larger than life is the definition of those records. It seems impossible that anybody could get so much top, so much bottom, so many effects, so many parts—so much of everything—crammed onto a piece of tape.

Mutt was just brilliant. There's so much depth of field to the way he produced those records in terms of the parts. The concept of how to make the drums sound and how to make the guitars sound and how to stack up hundreds of tracks of backgrounds. There were so many layers—it would take huge

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amounts of time to be as experimental as you could possibly be and then to start again and try a different approach altogether, let alone the time it would take to mix!

You were some of the first people experimenting with sampled drums. On Hysteria ***those huge drums were all samples, played in a Fairlight.***

Lots of people didn't know that. They were always asking me how I miked up such great drums! *Pyromania* was done the same way, on cheesy 8-bit Fairlight technology where we had to figure out how to record everything at half speed into the Fairlight to make it sound like it had some tone to it, and we'd be stacking up a bunch of snares and bass drums.

I remember at the beginning of *Pyromania* there was no idea of how we were going to do the drums. All Mutt was saying was that we'd have to figure out some way to do the drums in the end. The drums would be one of the last things to get done, so it was, "Wonder how we're gonna do them. I'm sure we'll figure out something."

A very simple drumbeat would go down at the beginning, but at the time, there wasn't any way of locking multitracks up with drum machines. There was no way to sync the Fairlights up to SMPTE. So we had to figure out how to do that because we had to be able to change the parts. You could put a drum machine part down and work to it, but there was just that Linn drum code, and it didn't run anything but itself, so we had to figure out, with the help of some pretty smart technical people, how to get a system together to sync to tape.

The main reason the drums were done that way was because, at that point, the songs and the arrangements would be changing all the time. If you had a performance and Mutt and the band decided to rewrite the chorus, whatever the guy had been playing became irrelevant. So the best way was for them to keep working on the songs, rearranging them and changing them all the time, and then to worry about what the drums should do afterwards.

It seems like these projects took on a life of their own, almost like they couldn't be controlled.

It was never out of control with Mutt, but because he's so involved in the whole process, he'd get to a stage where you had a song finished, we thought—we'd busted our balls, spending days on guitar sounds, days on vocal sounds—and he'd change the chorus.

But see, there's no sense having an attitude or ever thinking for even a second that having an attitude is going to do anything but make the process really hard for anybody else. All having an attitude will do is get in the way of what the rest of the process is supposed to be, which is people like Mutt and whoever is in the band getting what they want. It's my job to have no attitude and say, "No problem. I'll figure out how to do it," and then to do it.

You first came to the U.S. to mix Heartbeat City ***for The Cars. Mutt had produced it, but he didn't come out for the mix.***

No, I came out on my own to do that with the band; Mutt just needed a break. It was a bit of a struggle getting that record mixed. It was taking a long time. It can get to where when you push the fader up, even though it will be the same bass drum on tape that you've heard for the last six months, you'll wish to heck it was something different.

We'd spent some time mixing it at Battery, but it was a record that had gotten quite experimental in how it was made, and we actually needed a bigger console to mix on than it was possible to get in England. Electric Lady purported to have a big new console, so Mutt suggested we go there, and they said, "Sure, come right over," and I jumped on a plane. On Wednesday we decided to pull the plug, and I was on the plane on Friday. I walked into Electric Lady, saying, "Show me the studio. I'd better get started," and the studio manager's going, "Let's go out to lunch." I just wanted to get in the studio and get a feel for it, but it was "No, no, come out to lunch." So eventually I got to look at the studio, and you could see the sky; there were no modules in the console, no speakers in the wall, and I had to hang out there for a couple of weeks while they finished off the studio.

How did you come to work with Joni Mitchell?

Elliot Roberts, who looked after The Cars, also looked after Joni Mitchell. I'm the biggest fan you can imagine. When he asked me if I wanted to work on a Joni record it was, "I'll do anything to work on a Joni Mitchell record."

So I came to L.A. and worked on several records with her over a period of time, which was a big departure from working on rock stuff, and it was great. In England, in those days anyway, you wouldn't get bagged as being one kind of mixer or engineer so much.

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It was more across the board because music would change so fast there, whereas here they are much keener to bag you as having a certain sound.

Some people end up being stylized as being rock engineers or R&B engineers. I don't really see what difference it makes. It's just music, and it seems to me if you've got an affinity for music, you can work on pretty much any type of music. That's why, to me, it's so much fun bouncing around.

You worked intensely and pretty nonstop for how many years before you took a break?

Since I first started working, really—15, 16 years. Those were 18-hour days, seven-day weeks, and if you had Christmas day off you're lucky. And then all of a sudden music changed and the grunge thing came in, and then guys like me were, like, too big, too polished. Even though it was big because that's what was asked of me! And, at the same time as I was doing Def Leppard stuff that was big and over the top, I was also doing Joni Mitchell records. But, you see, you get labeled by the biggest thing that you do.

So I was labeled by the whole backlash of the rock thing turning to the grunge thing. Here I am, I just love working on music, and people were telling me that I was never going to work again! It really depressed me, because I was hitting this brick wall—all these people rebelling, quite rightly, of course, like everyone, in cycles, does rebel, against the kind of rock I'd been working on. But here's poor me, just into music, any kind of music, being told because I was involved in records like this I should never mention their name again.

So I went away for a while, and went to live in Hawaii, just to kind of get out of the scene. I spent some time

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trying to figure out what I was going to do and decided I didn't want to do anything else.

Then, something changed again. I started getting calls from bands whose first record they ever bought was *Pyromania*, so instead of having to duck at the mention of Def Leppard, saying "I'm sorry, I'm sorry, I didn't mean to do it!" I found myself working again, and for the last few years it's been nonstop.

You always mix on SSL consoles.

Always. I love working on a 9000 if I can, that's my favorite console of all time. It's just a matter of getting onto them these days; they're so highly booked up. At the same time, I love all SSL consoles, the G Pluses that they have here at Record Plant are equally great.

What gear do you always have to have on a mix?

Well of course I like to have a roomful of gear. A bunch of 1176s and LA-2As. Distressors, and DPR dynamic equalizers, made by Brooke-Siren, which are quite amazing, for vocals especially. You can put in a really fine bandwidth, and whatever certain character you want out of a vocal, whenever it hits that frequency it'll duck it out for you. I'm used to that because with Mutt we always have programmable equalizers where we can EQ every word, SSL equalizers where we can automate every consonant of every word if we want—literally, every part of every word.

Wait a minute, how do you do that?

Its a package of automatable equalizers for G and E consoles that you can buy from SSL.

How did you do that kind of thing before you had the programmable EQ?

In the early days, I'd sit there as we were mixing the Def Leppard vocals with a 32-band parametric in my lap, and we'd rehearse the moves. I had to pull out certain frequencies as we mixed, so I'd be doing that as well doing other moves.

What format do you mix to?

I always mix down to the 24-bit Apogee; the AD-8000 bit splits to eight tracks of the DA-88. I also go to half-inch, then we choose what sounds better in mastering; it depends on the type of music and the kind of bottom end.

I see you're using ProAc near-field speakers.

Always, for the last eight years or so. Like everyone, I've been an NS-10 person since they first came out, and I've got no problem with saying I still use them an awful lot and everything comes out fine. But the ProAcs I love; they're my favorite speakers. I also use the self-powered V8 KRKs.

You're an expert at balancing lots of parts.

It's one of those things, having spent so many years working with people such as Mutt whose whole thing is depth of field and whose whole concept is layering, so that even if something is just subtly audible, it's adding depth of field. You have to carve out space for things with EQ; you have to spend a lot of time making a place for everything to sit.

Is the console EQ the first thing you reach for?

No, not necessarily. It will be part of it, and I'll use the console as the de-esser every time and then I'll often use the Brooke-Siren 902. Quite often, what I'll do is parallel the vocal up in half a dozen or more channels and EQ it for different parts of the song.

Do you compress those channels before you split them, or all individually?

Individually, and some of them wouldn't be compressed at all, depending on what it needs. There would never be one rule that works for everything. Even in a verse there will be some lines that don't need de-essing and some lines

that don't need compressing and some lines that need different EQ, so I'll just parallel stuff up. To me it's just a matter of making the voice sit in the right place, and if it takes ten channels to do it with different EQ for different parts of the song, then that's what it takes.

What compressors do you like for vocals?

The good old LA-2 and 1176s; I also like to use a little bit of the console compressor sometimes.

Say on Shania Twain's "Still the One," when you get to the mix, how many tracks of those backgrounds of Mutt and Shania are you working with?

I think on that probably 12 tracks, maybe six pairs.

They really are gorgeous, the way they lift up the record.

It's one of the characteristic things Mutt does, and he does it really fast, just bashes through them; he sets the mic up in the control room, hammers down 20 or 30 tracks, or whatever's needed of each part.

It's amazing that with so many tracks the backgrounds still stay so clear and understandable.

[Laughs] It's massive amounts of equalization. As much as anything else, it's a matter of hollowing it out so that it sits in the track; you take out whatever frequencies you need to, sometimes on a very fine "Q," taking out large amounts of middle so that the breathy thing is there and they just sit in the right place in the track. With him EQ is nothing to be scared of, for sure.

Do you have some favorite reverbs?

I like Yamaha: the 1000s, 990s, REV5s, all those. I also like the new TC M3000, the Lexicon 480 and EMT plates.

Your drums always sound both bright and fat, like on Blondie's new single "Maria." Are there particular compressors that you use to make them that way?

No, not really. With "Maria," there are samples mixed in, so a lot of it is additive. I never replace; I just add to it. I take as long as needed to cut and paste a new bass drum and snare that work both tuning and soundwise with whatever's existing so that they blend in and sound like what's on tape, but with more focus. For "Maria," I just hunted through my collection and found a bass drum and snare, then worked it in so that it was locked exactly in time. We copied all the fills so that it doesn't sound like a sample but just adds weight to what's there already.

Do you trigger with that antique Forat I see there?

No, that's just got a lot of my sounds stored in it. To cut and cut and paste I'll either use Pro Tools or the good old Roland SDE-3000 trigger box.

What do you think is your biggest strength as an engineer?

I guess I'd say it's being able to get what the client wants and to give them more than they expect. And I know how to make space for things; I know that much for sure!

With all you've done already, why are you still working so hard?

Because it's too much fun to stop! I do take reasonably large amounts of time off each year. It took a long time to learn to do that, but in this job it's important to realize when you're overdoing it because it can creep up on you. But I feel so lucky to be offered records and songs that I want to work on. I always like to get sent something to listen to, to decide if I can do something for the project; I'll pop it in my CD or cassette and I'll hear some piece of music, and I'll just get excited about it and want to do it. That's never stopped for me since day one. ■

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

STUDIO B DIGITAL RECORDING

AN INSIDER'S VIEW OF FOAM AND CONCRETE

It takes a long time to grow a basement studio to the point where moving to a new facility is possible. For us at Studio B Digital Recording in Rockford, Ill., it took 15 years. Often, just leasing and renovating an old storefront or warehouse is the second stage of growth, but we decided that we wanted a place that was built exactly for our needs. We began looking into new construction techniques, and what we found was close to perfect for us. We discovered that for about the same cost as standard 2x6 conventional exterior wall methods, we could "pour" our new studio in concrete inside assembled foam forms.

A foam and concrete studio can be laid out in almost any fashion, including with curves, which is what we used for the corners of our building. The foam makes outer and inner runs held together by plastic tabs (made of recycled milk cartons). The space between these runs determines the width of your concrete wall. With the system we used, the walls could be varied from four inches to eight inches. In our case, based on SPL requirements, we determined that 6-inch-thick concrete would keep traffic noise out enough for our recording needs.

The foam forms are put together like plastic toy blocks. Each piece is light and easy to work with, but it does take some time. As the forms are assembled, rebar is placed inside for extra strength. When the wall is completed, a special "pumper truck" is brought in to pump the cement up and into the walls. This is the only scary part of the operation, because if a foam wall has a "blow out" you could have a real mess on your hands (and feet!).

The foam is left attached to the concrete after it hardens, acting as a thermal and vibration insulator between the outside world and the studio. The insulating value for both layers of foam together is about R20. The plastic tabs that originally held the foam in place are used for attaching siding to the outside of the building and drywall (or anything else) to the inside. (The inside of our facility was mostly done with drywall.)

PHOTOS: DEB CASTRONOVO

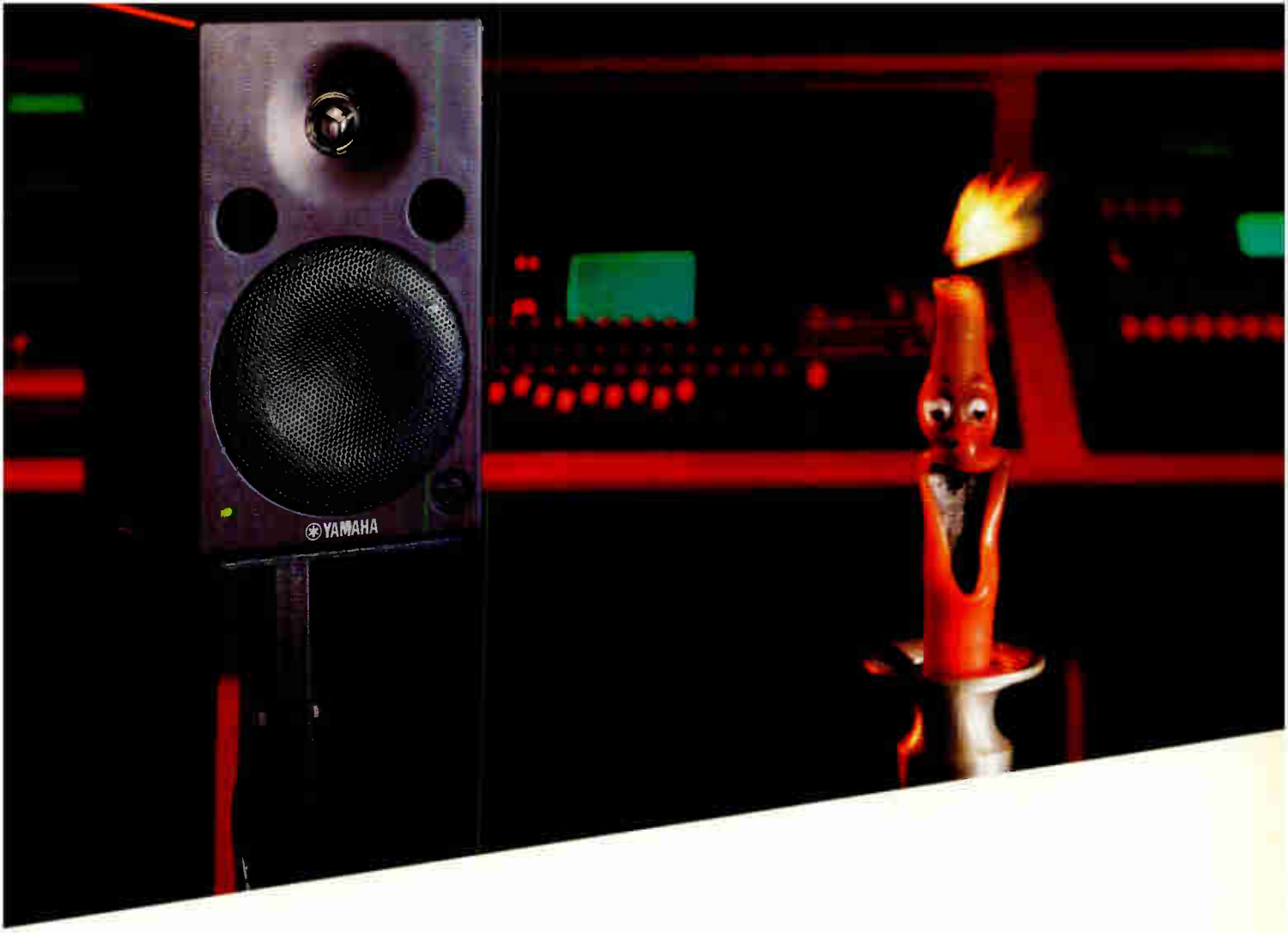
PHOTOS: TOM CLABOUGH

A concrete semi-floating floor sits on 1.5 feet of foam to help eliminate traffic vibrations. The cable runs were put in PVC pipes below the floor. We also used double windows (two in each opening—one outer, one inner) to allow natural light into the main tracking room while still keeping out road noise. A skylight in the control room just above the producer's desk allows a natural, open feel to the room. We've had lots of compliments on the layout and uniqueness of the studio, and we recently won a local award for best studio of the year.

This concept of foam and concrete has been around for a few years, though it is just now starting to get popular. At least three manufacturers make variations on this theme, and they're constantly upgrading their foam systems. As always, local codes have to be met, but we found that this type of construction exceeded all our local requirements. One word of caution: Make sure everything is well planned out! Once you've poured the concrete, it's too late to say, "Oh, by the way, can we still put in an extra window?" Only if you've got a strong arm and a good chisel! ■

BY MIKE CASTRONOVO

Mike Castronovo is a co-owner and chief engineer at Studio B. He is a member of the Engineering and Recording Society of Chicago (EARS), and he likes two-seater sports cars, but only if he can afford the insurance.



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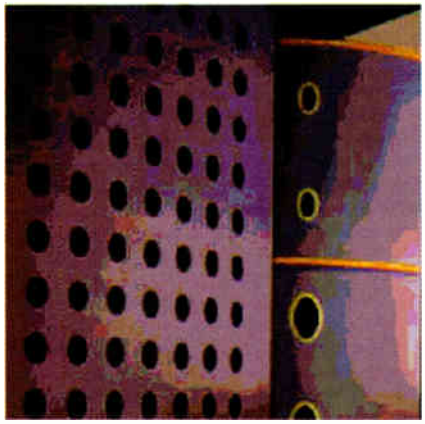
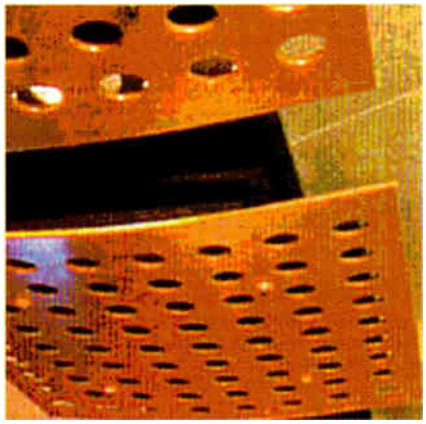
Recording Architecture

Change Soho, Then the World

Forty rooms in London's post center are a prelude to larger things.





by Dan Daley

Roger D'Arcy, 42, and Nick Whitaker, 37, started the English firm Recording Architecture in 1987, believing that, when it comes to studio design, acoustics and architectural design are two sides of the same coin. "What we've been doing is building rooms that are honest—brutally honest, you could say," says D'Arcy, who, along with Whitaker and two associates, maintains an office just outside of London in Greenwich. D'Arcy and Whitaker communicate like some sort of comedy duo, playing off each other's comments, finishing each other's sentences and adding the punch lines to each other's setups. But they are quite serious when it comes to the business of designing recording facilities.

When we met with this pair, they were sitting in a studio at Scramble, one of nearly 40 rooms they have built in Soho, the small, densely packed center of London's post-production industry. Their firm has accounted for nearly 80% of the city's post-production design, including five rooms at Angel Sound, two rooms at Gemini, five rooms at Jungle and a room at that facility's parent company, Zoo Studios.

What sets D'Arcy and Whitaker apart, they feel, is their exceptionally diligent attention to both the architectural and the acoustical components of design. D'Arcy is an architect, a graduate of Sheffield University; Whitaker is the acoustician, one of the first graduates of Salford University's acoustical sciences degree program in 1984. ("I loved the idea of the science of acoustics, and the brochure at the university had a recording studio on it, and that sparked my imagination," recalls Whitaker.) "Hence the name Recording Architecture," says D'Arcy. "That's the whole point: Studios were designed for years by people who were neither architects nor acousticians."

The studio *Mix* visited with them at Scramble is typical of the rooms they have done in post. It's not unlike the first rooms they did there at MagMasters a decade ago, when Soho was just becoming the prime location for UK television post. Bill Gautier, Scramble's managing director, was at MagMasters then as a mixer, and he recalls that, ten years back, London audio post rooms were not far removed from their radio heritage. "The acoustics were out the window, in that there were no acoustics to speak of," he says. "Post-production simply wasn't taking sound seriously. Room design was based on making post rooms smaller versions of cinema dubbing theaters; the client was seated in the front, and the console was behind him. That was the model, which doesn't work for a 5-inch television speaker."

"Studio owners were designing their own rooms," says Whitaker, "with just a little bit of rock wall for acoustics. That was it. We figured, why not use the rock 'n' roll model—put the console up front of the room, and do some real acoustics?"

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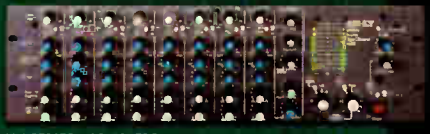

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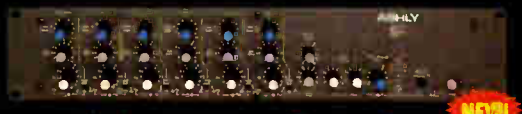

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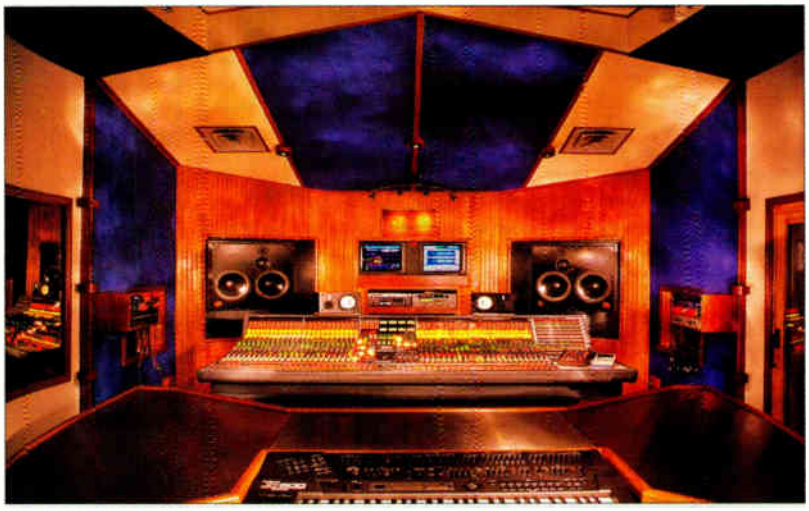

CRAZY SOUND STUDIOS

Recording Architecture's range of operation definitely extends beyond Soho. This is one of the design firm's recent projects, Crazy Sound Studios in Gosier Guadeloupe, French West Indies. In a pleasant, home-like building, this facility has a 65-meters-square recording room and a 76-meters-square-control room. Equipment includes a 48-channel Neve VRP Legend console with Flying Faders and Total Recall; ATC SCM 300A Pro main monitors; Mitsubishi X880, Tascam ATR 80, Alesis ADAT XT and Akai DR multitrack recorders; 2-tracks from Studer, Sony, Otari and Tascam; and an impressive collection of outboard gear, mics and keyboards/expanders. And, just as important in the Caribbean, Crazy Sound is close to the beach. ■

At Scramble, the console faces the front wall, side-loaded to the voice-over room, which in this case is sizable enough to be useful as a music overdubbing room. In addition to a combination of acute and obtuse angled wall placement acoustics, the room is characterized by black matting over an absorptive membrane. This, Whitaker explains, addresses the pressure rather than the velocity component of sound, or, put another way, the kinetic form of acoustical energy instead of the potential form. "When sound hits a solid surface, it becomes potential energy," he says. "If you use a frictional surface like rock wall, the potential energy is maximized, resulting in reflections. These things [the membranes] address the pressure of that energy and make it kinetic and channel it."

The result, Whitaker asserts, is that low and low-mid frequency issues are dealt with at least as well as with large bass trapping, while using up far less space than conventional bass trapping (critical consideration in a location where real estate is at a premium). "Anyone ought to be able do the highs and the mid frequencies," says Whitaker. "That's simple diffusion. It's getting the lower frequencies right in a small space that makes the difference. And not everyone understands the significance of that."

Other notable components of the room's acoustical design are curved wood diffusors hung above and across the plane of the mixer's position. Each measures about a meter square, with three rows of three circular cutouts to create a staggered surface, and each is also backed by a thin layer of an absorptive membrane. These same diffusors are placed in several other strategic points in the room on vertical as well as horizontal surfaces. "A lot of this is a function of how best to use space," explains D'Arcy. "It's a synthesis of form and function, and form tends to follow function." Form has become increasingly important, too, it seems; D'Arcy acknowledges the fact that, as Soho has grown as a television post center over the past decade, its aesthetic needs have expanded along with technological and acoustical ones. This, D'Arcy says, fits in with the Recording Architecture imperative: "Style can be inherent in form."

D'Arcy also says that, "If you weren't working in Soho in the last two or three years, you weren't working," and, considering how much work there was in what is really less than

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Zoo Studios


Scramble Studios


Angel Sound

one square mile, his comment rings true. "To have missed what happened in Soho was to have missed the point as to how rock 'n' roll transitioned to television. That's when post started taking sound seriously, and that's when acoustical design became critical to the evolution of audio post-production. And that's where we come in."

D'Arcy and Whitaker brought to the post industry some of the things they had learned and applied while doing music rooms, particularly rock rooms. Their clientele in that regard includes designs or revamps for The Kinks' Konk Studios, the Depeche Mode-owned Mute Records' recording facility, Landsdowne Studios (where gear genius Joe Meek spent much time), Orinoco and rooms for the BBC, Annie Lennox, the London College of Music and Great Linford Manor. "Those all employed radical design departures," explains D'Arcy. "They used tension structures—cables that suspended acoustical treatments in space. But there was style, too; there were raw, exposed steel beams for both aesthetic and acoustical effects, and we used New York City traffic lights for Orinoco's record indicators."

One of the trends that affected Recording Architecture's design approach to post, as a result, was the degree to which London's post business at the time depended upon freelancers, many of whom, as with their counterparts in music recording (in fact, the two were often one and the same a decade ago), were relying on near-field monitoring, often bringing their own favorite speakers into the post rooms. "We had to make the room neutral and natural," says Whitaker. "You want to design it so that it doesn't require equalization—and none of our rooms here do. You want to make the room so that it will expose any deficiencies in the monitoring. Like we said before, brutally honest rooms."

D'Arcy recalls that when they worked on Konk in 1989, Ray Davies was less than pleased initially. "He was working on a new album, and when he first started he said to us, 'This sounds terrible!' We told him to just keep on working in the room, that he'd see what we had been aiming for."

"Later, [The Kinks] came back and shook our hands," Whitaker adds. "Not only did they love the room, but Bob Ludwig had mastered the record completely flat—no EQ. The room was that accurate. That's what television needed,

for a lot of reasons: Not only did it sound bad to start with, but now stereo and surround broadcast were coming in in the 1990s. That, I think, was also something that helped us in Soho. Stereo and surround television were starting to drive demand for better broadcast sound, just as rock 'n' roll transitioning into television was driving demand for better sound, as well, and just like digital television and multichannel audio are driving it further now."

Recording Architecture has built more than 200 studios since the pair started their business, and their geographical range now extends to 30 countries throughout Europe and the Middle East, including music and post facilities in Israel, Saudi Arabia, Dubai and Egypt. In fact, while many studio designers have been talking about Asia and South America as the frontiers of the audio industry over the past several years (until the economies in both regions ran into global financial short circuiting in 1998), D'Arcy and Whitaker say that certain countries, like Israel, have developed very robust media industries, partially driven by legislation that requires a significant percentage of what is produced there to have local content. "Israel has a massive recording industry for its size, partly because everything has to be done in Hebrew to one degree or another," says Whitaker.

In addition to post and music studios in the UK and abroad, Recording Architecture has designed its share of upscale personal studios, including rooms for Bananarama producers Tony Swain and Steve Jolley (both in manor houses), for Genesis guitarist Steve Hackett, and recording artists Kim Wilde, Sade and Gilbert O'Sullivan. They bring to personal studios the same common-sense design theory as they do to their larger-scale projects. "We work for a balance, using as many methodologies as we think we need," Whitaker says. "We don't build rooms that are all based on some wonderful, mysterious [acronym] like LEDE. You still see rooms built based solely on diffusion. To us, diffusion is simply one element of acoustical control that has its place along with low-frequency control and balancing early reflections." D'Arcy sums it up when he observes, "The main difference is, we don't have any overarching philosophies of design. We base designs on what the space at hand and the client wants and needs." ■

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Pacific Microsonics' HDCD

LOOKING BEYOND THE COMPACT DISC

With both DVD-Audio and Super Audio CD on the horizon, the compact disc may face two serious challenges to its long-held position as the premium carrier for prerecorded music. Of course, even if consumer acceptance of these new formats—both scheduled for launch this year—is remarkably rapid, the CD will reign for the foreseeable future. But just as the CD did to the LP and the cassette on its way up, these new formats will take their toll on the prestige of the CD well before they actually eclipse the CD in units sold. A psychological turning point will likely come when the CD is no longer seen as the flagship format, at which time further efforts at improving its sonic fidelity may seem somewhat pointless.

This scenario poses an interesting dilemma for companies such as Pacific Microsonics of Union City, Calif. Because the CD is the only viable consumer digital delivery format available, the company's efforts to promote its High Definition Compatible Digital technology have until recently tended to focus on HDCD's benefits for that particular format, and its success to date has been built largely on its ability to provide 20-bit performance in a 16-bit medium. But with the introduction of new formats offering better resolution without special processing, Pacific Microsonics must now address questions of HDCD's future relevance, even as it successfully moves the process from the audiophile fringes to the mainstream of consumer audio electronics.

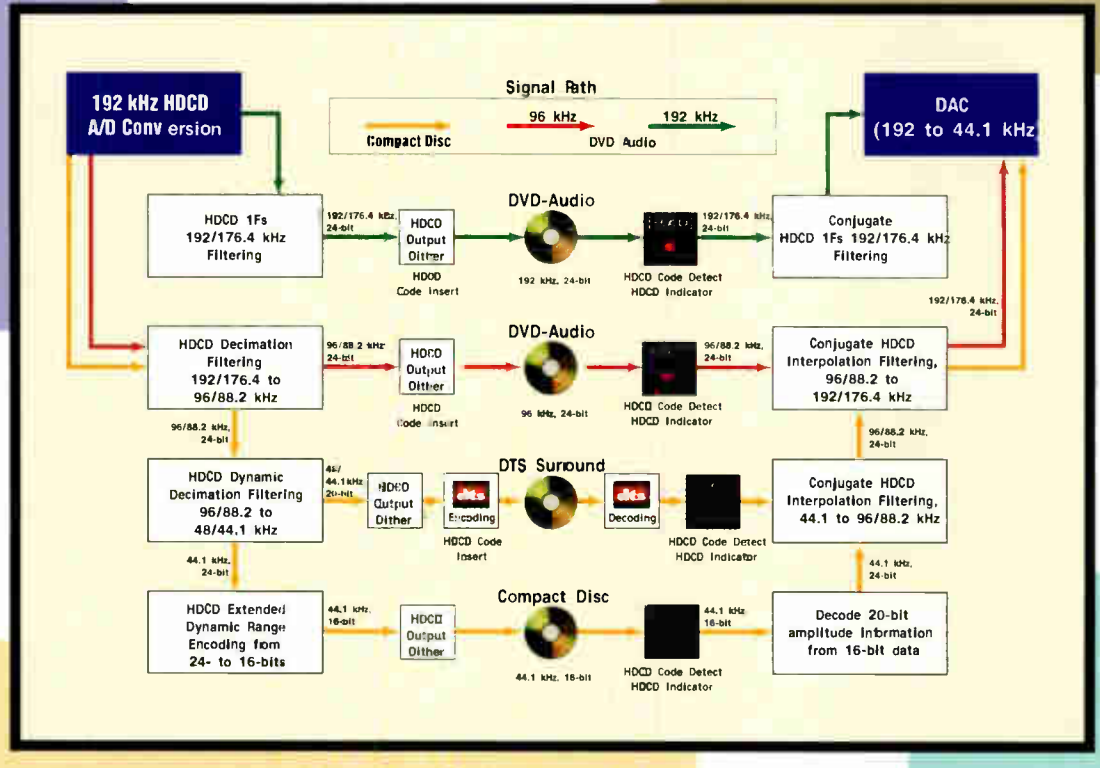
by Philip De Lancie

HDCD is a multifaceted process that is not specifically tied either to the CD or to the format's underlying Red Book specification, which calls for linear PCM audio at a 16-bit word length and 44.1kHz sample rate. "HDCD is really a brand name for a family of synergetic and interrelated technologies," says Michael Ritter, Pacific Microsonics co-founder and VP of professional audio. "All of the technologies are aimed at providing lower distortion and higher resolution through any form of digital audio recording and playback. Some parts of the system apply through all release formats, while subsets of the technology only apply to certain release formats." To help ensure a role for HDCD in new PCM formats such as DVD, the company is introducing this month at the Tokyo AES the Model Two HDCD processor, which will work not only at the 44.1/88.2kHz sample rates, but also at 48/96/176.4/192 kHz.

The three inventors of HDCD and founders of Pacific Microsonics, L to R, Michael "Pflash" Pflaumer, Michael Ritter and Keith O. Johnson

MASTERING THE MASS MARKET

Up until now, the Model One processor has been Pacific Microsonics' sole product for the professional market, and its only hardware product. Used mainly in mastering rooms, more than 70 of the units are now in use worldwide at top facilities such as Sony Music, Sterling Sound and Gateway Mastering on the East Coast, Future Disc, OceanView Digital and Precision Mastering in the West, and Georgetown Masters and MasterMix in Nashville. Bernie Grundman Mastering is in the process of acquiring a total of ten units (six in Hollywood and four in Tokyo). But Pacific Microsonics' main focus is on licensing HDCD decoding for



The HDCD process at different sample rates and word lengths

inclusion in consumer audio hardware. According to Ritter, 1999 looks like the year when HDCD licensing will move into mass market goods, largely because of synergy between developments in the realms of consumer and professional audio.

"The continued and growing acceptance of HDCD on the pro side," Ritter says, "has translated into our current list of well over 2,000 HDCD CD titles released so far." According to the company, that's double the number of HDCD titles available since the end of 1997. And with more than 125 million HDCD-encoded CDs sold so far, it's hard to argue that HDCD is simply an obscure phenomenon. Many of the encoded CDs are very high-profile projects, including recent releases from artists such as Bruce Springsteen, Garth Brooks and Jewel.

"Look at the *Billboard* Top 200," Ritter says. "At any given time you'll find between 20 and 30 HDCD titles. So it's not just a lot of titles, but titles from important artists. That has really caught the notice of some of the larger companies in the consumer electronics arena. In the past, the consumer hardware manufacturers who have licensed HDCD—more than 90 companies—were relatively high-end. But this last year we started to see products that are at prices that will really move us into the mass market." As evidence of this trend, Ritter cites recent HDCD licensing announcements, including a $399 DVD player from Toshiba, a $400 CD changer from Harman-Kardon, a five-disc changer from Denon at the $299 price point, a Marantz consumer CD-R recorder (HDCD decoding only), and upcoming products from Kenwood and TEAC.

Although these recent announcements indicate that HDCD is gaining momentum in the consumer hardware market, the current installed base of CD players and receivers equipped with HDCD decoding covers perhaps 1% of the total installed base of players. That means most of the people who buy HDCD releases, at least the many Gold and Platinum titles, are not actually listening to them with HDCD decoding. Yet there's been no groundswell among fans to demand that record companies sell the same recordings in non-encoded versions. By itself, this does not prove Pacific Microsonics' claim that HDCD encoding makes music sound better even if it is not decoded. But it does add credibility to the word "compatible" in the product's name. And the fact that many top facilities are using the process despite the limited installed base of decoders indicates that mastering experts believe that some of HDCD's conversion and encoding processes improve the translation of audio signals into the digital domain, and that these improvements are evident in many playback situations even without decoding. All of this ties in neatly with Pacific Microsonics' argument that its future is assured even if the CD is dethroned.

THE HDCD PROCESS

The HDCD process is the brainchild of Keith Johnson and Michael "Pflash" Pflaumer, who were brought together by Ritter in the mid-1980s to address what the three men perceived as shortcomings in the CD's digital sound. According to an AES paper describing their work, the trio's goal was to create a system that could deliver audio reproduction that "changes the sound as little as possible." The group was familiar with research by Louis Fielder, R.A. Greiner, Jeff Eggers and others suggesting that true fidelity in critical listening situations requires a dynamic range in excess of 120 dB, as well as a way to mitigate the effects of the "brick wall" filtering commonly used in 44.1 or 48kHz A/D conversion.

The methodology of the HDCD development team involved a thorough review—conducted intermittently over the first several years—of every component in the signal chain in order to isolate and either eliminate or minimize negative effects. Johnson and Pflaumer were guided not simply by test measurements but also by extensive listening tests. "Frequently," they say in their paper, "changing a design parameter produced a clear perceptual correlate that eluded quantification by measurement." They refer to the system they came up with as a "conjugate system of encoding and decoding," but they believe (as noted above) that some benefits are derived from improvements in encoding, particularly in the area of filtering, that do not require complementary decoding to be realized upon playback.

According to Ritter, HDCD's sonic improvements begin with the Model One's unique A/D conversion process. "The actual A/D converter in the Model One runs at 24 bits and 176.4 kHz currently; the Model Two will also convert at 192 kHz. We improve the linearity of our conversion with a high-amplitude broadband dither signal that we mix in with the program in the analog domain.

Pacific Microsonics' Model One

The dither appears to be random, but the system knows at any given instant precisely what the amplitude of that dither signal is. And because we use our own custom, discrete, full-ladder converter with excellent amplitude and phase accuracy, we are able to apply an 'anti-dither' signal, exactly out-of-phase and matched in time, in the digital domain after conversion. That nulls the dither noise out of the signal."

The next steps in the process are related to filtering, and they depend on the sample rate of the destination (release) format. "If it's going to be a 176.4 or 192kHz DVD-Audio release, then we will not decimate that signal; we use a proprietary filter [non-oversampled] optimized to that sample rate. If it's going to be 88.2/96 kHz, we use 2:1 decimation, and once again we use a filter optimized to that frequency. But in both high-resolution settings, the Nyquist frequency is high enough that we don't use the 'dynamic decimation' process that becomes necessary when we go down to 44.1 or 48 kHz."

Dynamic-decimation filtering is HDCD's response to the well-known problems inherent in filter design for digital conversion systems where the Nyquist frequency is only slightly above the range of human hearing. "A filter designer who has to make a 'brick wall' filter at 22 kHz is confronted with conflicting requirements," Ritter explains. "You want to have flat frequency response out to at least 20 kHz, but you can't have any energy above 22 kHz or you will get alias distortion. This requires a very sharp multipole filter with a very steep transition between the

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Scott Martin Gershin's film credits include: *JFK, True Lies, Braveheart, Flubber and Mouse Hunt*

CIRCLE #123 ON PRODUCT INFO CARD

passband and the stopband, which has a number of distortive effects on the signal. It smears transients and causes significant ripples in the passband. If you try to simplify the filter, then to avoid totally unacceptable aliasing you have to start rolling off at 13 to 15 kHz, and even then the signal will not be completely cut off by 22 kHz."

Ritter describes the HDCD approach to this problem: "We slightly delay the 88.2kHz signal, not enough to cause any sync problems but enough that we can do a continuous Fast Fourier Transform. The resultant information is digitally analyzed in real time by an algorithm that determines, based upon a model of the mechanics of hearing and psychoacoustics, what is perceptually dominant in the signal from instant to instant. And that information is used to optimize the decimation filter. One moment you might have a sudden sharp transient, so it uses a filter with minimum time dispersion to pass the transient cleanly. The next instant, there might be a cymbal crash, so it uses a filter that minimizes alias distortion. All the filters are the same length, so you are not getting a phase shift as this is going on."

Another element in the process of downconverting for CD is word-length reduction to 16 bits. "We never simply truncate," Ritter says. "And with the introduction of Version 2.0 of the Model One at the end of 1998, available as a flash-ROM upgrade to existing units, we now have a palette of four 16-bit dither options." The dither and the dynamic decimation together, Ritter believes, add up to a big improvement over typical CD sound. "The reduced distortion—sharper transient response and reduced aliasing—becomes part of the digital recording and will be heard on any player, whether it has HDCD decoding or not," he says. Nonetheless, the optimal playback setting is one in which the playback filters are matched to those used in recording. To achieve this, the Model One hides control information in the signal that tells the HDCD decoder which filter to use. This data is encoded as a pattern in the dither used for word-length reduction. It occurs only 1% to 2% of the time, and the company says that extensive testing has shown that it is inaudible.

In addition to dynamic decimation filtering, HDCD uses the control data to fit a 20-bit dynamic range into a 16-bit signal. Two types of complementary amplitude encoding/decoding are available; the use of either is optional. At the high end of the dynamic range, "peak extend" allows the user to boost gain by up to 6 dB. For quiet signals, "low level range extend" may be used to add up to 7 dB of gain. With both dynamic processes, the control data allows the decoder to restore the dynamics of the original signal. "When you have control over the whole signal path from start to end, you can optimize the record side for what you know will be happening on the play side," Ritter says. "You just can't take it to that degree of optimization if you have no control over playback."

In sum, then, HDCD is a multitiered process, with some aspects involved at all supported sample rates and word lengths, and others used only in certain contexts (see page 95). "Our proprietary A/D conversion, D/A conversion and filtering processes are used at all times," Ritter says, "though the filters used at the 176.4/192 kHz sample rates are different from those used at 88.2/96 kHz. When you get down to the 44.1/48kHz sample rates, then you have 'dynamic decimation filtering' going on. And when you use 16-bit resolution, you also have the option of using 'amplitude encode/decode' processing."

HDCD FOR DVD AND DTS

The ability of the new HDCD encoder to work with the 48kHz sample rate family will allow HDCD encoding to be used on the audio tracks of a DVD-Video disc. Toshiba will introduce two DVD-Video player models featuring HDCD decoding in the second quarter of the year. "The HDCD technology in a DVD-Video player will typically handle several tasks," Ritter says. "It will provide proprietary precision digital filtering, and interpolation for the D/A converter, for all stereo sources [audio from a DVD-Video disc or a CD], as well as for the two front channels of surround sound material. In addition, for playback of Red Book audio for HDCD-encoded CDs, the playback circuit will provide amplitude decoding to enable up to 20-bit dynamic range."

Another area where Pacific Microsonics is working to broaden HDCD applications is multichannel delivery. In January, the company announced an agreement with DTS Entertainment

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(Digital Theater Systems Inc.) to "work together to enable producers, engineers and record labels to use the HDCD process as the front-end recording technology for DTS Digital Surround 5.1 music CD releases." Ritter explains that "in the DTS header there is now a place for a flag that has been identified as an HDCD flag. That feature is implemented now in DSPs from companies such as Analog Devices that handle decoding of both DTS and HDCD. If a player has both DTS and HDCD in it, then if a DTS recording was made with HDCD, the HDCD playback filter will be selected. But there will be no amplitude processing going on." Ritter also notes that with the Model Two, HDCD encoding will be possible not only for DTS CDs, but also for DTS tracks on DVD-Video discs.

The multichannel processing required for implementing the DTS capability is achieved by using three HDCD processors together. "For surround," Ritter says, "you put one of the units into master mode and the other two into slave mode. There is an AC-coupled precision word clock that comes out of the master that you daisy-chain through the slaves, and then you terminate the last unit. That gives you a conversion clock that is synchronous throughout all the converters."

The use of multiple processors will also allow HDCD to be used to create high-resolution surround material for the DVD-Audio format. One potential complication there is the Meridian Lossless Packing scheme used to fit high-resolution multichannel into the DVD transfer rate. But Ritter says MLP should have no effect. "Any system that is bit-for-bit lossless," he says, "will have no impact on the HDCD signal."

Granting that HDCD will work for DVD-Audio, the question arises again as to why you would want to use it in a format that already has such high resolution. Ritter's answer is that better resolution actually increases the need for optimizing all links in the recording/playback chain. "Let's take a camera analogy," he says, "where HDCD is like a lens with very high resolution and very low chromatic aberration. That quality can actually be better appreciated if you are making a 4x5 plate than a 35mm image. So the truth is that the advantages of all the work we do to achieve extremely low distortion and extremely high resolution are even more evident in a high-resolution format like DVD-Audio than with the CD."

Beyond the purely technical considerations, Ritter adds that "CDs will continue to be the dominant format for a long time to come, so player manufacturers will want to include HDCD in their DVD players for playing back CDs. And once that capability is there, it doesn't cost any more to make it available for DVD playback, as well. That means that in addition to the advantages in performance, there are also no obstacles in terms of cost or marketing. So I think we are going to do very well as far as getting HDCD into future generations of audio players." ■

New Technology Editor Philip De Lancie (pdel@compuserve.com) is a freelance writer covering audio and multimedia production and distribution technologies from Berkeley, Calif.

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HOWIE B.

UP FROM THE LONDON UNDERGROUND

PHOTO: RANKIN/PHOTO ILLUSTRATION: MIKA CHISAKI

Howie B. has been something of a ubiquitous figure in popular music the past few years, particularly in Europe. The producer/engineer/mixer/composer/DJ has turned up on all sorts of projects in his various capacities: He's worked on three Björk albums; Robbie Robertson's acclaimed *Contact From the Underworld of Red Boy* CD; with Ry Cooder on the soundtrack for Wim Wenders' film *The End of Violence*; producing Sly & Robbie's recent album, *Drum and Bass Strip to the Bone*; helped out on U2's *Pop* album and the group's megatour that circled the globe supporting that record; and he's written with, produced, remixed or doctored tracks by the likes of Brian Eno, The Passengers, Tricky, Everything but the Girl, Baaba Maal, Soul II Soul, Major Force and many others. Both his writing and production have been heavily influenced by his work as a DJ in London clubs through the years, and though he has increasingly moved into producing other acts and composing his own music, he continues to spin discs whenever he can. Indeed, when we spoke by phone in early March, he was in Berlin promoting his intriguing new all-instrumental CD, *Snatch*, and preparing to go on a whirlwind DJ tour that was to take him to Milan, Paris and Brussels.

Snatch, on the Palm label, shows many sides of Howie B.'s artistry. As you'd expect from a DJ, the grooves are fat (and phat), the loops and samples mesmerizing and intoxicating, the melodies and rhythms a polyglot that spans many genres. There is darkness, pathos and more than a little whimsy in the music, but also some very pretty melodies. Howie B. wrote, performed, recorded and produced the CD himself. It won't be everyone's cup of tea, but it's difficult not to be swept up in its textural inventiveness and sonic weirdness. It's surprising and unpredictable—which is how he likes to keep his DJ performances, too.

BY BLAIR JACKSON

What do you typically do in a DJ show?

Well, I carry about three bags of records with me, which is about 150 pieces of vinyl. And it can range from playing something like a jig from the film *The Wicker Man* to James Brown to hip hop to dub and whatever.

Do you mix your own music in with that?

Not really. There's an unwritten thing with DJs that you don't play your own tunes. Sometimes I'll play other people's mixes that they've done for me, but usually, no. It's more fun for me to play other people's music.

Tell me a bit about how you made your new album—the elements you used, how you constructed it, what inspired it.

The main element was a physical and mental crash; that was the start. I was working too much, socializing too much and basically not looking after my soul. I'd been looking after too many other people's souls, and I forgot to pay attention to myself. I'd just come off the U2 tour, I'd just finished a relationship with a woman and I wasn't in a particularly good place. And the way I thought I could get out of that was to go into the studio and create, almost as a sort of self-help. So that was the fire; it was very personal. I'd never really focused on myself for such a length of time.

What is Chilli Mobile, where you made the record?

It's a portable studio that a friend of mine, Nick Young, put together while I was on the U2 tour. It's like a full studio, but you can take it anywhere in the world in two flight cases. It only takes me a few minutes to set up, and I can record and make music and make records. It's got an Akai 3200 sampler, an H3000 SE effects box and SPX 1000

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effects box, an M500 stereo gate, dbx 160 compressor. The sequencer I use on it is an Otari 1040 computer running C-Lab software. I've got an [Roland] MKS 70 rackmount [synth] and a Nord rack [synth] as well, controlled by a Yamaha mini-keyboard. I have three VCOs and one LFO, a Fostex R-8 8-track analog recorder, a DAT player, one record deck and one crossfade mixer, and two Mackie 16-channel desks linked together. It sounds like a lot of stuff, but it only cost something like £10,000—maybe $16,000 in America—to put it together. Compared to what's normally at my fingertips in big studios, it's not much really, and that was another challenge for me on this project—to see how far I could take my ideas with the material limitations.

Some of what this project was for me was to get back to what I was doing eight, nine, ten years ago; get back to those moments when I didn't rely on anybody else apart from me, and I had to do everything myself. The largeness of this life I've got, working with U2 and all these others...I needed to get back to basics and rediscover what I've

got in me, find my music again, because I've been working so much with others.

I imagine these songs started all different ways—with a sequence, maybe, or a simple keyboard melody line.

All sorts of ways. Some of them started with a noise. Some of them started with me rubbing the stylus of the record deck. Some of them started with me crying in the studio. Some of them started with me staring at the wall. Some of them didn't even start. [Laughs] It was a mad time for me. But once I got started and got to about the halfway point, then it was cool. I became quite sociable, I could talk to people again, and I started to actually enjoy myself. I think it's the most difficult project I've done because, like I said, I didn't rely on anyone except myself, and I really pushed myself. I didn't lift the phone for help. I didn't call in any other musicians...

And at this point you could probably make a helluva record calling up some of the people you've worked with through the years.

That's right. I could've made the album of all bloody albums if I'd wanted to, but that wasn't the intention. The intention was to get myself out of the shit, basically. And it worked. It helped me face up to my depression that I was experiencing and my low self-esteem. "C'mon, get on with your life, Howie!" Once I got to that point it became quite joyful and the music changed as well.

You've become known for your collaborations with a wide variety of musicians. Can you talk about how that developed?

I think for me it just happened socially through meeting people at a club or a bar or a park over the years. I suppose they liked what I did. Maybe they heard me DJ or they heard a 12-inch I did for some independent label—the Mo Wax stuff or the music I did for this Japanese label called Major Force. And they started askin', "Fancy comin' into the studio

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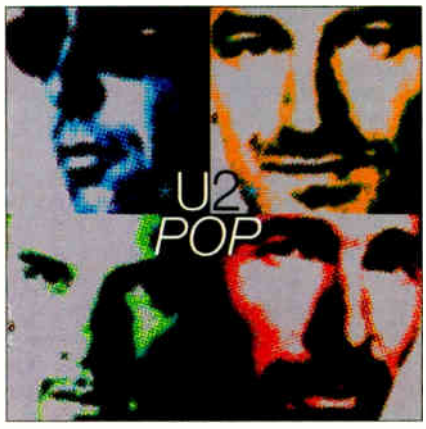
and workin' with us?" For me, collaborating seemed like such a natural thing to do. I never went fishing in terms of looking for work in that area.

My collaboration with Robbie Robertson came about because he sent me a letter. I was in Dublin at the time, and I received this letter that was a poem about someone going on a journey, and at the end of it he wrote, "Will you come on a journey with me?"

Were you familiar with his work with The Band?

Oh yeah. I remember seeing *The Last Waltz* when I was 13, and I thought it was magic; I thought it was outrageous.

At first he said to me, "Will you come over to L.A. to work with me?" And I said, "No, I won't go there. It's not the place for me. I've been there once, and it wasn't a pleasant experience." So he came over to London. We'd never actually met, but he came over to London for a week and we recorded two tunes at Milo [Studios], where I do a lot of my work, and then we mixed them at Whitfield Street Studios. At the end of the mix he turned around and said, "Howie, this is magic. Since I came here to London, you have to come home with me to L.A.



and we'll do some more." So I did, and we did some great work together. He introduced me to some crazy, crazy people. [Laughs]

Were you working at Robbie's little room at the Village?

We were working there, and we had another room downstairs at the Village. It was a great time.

What did you do with Ry Cooder?

I wrote three songs with him, and then I mixed a few of his pieces for a film by Wim Wenders called *The End of Violence*. Through that I met Jon Hassel and Jim Keltner. It was a crazy and fun time.

Had you worked with Eno before you met Hassel? I really like the music they've made together.

Me, too. No, I met Eno earlier. They're both characters. I've never seen them together, but I can imagine what it would be like to have the two of them in the studio.

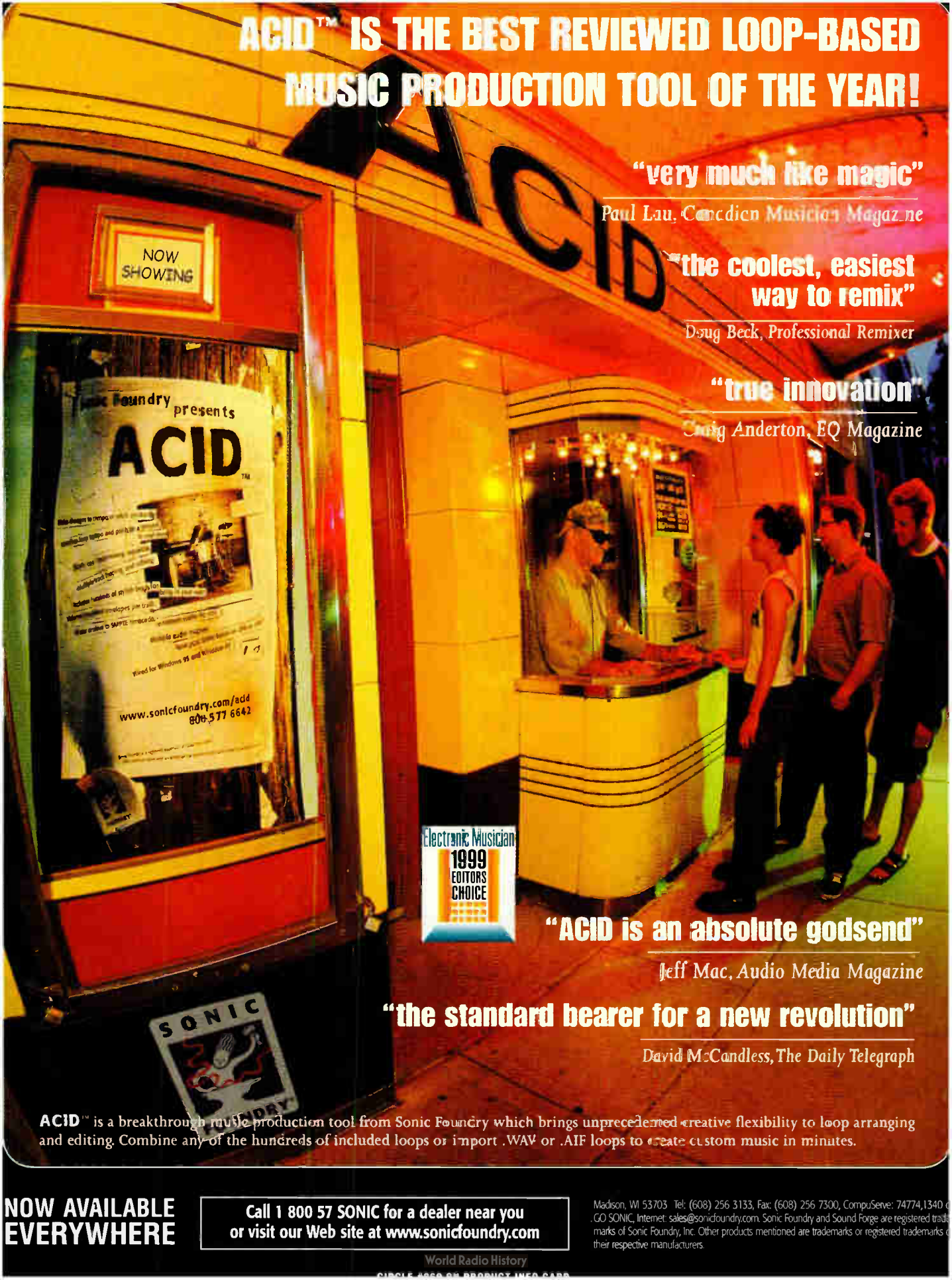
As the years go on, Eno's influence on so many different musical movements seems bigger and bigger.

That's true. He's a man who's about giving life; that's his sole concern. He's incredible. He's always got lots of different things going. He's a great inspiration to me; not so much his music, but him as a person.

We've done some nice things together—The Passengers project, a Baaba Maal project. We jam together quite a lot at his little studio. I'll go over there for two or three hours and we see what happens. We talk together, we eat together. We have a common interest in ladies' bottoms...[Laughs]

How did your connection to Björk happen? The two of you have made some interesting music.

Again, it was just social, meeting her in clubs around London. So she asked me to come in and do some engineering on her first album. I recorded most of the live tracks on the first album. Then on the second album she asked me to come in and write with her. I mixed that album and produced and wrote one of the songs on it. Then on the



third album my role was to...I don't know...I gave her a big kick to push her into a lot of different situations. I recorded the vocals on that album with her in various places in the world, ranging from Spain to Los Angeles to New York to London to France. Because when that album was being made I was on tour with U2, so she would fly to wherever I was. The tapes would arrive, and I'd go into a studio, get a balance up for her and we'd do vocals. It was a good little thing.

Is it hard to keep a consistent vision of a project when you're working like that?

Not really. The vision was hers. I was pushing her to get that vision out of her. When I'm producing, I feel like it's my job to push these people so that they don't let themselves down; so they express themselves as best as they can. I was really pushing her on that album, maybe more than anyone had done with her before. We'd go in and do three or four vocals in one day, then I wouldn't see her for two weeks and then I'd see her in another city, and so on.

Is there an element that unites all these artists you've worked with, from Björk to Tricky to U2?

It's like I said about Eno: They're all life-givers. They're interested in opening doors and challenging themselves. They're experimenting and breaking the rules.

What was your role on the U2 tour? I know you were DJ'ing...

I was DJ'ing, I was musical director.

What does that mean?

I told them they were playing shit and that they had to get better. I rehearsed them each day for almost eight months. I'd change the arrangements of their songs and work with them as a band to get the best out of them. So that was one role—the MD. Then there was me as the DJ and there was me as live mixer. I was a front-of-house engineer with a guy called Joe O'Herlihy, who's been with them for something like 20 years, since day one. That was the first time I'd ever done front-of-house sound. Joe took me on, and he was brilliant. We moved a lot of air. To work with a system that big was outrageous for me.

Personally, I wish they'd get out of the stadiums.

I agree with you, but Bono loves singing to a lot of people, and it's amazing how well he can communicate with everyone, even way in the back of a stadium. This tour was a little different, too, because with the huge screen, it

—CONTINUED ON PAGE 214

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Report From NAB99

The Las Vegas Wrap-Up

By Sarah Jones

NAB99, held in Las Vegas April 17-22, was the biggest broadcast show yet, drawing a record 105,000 attendees. For those of you who didn't get a chance to attend the convention, here's a sampling of what you missed.

DP571 Dolby E Encoder and DP572 Dolby E Decoder

Dolby Laboratories (www.dolby.com) unveiled Dolby E professional audio encoding technology for distributing multichannel (up to eight channels, plus Dolby Digital metadata, via an AES/EBU pair) audio through a 2-channel system, providing a solution for issues such as delivering 5.1-channel digital audio through a 2-channel broadcast infrastructure (and 4-channel tape formats). Dolby E allows material to be decoded, processed and re-encoded many times (the company says up to ten), without degradation. As audio and video frame rates are the same with Dolby E, picture edits may be made without mutes or glitches. The DP571 Dolby E Encoder is $5,395, and the DP572 Dolby E Decoder is $3,995.

CONSOLES

AMS Neve (www.ams-neve.com) introduced the Libra Post console, designed to bring the power and functionality (including automation) of Neve's Digital Film Console to video post. Available in 24/36/48-fader frames, the scalable-architecture Libra Post controls up to 96 channels and provides monitoring and matrix/processing inserts for up to 8-channel surround. Libra Post also features AMS Neve's new 96kHz-ready proprietary processing platform, ESP, which comprises processing cards featuring 21 custom ASICs powering nine DSP chips.

AMS Neve Libra Post console

Soundtracs (www.soundtracs.com) showed a prototype of its new digital production console, the DS-3. Designed for video post, the DS-3 offers 96 channels—each featuring 6-band EQ and dynamics, 25 motor faders, 24-bit converters, 48kHz resolution, 32 output buses, stereo, LCRS and 5.1 surround support, and a 32x8 monitor matrix. Internal processing is 32-bit floating-point.

XXL SSL? **Solid State Logic** (www.solid-state-logic.com) showed the largest digital console ever exhibited at a trade show: an 18-foot, three-operator Avant with 384 in-

puts and more than 1,000 signal paths. SSL also announced that Atlanta's Crawford Post ordered a 24-fader, 96-channel Avant for its new facility, as part of a large-scale networking and system integration plan.

Harrison (www.glw.com) found a lot of interest in its TV5.1 board for broadcast applications. Smaller markets looking for a bargain in multichannel? Check it out.

Graham-Patten D/ESAM 8000

New from Graham-Patten (www.gpsys.com) is the D/ESAM 8000, optimized for surround, accepting up to 96 inputs and offering comprehensive monitoring facilities, with eight analog monitor outs and a built-in monitor matrix. Other features include metadata bridging and authoring, plus the ability to assign either single or multiple channel sources to faders.

Remote-truck owners will want to check out Calrec's (www.calrec.com) new Alpha 100 digital production board. The console has a maximum configuration of 96 stereo/48 mono channels with a two-layer design allowing channel path per fader or dual path arrangements. Other features: eight stereo or mono groups, four main outputs (configurable for 5.1, Lt-Rt or stereo), and mix-minus outputs per channel.

Zaxcom (www.zaxcom.com) introduced two digital consoles, the Cameo LRC (Location Recording Console), optimized for location recording, and the Cameo SV (Studio Version), designed for nonlinear edit suites and telecine applications. Both mixers are compact (12x14 inches), 24-bit/96kHz, offer detachable plasma display and feature eight inputs, each offering parametric EQ, notch filter, compressor, delay, phase inversion and sample rate conversion. Some differences: The Cameo LRC operates four hours on a 12V lead acid-type battery; the Cameo SV's outs can be configured to feed a 5.1 monitoring system.

DISK RECORDING

360 Systems (www.360systems.com) introduced two rackmount disk recorders, the 4-channel TCR4 and the 8-channel TCR8, designed for broadcast, video production and video post applications. Both models are 24-bit and feature internal and removable storage options, timecode implementation, VTR emulation, and a fast, easy-to-use interface.

360 Systems TCR8

Sonic Solutions (www.sonicsolutions.com) continues the DVD push with the expansion of its DVD Creator line, with new workstations retailing for less than $20,000 and the introduction of a DVD-Audio workstation. Also debuted: AuthorScript, an open standard for passing DVD authoring information from nonlinear editors and interactive authoring tools to DVD publishing systems. In addition, Sonic showed DVDit!, an easy-to-use DVD publishing package, listing for $499.

Soundscape (www.soundscape-digital.com) announced R.Ed., a new Windows-based workstation featuring 32-track, 24-bit capability. The expandable system is based around the Mixtreme engine and offers recording, editing and playback functions with an enhanced version of Soundscape's SSHDR-1-Plus Version 2 software.

Fairlight (www.fairlightesp.com.au) unveiled Version 2.0 software and major hardware enhancements for its FAME 24-track/40-bit internal processing digital audio editing/mixing environment, including expanded frame sizes (up to 48 moving faders), compressor/limiters on all mixing buses (and EQ/dynamics available on all inputs patched to tracks), automated control of outboard signal processing and support for up to six surround channels.

New from Akai (www.akai.com) was the DD16PB Plus. Resolution is 24/96, and full 16-track playback is possible from single or multiple drives (even those with differing data formats). Mixed 16/20/24-bit playback (nearly every format is supported, including Tascam MMR-8 Fairlight, WaveFrame, SDII, etc.) is possible within a single project, and the DD16PB Plus locks to LTC and biphase and offers video sync/word clock output. Akai also showed a preliminary version of its new SuperVision software for controlling its digital dubbers machine room software.

Tascam (www.tascam.com) introduced ViewNet Audio, networked graphical user interface software for operating the MMR-8 and MMP-16 machines. The application provides a real-time display of system activity and allows graphical editing of projects. ViewNet is Java-based, works over a 100 BaseT Ethernet connection and is available for a variety of computer platforms, including Macintosh, Windows 95/98/NT and UNIX.

MICS AND MORE

A few new shotgun mics were shown at the show. Audio-Technica (www.audio-technica.com) showed the AT895, designed to replace parabolic dish and shotgun mic designs—see "Technology Spotlight" on page 140 for details. The Electro-Voice (www.electrovoice.com) ENG 618 is an integrated boom pole/shotgun mic, with headphone amplifier plus 200Hz roll-off switch. Beyerdynamic (www.beyerdynamic.com) introduced two new digital shotgun mics, the MC 836 (short) and the MC837 (long). Both are digital condensers fea-

Audio-Technica AT895

Electro-Voice ENG 618 boom pole/shotgun mic

turing Beyerdynamic's True Match digital circuitry, AES/EBU output, and internal software for eliminating digital clipping and improving digital gain staging. Beyerdynamic also introduced the EM686, a wireless shotgun.

Leading UK audio supplier Canford Audio (www.canford.co.uk) arrived on U.S. shores: The company is distributing the Dutch-made Maycom Easycorder, a second-generation portable digital recorder, storing to either PCMCIA card or internal memory, and powered via a 12V XLR power socket, NiMH or C-cell batteries. Prices start around $2,574, depending on configuration. Canford has also worked with Sennheiser and Beyer to create a line of hearing-protection headphones with onboard limiter circuits (kicking in at 93 dB), based on Sennheiser's HD480 open-air model and Beyer's DT100 (and DT109 with integral microphone) sealed designs.

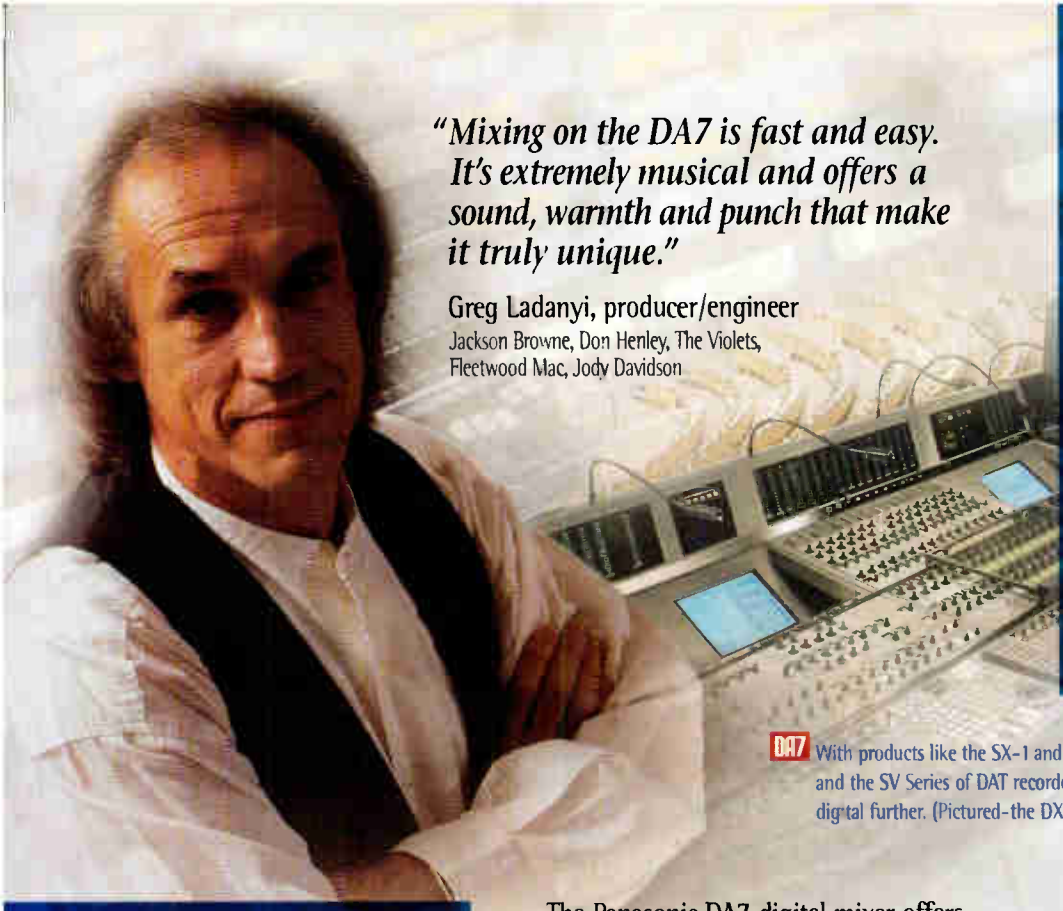
M&K Professional (www.mkprofessional.com) launched four systems in its new MPS line of studio monitors, including the MPS-2510 powered version (all are expected to be powered by year's end). Based on proprietary driver elements, the entire line, from desktop to large control room systems, is scalable from mono to 7.1 (or more) multichannel monitoring.

mSoft (www.msoftinc.com) introduced new software modules for its ServerSound media retrieval system. Pro/Spotter is an automated effect spotting module that allows total supervision of spotting over multiple projects, facilitywide. The Pro Master module automates the process of digitizing audio from CD or DAT, splitting it into individual track and index, and linking each audio segment to a database. Meanwhile Gefen Inc. (www.gefen.com) unveiled a Windows version of its SFXNet sound effects database software.

M&K MPS-2510 studio monitor

OTHER NEWS

Popular Web-based equipment auction network Digibid.com announced its recent entry into the broadcast market at NAB...WaveFrame (www.wave-



"Mixing on the DA7 is fast and easy. It's extremely musical and offers a sound, warmth and punch that make it truly unique."

Greg Ladanyi, producer/engineer
Jackson Browne, Don Henley, The Violets, Fleetwood Mac, Jody Davidson

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Audio Precision System Two Cascade

frame.com) released Version 6.5 software for its DAW, adding the ability to reverse regions on-the-fly (even across edits), import/export Broadcast .WAV files and make use of mSoft's NT-based sound retrieval system through NetWave. Also, the company showed its new sampler, the Event Processor Sampler, developed in partnership with E-mu and able to address up to 128 MB of RAM...**The Hollywood Edge** (www.hollywoodedge.com) introduced the five-CD set "Apocalypse Now: The American Zoetrope Sound Effects Collection" (see "Field Test" on page 148)... Thomas Dolby's company, **Beatnik** (formerly Headspace), announced an alliance with **FirstCom Music** in which the Beatnik Web site features Firstcom's music libraries, allowing users to search, preview and license music online. Check out www.beatnik.com...**Sound Ideas** (www.sound-ideas.com) released Audience Reactions!, a library of more than 500 audience reacts, and **Fresh, The Music Library** (e-mail: chas@valley.net) released a disc of call letters and numbers, all sung and completely editable...**Telos Systems** (www.telos-systems.com) announced plans to release MPEG-4 Audioactive Internet audio tools by the end of this year...New from **Sonifex** (www.independentaudio.com), Redboxes are a range of little, red, stand-alone/rackmountable, low-cost ($315 and up) connection units (such as mic amp, stereo-to-mono converters, limiter) for use in radio stations, TV studios and video and recording suites... MD Report, distributed by **PMI Audio Group** (www.pmiaudio.com) is a rugged housing that connects to your pocket MiniDisc or DAT recorder, adding XLR mic preamps, balanced inputs (mic/line switchable), 48V phantom power and much more...**Audio Precision** (www.audioprecision.com) announces System Two Cascade, a series of additions to the System Two product line of test gear now offering 96/192kHz capability. ■

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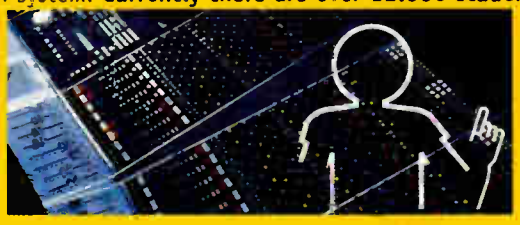

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CIRCLE #154 ON PRODUCT INFO CARD

BY GEORGE PETERSEN

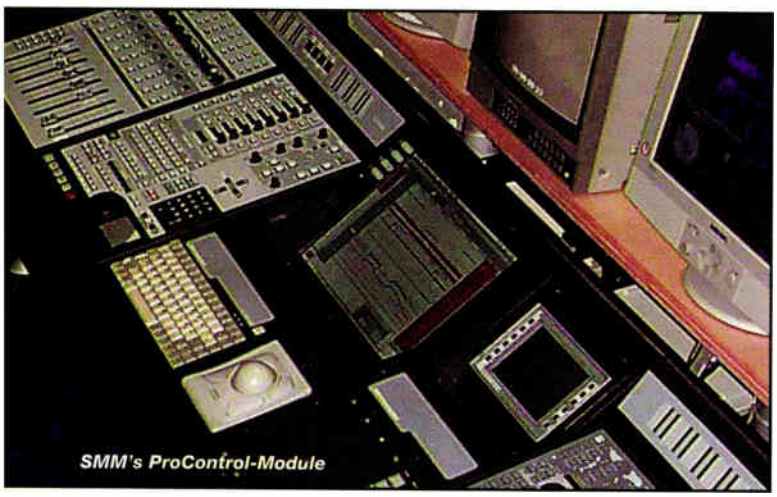
HOT HITS FROM THE 106TH AES CONVENTION!

FROM MAY 8 TO 11, 1999, thousands of audio professionals converged on Münich's M.O.C. Congress Center for the 106th convention of the Audio Engineering Society. The event featured 14 workshops, 18 facility tours and 130 technical papers. Clearly there was a lot to see and hear in a four-day period, but as with previous AES conventions, all eyes were on the four exhibit halls, where more than 300 manufacturers unveiled the latest in Tontechnik.

CONSOLES

The focus was on BIG boards, with both new products and updates. **Amek** (www.amek.com) showed its 9098i, the in-line version of the acclaimed 9098 analog mixer, combining SuperTrue 4.0 automation with two moving faders per channel strip, bandwidth extending to 200 kHz and ranging from a 48-frame chassis to large custom ring or bucket configurations. Three mixers have already been installed, with several more in the months to come.

Amek also debuted new features for its Digital Mixing System consoles. Designed specifically for audio post, the new DMS-Post version can be reset instantly to handle any format from mono to multistem 5.1. An optional DMS-XP audio expander increases capacity to 96 mix inputs, with EQ on all channels; the optional Channel Panel control surface module offers one-control-per-function operation of all channel parameters, via 48 rotary encoder pots and 32 switches. Version 3.3 software adds simultaneous dynamic and snapshot automation, multi-user passwords/privileges, a pan/divergence editor and multiple operators mode.



SMM's ProControl-Module

Version 2.0 software for **Studer's** (www.studer.ch) D950 console adds improved Virtual Surround Panning (VSP), advanced channel strip assignment and refinements that simplify console operations, along with the capability to split the desk for two-operator mixing, and new Dolby Digital EX and 7.1 surround capability. Each channel now offers variable Low Frequency Effects and center-channel feeds, as well as automatable VSP room simulator effects, with DSP-based simulations of XY/ORTF/sphere/HRTF stereo miking techniques.

Software V. 2.0 for **Sony's** OXF-R3 Oxford console (www.sony.com) includes expanded multiformat functionality for 5.1 surround mixing; multiformat, multistem recording and monitoring; multiformat sub-level control from each full channel; new Sony EQ and compressor choices; jog/shuttle machine control capability; MIDI support for dynamically automating parameters of external MIDI devices and a new GUI for simpler, faster offline automation operation. The update also supports the just-announced GML signal processing option, which integrates 96 channels of GML8200 EQ and GML8900 dynamics processing.

Speaking of GML, **Massenburg DesignWorks** (www.gmlinc.com) is a new company founded by producer/engineer/equipment designer George Massenburg to create hardware/software tools for GML and other companies. The company's debut product is the 2x2 High-Resolution Parametric Equalizer, a double-sample-rate plug-in. Mackie's D8B and the Sonic Solutions Sonic Studio HD are the first products to incorporate this proprietary technology.

ESP, a new platform for **AMS Neve** (www.ams-neve.com) digital consoles, comprises powerful processing cards with 21 custom AMS Neve ASICs controlling nine DSP chips on a single card, which takes the load off the DSP for faster processing. Developed to provide the processing power for the company's three-operator DFC board, ESP is a scalable, 96kHz-ready architecture that can be used with either large or compact AMS Neve consoles.

Solid State Logic (www.solid-state-logic.com) demonstrated new V4 software for its SL9000 flagship analog desk. V4 adds extended machine control, with revisions to parallel machine control and automatic ID'ing/configuration for controlling serial transports. Other enhancements include automatic file version handling, a simplified user interface, timecode masking and offsetting, while expanded grouping flexibility eases 4-channel panning with increased control of 5.1 mixes.

Several new analog boards are targeted squarely at the "pro project studio" market. **Oram** (www.oram.co.uk) unveiled the Oram PROject 24, a small-footprint console (frames range from 24 to 48 inputs) featuring 24-track monitoring and pricing from about $24,000. Meanwhile,


DAR Soundstation Storm

Malcolm Toft (www.toft.co.uk) has begun shipping the MTA Series 924, available in 24- to 48-input versions and priced from about $12,600.

WHIPPING UP A STORM

The workstation buzz of the show was the new Soundstation Storm from DAR (www.dar.uk.com). Storm is a completely new hardware platform that puts the power of 16 of DAR's earlier generation cards on a single card that operates five times faster and handles up to 700 MB of RAM. Initially available as a 32-track system (with the ability to simultaneously stream 32 tracks off a single hard disk), Storm is scalable up to 132 tracks and features a new high-res color touchscreen that displays up to 32 tracks at a time with selectable viewing of waveforms, visible fades/crossfades and vertical track zoom. Storm supports up to 192kHz sampling with 16- and 24-bit resolution, and has the ability to use different bit-depth segments on the same reel. Storm is available in both standard touchscreen and compact controller versions.

Based on the competitive upgrade concept so common in the computer industry, Digidesign (www.digidesign.com) made the unprecedented move of offering $1,000 toward the purchase of a Pro Tools|24, Pro Tools|24 MIX or Pro Tools|24 MIXplus system for the trade-in of an Alesis ADAT series, Tascam DA series, Sony PCM800 or Fostex RD8 MDM deck. But rather than simply attack tape-based users, the plan could provide owners of a 24- or 32-track MDM system with a more affordable means of integrating the advantages of random-access production with their tape system.


DPA 3541

German Digidesign distributor SMM (www.protools.de) turned heads with its ProControl-Module, which takes the basic modules of a standard Digidesign ProControl controller and puts them into a large-format housing that accommodates keyboard, trackball, display monitors and the ProControl elements in a single integrated unit with everything right where you need it. The unit also offers space for adding custom accessories, such as Gallery Software's (www.gallery.co.uk) Axis joystick surround panner or ProductionPalette 128-key edit controller.

THE HITS KEEP COMING

Designed for large control rooms, Genelec's (www.genelec.com) 1036A system consists of two three-way double-18 enclosures and two electronics racks with the active crossovers, 3-channel power amps, protection and diagnostic circuitry. Highs and mids are handled by two 5-inch cone drivers and a 1-inch throat compression driver, mounted on a Directivity Control Waveguide, which is rotatable for horizontal or vertical installations. The 1036As are said to produce peak SPLs in excess of 136 dB, and frequency response goes down 17.5 Hz, with a -3dB point at 19 Hz.

In other monitor news, TC Electronic (www.tcelectronic.com) has signed an exclusive agreement for the worldwide distribution of Danish studio monitor company Dynaudio Acoustics, effective June 1, 1999.

Quantec (www.quantec.de) has its eyes on regaining the reverb/effects throne with its 2402 Yardstick, which puts its classic QRS (Quantec Room Simulator) sound into a slick, single-rackspace unit priced at about $2,900. The compact unit features an extremely simple, yet powerful interface, but perhaps most interesting about the 2402 is the fact that this is the first reverb I've seen that has digital AES/EBU stereo I/O, but no analog connections.

NEW MIC DEVELOPMENTS

Microtech Gefell (www.microtechgefell.com) is finally shipping its KEM 970 Cardioid Plane Microphone, which has a cardioid-shaped pattern, but only in the horizontal plane. The first installation was in Germany's new Reichstag parliament building, where the KEM 970 provides podium miking without the negative effects of reflections off the podium surface.

Sweden's Milab (www.milabmic.com) joined the digital mic movement started by Beyerdynamic three years ago. The Milab DM-1001 is a large-diaphragm studio condenser with integral 24-bit/48kHz converter, AES and S/PDIF outputs and a software providing computer control of polar patterns and filters.

A popular attraction at AES was the DPA (www.dpamicrophones.com) 3541 large-diaphragm studio microphone, which is based on the famous B&K 4040 "gold" mic. The 3541 is available with either pentode-based or solid-state electronics, features a self noise that's an impressive 7 dB(A) and will ship this fall.

Schoeps (www.schoeps.de) unveiled a prototype of its VariMike (variable-microphone), a remarkable stereo mic system that uses an outboard 24-bit DSP controller box and two double-transducer microphones to simulate a wide range of microphone sounds and techniques. As an example of VariMike's versatility, knobs provide independent control of the polar pattern in three frequency ranges, offering flexibility that goes far beyond conventional mic technology. At present, VariMike is still in prototype stage, so no word on pricing or availability, but we're keeping our eye on this one!

AES returns to New York (September 24-27, 1999), and to Paris (February 19-22, 2000). See you there! ■

Tennessee Top 20

A SCORE OF PRODUCT HITS AT NSCA

This year's NSCA show (www.nsca.org) took place at Nashville's Opryland Hotel, an antediluvian biosphere where attendees could lose themselves for hours looking for exhibits, their rooms or dinner. Your loyal scribe overcame injury and mediocre food to bring you a Top 20 of product highlights.

Ashly (www.ashly.com) expanded its Protea line of digital EQs with the 2.24PS and 4.24PS, 2- and 4-channel 10-band parametrics that have the same highpass and lowpass filters, full-featured compressors and digital delays found in the Protea graphic EQs.

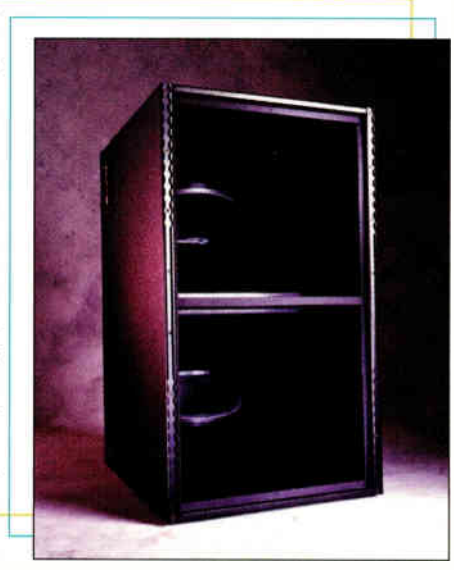
BSS (www.bssaudio.co.uk) showed its new 9010 "Jellyfish" programmable palm-sized remote for SoundWeb, which has six touchscreen buttons, a rotary encoder, a built-in mic, plus an external mic input. BSS USA also distributes **C-Audio** amplifiers, including the new Pulse amps in a turbo shade of blue, filling the void left by the discontinuation of its EPC line.

Neutrik (www.neutrikusa.com) introduced Speakon NL2 two-pole connectors with a smaller parts count, making them competitively priced with phone jacks. The new NL2FC female connector maintains compatibility with the previous NL4MP male plug by picking up only pins 1+ and 1-. The new two-pole NL2MP male plug is intentionally incompatible with the old NL4FC.

Sennheiser (www.sennheiser.com) showed its Digital 1000 Series of 900MHz wireless systems based on technology licensed from X-Wire.

SIA Software's (http://siasoft.com) new SMAART Pro measurement software incorporates plug-ins to control many top equalizers. It now supports up to 24-bit digital audio, bigger FFTs, and 24-point-per-octave resolution. Version 3 can be purchased through SIA, EAW or JBL for $595; an upgrade is available for $99 by calling 877/SMAART3. **Opcode's** (www.opcode.com) SonicPort A-to-D ($249 list) allows USB connectivity to a W98 computer, reducing S/N by 30 dB over onboard converters. **AudioControl's** (www.audiocontrol.com) MP-200 battery-powered 2-channel mic preamp ($349, with measurement mic) includes pink noise and provides a portable solution for laptop-based measurement systems.

The **Midas** (www.midasconsoles.com) Heritage 2000 is a 12-aux, 12-sub, LCR dedicated FOH version of the 3000, costing about 20% less. **Soundcraft's** (www.soundcraft.com) new Series Four (in an SM-20 frame) costs 27% less than a Series Five and foregoes a few of its functions, while adding **Amek's** Showtime features, including Virtual Dynamics, without the Recall.



Meyer Sound's DS-4P mid-bass loudspeaker

Peavey (www.peavey.com) celebrated its 2,000th MediaMatrix® installation by announcing a Remote Access MediaMatrix (RAMM) upgrade, which allows MediaMatrix system control over any LAN.

Mackie (www.mackie.com) launched a new division—Mackie Industrial—targeted at the contractor market, with dozens of products ranging from the DX8•2™ rackmount digital mixer (scalable up to 48 inputs) and an array of speakers including the AE800SW 70-volt subwoofer and an 8-inch carbon-fiber cone co-ax for wedge/fill/under-balcony use.

Eastern Acoustic Works' (www.eaw.com) new MQ mid-high enclosures utilize the same midrange phase-plug developed for the KF-750. Five models are available in 60x40°, 90x40° or 60x60° patterns, with either one or two 10-inch drivers.

Electro-Voice (www.electrovoice.com) offers several new X-Array installation enclosures employing Ring-Mode Decoupling, including the Xi-2181 dual-18 and the Xi-2122/42 mid-high, which offers 40x20° coverage from pairs of 12s and compression drivers.

L-Acoustics' (www.coxaudio.com) compact two-way DV-DOSC enclosure has two 8-inch speakers plus the proprietary DOSC waveguide. They can be used as a V-DOSC array extension, but as few as three can construct stand-alone DOSC arrays, with frequency response from 100 to 18k Hz. The DV-DOSC has wider 120° horizontal coverage and measures 27x18x9 inches (WxDxH)—half the height of a V-DOSC, and tapering to 7 inches at the rear.

Meyer Sound's (www.meyersound.com) UPM-1P is an improved, self-powered version of its UPM-1 speaker for under-balcony, front-fill or stand-alone use. The bi-amped enclosure has two 5-inch cone drivers and a 1-inch titanium dome on a symmetrical horn replacing the piezo tweeter. A companion dual-10 self-powered sub can be added for small 5.1 boardroom or home theater systems. Also new is a dual-12 DS-4P mid-bass companion for the MSL-4.

In other speaker news, **Nexo** (www.nexo-sa.com) introduced the PS8, rounding out its line of powerful two-way PS speakers, plus the three-way Alpha E Series. **MacPherson's** (www.macpherson-inc.com) Axia (axial inline array) is a horizontally oriented, stackable version of the Monolith, designed for building line-arrays. **ServoDrive** (www.servodrive.com), makers of the powerful BassTech7, introduced the Unity, a compact 100-pound, 22.5-inch three-way cube that uses 13 drivers to create a point-source image with 60° dispersion and 100 to 20k Hz (±2 dB) response. ■

BY MARK FRINK

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PREVIEW

TASCAM CASSETTE DUPLICATOR

Tascam (Montebello, CA) debuts the T-3000 Cassette Duplicator system, a rack-mount 4x-speed stereo duplicator with three recorder mechanisms. The system uses a 4-track/4-channel record/play head and a half-track/2-channel erase head. Mechanisms 1/2 act as slaves, while mechanism 3 can act as master or as a slave deck. Units are auto switchable for Normal or CrO^2 tapes. A C-60 cassette can be copied in 7.5 minutes. Price: $1,625.

Circle 327 on Product Info Card

AKG DRUM MIKING KITS

AKG Acoustics (Nashville) intros two AKG Drum Miking Kits, the Standard and the Big, each a comprehensive package of AKG dynamic and condenser microphones specially selected for drum miking applications. The Standard kit includes a D 112 kick drum mic, with mic stand, and four C 418 MicroMics, each supplied with a foam windscreen and a mounting bracket for securely positioning the mic on a snare or tom. The Big kit includes the same complement, plus two C 1000 S mics, with polar pattern converters (cardioid/hypercardioid), presence boost adapters and mic clips. Both kits are supplied in padded metal cases, and package prices are lower than the single microphone costs. The Big package is $1,195.

Circle 328 on Product Info Card

HHB CD RECORDER

HHB Communications (Los Angeles) debuts the CDR850 stand-alone CD recorder. Compatible with CD-R and CD-RW rewritable discs, the CDR850 provides control over copy-prohibit status, fade in/out times, auto track increment levels, auto stop delay and input margin. An onboard sample rate converter converts any digital input signal to the 44.1kHz CD standard. Connections include co-ax/optical S/PDIF I/O, AES/EBU digital in, and analog RCA and balanced XLR I/O. Price is $1,249.

Circle 329 on Product Info Card

ANALOG DEVICES 192kHz DAC

Analog Devices (Norwood, MA) has released a new 24-bit stereo digital-to-analog converter that meets the 192kHz audio sample rate standard for DVD players. Compatible with all DVD formats and sample rates, the new AD1853 is backward compatible with 32/48kHz sample rates, and supports the 50/15 msec digital re-emphasis intended for Compact Discs. The AD1853 operates from a single +5V power supply, is packaged in a 28-pin SSOP and is priced at $4.95 in 10,000-piece quantities.

Circle 330 on Product Info Card

SVETLANA SV300B TRIODE

Svetlana Electron Devices Inc. (Huntsville, AL) announces the SV300B power triode, available singly or in matched pairs. Made in Svetlana's St. Petersburg, Russia, facility, the SV300B features a thicker glass envelope than the 300B, a gold-plated control grid to minimize grid emission and improve stability, and improved vacuum processing. Otherwise, the SV300B is a close duplicate of the original 300B. Each tube includes documentation specifying its measured transconductance performance.

Circle 331 on Product Info Card

MILLENNIA MEDIA MM-990 OP AMP

Millennia Media (Placerville, CA) announces the MM-990 high-performance audio amplifier module. Fully compatible with the Jensen/Hardy 990™, the API 2520™ and others, the MM-990 is a pure Class A, all-discrete J-FET op amp designed for superior audio performance. Price: $75 each in small quantities.

Circle 332 on Product Info Card

PREVIEW

NEW CHIP DRIVES AMS NEVE CONSOLES

AMS Neve (New York City) announces a new digital processing platform for its range of digital consoles. The third-generation ESP processor card has nine DSP chips and 21 custom ASICS (mainly used for remapping processor inputs and outputs to free up DSP horsepower). The scaleable ESP provides the processing power required for the company's three-position DFC (Digital Film Console) but is also usable in compact AMS Neve consoles. The 96kHz-ready ESP chip assures compatibility with future production and delivery formats and is integral to the Libra Post multiformat digital post-production console.

Circle 333 on Product Info Card

TC ELECTRONIC INTONATOR

The TC Electronic (Westlake Village, CA) Intonator is a vocal processor designed to eliminate the tedium (and cost) of re-recording out-of-tune vocals. Featuring TC's DARC™ chip technology and 96kHz internal processing, the rackmount unit offers 24-bit resolution. Functions include pitch correction, de-essing and an Adaptive Lo-Cut filter designed specifically for vocal processing. A Pitch Window allows the user to adjust the out-of-tune threshold, and the vocalist's vibrato and initial intonation may be preserved by adjusting the amount of automatic correction. Analog dual I/Os allow for the simultaneous independent recording of processed and unprocessed signals. Additional features include MIDI control and a unique "do not process anything but this note" function. Price: $1,499.

Circle 334 on Product Info Card

NEW NEUMANN CONDENSERS

Neumann USA (Old Lyme, CT) intros the KM 183 omnidirectional and KM 185 hypercardioid condenser microphones, companions to the popular KM 184 cardioid condenser mic. Like the KM 184, the two new Series 180 models are similar to Neumann's KM 100 Series of modular microphones but do not offer the latter's interchangeable capsules. All Series 180 mics can be battery- or phantom-powered and are available in matte black or nickel finishes.

Circle 335 on Product Info Card

STAX ELECTROSTATIC EARSPEAKERS

Stax® (distributed by Morishita & Associates Limited, Mississauga, Ontario) offers a new high-performance electrostatic earspeaker, the high-bias SR-007 (Omega II). A completely new design, the SR-007 has a gold-plated copper electrode and a lightweight 1.5-micron polyester diaphragm. Featuring high-voltage 6FQ7/6CG7 output tubes in a parallel configuration, the SRM-007t includes a pure transformerless circuit and a non-wirebound resistor. Price is $8,500 (Canadian).

Circle 336 on Product Info Card

SHURE DRUM CONDENSERS

Shure Bros. (Evanston, IL) debuts two condenser mics for close-miking drums. Tailored for toms, the $395.95 Beta 98D/S miniature supercardioid condenser handles max SPLs of 160 dB. The

PREVIEW

98D/S includes a locking windscreen and flexible A98D gooseneck mount and features a detachable preamp; a cardioid capsule is optional. Without the A98D drum mount, the mic is $326.45. A condenser boundary mic designed for kick drum, the Beta 91 ($341) also has a detachable preamp. Like the SM91 microphone, which it succeeds, the Beta 91 requires no mounting hardware; it simply sits on a pillow or blanket within the drum shell.

Circle 337 on Product Info Card

HAFLER POWERED SUB

Hafler (Tempe, AZ) offers the TRM10s Trans•ana powered subwoofer, a down-firing ported system designed to augment its TRM6 monitors. Finished in black matte and featuring a 200-watt Class-G Trans•ana amp powering a 10-inch woofer in a one-cubic-foot enclosure, the TRM10s provide additional bass response for any small monitor down to 25 Hz. Input sensitivity and phase controls are standard, as are XLR and RCA inputs. Price: $695.

Circle 338 on Product Info Card

HOT OFF THE SHELF

EMTEC Pro Media intros BASF Formatted ADAT Master tape cassettes for 20-bit recorders in 40-minute lengths. Call 805/295-5551 or visit www.emtecusa.com…**Aardvark's Aark DIRECT** ($425) is a two-mic/line input, 4-output digital audio interface for the PC. Consisting of a PCI host card and breakout cable, the unit offers S/PDIF and MIDI connections and real-time DSP Effects. Call 313/66-8899 or visit www.aardvark_pro.com…**Promusic's Swing!** is a new addition to the Abaco Music Library. Preview this 73-track CD of modern jump, swing, big band vocal and instrumental music at www.promusic.com. Call 818/506-1588 for a copy…**CEDAR Audio USA upgrades the DCX Declicker** with Version 2 software. DCX owners get a free upgrade from CEDAR or local dealers. Call 207/828-002 or visit www.cedar-audio.com…**Alesis announces new pricing** for the M20 20-bit digital multitrack recorder. The new price is $4,999. Call 310/255-3495 or visit www.alesis.com…**Russian microphone manufacturer Oktava** has renamed its VM-100 tube condenser mic to the MKL-100 to avoid confusion with a similarly named product from German manufacturer Brauner…**Bi-Tronics' 152-page 1999 catalog** features over 7,000 unique and hard-to-find products designed to interface, interconnect and integrate audio, video and broadcast equipment. Call 800/666-0996 or visit www.bitronics.com…**Selco adds aluminum knobs** to its line of push-on knob products for D-shaped, splined and smooth shafts. Call 714/712-6200 or visit www.selcoproducts.com…**Miller & Kreisel Sound (M&K) now offers a ten-year warranty** on its passive speakers and a five-year warranty on amplifiers and powered speakers. Call 310/204-2854 or check at www.mksound.com…**Analog Devices offers the *1999 Short Form Designers' Guide*** in both print and CD-ROM versions. Call 800/262-5643 or visit www.analog.com…**The Fresh Music Library offers a six-CD package** of sound effects and production elements. Call 603/643-1388 for a free sample CD or visit www.freshmusic.com…**The 1999 Full Line Catalog from Pomona Electronics** features a huge selection of test and measurement accessories. For your free copy, call 909/469-2900 or visit www.pomonaelectronics.com…**Sweetsong Productions releases five production library music CDs.** Three are titled Romantic, Holiday and Soothing Moments and the two remaining discs contain easy listening tracks and audio/video logos, and short cuts including full orchestra, electronic music and percussion. The buyout discs are priced at $45 each ($150 for the set). Call 304/428-7773 or visit www.sweetsong.com…**The Comprehensive Video Group offers a 144-page color catalog** featuring a wide range of cables, connectors, switchers and accessories. Call 800/526-0242 or visit www.compvideo.com. ■

TESTS EVERYTHING BUT YOUR PATIENCE

QBOX

This compact, rugged box can make your job a hell of a lot easier. Quick-check dynamic mics without firing up the entire system. Use Test tone to confirm connections back to the board without unpacking the mics—or uttering a single "check."

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New Software/Hardware for Audio Production

INMOTION 3D AUDIO PRODUCER

The InMotion 3D Audio Producer (www.inmotion.com) is a Windows-based spatial sound processing/encoding application, providing environmental modeling capabilities including 3D positioning, reverb, Doppler effect, air absorption and occlusion modeling, plus crosstalk cancellation. Place virtual loudspeakers anywhere around the listener, and InMotion works in real-time by processing a stereo soundstream and synthesizing virtual speakers to enhance the stereo sound field. All effect parameters including reverb time, reverb room size, reverb predelay, reverb damping, filter frequency and width can be updated in real-time; low and high-shelf EQs are included. An easy-to-use interface provides intuitive editing of multiple sound sources, and complex scenes can be previewed in real-time on capable systems. InMotion encodes audio as standard stereo .WAV files and supports 11.025/22.05/44.1kHz sample rates.

Circle 339 on Product Info Card

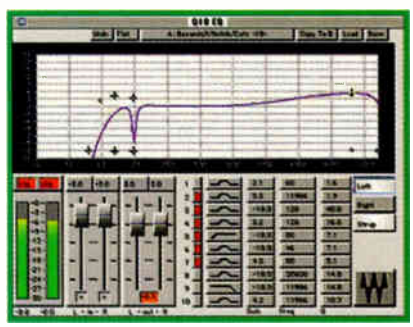
MASSENBURG DESIGNWORKS PLUG-INS

Massenburg DesignWorks (www.gmlinc.com) is a new company founded by producer/engineer and equipment designer George Massenburg to design software and hardware tools for GML and other companies. The company's debut product is the 2x2 High-Resolution Parametric Equalizer, a double-sample rate plug-in designed to run on the effects board on various consoles. The Mackie D8B, Sony Oxford 2.0 and the Sonic Solutions Sonic Studio HD are the first products to incorporate this proprietary technology.

Circle 340 on Product Info Card

WAVES GOLD NATIVE BUNDLE

Waves (www.waves.com) announces the Gold Native Bundle, a comprehensive collection of DSP plug-ins for native processing on both Windows and Mac programs. The bundle contains Waves' new Pro FX plug-ins, plus the Renaissance EQ and Compressor plug-ins. Also included are the L1 Ultramaximizer and the complete C1, including compressor, gate and sidechain, Q10 paragraphic EQ, S1 Stereo Imager, TrueVerb virtual space/reverb, Track Pac lite, PAZ (Psycho Acoustic Analyzer), the De-Esser, MaxxBass and WaveConvert Pro. Gold bundle owners will automatically receive any new plug-ins that Waves releases in 1999. Retail is $1,200.



Circle 341 on Product Info Card

TERRATEC EWS64 XXL

TerraTec Pro Media's (www.terratecpromedia.net) AudioSystem EWS64 XXL combines the EWS64 card (which includes a 64-note polyphonic sampler, digital I/O and effects) and microWAVE PC, a full-featured version of Waldorf's microWAVE XT synth, jointly developed by Waldorf and TerraTec. The Digital XTension microWAVE PC module is designed to fit in a standard 5.25-inch drive bay and includes S/PDIF (coax and optical) digital inputs, two 20-bit co-ax S/PDIF outs, MIDI I/O and more.

Circle 342 on Product Info Card

POWER TECHNOLOGY DSP•FX VERSION 6.0

Power Technology announces Version 6.0 of the DSP•FX Virtual Pack plug-in package. The 6.0 release includes Power Technology's latest DirectX plug-ins: the StudioVerb; the Optimizer, a mastering tool that combines a look-ahead peak limiter with dithering algorithms; and the Aural Exciter, a spectral enhancer that adds high-frequency harmonics to the output signal. The DSP•FX Virtual Pack now contains 11 effects, for the same retail price of $299. Download a full demo of the Virtual Pack (with free Multi-Tap Delay plug-in) at www.dspfx.com.

Circle 343 on Product Info Card

SADiE ARTEMIS WORKSTATION

Studio Audio Digital Equipment's (www.sadieus.com) Artemis is a Windows-based, 192kHz-capable, DVD-ready workstation system offering up to 24 inputs and outputs and optimized for DSP-intensive audio with large amounts of real-time effects. Rackmount turnkey systems range from eight to 24 inputs and outputs; the entry-level system has eight inputs and outputs and can replay 24 tracks of edited 16-bit audio (internal processing is 32-bit floating point). The

NEW SOFTWARE/HARDWARE FOR AUDIO PRODUCTION

breakout box has eight channels of AES/EBU digital I/O, digital reference input, RS-422 I/O, XLR timecode I/O and eight channels of unbalanced analog I/O with 20-bit conversion. The interface is based on SADiE 3 software; features include surround mixing facilities, sample-locked automation, and Mac AIFF and SDII support (without translation), plus EDL export to AudioFile. SADiE EDLs can be created from a mix of any file or disk format currently supported by SADiE.

Circle 344 on Product Info Card

SIA SMAART PRO V3.0

SIA Software Company and EAW (www.eaw.com) jointly release Version 3 of the SMAART Pro audio system optimization and acoustic measurement software. The first release since the SIA and EAW development merger this year, Version 3 now incorporates a plug-in architecture for control of EQ devices, linkable via MIDI, serial or parallel connections. Manufacturers announcing development support of the architecture include Rane, BSS, Ashly, Level Control Systems and TC Electronic. Major new features include support of high-res (up to 24-bit) digital audio I/O, plus a built-in signal generator providing a choice of pink noise, sine waves and dual sine waves. Version enhancements include improved FFTs and higher-resolution in SMAART Pro's proprietary FPPO (Fixed Point Per Octave) Transfer Function. Retail: $595; registered users can upgrade for $99.

Circle 345 on Product Info Card

TANGO24 CONVERTER

Frontier Design Group (www.frontierdesign.com) releases Tango24, a 24-bit version of its Tango audio converter. This 1-rackspace, 8-channel unit features ADAT LightPipe I/O and balanced +4dB analog I/O on TRS jacks, along with BNC word clock I/O, front panel switches for selecting external, ADAT or internal clock sources for 44.1kHz and 48kHz operation. Also standard are eight sets of level meters (input/output switchable), plus LEDs indicating signal present, -3 dB below full scale and clipping, for each channel. Street price is estimated at $699.

Circle 346 on Product Info Card

UPGRADES AND UPDATES

Berkley Integrated Audio Software (BIAS) announces Version 2.0 upgrade releases of both Peak and Peak LE. Peak 2.0 now can record/play/edit up to 32-bit files, supports playback and recording through DAE, and can encode MP3, Shockwave, and RealAudio files. Peak LE 2.0 includes user interface enhancements and new tools for recording, editing and processing. Visit www.bias-inc.com for more information...**Steinberg's GRM-Tools** is a collection of four PC/Mac VST plug-ins by the Paris-based Institut National de l'Audiovisuel. The package includes "shuffling," comb filter, bandpass and "pitchaccum" algorithms for creative processing. For details, check out www.steinberg.de...**ThinKware's** (www.thinkware.com) new USB products from Roland include the UA-100 Audio Canvas USB audio and MIDI processor; the Super MPU64 high-speed, 64-channel MIDI interface for USB; and the MA-150U USB powered speakers...**Antares TDM plug-ins** are now Pro Tools 24 MIX-compatible. Also, new features, such as automation of all Automatic Mode sliders and pop-up settings, have been added; check out www.antares-tech.com...**CD Cyclone Systems** debuts the T-30 duplicator, featuring 30 8x CD recorders. Visit www.cd-cyclone.com...**Arboretum Systems** (www.arboretum.com) premieres Hyperprism TDM 2.5, featuring Pro Tools MIXplus compatibility, improved filters and noise gate, parameter change automation and more...**Opcode** now offers iMac and G3-compatible versions of Vision DSP and Studio Vision Pro, as well as its new MIDIport series of USB interfaces. Visit www.opcode.com...**CreamWare's** Pulsar Version 1.1 offers three new virtual analog synths and DSP enhancements. Download the free update at www.creamware.com...Version 1.3 of the Retro AS-1 synth from **BitHeadz** (www.bitheadz.com) now features 96kHz support and improved sequencer integration...**Syntrillium** is offering an upgrade from Cool Edit to Cool Edit Pro for $99. Cool Edit Pro offers 64 tracks, 32-bit and DirectX support, 34 effects, and SMPTE and MTC sync. Visit www.syntrillium.com ...The AudioWritePro system from **Microboards Technology** is a desktop 4x CD recording system offering both audio and data functionality. Visit www.microboards.com...**Soundscape** introduces a parallel interface cable for using the SSHDR-1 Plus in a mobile or remote recording situation; ideal for laptop use, the cable connects to the standard Soundscape interface port from the PC parallel port. Check it out at www.soundscape-digital.com...**MediaTouch**, a division of OMT Technologies (www.omt.net) announced it has signed a licensing agreement with **QDesign Corporation** (www.qdesign.com) that will allow MediaTouch to incorporate QDesign's MPEG-2 Layer II software codec into all of its radio and multimedia products. The QDesign MPEG-2 stereo compression technology is based on an advanced implementation of the MPEG-2 Layer II standard for audio bit-rate reduction. ■

BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

"WHAT'S A BINKY?"

LARRY BLAKE'S FILM SOUND GLOSSARY PART THREE, R-Z

by Larry Blake

Here is part three of my film sound glossary. Parts one and two appeared in the March and April issues. Note that when you see a word in SMALL CAPS, this means that it will be defined elsewhere in the glossary, maybe even a previous issue.

RCH Smallest deflection visible in a standard VU meter; less than a needle-width. *See also* GNAT'S NUT.

COMPOSITE IMAGE: ALEX BUTKUS

REASSIGN Output bus designed for internal re-routing and combining within the console.

RECORDIST To some, a "sound recordist" is the person who records sound during shooting. This usage is more popular in the UK and on the Continent than in the U.S., where "production mixer" is more common. In U.S. re-recording parlance, the recordist is the person in the machine room who is in charge of aligning and loading the recorders and playback DUBBERS.

REEL For information on how reels of film are counted in motion pictures, *see* AB REEL and FILM FOOTAGE.

REGROUP The transfer procedure in which material is copied from one medium (most often multiple UNITS of MAG FILM) to another in order to facilitate RE-RECORDING. For example, a facility might have only five playback DUBBERS on a re-recording stage, and they might transfer 20 units of mag film to a piece of 24-track tape in four passes in order to be able to hear all 20 tracks simultaneously.

RELEASE PRINT A copy of a motion picture made from an INTERNEGATIVE and TRACK NEGATIVE.

RE-RECORDING Also known as DUBBING, the process in which dialog, music and sound effects are mixed to picture.

RESOLVER Device that governs the speed of audio machines with reference to either a given recording or a common, known reference, such as a crystal or AC line frequency. A resolved transfer ensures that material will always be transferred at the same speed, and in the case of motion pictures, will be in sync with picture.

ROOM TONE The sound present in any production recording between the words. Also known as "fill." Should not be confused (during post-production) with background sound effects.

RTA Real-time analyzer. Audio measuring equipment used to view the whole audio spectrum simultaneously, as opposed to the voltage of a specific frequency. Typically, the display resolution is ⅓-octave.

RUNNING MASTER *See* PRINT MASTER.

'SCOPE Film industry slang for ANAMORPHIC prints or lenses. Originally an abbreviation of CINEMASCOPE, *op cit.*

SDDS Sony Dynamic Digital Sound. Digital film format that utilizes in its complete form five screen channels. The optical digital information is printed outside the sprocket holes on the print. First used in its final format in 1994 for *City Slickers II.*

SDU4 *See* DS4.

SENSURROUND The now-obsolete low-frequency enhancement system for motion picture exhibition developed by Universal Studios in 1973 for *Earthquake.* The first film simply triggered a noise generator during the earthquake sequences, although later versions of Sensurround did record very low-frequency information on the print.

SEPMAG "Separate mag": Laboratory terminology for a print whose track is on a separate roll of mag film to be run in interlock with the picture. Same as DOUBLE SYSTEM.

70MM The motion picture exhibition format that contains 6-track magnetic sound. In use primarily from 1955 to 1971, 70mm films usually made use of camera equipment manufactured by TODD-AO and Panavision. The camera negative was

—CONTINUED ON PAGE 129

FACILITY SPOTLIGHT

CONVERTING THE CATALOG

CHACE PRODUCTIONS TURNS MONO TRACKS INTO SURROUND

by Tom Kenny

Find a need and fill it. It's a ready-made success formula for just about any business, and it's worked especially well for Chace Productions of Burbank.

Last year, the company scored a pair of technical coups with the theatrical re-releases—in glorious 5.1-channel sound—of *Gone With the Wind* and *The Wizard of Oz*. Chace was the company that took the original composite mono tracks and converted them—via a patented process—to the multichannel release format. Before that, the company had gained some notoriety for restoring matrixed soundtrack versions of 4-track stereo, Cinemascope™ features. These restorations were required because the original 4-track magnetic masters from the 1950s had been re-used by the studios back in the days when magnetic stock was considered expensive. And before that, the facility had a nice business getting mono movies, including more than 400 titles from the Turner, Warner Bros., 20th Century Fox and Disney libraries, ready for stereo television and video cassette. Many of the old movies seen on TV, VHS and laserdisc (and soon, DVD) have had their soundtracks cleaned up and

At right: one of two Digital Stereo processing rooms at Chace

Below: John Blum, left, and Jim Young at the LaFont console in the Rick Chace Theatre, with Dorothy as a backdrop

FACILITY SPOTLIGHT

THE ENTERPRISE SOARS ON

by Maureen Droney

No one would ever accuse Craig Huxley of being timid. In 1985 he opened a sprawling, Memphis-modern decorated, multiroom recording complex in Burbank and dubbed it The Enterprise, in honor of his tenure as a child actor with, and later composer for, the *Star Trek* television series. At the time, the space also housed his high-end equipment rental company, Audio Affects, and the facility quickly became a bustling warren of activity that hasn't stopped since. Through constant upgrades and equipment changes, The Enterprise has continued to be busy and successful.

In 1998 Huxley took over a building across the street and gutted it, turning what had originally been Evergreen Studios, and more recently the second incarnation of Ground Control Studios, into E2, a top-of-the-line post-production facility complete with the SSL Avant digital console, an SSL J 9000-equipped scoring stage that can comfortably hold an 80-piece orchestra, and nine editing rooms.

Meanwhile, back at the original Enterprise, six rooms are online: The THX-certified Bridge, or Studio B, with its multilevel control room, 12x9-foot projection screen, film dubbers, M&K 5.1 DTS/Dolby AC-3 monitoring system and 101-channel SSL J 9000; C, The Cabin, also with a 101-in SSL J 9000; Studio E (for Energizer) fitted with an SSL 8000/80G; Mission Control (Studio M, of course) and A, Arena, both with Neve Capricorn digital consoles. There's also a Pro Tools/Synclavier/Sonic Solutions edit suite dubbed The Dock.

The first Avant digital console in the U.S. was installed at The Enterprise.

Recent projects in at The Enterprise have included Aerosmith with Mike Shipley engineering, Celine Dion with David Foster at the helm (75 pieces!), Mariah Carey with producer Randy Jackson, and Paul Westerberg working with Don Was. The Enterprise was

—CONTINUED ON PAGE 136

"stereo-ized" at Chace Productions. It's a small company with a big track record.

The late Rick Chace founded the company in 1981. He was a mixer, a designer, a builder, a programmer and a tinkerer, and he had a passion for restoration and preservation. Long before Sonic Solutions came out with NoNoise, Chace had developed a "noise busters" process. Later he developed the Chace Optical Sound Processor, a patented device that used a customized video camera to photograph optical track negatives and clean up distortion and noise. And after that, he came up with Chace Surround Stereo™, a patented processor that unlocked composite mono tracks and output Lt-Rt stereo with surround, with a consistent sound field.

In 1992, just as the company began internal discussions about a mono-to-5.1 processor, and just after they moved into a new building on Victory Boulevard, Chace passed away. Bob Heiber, general manager and colleague, moved up to president of the company and, with the help of the engineering team, completed the mission for discrete multichannel output. The result was another proprietary device, dubbed Chace Digital Stereo™.

"All of this coincided with a drop in the need for stereo programming for television," Heiber explains. "John Blum, Jim Young and a couple of the engineers had already developed a methodology of using three of the stereo processors to output a 6-channel, 5.1 stereo image. Then when we really started tearing into the guts of Rick's designs from the early '80s, we realized that he was inventing stuff that people take for granted now, like MIDI control. Rick essentially created his own version of MIDI, not realizing he could have patented that and made a fortune in the control world."

Today, the glamour part of the facility revolves around the two Chace Digital Stereo rooms—where spatialization artists program the cues in space and time—and the THX-approved Rick Chace Theater. But the company has six divisions, all connected over a network to a central machine room, that do everything from preservation, restoration, transfers to/from any format (there are 48 formats currently in-house), sweetening, Foley, re-synching, audio forensics, you name it. Chace even has one of the few approved nitrate vaults in town. A job such as *The Wizard of Oz* required roughly 500 hours from the various divisions working in parallel, but only a three-day programming session and three-day mix, which should give some idea of the amount of prep work that goes into such an undertaking.

Essentially, all of these divisions work offline, which helps keep costs down. Before reaching the Lafont Chroma console in the Rick Chace Theater, a film will typically pass through one or all of the three transfer rooms that deal with multisource projects: one of the two Sonic Solutions NoNoise suites; a Sonic Solutions/Soundcraft Ghost-equipped editing room for effects or music rebuilds (from the original tracks, when material is missing); a Neotek Elan/Soundmaster room for sync correction; one of the two sweetening rooms, which include Sony MXP-3000 boards (with PicMix) and CEDAR DC-1 de-clickers; and the Chace Digital Stereo rooms, equipped with the patented processor and M&K 5.1 tripole monitoring system.

Chace president Bob Heiber stands at the producer's desk in the Rick Chace Theatre.

There is an incredible assortment of old and new technology, both off-the-shelf and proprietary, all of it kept running by four full-time maintenance techs. While Heiber admits that the processor gives his facility a leg up on the competition, he reserves all praise to his "product specialists," the rather nondescript title the company uses to describe those who excel at sound placement, seamless transitions and true directional stereo.

John Blum, a "product specialist" since 1993, says, "You have to think about what stereo is. It's timing cues, differences in phase from reflections in the hall, and a mono piece of audio will typically have all that folded onto one track. What this system can do is unlock it and put it back in its proper perspective. I'll literally go through each stem [from a mono composite DME] and design, even down to the frame, a stereo sound field and all the movement within that. I can program the box to very realistically and efficiently put in left-right moves, back-to-front movement, surround ambiences, just from a mono effects stem. We often liken it to audio animation. We're not just putting it through a black box; we're dynamically adjusting per sound, and that's where it really excels."

"There's a person making aesthetic decisions all along the way," interjects Jim Young, former "product specialist" and now lead re-recording mixer. "In addition to the directional moves, there's also what we call the width, or depth, of the stereo field, where there's no actual directionality, but you can make elements seem bigger.

"The original process had been an Lt-Rt, and it worked nicely for a Dolby ProLogic decoder," Young continues. "It was completely and wholly collapsible back to mono. When we combined Chace Surround Stereo Lt-Rt back together at equal levels, we got exactly what we started with, which was necessary because while stereo TV was just getting started, most people were watching TV in mono. When it comes to 5.1, it's not so simple. The AC3

downmix doesn't necessarily work that well going from 5.1 to Lt-Rt, and I don't know who's experimenting going 5.1 to mono. But it's not as straightforward. For that reason, most of our clients are distributing their software with a 5.1 mix and Lt-Rt version on it."

All of the engineers at Chace are certainly well aware of the purists' argument, which at times accuses them of doing for audio what colorization did to picture. Their aesthetic, they insist, is to remain conservative, unless the client demands exaggeration, and they rarely add sweeteners; when they do, it is to fill in a hole, and they use material from the existing tracks. The first step in any restoration or stereoization is to clean up the original mono track, which is then stored in the vault. *The Wizard of Oz* DVD will include both the 5.1 and the mono track, as pristine as it's ever been.

"When you go see *Wizard* in theaters, there is still some optical noise in there; it still sounds like 1939," Heiber says. "But it's in a contemporary format. The real goal is that it should sound as good as the day the track came off the stage the first time. All the wear and tear, all of the flaws that have crept into the track over time from usage and handling and storage, have been taken care of. The day that engineer pulled it out of the soup and put it up for the first screening—that's our aesthetic here. We don't presume to know what the director's intent was. Michael Friend—Director, Center for Motion Picture Study, Academy of Motion Pictures Arts and Sciences—phrased it much better. He said, 'The real goal is to preserve the director's achievement.' That's our goal—to preserve the achievement and never presuppose that we know the intent."

The big decision now facing Chace Productions is what to do with the processor. The coming of digital television, multimedia games and music in surround opens up an incredible amount of work updating catalog material. And Heiber doesn't begin to assume that his company can do it all. For that reason, he's exploring the idea of manufacturing and selling units, working on a deal with an overseas company, licensing use of the processor to other facilities, creating a plug-in or any number of similar ideas for different markets. Whatever the outcome, Chace will be sure to play a major role in the preservation and contemporary presentation of our shared heritage. ■

—FROM PAGE 126, FILM SOUND GLOSSARY

65mm wide, with the additional 5mm outside the sprocket holes used for the magnetic stripes on RELEASE PRINTS.

Almost all films released in 70mm from 1971-1992 were originally photographed in 35mm and then blown up primarily for the 6-track magnetic sound. With 6-track digital sound now available in 35mm, there is no need to do a blow-up for sound quality, and in fact almost all newly manufactured 70mm prints in the U.S. have no magnetic track, but instead use the DTS system in the form of two players (one as a backup) in conjunction with a wide timecode track outside of the perforations.

The image, in its widest and standard form, has an ASPECT RATIO of 2.20:1, which is *narrower* than the 2.40:1 ANAMORPHIC 35mm format that is the source of many 70mm prints. However, when FLAT 1.85:1 films are blown up to 70mm, they usually retain their original aspect ratio, with black borders on the side.

The IMAX/OMNIMAX special venue format also uses 70mm film, although it runs horizontally through the camera/projector, and each frame is 15 "perfs" long, as opposed to the standard

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stands for the use of separate surround speakers in any sound format, such as IMAX or Showscan, both of which have two completely discrete surround tracks.

SPO The optimum viewing spot in a theater: always in the center (unless there's an aisle there!), and usually about halfway between the projection booth and the screen (this depends on the length-to-width ratio of the room). Spo first came into usage during the mix of *Apocalypse Now*. Among the more common variants are "spo meter," usually the Radio Shack Sound Level Meter (Cat. No.33-2050) used to measure SPL.

SPOACH To arrive early at a movie theater and get the best seats for you and your yet-to-arrive friends.

SPOT In film sound, the act of listing the sound effects or music required for a scene. Also, the general act of reviewing the film with the director to determine work that will be needed on the soundtrack. For example, spots for a car chase scene would be tire skids, auto accelerating, auto suspension bumps, etc. The next step is to audition and PULL specific skids, bumps, etc. from the sound library.

SR *See* SPECTRAL RECORDING.

SR•D The 35mm digital sound print format developed by DOLBY LABORATORIES and first used in June 1992. It places five full-range digital tracks and one LFE track on a 35mm print in addition to an SR analog stereo optical track. The digital recording format—theatrical or home—is more properly referred to as DOLBY DIGITAL.

THE STAGE The RE-RECORDING room and the people contained therein: "The stage has broken for lunch," or "This is a stage rush" (and must be transferred now so the sound editor can cut it ASAP).

STAGE SYNC How close in (or out) of sync the FOLEY or ADR is when it is recorded.

STEMS The three or more final components of a stereo film mix, usually comprising three LCRS mixes, one each of dialog, music and sound effects that, combined, make up the final mix of a film. Minimal (hopefully no) additional level changes, equalization, etc., should be needed to create a PRINT MASTER, although of course a 6-track print master will have different requirements than a 2-track stereo optical print master.

The separation of elements afforded by stems allows domestic (English-language in the U.S.) mono and M&E stereo and mono mixes to be easily derived from the original stereo mix. The

word "stem" should not be used for any other element prior to the final mix masters; it is a common mistake to refer to the various PREMIXES as stems.

STRETCHED A recording that has been processed through noise reduction encoding. A stretched transfer involves making a new recording of a stretched recording without decoding and then re-encoding the material. In this manner, a stretched transfer retains the original noise reduction encoding level. As a rule, it is recommended to *not* transfer stretched because any response error is multiplied by the compression ratio, typically 2:1, of the noise reduction system.

STRIPE Short for "single stripe"; *see* MAG FILM.

STRING OFF Copying off a track from a multitrack master, usually to single-stripe 35mm MAG FILM, in order to facilitate editing. Can be either a noun or a verb. *See* REGROUP and LAYBACK.

SUBWOOFER Speaker designed specifically to reproduce low-frequency information, usually between the range of 20 to 120 Hz.

SUPER 35 Widescreen film format that makes use of the full width of the 35mm film frame (including the area normally occupied by the OPTICAL SOUNDTRACK). Therefore, there can never be any 35mm EK NEG prints from a Super 35 negative. An INTERPOSITIVE from the full-aperture original negative is enlarged to an ANAMORPHIC internegative when the aspect ratio is 2.40:1.

SUPERVISING SOUND EDITOR The person in charge of the sound editorial process, including dialog, FOLEY and sound effects editing.

SURROUND CHANNEL The single track that feeds multiple speakers usually placed on the walls of a theater. In standard practice it is used for ambient information only.

SVA Stereo Variable Area. The technical term for the recording format of Dolby Stereo in optical 35mm prints. The term is not used much anymore.

SWEETEN To add a sound to other, previously existing (i.e., cut or mixed) sounds. ("We sweetened the car crash with some dumpster hits.") Should never be used in reference to mixing, although this usage is indeed common, especially in reference to television shows.

SWELLTONE The dubbing theater speaker system first used in 1991 for the film *Kafka*.

SYNC POP A single film frame of 1 kHz used as a guide to synchronize sound and picture. The pop on the resulting TRACK NEGATIVE creates a visual guide to the negative cutter, who uses it to make a printing start mark. The pop occurs two seconds before the first frame of picture, and thus corresponds to the "2" frame on the sweep-hand SMPTE Universal Leader, which counts down in seconds. On standard film leaders, the number at the pop is "3," because they count down in film footages.

TAP Theater Alignment Program. Beginning in 1983, Lucasfilm Ltd. began an organized process of inspecting selected (mostly 70mm in the early days) prints and theaters for their films and anyone who contracts their services.

TELECINE The process in which film is transferred to video. Telecine occurs at three points in the filmmaking process: 1) When film is transferred to video in preparation for editing on a nonlinear system. 2) When an edited WORKPRINT is transferred to video to give sound editors a guide with which to edit sound. 3) When an INTERPOSITIVE is transferred to a videotape to create a master for home video release.

TEMP DUB Quick mix of a film made during the post-production process, allow-

ing the movie to be screened and evaluated in DOUBLE SYSTEM.

THUMPER A pure, low-frequency tone (around 30 Hz), triggered by a noise gate keyed to a click track. Used to give dancers the beat of a song while recording synchronous production sound, which can be used once the "thumper" track is filtered out.

THX Specifications for motion picture sound systems and home theater systems licensed by Lucasfilm Ltd. The only part of the theatrical system manufactured by Lucasfilm is the speaker crossover network; other parts, such as amplifiers and speakers, must be on the "approved" THX list. Installation procedures in a THX theater also must follow rigorous Lucasfilm specifications.

The name is a *double entendre*, partly being derived from the name of George Lucas' first feature film, *THX-1138*, and partly as an acronym standing for Tomlinson Holman's eXperiment, as he was the person responsible for the system design and philosophy.

To clear up a few misconceptions: THX has nothing to do with the recording of sound on a print, and therefore is not a competitor to DOLBY STEREO or any of the digital release formats. Films do not "play in THX," and there is no such thing as a "THX film." Also, it has nothing to do with whether or not the soundtrack has been edited or mixed by the staff of Lucasfilm Ltd. and its SKYWALKER SOUND facility.

TODD-AO a) The 70MM widescreen process developed by the promoter Mike Todd in association with the American Optical Company. b) The Hollywood-based film sound company.

TOP SHEET *See* BINKY.

TRACK NEGATIVE Standard laboratory terminology for the soundtrack negative. "Photographic sound" might be more by the book, though.

TROMBONE GOBBLE Classic sound effect used when Warner Bros. cartoon characters are hit in the head.

TURD POLISHING Colloquial film sound term for the futility of the work undertaken by mixers in trying to make bad tracks sound good.

TWO-POP *See* SYNC POP.

TYPE C PRINTER Industry-standard printer, originally manufactured by Bell & Howell, for the slow-speed (up to 180 feet per minute) manufacture of film prints.

ULTRA STEREO The stereo optical process designed to be compatible with standard A-TYPE DOLBY STEREO prints.

UNADVERTISED SPECIALS Sounds that appear on a track but whose presence is not noted by the CUE SHEET.

UNIT A single reel of edited MAG FILM, corresponding to a given picture reel. The unit can be made up of either single-stripe or fullcoat MAG FILM, and will almost always contain FILL LEADER in certain sections in order to maintain sync.

VOICE OF THE THEATER The theater speaker system developed in the 1940s by Altec Lansing Corp. for motion picture theaters, and the industry standard for 40 years until the introduction of direct-radiator speakers such as the JBL 4675 in the early '80s. (The basic horn-loaded design dates back to the '30s and speakers manufactured at MGM and The Bell Laboratories.) The product line included the single-cabinet A-7 and A-4, and the dual-cabinet A-2 for larger theaters. These speakers are no longer made.

VOICING *See* EQUALIZATION, ⅓-OCTAVE ROOM.

WALLA Film sound slang for the sound of a group of people talking. "Group walla" is when a number of actors will create background crowd sounds in a studio against edited picture.

WESTREX The sound company that, along with RCA, ruled over film sound for the first 40 years. Its equipment—which encompassed the whole chain from microphones, production recorders, re-recording consoles and machines to optical cameras—was leased to studios in exchange for royalty fees. By the mid-'70s most licenses were not being renewed with the coming of manufacturers of specialized gear: consoles (Quad-Eight), mag machines (Magna-Tech) and stereo processes (DOLBY LABORATORIES).

Licensees to Westrex equipment included Paramount Pictures, Twentieth Century-Fox, MGM, TODD-AO, and Universal Studios. RCA's domain included Republic, Warner Bros. and Walt Disney Pictures.

WIDE-RANGE CURVE/WIDE-RANGE MONITORING *See* X CURVE.

WIG-WAG Hollywood slang for the lights outside SOUND STAGES to indicate when shooting is taking place.

WILD TRACK A recording of dialog or sound effects on the set of a film but without the camera running. Wild tracks are frequently used to get a clean recording of dialog that was otherwise unobtainable because of the noise-production devices (e.g., wind machines) that have to be on during filming.

WORLDIZE To re-record a track (usually music) in the space where it would naturally occur. This "worldized" track (or

two) is then mixed together with the dry original.

WORKPRINT/WORKTRACK Respectively, the edited sound and picture elements that the picture editor cuts together during editing. They both are invaluable because of the ACMADE edge numbers (placed by the editorial department on both sound and picture to guide in synchronization) and KEY NUMBERS (placed on the film negative by the manufacturer).

X-COPY An exact copy of material. *See* 1:1.

X CURVE Stands for "extended," as opposed to the "N" (normal) curve, which is the same as the ACADEMY CURVE. The "X" curve is also known as the "wide-range curve," and is codified in ISO Bulletin 2969. Specifications call for pink noise, at listening position in a re-recording situation or two-thirds of the way back in a theater, to be flat to 2 kHz, rolling off 3 dB per octave after that.

The "small-room X curve" is designed to be used in rooms with less than 150 cubic meters, or 5,300 cubic feet. This standard specifies flat response to 2 kHz, rolling off 1.5 dB per octave after that. Some people use a modified small-room curve, starting the roll-off at 4 kHz, with the response down 3 dB per octave thereafter.

X-TRACK Portions of PRODUCTION TRACK that are split off into a separate UNIT (or separate track on a workstation) because they will be replaced by ADR.

ZIEGFELD Large first-run movie theater in midtown Manhattan. This is the proper spelling; it is *not* the "Ziegfield."

I hope that this long-overdue glossary will help make an easier go of wading through my column. But please don't hesitate to let me know when I've thrown a new arcane term at you. I can be found at P.O. Box 24609, New Orleans, LA 70184; fax 504/488-5139; or via the Internet: swelltone@aol.com.

Editor's Note: Due to popular demand, we have made Larry Blake's Film Sound Glossary, originally published in three parts (March, April, June 1999 issues), available online. For a complete, downloadable version, visit mixonline.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that even if he gets a film sound term wrong, no one knows.

—FROM PAGE 127, THE ENTERPRISE SOARS ON

one of the early studio players in music for film, DVD and surround sound, so when the building across the street, with its 100-space parking lot, became available, it's not too surprising that Huxley's thoughts turned to expansion.

"We wanted to expand our services to be able to take pre-production movie scores from the orchestral recording stage to the final high-bit 5.1 mixdown," he explains.

The new scoring stage, with its walls moved out to enlarge the recording space, is a warm but live-sounding room with an airy feel and light wood floors. It has been host to scoring projects engineered by Bobby Fernandez and Armin Steiner, among others. Mix projects have run the gamut from film scores for *Africa the Serengeti*, *Ring of Fire* and *Boyz II Men Live* to music projects for Alan Parsons, Eric Clapton, the Allman Brothers and Beck, Bogart & Apice.

Stage X, designed from the ground up for dubbing, is the first U.S. installation of an SSL Avant. Andre Perreault is COO as well as lead mixer for E2, and it was largely his input that tipped the balance toward the Avant. Perreault, who has been with the Enterprise for three-and-a-half years, and who previously worked at POP, Hollywood Digital and BOP Studios in South Africa, is

no stranger to digital consoles.

"I've worked with SSL for many years," he says. "I was probably the first to run their Omnimix, which at the time, in '92, was their new digital desk. I've also worked on the AMS Neve Logic 2, and on the Neve Capricorns here at Enterprise. I like technology. I'm not afraid of it. Yes, going to a digital console is an expensive decision to make, but there's really no choice; you have to do it.

"Production schedules are so crazy nowadays, and there's so much information to deal with—you can have 300 sound effects for one scene," he continues. "You need a device that will let you reduce that quickly, but in a way that allows you to also easily backtrack and go in and make changes. You have to be able to work really fast, and you need equipment that will allow you to do that. All the normal, conventional analog desks are very sluggish, very slow, everything's still manual. In the case of the Avant, everything's fully automated. One of its best features is that it runs as a master, which, compared to the other desks, makes a big difference. The automation is alive at all times, even when no picture is rolling and no tapes are rolling. You can make automation moves and prepare your EQ, etc., as opposed to other desks where you have to roll back, then, once you're at play speed, hope that you grab the move on time. With the Avant you can park on the frame and do all your moves, then press 'play' and go right from there. It's extremely powerful.

"Mixing for film is a lot of fun, but it's very complicated, and the more tools you have the easier it is," Perreault says. "Mechanically, doing a film is very tough; there's a lot going on, a lot of elements, and what the manufacturers need to do is to make your life simpler. The first digital console was practically the opposite of that—they wanted to make it full of menus and surfaces and switches. When you're mixing to picture you don't have time to switch around. Everything has to be fairly obvious and similar between layers. That's another of the qualities of the Avant: Although it's an extremely large and powerful system, it works like a normal desk, and you can get to what you need to do very quickly.

"We wanted to be the first ones to use it," he adds, "and we jumped right in. That's what we did with the Capricorn also. I knew it worked; we just bought one and went for it, when, at the time, no one else wanted to touch

it. It's been in two-and-a-half years, and a lot of other studios have them now. We love to be in at the beginning. You get better support from the company, and you can get pretty much what you want from them as they're working on getting the product established. Also, I believe that what really makes a good facility is the crew, and the faster you get a crew onto the new technology, the better off you will be. It's like the first time you do a movie—there's a lot of stuff that can go wrong. But after ten movies, everything's running just like clockwork. So if you're going to buy new technology, you might as well do it as fast as you can so you can get up to speed and go."

Projects done in Studio X since its opening include Jerry Springer's *Ringmaster*, Paramount's *The Wood* and Lomax's *Inferno*, starring Jean Claude Van Damme, with Perreault as dialog and music mixer on all of them. He seems unfazed by his dual role as mixer and COO. "I manage the facility, yes, but I'm mostly in the studio and Ethan Bush is the operations manager," he explains. "I come in early to see what's going on, and then I basically mix every day. It's always very tight schedule-wise here. It's a small crew, and we try to achieve what we need without a lot of management. The sound supervisor runs his own show, and if he's not happy it's his problem and he needs to fix it. If I don't like the stage, I can't turn around and blame someone; I have to fix it."

Production schedules are so crazy nowadays, and there's so much information to deal with—you can have 300 sound effects for one scene. —Andre Perreault

The exterior of E2 is still under construction. "Craig can tell you," laughs Perreault. "You go one mile, and then you see there's another mile to go and you have to do it. We were mixing long before the building was complete. We built it from the inside out, and now we are struggling to finally finish the outside." ■

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AUDIO-TECHNICA AT895

DSP-CONTROLLED, ADAPTIVE-ARRAY SYSTEM MICROPHONES

Microphone technology has advanced steadily (if slowly) over the past century, with changes occurring at an evolutionary—rather than revolutionary—pace. However, as DSP control becomes an integral part of the transducer chain, we can expect major advances in microphone design. A recent example of the shape of mics to come is the Audio-Technica AT895, unveiled six weeks ago at the NAB show in Las Vegas.

The AT895 is intended as a replacement for the parabolic dish and shotgun mic designs used in location recording, where long-range pickup is required. However, unlike the 60° acceptance angles (from 200 to 2k Hz) typical of shotgun mics, the AT895 uses DeltaBeam™ technology, with a single A-T MicroLine short shotgun design and four cardioid capsules set in a co-planar diamond configuration combined with a DSP-based controller. The result is a mic with an ultranarrow 20° pattern and off-axis noise cancellation performance up to -80 dB.

Using a revolutionary software algorithm, DSDA-PRO,™ an acoustically tuned element microphone array and analog circuitry, the AT895 provides adaptive directional acquisition of sound sources. The system allows for the isolation of specific sound sources, even in high ambient noise environments or extreme wind conditions. And, unlike traditional shotgun mics, the DeltaBeam mic offers three modes of polar response: an X *and* Y beam adaptive lobar for an extremely narrow pickup angle; X *or* Y beam adaptive response in only the X or Y plane; or MicroLine lobar for a wider, more natural response in less noisy environments.

OUTSTANDING LF DIRECTIONALITY

Specs include a frequency response of 60 to 12k Hz, self-noise of 24 dB (A-weighted), maximum SPL of 117 dB (1 kHz at 1% THD) and open circuit sensitivity of 70 dB (1 kHz at 1 Pa). Among the AT895's performance benefits are improved sensitivity, greater pickup distance and gain-before-feedback as compared to currently available microphone technology; unprecedented off-axis rejection, even in high-interference environments; outstanding low-frequency directionality (up to 78 dB rejection at 200 Hz); decreased proximity effect; and reduced susceptibility to mechanical noise, wind noise and racking.

The AT895 mic body houses the array of five condenser capsules, preamps and a 7-pin XLR output jack that connects to a compact AT895CP Control Pack. The five amplified signals are sent individually down the seven-conductor, detachable cable to the AT895CP, which provides all the power, digital processing and control for the AT895 microphone. The audio output is a standard 3-pin male XLR jack. Controls include a three-position mode (pattern) switch; a three-position filter switch with flat, highpass (-18 dB/octave at 80 Hz) and bandpass (300 to 5.5k Hz with -6dB slopes) settings; a headphone output with gain control; and an LCD battery condition indicator. In addition to providing remote pattern control, the AT895CP supplies power to the mic and can, itself, be powered by a clip-on pack containing three 9-volt batteries (battery life for alkaline batteries is 5.5 hours, 12 hours with lithium cells) or an industry-standard 4-pin XLR power jack for connection to 12 VDC sources, such as Cine-60 belts, Anton Bauer packs, etc. A 120-volt AC supply is also offered.

The AT895 offers versatile mounting possibilities. The 16.7-ounce, 14-inch mic body balances nicely in the hand, while reducing the intrusive appearance and "always-gets-in-the-frame" nature of conventional long shotguns. Microphone systems are available in two configurations: The $2,995 AT895/RK Remote Kit is designed for field use and includes a 10-foot (7-conductor) cable, click-on battery housing, shock-mounted pistol grip, Zeppelin-type windscreen and heavy-duty protective carry case. The AT895/MK Mount Kit is $2,495 and includes a 25-foot cable and shock-mount plate with standard ⅝-inch x 27-thread mount and a 120V AC supply. Accessories for mounting an AT895 on a Fisher boom and for rack-mounting the Control Packs are optional. Additionally, all modules and accessories are available separately to expand systems or use as field spares.

Audio-Technica, 1221 Commerce Drive, Stow, OH 44224; 330/686-2600; fax 330/688-3752; www.audio-technica.com. ■

BY GEORGE PETERSEN

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RPG DIFFUSOR SYSTEMS ROOM OPTIMIZER

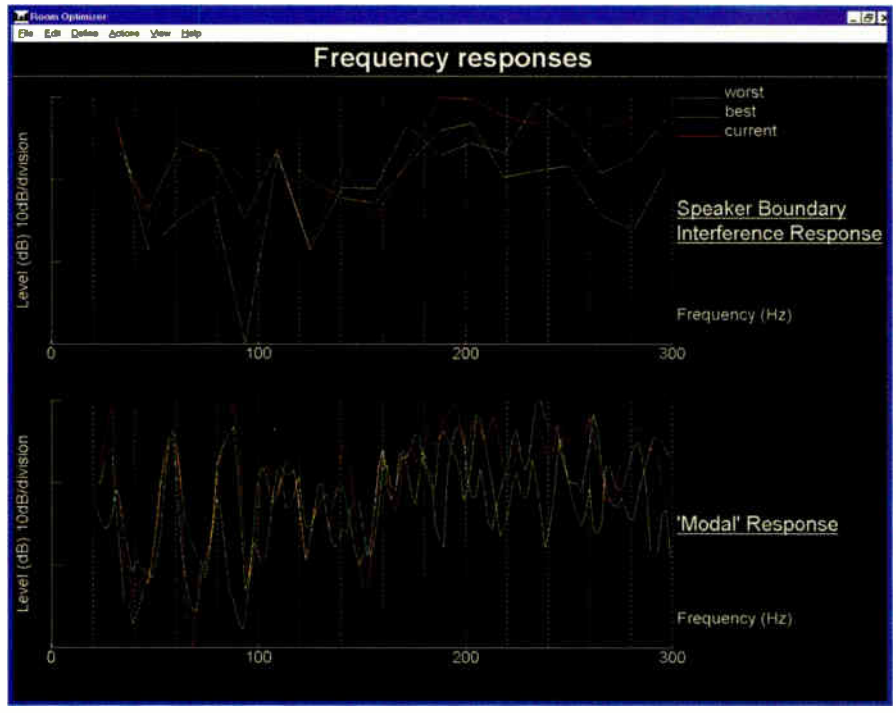
STUDIO SPEAKER PLACEMENT SOFTWARE FOR WINDOWS

Many studio listening environments today depend upon near-field or midfield monitors. And many veteran recording engineers make the mistake of placing their favorite near-fields on the space above the meter bridge of the console. But unless the studio owner has considered the boundary interference and placed the console accordingly, the engineer may be in for a long night.

It's not enough to orient the speakers at the appropriate distance from the listener and from each other; the orientation of the speakers and listener from the boundaries of the room are also crucial to critical listening. This is because nondirectional low-frequency energy wraps around the back side of the speakers and returns from the front part of the room to the listener at a later arrival time than direct energy, causing both constructive and destructive (boosting or canceling) deviation in the frequency response at the listening position. This effect, combined with the modal response of the room, creates the response at the listener position. The idea is to situate the speakers and listener where the least amount of deviation will occur.

Finding these positions in real time is possible but cumbersome; it can be achieved by placing either the speaker or microphone in a stationary position and moving the other component in small (about 6-inch) increments while running pink noise through the speaker and routing the microphone to a real-time analyzer. Many locations must be observed before the most linear low-frequency response can be determined.

Enter RPG Diffusor Systems' Room Optimizer software. This product is said to be the first Windows 95 program that automatically and simultaneously optimizes speaker-boundary and modal coupling to minimize this acoustical distortion. Room Optimizer does the dirty work at the speed of a computer processor. Whether configuring for stereo, 5.1 or some other setup, Room Optimizer software not only provides assistance in the placement of studio monitors but also provides a graphical display about what is occurring during the process of searching for the optimum speaker and listener position.



RPG Room Optimizer software eliminates trial-and-error room analysis by automatically and simultaneously calculating speaker boundary interference response and modal response over increments of change in speaker placement, and optimizing positions for minimal acoustic distortion.

HOW IT WORKS

Room Optimizer combines geometrical and wave acoustics as part of the process of arriving at the desired speaker placement. Geometrical acoustics is the study of the more specular reflecting characteristics of sound; analysis combines ray tracing and image source methods. Similar to reflecting light off of a mirror, ray tracing follows the ray (wave) off the surface it strikes at the same angle of impact. After several reflections, this energy is diminished to below the hearing threshold. The image source method replicates a mirror of the original source equidistant to the perpendicular dimension from the source to the reflecting plane. Whereas ray tracing is more like a laser, the image source is similar to a flashlight or an expanding cone effect.

Wave acoustics characterizes the way distances between perfectly reflecting boundaries dictate the

BY CHRIS PELONIS

tonic frequencies and, thus, the harmonics of such frequencies in a given enclosure. The relationship between these roots and harmonics defines an enclosure's modal response. Through mathematical formulations combining geometric and wave acoustic modeling, Room Optimizer emulates the impulse response of the room repeatedly as the position of the speaker and listener are continually relocated, until minimum deviation is achieved at the listener position. The speaker boundary response, which is the first or short-time response, and the modal or longtime response are considered in the final optimization.

IN USE

Room Optimizer walks the user through the set up of the speaker configuration, room dimensions, and three-dimensional limitations on speaker and listener placement. Once the configuration is established, the analysis process begins. While the program searches for ideal placement, the user can view:

- Data (values and position coordinates);
- Room (the changing locations of the speakers and listener with plain view, side and front elevation);
- Spectra (graphic information relating to the "best," "worst" and "current" speaker boundary response and the modal response);
- Wizard (default search configurations);
- Configuration (described above);
- GRP Data (the location and recommendation for treatment of reflecting areas); and
- Error (graphical display of the progress of the error, which continually attempts to exceed itself).

FIELD RESULTS

All of this theory is great, but does it apply in the real world? To satisfy my own skepticism, I set up a rectangular room for testing. I used a 15-inch subwoofer with response to the mid-20Hz range. The test rig was SIA's SMAART Pro analysis software and a B&K 4007 test microphone.

My first test was to run Room Optimizer and then position the mic and speaker according to the locations it specified. I then ran the SMAART Pro program to see how the response of Room Optimizer compared to that of the SMAART Pro. The response matched up remarkably. The SMAART Pro graph was ever so slightly different, because the boundaries of the room were not perfect reflectors; but the differences were basically insignificant.

So the math worked, but did it find the best location? I searched the room manually and found a flatter response. I beat the computer! Or did I? Oops—I had limited the search area in the Configuration window so the program could not search the entire room. When I freed the computer, it found a spot very close to mine with at least as flat a response in a fraction of the time, with much less effort.

A subwoofer can sure be heavy. The program kept re-proving and improving its findings, while I lost my breath competing with it. I much prefer having a beer while these virtual ghosts move my 80-pound subwoofer for me on the computer screen.

The results of the testing to this point were very impressive. I decided to introduce a bit of treatment into the otherwise naked room. I put lightweight free-standing devices in the corners to settle down a bit of the LF. The response changed; there was some shift in the affected frequencies. As you introduce people, furniture, equipment, acoustical treatment, etc., the response of the room changes, and thus the optimum speaker/listener position may also change.

While real acoustic measurement of a room is crucial, Room Optimizer is of great assistance in finding a solid starting—and in some cases, finishing—point. The majority of the rectangular room measurements I study agree with the positioning recommended by Room Optimizer, even after equipment and treatments have been added to the space. The more variables you bring into the room, the more it is likely to change, but the beauty of the Room Optimizer is that even in those cases this program gets you quite close as a starting point, so configuration becomes a tweak instead of a tear-down.

SUMMARY

Retailing at $99.99, RPG's Room Optimizer is a highly useful tool for acoustically orienting a listening environment. As a professional studio designer/acoustician, I often find myself running this program. I am waiting for the next generation that will consider irregular shapes, treatment, furniture, etc., but in the meantime, here's a program that has great value in the studio world.

RPG Diffusor Systems, 6512-C Commerce Drive, Upper Marlboro, MD 20774; 301/249-0044; fax 301/249-3912; www.rpginc.com. ■

Chris Pelonis is a studio designer and acoustician and founder/president of Pelonis Sound & Acoustics.

NHTPro Model A-20

STUDIO REFERENCE MONITOR SYSTEM

There are *lots* of studio monitors on the market today, so when the founders of the popular consumer speaker company NHT formed a separate company to build professional products, they had something different in mind. At last year's AES show, NHTPro unveiled its flagship A-20 studio reference monitoring system, and it was definitely different from the usual approach to powered monitors.

Essentially, the A-20 is a unique system comprising a two-rackspace control amplifier that connects to two compact near-field speakers via two 20-foot multipin cables. However, the key word here is *system*: The speakers must be used with the control amplifier and vice versa.

From a design standpoint, it is this system approach that sets the A-20 apart from other powered monitors. Rather than build the amplifiers into the speakers—which leads to larger enclosures, heat build-up within the enclosures, etc.—the amps/control electronics are in an external chassis. Therefore, the speakers themselves remain fairly compact, the amplification is precisely matched to the drivers/crossover for optimal reproduction, and the system adjustment parameters are accessible from the amp/controller front panel.

The hefty 34-pound control amplifer houses a 250-watt, dual-mono amplifier and the crossover for the woofer. (To reduce the effects of long cable runs on low-power HF signals, the tweeter crossovers are housed within the speaker enclosures.) The control amp also features three five-position rotary switches: Sensitivity is an input gain adjust, with stops at -10/-3/+4/+11 dB, as well as a mute position. The Boundary control provides LF shelving below 400 Hz to reduce the effects of LF build-up caused by nearby walls or corners: When this control is set at 0, the filter is bypassed; each of the four settings below that cut -1.5dB of LF response. The Position switch has five settings that select for near-, mid- and far-field response, with two intermediate positions. The Position switch is essentially an HF attenuator that adjusts the monitors' very high-end response using a 20kHz shelving filter; each setting below Far-Field (a flat response) attenuates the highs by -0.75 dB to adjust for HF losses due to distance, air absorption, etc. So the Mid-Field setting has a -1.5dB roll-off, and the near-field setting is a -3dB filter.

The control amp also has a headphone jack, but I found this of little use. More valuable were some of the control amp's other features,

BY GEORGE PETERSEN

Lab Analysis: NHTPro Model A-20

by Ron Horowitz, John Schaffer and Rob Baum

SPEAKER MECHANICAL DESCRIPTION

The NHTPro Model A-20 cabinet is constructed of double-laminated ¾-inch miter-folded MDF. The finish is a black laminate on the outside with an inner liner that appears to be of an impregnated-fiber construction. Double lamination reduces warping, raises cabinet stiffness and increases the box strength.

Both drivers are flush-mounted, reducing early reflections and related comb filtering. The front baffle is canted at 21 degrees, which reduces the severity of internal standing waves. The speaker is of the acoustic suspension type and stuffed with polyester fiber.

The speaker connector is a locking XLR mounted in a recessed terminal cup on the back of the cabinet. The connector utilizes a common ground for the tweeter and woofer circuits, with phantom power on the tweeter circuit for the power status LED. A pair of XLR cables are included with the A-20 amplifier and were used for all tests.

Vifa of Denmark makes the cast-aluminum-frame, 6.5-inch woofer. The woofer has a treated-paper, curvilinear cone; treated-paper dust cap; and a butyl rubber half-roll surround. The spider is flat, measuring approximately 4 inches in diameter, and has four broad pleats. The motor structure uses a 1¾-inch-diameter copper-clad aluminum voice coil, a vented, staked pole piece, and a bumped back plate. A bucking magnet is used for shielding without any shielding can. Elec-

—CONTINUED ON PAGE 146

such as power and clipping LEDs, and a numerical LED readout that's switched to display incoming line voltage, temperature of the output heat sink, or average system SPL. Calibrated at a 2-meter distance from a stereo pair, the SPL display has a 68 to 120dB range and offers a useful indicator of just how loud your ears are being assaulted after hours of studio sessions.

Although monitoring the heat sink temperature or line voltage isn't something you'd do every day, its use is somewhat akin to oil pressure or engine temperature gauges on a car, where access to this data is preferred to simply having a "fault" light that glows once your system has failed. Also, high readings on the temperature display may simply indicate that the amp needs better ventilation, such as leaving an extra rackspace above the unit for airflow. However, after using the system for several months, even in a tight rack, I never encountered any situations where heat was a problem, and the unit only ran slightly warm to the touch.

The control amplifier's rear panel offers flexible interfacing. Inputs are electronically balanced ¼-inch TRS or XLR (pin 2 hot); the outputs are also 3-pin XLR, but carrying a common ground and separate feeds to the tweeter and woofer, and NHTPro supplies a pair of high-quality 20-foot XLR speaker cables that are impedance-matched with the system.

The enclosures are mirror-imaged, with the 8x14-inch front baffle slanted inward, so the 6.5-inch woofers and 1-inch aluminum dome tweeters face toward the listener. This arrangement also creates a cabinet with fewer parallel surfaces. Each speaker's front panel also has a power-on LED, which is phantom-powered from the control amp. Due to space considerations within the cabinet the woofer has only partial mag shielding, but as long as the speakers are kept at least a foot or so away from video/computer displays, image distortion is not a problem.

In session, the A-20 system was impressive. Setup was simple—little more than plug and go. The 20-foot cables included with the system provided ample length for most controls rooms, but just to check it out, I tried extending the stock cables with two high-quality 20-foot XLR mic lines. The net effect was subtle, with a slight perceptible change in the HF reproduction and perhaps a slight loss of tightness in the bass. Obviously, it's best to use the system's stock cables, but it's nice to know that alternate cables can be substituted in an emergency—such as leaving your cables at home after transporting your A-20 system to a studio across town. Thankfully, NHTPro had the foresight to base its system's multipin cabling around readily available items, as opposed to something like 17-pin Tuchel jacks.

I began my listening to the A-20s with the monitors mounted on stands behind the console. At a mere 17 pounds each, these aren't liable to crush most meter bridges and present no challenge to most speaker stands. I used the A-20s in an equilateral triangle arrangement, with the speakers about five feet apart and seating about five feet back from the monitors. In this particular space, the rear wall of the room was about 15 inches behind the speakers, and there was a bit of overzealous LF build up, and switching the Boundary control one click back (-1.5 dB) from its Flat position brought the bass into balance. Here, I liked the ability to

—FROM PAGE 144, LAB ANALYSIS: NHTPRO MONITORS

trical connections are via 0.110-inch and 0.205-inch male connectors.

The 1-inch aluminum dome tweeter is by SEAS of Norway. The tweeter uses a shallow aluminum dome; a separate, treated cloth half-roll surround; and a vented aluminum voice coil former. The voice coil is under-hung, with 180-degree lead-outs to reduce rocking. The coil operates in a ferrofluid filled gap. Electrical connections are via a pair of 0.110-inch connectors mounted at 180 degrees under the faceplate. The pole is not vented or chambered, and the driver has a small bucking magnet and can for magnetic shielding. The faceplate is black plastic, with a high-frequency diffuser for improved off-axis performance.

AMPLIFIER DESCRIPTION

The NHTPro A-20 system is very unusual in comparison to other monitors we have tested, in that the amp is external to the speakers and the crossover is passive. The two-rackspace A-20 amplifier houses the passive woofer crossovers, while the tweeter crossovers are in the loudspeaker cabinets. The A-20 amplifier and speakers are not useable with other speakers or amps.

The A-20 amplifier's front panel has three rotary controls, for Sensitivity, Boundary Proximity and Distance. The five-position Sensitivity control has steps at -10, -3, +4, +11 and M for mute. All acoustical tests were made using the +11 position. The Boundary control provides low-frequency equalization, according to the manufacturer, to offset the acoustical bass-boost effect of wall, floor or ceiling mounting, and is marked in the number of reflecting surfaces, i.e., 0-2. (Presumably, a "3" setting for corner mounting was not considered necessary.) The user adjusts the control to match the acoustical environment, yielding the flattest possible low-end response. The Distance control, on the other hand, provides high-frequency equalization, to offset the high-frequency effects of near- and far-field monitoring. This five-position control is calibrated from NF (near-field) to FF (far-field) and is adjusted accordingly for various listening positions.

The front panel houses a speaker-muting headphone jack, a rocker-type power switch, and a momentary push-button-type switch that controls a three-function LED display. The LED display can be toggled among SPL mode to display the approximate sound pressure level at two meters, "VAC" mode to display the mains voltage, or TMP mode to display the amplifier operating temperature. Although we didn't test the VAC display with a Variac, the VAC display appeared to be running several volts high when measured against a Fluke 87. No calibration control is provided for the VAC display. We were unable to verify the amplifier temperature display, as the amplifier wasn't bench-tested and never got hotter than ambient during acoustical tests.

All electrical connections, except for the headphone output, are made on the amplifier back panel. Either XLR or ¼-inch stereo phone plugs (configured as a balanced mono connector) make low-level connections, while speaker outputs are by XLR. The amplifier uses star-type grounding, and there is no "ground float" provision on the chassis. The amplifier has two large, heavy, EI-type power transformers positioned at either side of the chassis, which yields a balanced but heavy package.

ACOUSTICAL DESCRIPTION

The NHTPro Model A-20 has a flat frequency response and low distortion. The A-20 measures about 3 dB from about 100 Hz (the lower limit of the frequency response measurements) all the way out to 20 kHz. The exception is an octave-wide, 2dB-shallow dip from 4 kHz to 8 kHz. The 30° off-axis response is also very smooth.

The A-20's impulse response is very good. The transient response indicates the drivers' acoustic centers are well-aligned. The impulse is damped. There are slight ripples in the response, with a smooth and rapid decay afterward.

The distortion of the A-20 system is low. From 120 Hz on up, the THD remains at or below 0.5%, dominated by a third harmonic. However, at 50 Hz, the distortion is fairly high, over 10%, which is about what can be expected make such changes from the sweet spot, and I could quickly make A/B comparisons between settings. Of course in a "traditional" powered speaker (with controls on the back panel), the notion of tweaking without leaving the listening position or making quick A/B changes is simply impossible.

My net impression is that the A-20s offer a huge sound from small boxes. They are accurate and smooth, especially through the critical 2.1kHz crossover region. The top end is flat and extends well past 17 kHz, and I liked the HF response best with the system set in the far-field position, even when I was listening mainly in the near and mid-field.

Unlike most small studio monitors, the A-20s have sealed (non-ported) enclosures, which reduces their efficiency somewhat, but given the punch of the system's 250-watt amp, the A-20s are capable of ample (110dB+) SPLs for most small control rooms. The low end is nicely defined—never tubby or overblown—and as one would expect from compact 6.5-inch woofer design, the LF response drops off sharply below 60 Hz, which is adequate for most applications; anyone dealing with LF-heavy material—whether rap, rock or pipe organ—may need to consider adding a subwoofer to the system.

Overall, the A-20s reproduced instruments, taped tracks and all kinds of program material with clarity and accuracy. The off-axis response was free of undue coloration, creating a useable sweet spot that was wide enough so that the sound remained constant even when reaching off to the side to tweak a kick drum EQ on channel 1. The speakers' low-distortion reproduction translated into low ear fatigue over extended listening sessions, and the system's tight phase response offered excellent imaging throughout the soundstage. And no adjustment period was necessary—you can sit down in front of the A-20s, track and mix that same day and sleep at night, knowing your mixes will sound good on other systems ranging from boomboxes to huge stereos.

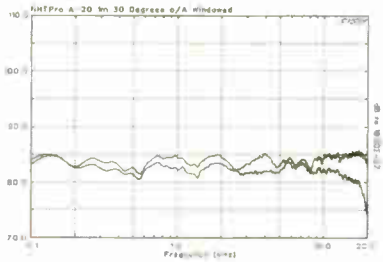
At $2,000/pair (including cables and 250W amplifier), the NHTPro A-20s aren't exactly in the low-budget league, but any serious listener looking for a well-crafted, compact system should give these an audition.

NHTPro, 555 First Street #302, Benicia, CA 94510; 707/751-0270. Fax 707/751-0271; www.nhtpro.com. ■

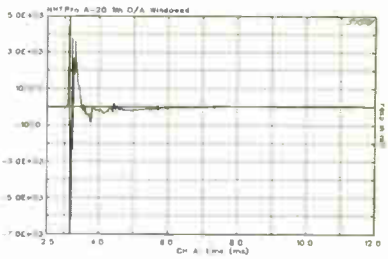
from a 6.5-inch driver, even a very good one. Above about 5 kHz, the distortion drops even further, to around 0.2%, in part an indication of the high quality of the drivers selected by NHT-Pro.

The spectral contamination measurement tests a speaker system's nonlinear distortion, meaning the amount of non-harmonically related distortion products generated by the device under test. Spectral contamination measures the most objectionable type of distortion, and is a good indicator of a system's subjective "clarity." The A-20 measured well on this test of "self-noise," with distortion products approximately 50 dB below the input tones. The A-20 measured better than most monitors did, except below 100 Hz, and about as well as other low-distortion powered speakers. ■

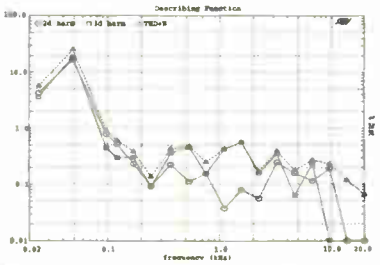
Ron Horowitz, John Schaffer and Rob Baum are test engineers associated with Menlo Scientific, an acoustical research company based in Berkeley, Calif.



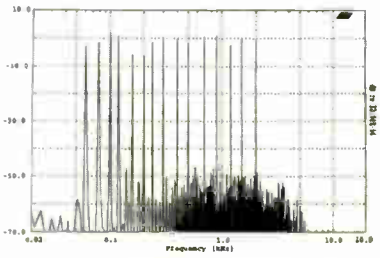
The A-20's on-axis (upper trace) and 30° off-axis (offset lower trace) frequency responses are fairly flat.



Impulse response (showing time coherence between woofer and tweeter) is very good, with good alignment of both woofer and tweeter.



Distortion vs. frequency: Overall, distortion is low, except at the lowest frequencies. THD+N = Δ trace, 2nd harmonic = ❍ trace, and the 3rd harmonic = ⊿ trace.



Spectral contamination test compares a series of input tones (tall spikes) to speaker output. Distortion products (low-level spikes) are quite low, about 50 dB down from input signal.

APOCALYPSE NOW FROM THE HOLLYWOOD EDGE

THE AMERICAN ZOETROPE SOUND EFFECTS COLLECTION

There is no question that Francis Ford Coppola's *Apocalypse Now* (1979) ranks among the top films of all time in terms of its sonic impact and creative use of audio elements. Creating the sounds for *Apocalypse* wasn't easy, given the conditions and length of the production schedule—month after month on location, with cast and crew enduring the very real hardships of the Philippine jungle exteriors. But the resulting film, released in 70mm 6-channel Dolby Stereo, was nothing short of a masterpiece, and nearly 20 years later, it's lost none of its power.

Now, The Hollywood Edge, working with American Zoetrope, has compiled the definitive collection of original sound effects from *Apocalypse Now*. Available as a set of five compact discs priced at $395, "Apocalypse Now: The American Zoetrope Sound Effects Collection" features 621 sounds recorded/created by the original post-production sound team of Andrew Aaron, Richard Beggs, Mark Berger, Richard Cirincione, Michael Jacobi, Walter Murch, Dale Strumpell and Randy Thom.

The CDs are packed in a storage box along with an 85-page index listing all the tracks, both in a numerical index and an alphabetical cross-reference. Additionally, each disc's CD book has a track listing. The effects are broken down with disc titles dedicated to Aircraft; Military Vehicles and Radio; Patrol Boats and Machinery; Weaponry; and Backgrounds, Walla, Humans, Animals and Foley. Generally, the effects stick to these classifications, but certain effects, such as troop activity and some crowd reactions, are found on both the Weapons and Backgrounds discs. In any case, the reference index book is accurate and complete.

The effects were recorded on Nagra mono or stereo decks and are reproduced on CD as stereo, mono or dual-mono tracks—generally presented exactly as they were recorded. The stereo and mono recordings are self-explanatory, but the dual-mono tracks were recorded with two microphones to capture different aspects of the same sound source and were not intended as stereo tracks, per se. Having said that, rules were always meant

to be broken, and in some cases the dual-mono tracks can be used as stereo, either as-is or with a bit of post-manipulation, such as panning, delaying one side or adding reverb or an LF boost to one channel. Also, it should be noted that most of the effects in this collection were recorded dry, offering users the freedom to tweak ambience/perspectives to taste.

One of the more interesting aspects of this library is how effects that may seem very specialized can work in general settings. For example, some of the patrol boat sounds could double as an industrial drone effect, while the "Futz Radio Interference" would be right at home in any sci-fi scene where the radio static inevitably leads to a UFO encounter. Some of the other effects in the collection—tarmac and rowdy USO crowd ambiences, electric saws, grinders, sirens, ice cube clinks, baby cries, crickets, frogs, tigers, pigs, streams and waterfalls—fall into the all-purpose category, while the "Gibbon Monkeys" have an eerie, otherworldly sound. The set also includes a fair number of Armed Forces Vietnam radio spots, which are of less general use but are entertaining nonetheless. Note: Richard Beggs' famous synthesized Ghost helicopter sound that opens the movie is *not* included.

Of course, "Apocalypse Now" is intended as a collection of war sounds, and it certainly does not disappoint in this regard. Recorded on location in the Philippines, Camp Wilson, Camp Pendelton and Bellingham, there is no shortage of military aircraft (Hueys, Loaches and Phantoms), vehicles (tanks, APCs, Amtracs, patrol boats), weapons (shotguns, pistols, M-16s, M-60s, Russian SKS, AK-47s, Howitzers, mortars, napalm, flare guns, cannon and explosions of every magnitude), along with troop activity, backgrounds, walla and Foley effects. Curiously, there is only one track of Jeep sounds, but I suppose this effect is a little easier to create from existing auto sounds than, say, the sound of a Vulcan cannon.

If your next project requires creating some aural mayhem, whether for a shoot-em-up video game, urban streetfighter epic or ultimate battle scene, you'd be hard-pressed to find a library that outdoes "Apocalypse Now: The American Zoetrope Sound Effects Collection." And at $395, it's cheaper than spending months on location recording your own private army.

The Hollywood Edge, 7080 Hollywood Boulevard, Suite 519, Hollywood, CA 90028; 323/603-3252; fax 323/603-3298; www.hollywoodedge.com. ■

BY GEORGE PETERSEN

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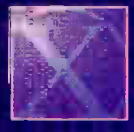

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FIELD TEST

OTARI RADAR II

MULTITRACK HARD DISK RECORDER

I don't want to date myself, but my relationship with Otari goes back to 1979 when I first bought a 1-inch, 8-track Model 7308 analog tape recorder. Shortly after that, I purchased a 2-inch, 24-track MTR-90II. The MTR-90 and MTR-100 Series analog tape recorders have long been established among the most reliable and best-sounding multitracks available.

Otari had the foresight to see a changing industry and created RADAR I (Random Access Digital Audio Recorder), which has been on the market since 1994 in a 16-bit/48k format. The "I" has been considered one of the best-sounding 16-bit recorders on the market. RADAR II is a second-generation upgrade with many technological and performance enhancements. As part of its natural evolution, this machine has been upgraded with A/D and D/A converters that record at 24-bit/48k. Future upgrades to 24-bit/96k are promised; this is possible because of the modularity of the audio cards and mainframe.

RADAR II's mainframe is PC-based and housed in a four-rack-space/20-inch-deep chassis. The front panel has three drive bays and an illuminated Otari logo. A floppy drive is provided for loading software updates to the internal IDE hard drive and for importing .WAV files. The next drive is a 9GB ultrawide 2-SCSI drive in a removable (hot-swapable) bay. The ability to have multiple projects on different drives and slide them in was very convenient when I needed disk space and could not take the time to download a project or allocate more space on the current drive. The last drive is an 8mm Exabyte Eliant 820 fast data tape drive for backing up and restoring projects on the audio hard drive. This was not built-in on the RADAR I. The average download time is three times the length of the file size. You can back up individual projects or select multiple projects as a set.

The RADAR I required three internal SCSI drives to record 24 tracks of digital audio reliably. Thanks to the advent of ultrawide SCSI and drives running at 10,500 rpm, all 24 tracks can be recorded to a single drive in one pass. To get this kind of throughput, Otari uses a V24 SCSI engine, which directly processes all audio to the SCSI drives. This eliminates the processing of any audio by the motherboard.

FEATURES & FUNCTIONS

On the rear panel the analog and digital I/Os are handled by DB-25 connectors that are configured to the same specifications as Tascam DA-38, 88 and 98s. RADAR II's AES and S/PDIF connectors can be routed to and from any two channels. Connectors are provided for house sync, TDIF word sync, MIDI in/out/through for MTC and MMC, and SMPTE in/out. Above the 68-pin, ultrawide SCSI-2 connector, which is used for chaining audio drives, is the RE8II remote control interface. Two RADAR link (in/out) connectors are for locking up to eight machines or 192 tracks of audio. A Sony 9-pin serial machine control connector is available for remote transport control and synching. This wide variety of sync options allows you to drive, chase or transfer to and from most any source with ease. Support for an SVGA monitor is included for running RADARVIEW that graphically displays system and sync sources, metering, track overview, location points, track names and in/out edit points.

Operationally, RADAR II is much the same as a traditional 24-track analog machine in transport and track-arming functions. There is a feeling of stability with this unit along with a jog wheel that handles audio like tape. This is where the similarities end and the true functioning of the RADAR II begins to shine.

Editing, transport control and location functions are carried out by an RE8II remote session controller that closely resembles a custom computer-style keyboard. This

BY MICHAEL DENTEN

remote has been refined from past versions and is 48-track ready. I found it most intuitive and well-laid-out. Dedicated function keys are used to carry out some of the most frequently used menu commands. These parameters include keys for varispeed, digital I/O, sync, cycle, chase, autopunch, most editing functions and UNDO! The QWERTY keyboard is used for project titling and naming tracks. Numerous hidden functions on the keyboard speed operations, such as typing the letter "M" to bring up the Mute Track page. Two rows of 24-track arming keys (1-24 and 25-48) are available, making this remote ready for controlling two machines. The arming keys also double as the track source selection keys for the editing of individual tracks. Blank keys are available for programming your own macros. This allows the user to customize moves and have instant access to the most frequently used keystrokes.

The supplied 24-track Meter Bridge can be switched between two machines via a small slide switch on the back. A jog/shuttle wheel allows for scrolling audio, fine-tuning of edit points and scrolling through the different menu functions. A 2-digit LED displays current project numbers up to the limit of 99 available projects, and a 2-line by 16-character backlit LCD screen offers feedback on numerical location points or any editable menu that is currently active.

The software allows for 99 projects to be created with 99 location points. Each project will remember project name, track names and system information such as bit rate (you can initialize projects at 16 or 24 bits and five different sample rates). To build a new song, go to the project menu and scroll to Create Project. This menu gives options to set start times, bars and beats display, tempo map, TC rate/format and any other variables. Access to another project is a keystroke away. The beauty of this system is its ability to copy material between projects and make copies of individual projects.

EDITING: CUT...PASTE...DUPE!

On a recent album project, I was able to make slave copies instantly to record background vocals and record multiple lead tracks. After comping the lead vocals and bouncing down the backgrounds, I was able to copy the new parts and fly them back to the original project or master. Imagine, you need a project to be recorded in three different languages. Copy the project three times, creating International, InternationalV2, and InternationalV3. Record the new vocals on V2 and V3, then mix one after another. You'll have instant access to each version, and everything stays in the same place with only minor adjustments to the changed vocal parts. Because projects are "playlists," copying material between projects does not reduce the amount of free recording time. Erasing or recording over a copied project is nondestructive to the original project.

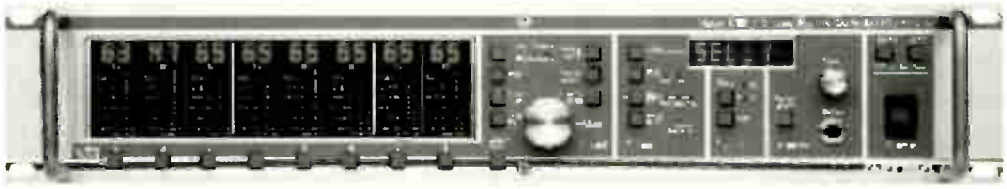
Conceptually speaking, this machine, being a hard disk recording system, could be regarded more as a multitrack audio dubber rather than a digital audio workstation. DAWs generally have a mixing interface, EQ, dynamics, plug-ins and the usual all-in-one packaging. RADAR II has no provisions for internal mixing and uses individual outs to interface to an external mixing console. The session keeps rolling at instant access speed because it is a HD-based system, but RADAR does not get in the way as computers often can. This leaves more time to concentrate on the performance and not the mouse or computer screen. Having almost all basic editing features available, RADAR provides instant access to creative editing when you need it.

For post applications, not having to wait for tape-wind greatly reduces stress and increases productivity. A click on the transport Fast Forward/Rewind button twice can double the speed of that function. If you marry the RADAR with a Doremi Labs V1 VDR (Video Digital Recorder), the locate time is virtually instantaneous for both video and audio stems. Studios or post houses will also be able to network the RADAR IIs together for seamless transfer of projects or stems to multiple rooms.

I found that using RADARVIEW on the SVGA monitor is very useful but not always necessary. On the monitor, audio appears as pale blue blocks (waveform display will be available soon). Block view editing did not slow me down, and it forces a person to listen to the edit points more closely. The space between the in/out points appears as a dark shadowed area. It is easy to find a location in reference to the track on the monitor. There is also a helpful feature on the meterbridge that allows you to edit quickly. As you jog the track, the bar graph display

—CONTINUED ON PAGE 215

APHEX 1788 REMOTE PREAMP



The Aphex 1788 is a full-featured, 8-channel, remotely-controllable microphone preamplifier offering excellent sound quality plus two inventions: continuously variable gain control without "zippering" noise and a peak limiter that offers additional dynamic range without clipping the preamp's input.

In addition to 26 to 65 dB of variable gain, a 26dB pad, polarity reverse, a 75Hz low-cut filter and 12-segment LED headroom meter, each channel includes a unique microphone limiter (MicLim™) before the preamp, preventing clipping altogether and allowing higher gain settings. The main and auxiliary outputs are individually adjustable to match the limiter's operation to the input headroom of connected analog devices. The limiter also assures that the optional digital outputs never hit 'Over.'

All controls can be accessed from the front panel. Channels can be grouped to adjust the parameters or gain of several at once. A headphone amp allows local monitoring. A 700Hz test tone at either -20 or 0 dBfs can be assigned to any channel.

Remote control of up to 16 units (128 channels) can be handled with a single MIDI, RS-232 or RS-422 control line via MIDI protocol. The controller can be anything that talks MIDI or a personal computer. An optional dedicated remote controller, the 1788-R, duplicates the front panel controls and adds clip/limit indication and device selection for 16 units, as well as preset loading and editing. Multiple 1788-Rs can be used in serial with or without a PC, allowing control from various remote locations.

1788 Program Software for Windows 95 is included, providing screens for control and status, or saving and recalling scenes. Its main window duplicates the front panel's control and metering for each device, including grouping functions. In addition to real-time metering, the software displays either peak-hold or absolute maximum levels, updated every half second. It allows up to 20 scene changes, each linked to presets that are named in software, and each snapshot is a MIDI dump containing all device parameters. As the preamps offer glitchless gain changes, scenes are smoothly ramped without muting. The System Setup window is an alternative to the master window that simplifies comparing the settings or programming multiple units. All settings of four 1788s, including channel and device names, can be seen at once, and for larger systems this window scrolls.

Each channel has two independently adjustable balanced outputs. A digital option—24-bit sampled at 32, 44.1 or 48kHz—has three outputs simultaneously: AES/EBU, ADAT optical and TDIF. Connections are eight XLR inputs, eight XLR outputs and DB-25 (Tascam) for the auxiliary outputs. The digital option has AES/EBU on a DB-15, ADAT optical, TDIF on DB-25 and Word Clock in/out on BNCs.

The 1788 is a cost-effective solution for touring acts that want to record their shows as it offers direct digital connection to recorders while the main out is connected to the FOH and the Aux out routed to the monitors. It can substitute for conventional passive splits and offers enhancement over active splits. Placing the preamp closer to the microphone reduces mode noise because gain does not have to be taken at the end of the run. Frequency response effects of capacitance in long mic lines are reduced. Also, loading a mic into a single preamp allows higher quality than loading that mic into several preamps through a splitter. Remote control allows use of fiber systems without an engineer babysitting the preamps.

An internal jumper allows users to "unload" this transformer for a more colorful character, though I prefer the honest transparency offered by the factory-default setting. I used it for several vocal applications, from choir mics to handhelds, where the 75Hz high-pass was convenient and the mic limiters were a luxury. It was also used on a Pavarotti show for the two Schoeps MK-4 vocal mics, substituting for the usual active splitter, where it offered an open, clear sound, earning compliments from both the artist and the audience. The auxiliary output allowed separate connection to two more channels in the console, used strictly for foldback. It was also used at field level on shotgun mics used at the SuperBowl for crowd ambience.

With the 1788, you will discover new approaches for both live and recorded sound. Listing for $4,995, it costs no more per channel than many high-quality mic pre's, but adds the double bonus of remote control and preamp limiting. The digital output option is $995.

Aphex Systems, 11068 Randall St., Sun Valley, CA 91352; 818/767-2929; fax 818/767-2641; www.aphexsys.com. ■

BY MARK FRINK

SOUNDELUX U95S

MULTIPATTERN TUBE CONDENSER MICROPHONE

The U95S is the latest microphone in the growing Soundelux line, features audiophile grade electronic components throughout and is designed to be the flagship of the Soundelux fleet.

According to designer David Bock, the U95S is a no-compromise design. The centerpiece of the mic is its capsule, a copy of the KK47 capsule developed by Neumann for its U47 and M49 microphones. The U95S capsule is manufactured in Latvia by BLUE; Soundelux feels this is the most advanced version ever built of that timeless design. The capsule feeds an EF86 pentode that is operated as a triode in a common cathode configuration. From there, the signal passes through a custom-designed transformer that is enormous compared to what is usually found inside a microphone.

The overriding theme in the U95S is to maximize headroom throughout the signal path. The classic mics built with this capsule design were developed for more distant recording applications. Recording techniques developed for modern popular music have often placed those older mics in some very high-SPL situations. Other tube circuits, in general, have posed problems in maintaining linear behavior. Soundelux has designed the U95S circuit around a very high voltage supply to avoid any such problems. The transformer is designed to stay out of saturation for signals up to +4 dBu! As the mic does not have a low-frequency roll-off switch or a capsule attenuator, and because the capsule is capable of picking up infrasonic signals, such a large transformer is necessary to ensure that the mic consistently delivers a clean output. Other designs have neglected this essential aspect. The transformer is also a very wide bandwidth device, with its -3dB point at 45 kHz.

The EF86 (a.k.a. 6267) is a tube that has found its way into many designs, but it is often used in very different ways. The venerable U67, for example, uses it in a circuit that has a novel approach to attenuation and filtering. That circuit has a great deal of negative feedback. For Soundelux to use the EF86 as a triode is not as strange as you might think. The curves for an EF86 operated in triode mode are much more linear than for most other tubes that were initially designed as triodes. Also, the design of the EF86 specifies an internal shield that enhances its electromagnetic shielding. In many applications, an external shield hood is not necessary. Soundelux chose a modern Svetlana tube that is superior in both shielding and linearity over the conventional EF86.

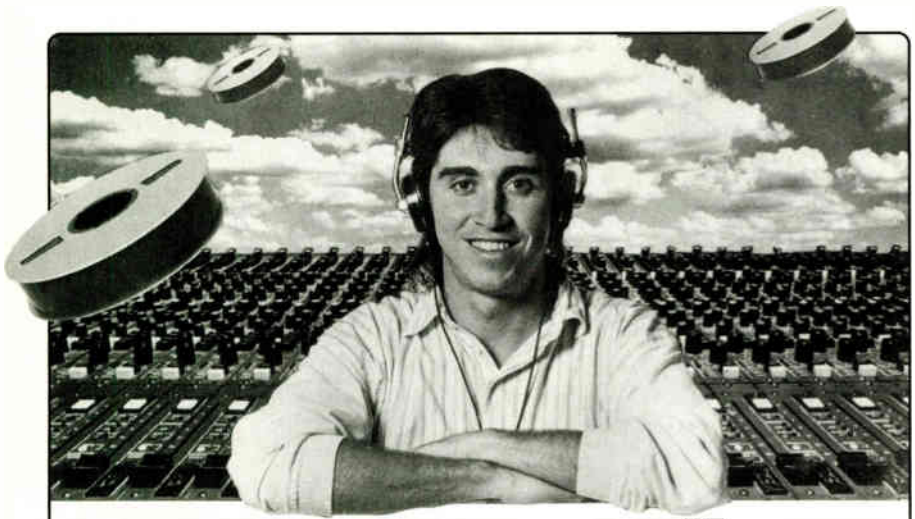
Some tubes used in condenser mics are connected as cathode followers. This configuration has no net gain but provides a lower-output impedance and the least distortion. Soundelux opted for the common cathode arrangement that results in more of the tube's color being retained. Since no loop feedback is used, there is no possibility of encountering the transient intermodulation distortion, or TIM, that has plagued other designs that might also measure well. The only penalty I could see with this configuration is the possibility that variations among individual tubes may result in differing gains and sonic attributes. According to Dave Bock, the tubes are hand-selected, so the effect should be minimal, but I decided to make a point of checking it just the same.

BY JOHN MONFORTE

All of the U95S microphones come supplied with a spare tube. I swapped the original tube with the replacement and found there was little, if any, difference. I also swapped in an EF86 that I was using in one of my own microphones. There was a very mild gain change, much less than I expected, but most notable was increased microphonics—the noise that comes from the internal elements of the vacuum tube vibrating when the tube is tapped or shaken. I also found that the Svetlana tube was less sensitive to hum, thanks to superior shielding. However, once enclosed inside the mic housing that made no difference, but it is indicative of the higher level of quality in the new Russian tubes.

The U95S is capable of being switched to any of the common pickup patterns. This is done via remote control at the power supply. It took several seconds for the pattern change to take place. This is a direct indicator of the low-frequency limit in the capsule circuit (and it is a good way to check for a failing capsule). The figure-8 pattern nulled precisely where it should, which shows the capsule diaphragms are well-matched.

I directly compared the mic to the best of my classic Telefunken U47 mics that use the same capsule design. At identical gains, the noise was noticeably lower, with no signs



of popping or sputtering.

In session on vocals, the sound was enormous. It comes as no surprise that this is not a neutral mic. On the cardioid setting it gives generous amounts of proximity effect when worked up close. As with its classic ancestors, a sharp edge is etched to the upper reaches of the vocal range if addressed directly on axis, with a smoothly tailored reduction of that effect as a slight angle is introduced. What is unique to the sound is extremely low distortion and a rich, deep bass. I can imagine it useful in any of the applications where a classic mic would be placed, expecting added cleanliness as the only major difference.

I also loaned the mic to a local engineer, who put it up alongside a Stephen Paul-modified AKG C24 for a vocal session. The client did not hesitate to choose the Soundelux for the session. The studio also arranged to buy my sample unit!

The mic I tested was an early production unit that had some minor fit and finish problems in the power supply, but I am told that those anomalies have been rectified. My only major complaint with this mic was with the shock mount, which was not only ineffective but actually caused a mechanical resonance, with an audible pitch around 200 Hz. I recommend using the supplied fixed stand adapter, along with taking care to avoid stand vibrations.

The rest of the mic was well-crafted, and is dressed out with an attractive black chrome trim. It comes in a solid wood case, and the entire system is ready to travel in a high-impact plastic waterproof field case. When compared to the going street price of a classic mic, complete with its old-technology flaws, or even a new mic that uses a similar capsule configuration, it is surprising that a no-compromise design can sell at a list price of only $3,600. If you are interested in the color of the classic "Tele," with all the rough edges polished to precision, the Soundelux U95S deserves your attention.

Soundelux Microphones, 1147 North Vine St., Hollywood, CA 90038; 213/464-9601; fax 213/856-5491; www.soundelux.com. ■

John Monforte taught loudspeaker and microphone design for 16 years. Now he is the audio lead in a multimedia research center at the University of Michigan, but he still enjoys a fine transducer when he comes across one.

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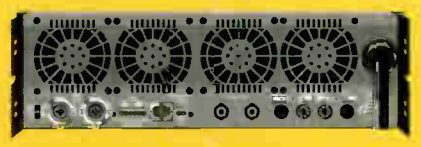

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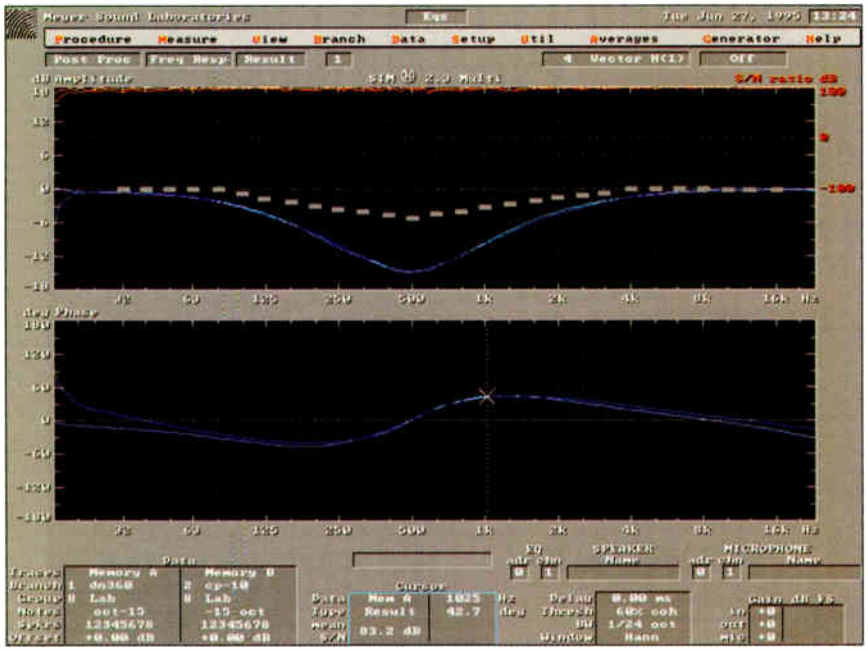
Equalizer Inequality

All EQs are NOT Created Equal

"More" isn't always "better." Sometimes a 5-band parametric can outperform a 31-band graphic.

By Bob McCarthy



The upper window illustrates the difference between a graphic equalizer's measured response and its front panel settings in contrast to a parametric. The graphic equalizer panel settings (indicated by gray rectangles) are off by as much as 10 dB from the actual response created. The lower window indicates phase response.

Seemingly, everyone already knows all about equalizers. Their effects are easily heard. Their settings are easily understood. And in an industry that's barely able to formulate standards, the equalizer stands out as the industry's most consistent device. Every professional graphic EQ has the same frequencies. Operation is a snap, and an engineer with only minimal ear training can get a feel for pushing the right sliders up and down. By comparison, digital processors seem endlessly complex.

So why are equalizers shrouded in mystery, vaguely understood and often poorly operated? Why do equalizers with identical front panel settings sound so different? Why the 10:1 difference in price for devices with identical features? Why is everyone concerned about the phase response when not a single unit on the market offers independent user control of that parameter? Why do we have such a love/hate relationship with equalizers? (Engineers wouldn't dream of leaving their equalizers in the truck, but they feel deep satisfaction if they do not have to use them.) Most

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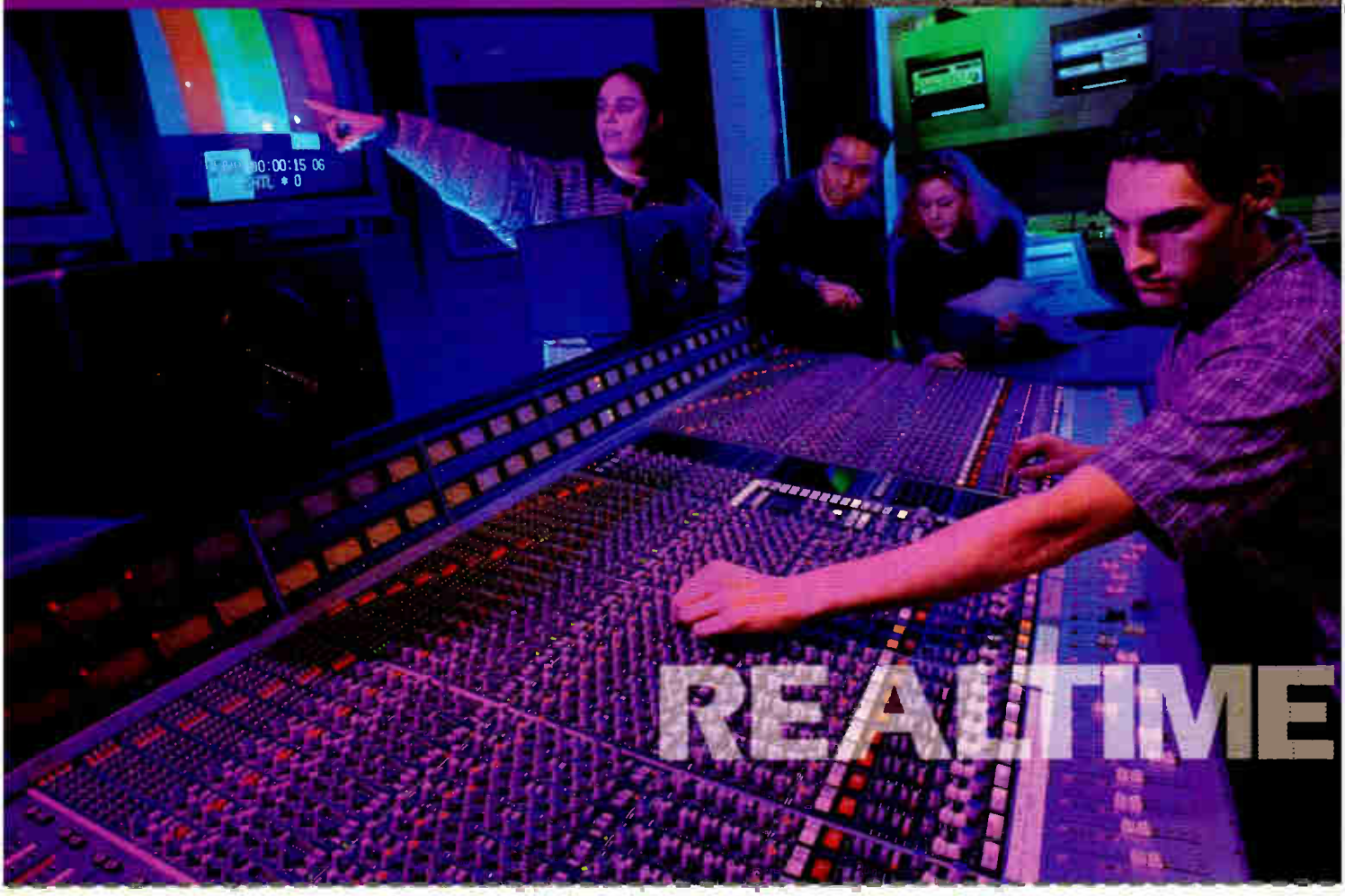

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importantly, why are the results so often disappointing?

What is underneath all this? Could it be that the front panel settings of most equalizers are not representative of the actual curve being created? Could the difference in price (and sound quality) among seemingly identical units simply be a result of the quality of the parts inside, internal gain structure and reliability, rather than more costly units having altogether different circuit topologies?

Perhaps engineers' mixed feelings about equalizers are related to the possibility that the wrong type of equalizer is used for most applications. The problem is complicated by engineers trying to use EQ to solve problems that are better handled by delay lines, volume controls, speaker positioning, room acoustics modification or just merely correct system wiring. Let's dig deeper...

THE RIGHT TOOL FOR THE JOB

The first rule in choosing an equalizer is selecting the proper tool for the job. Since there are only two basic types of tools (graphics or parametrics) and only two types of jobs (tone control or system alignment) this should not be difficult. Tone control refers to the artistic touch-up of the system's response, as might be done by the mix engineer to tailor the response of the system to taste; this is done by ear or perhaps aided by low-resolution instrumentation such as a real-time analyzer (RTA). System alignment, on the other hand, is a scientific process where the interactions of the speakers and the room are compensated for by carefully adjusting delay, levels and finally, equalization. This procedure is best done with instrumentation capable of precisely displaying amplitude, phase and signal-to-noise. This distinction is important: Broad strokes are better for artistic tone control, whereas system alignment requires precise filter locations and shapes.

As all three parameters (frequency, level, bandwidth) on parametric EQs can be adjusted, their filters can be shaped for any type of response. The main limitation is the number of filters available, which is simply an economic issue. Graphic EQs, on the other hand, are hobbled by fixed filter frequency and fixed bandwidth, a limitation so severe that they can really only be used as tone controls. In short: A parametric EQ can match any curve that a graphic can dish out, but a graphic cannot come close to creating the response of a parametric. Most importantly, however, the parametric can create the inverse of any equalizable problem that speakers and rooms can dish out.

Unfortunately for graphic equalizers, the anomalies of speaker interactions in a room do not often occur at ISO standard center frequencies, nor do they only present themselves at a single fixed bandwidth; the probability that a graphic EQ can create the inverse response of speaker system interaction is practically zero. Graphics used for system alignment are incapable of accurately suppressing peaks due to errors in center frequency and bandwidth. This leads to a prevalent industry myth that graphics are filled with mysterious phase problems. All sorts of arcane rules of thumb prevail about how far you can cut on a graphic and what you should do with neighboring faders. It is all misguided. The actual problem is much simpler than that: The amplitude and phase responses are off the mark, and the results are horrendously audible.

BANDWIDTH: A DECISIVE PARAMETER

Graphic equalizers are "constant-Q" devices, where each filter has the same percentage of an octave bandwidth as the next. Few people realize, however, that the standard for graphic EQs refers only to the spacing of the center frequencies, and not the *bandwidth* of the individual filters. Depending on the model, the width of the filters can vary from a full octave to ⅓ octave. Two units with identical visual settings can sound radically different due to the interaction of adjacent filters. Some models may even change filter bandwidth when you change the gain range setting (without telling you, of course).

Parametric equalizers can be confusing, as many units on the market use asymmetrical filters: If set to boost, the filter is wide, but when set to cut, it becomes a narrow notch filter. For example, a user with a trained ear can sweep a boost filter and locate the approximate center frequency of a problem area, and then adjust the bandwidth to feel how wide the affected area is. But when the filter is moved into a cut mode, the bandwidth totally changes. Once again, what you see is not what you get.

THE PHASE MYSTERY

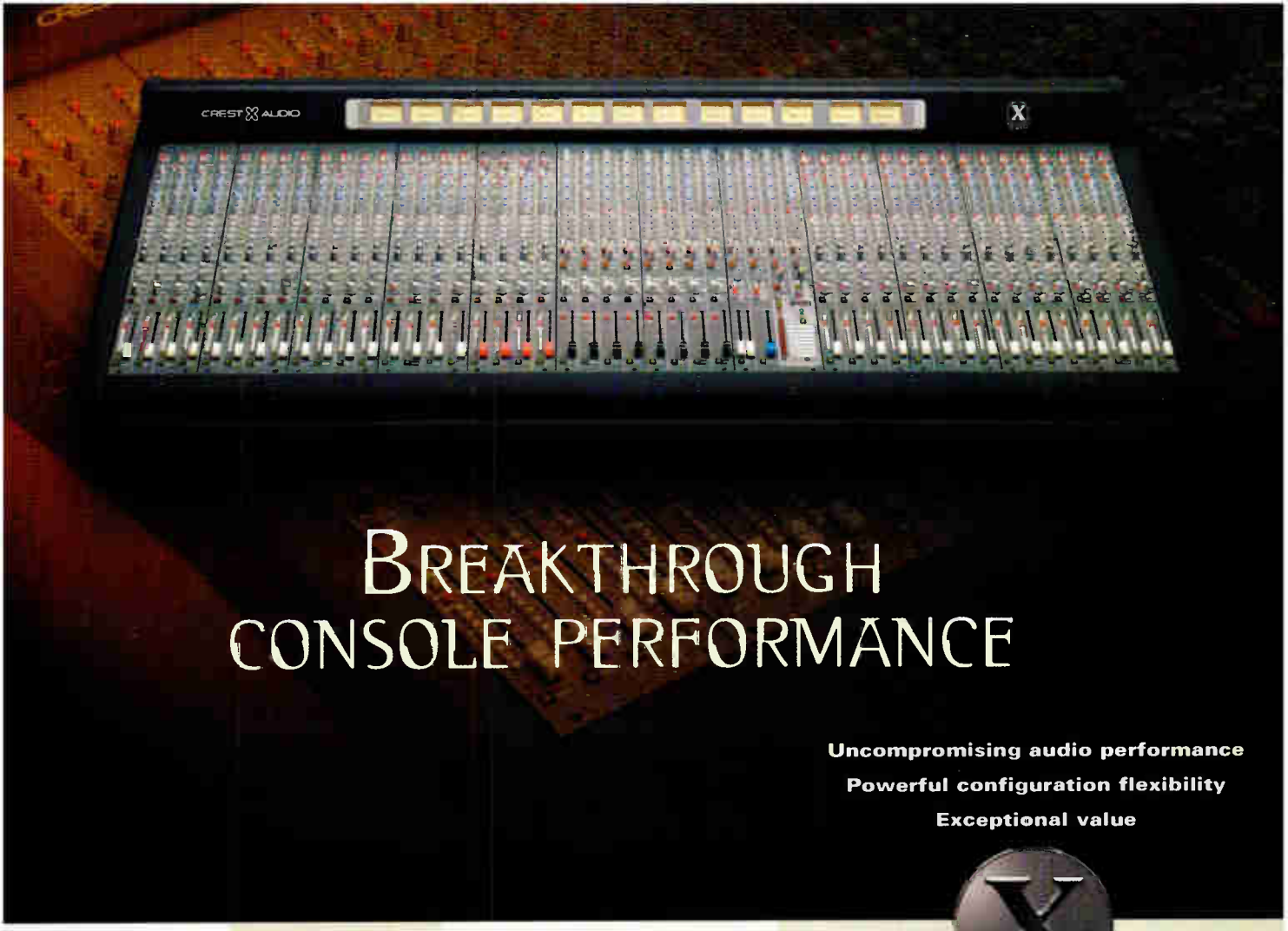
There is no shortage of discussion regarding the phase of equalizers. Phase is, of course, the invisible enemy to all but the few who have access to high-tech analysis equipment (and know how to read it). In some cases I have seen engineers apply simplistic logic: If adjusting the amplitude cannot solve the problem, then it must be a phase problem. In some cases this is true—for example, when the speakers are wired wrong or there is a delay between components. But in the case of the misapplied graphic equalizer, it is simply impossible to correctly locate and shape the filter's response to fix the problem—even when an equalizer is the right tool. The harder you try (with more filters and deeper cuts) the worse it gets, because the amplitude response gets further off target as the filters interact with each other. The phase response does indeed worsen, but only because it is tied to the amplitude response of incorrect filters.

Even if you invented a graphic equalizer with phase response that was somehow different from any on the planet, or perhaps had no phase shift whatsoever, it would still be an ineffective tool for system alignment because it can control only one parameter per filter—the boost or cut.

The quest for a "phase perfect" equalizer is a futile search for the Holy Grail. A common misconception is that an EQ with no phase shift would be better than one that follows the normal laws of physics where the phase response is the first derivative of the amplitude. This belief has found a new life in the world of ultimate fantasy: digital EQs. ALL filters have a phase component and create shift proportional to steepness, regardless of whether they're derived in the analog or digital domain. Even if a "phase-perfect" filter could be found, it would not work well for system alignment anyway, since in order to create the inverse of the response created by speaker and room interactions, we must introduce equal and opposite amplitude AND phase response.

COMPARING MODELS

How can we tell if one equalizer is better than another? First we have to define the application. If the EQ will be used for artistic control, then either a parametric or graphic can be used. Since this application is primarily creative, it makes sense to judge these EQs using artistic criteria, running



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them through the full range of adjustments while listening to music. Units with wider bandwidths are generally perceived as more musical. Exercise several faders together: Wide filters produce interaction with their neighbors, creating the desirable sound of a single plump, smooth filter. Narrow filters combine when adjacent faders are moved together to create an audible ripple response that is unsuitable for tone controls. Feedback control is another issue, but we'll save a rant on the misuse of graphics in monitor systems for another time.

Be sure to exercise both the boost and the cut side of an equalizer. Filters may sound different as you move the slider from boost to cut if their response is not symmetrical. For alignment applications, you must be assured that the device can create the required curves. The frequency and bandwidth must be continuously selectable (not stepped). The bandwidth should be adjustable from 0.1 to 1 octave in both boost and cut. Unfortunately, judging the range of a filter's response without accurate measurement instrumentation can be difficult.

One key to sonic quality is distortion. Cheap EQs use cheap capacitors and op-amps in the signal path. Good ones use high-quality capacitors, which cost real money. The difference is distortion. To test this you will need to make sure that the filter is inserted and placed in a cut and then in a boost mode. The good ones have noticeably better distortion specs. Cheap digital equalizers use cheap A/D converters. Same problem: noise and distortion. Once again, measure with filters inserted, since the bypass switch may actually bypass the A/D converters.

Internal gain structure is an important factor. Cheap EQs have great signal-to-noise specs until you take them out of bypass. A popular design trick is to add gain before the filters and then attenuate the signal just before the output, leaving a perceived unity gain. This costs you 10 to 20 dB of headroom, but allows the EQ to hide filter noise. In particular, watch out for this in digital devices. You can observe this by feeding the device a high level (+20dBu) sine wave while the unit is in bypass. Then switch the filters back in and observe. If the unit goes into distortion even with the filters zeroed at unity, you know that you have a pseudo-unity device. Like most things in life, you get what you pay for—if it's really cheap, then it's *really* cheap.

Can you hear all these differences? Try a simple comparison the next time you set up in stereo, using your old EQ on one side and something newer or possibly more expensive on the other. Now listen and try duplicating your old sound on the new unit. Can you do it? To simulate louder applications, turn your amps down and compare the EQs when the music is going through them full-tilt boogie.

Equalizers are simple but limited tools, however all your sound passes through one. And although they tend to be fairly simple devices, their role is critical. If the right tool is chosen for the job and operated properly, predictable improvements in the sound can result. Once you've heard the difference a correctly adjusted quality equalizer can make, you'll no longer take your EQ for granted. Don't you wish the rest of your system was this easy to improve? ■

Bob McCarthy is an independent engineer specializing in sound reinforcement alignment and design.

GETTING YOUR ROOM IN TUNE

EARS + EQ + RTA + FFT

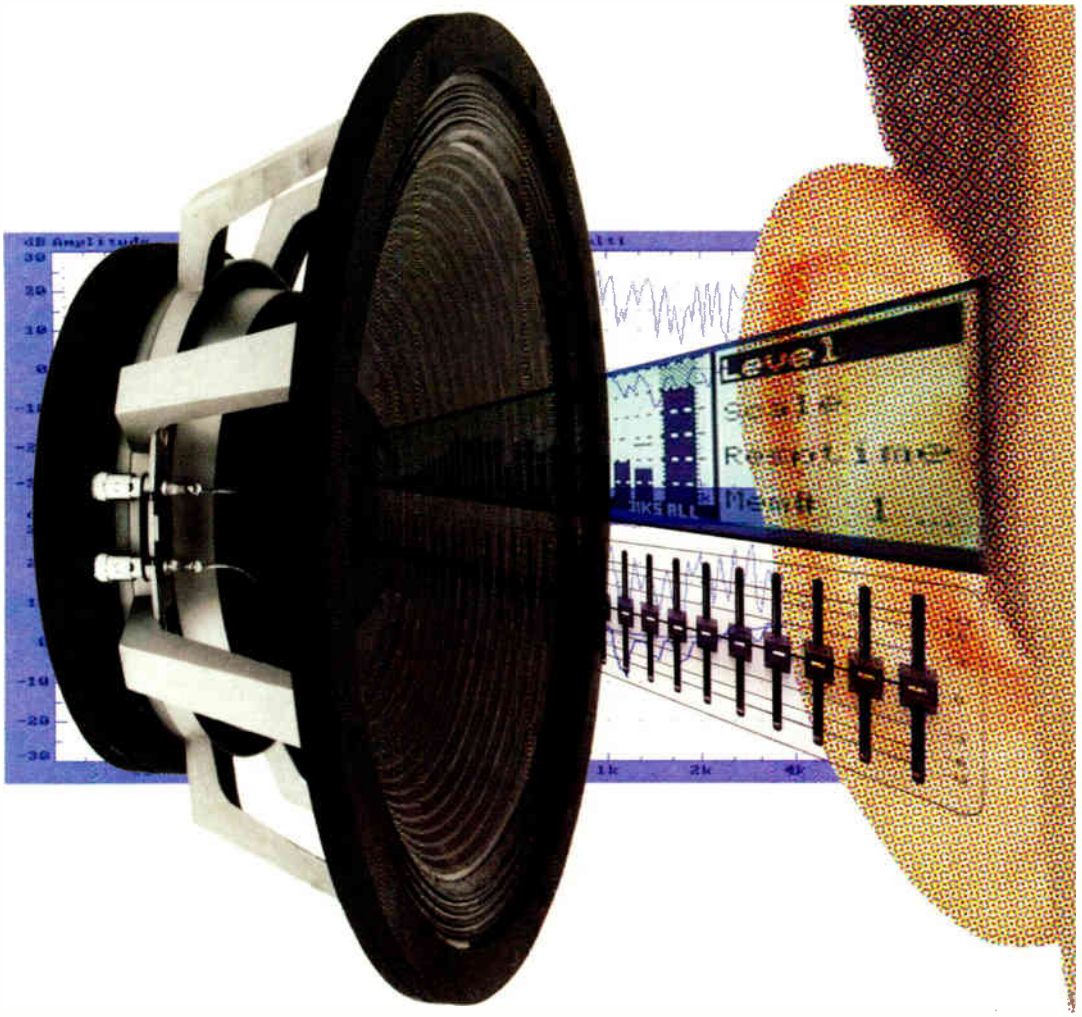


PHOTO ILLUSTRATION: MIKA CHISAKI

At my first job working for a real sound company, I had the good fortune to be paired with the company's senior engineer, Fred Mueller, who taught me what really counts in live sound. One game we played was taking turns equalizing the sound system, each doing a side. We used the mantra of, "Check, one, two" into a vocal mic. In the early days there were no Walkmans, laptops or affordable real-time analyzers, so being able to make critical adjustments by ear with this convenient, familiar sound source and using the vocal mic *du jour* was a critical skill. The response of the microphone, including its proximity effect, imparts a contour to the sound that makes the vocals in the system sound natural, but at the same time it colors the other inputs. Freddy would sometimes borrow the bass guitar to tune up the low end of the P.A. before the band showed up.

In the '80s, the advent of the CD made it possible to play well-recorded tracks, such as Donald Fagen's *Nightfly*, over the P.A. as a reference. With today's CD-R technology, a custom compilation disc can be recorded with pink noise, tones, favorite cuts or even material from the act being mixed. And, of course, MDMs now allow engineers to hear individual tracks and build a mix from the previous night's show before the band even shows up for soundcheck.

It's possible to perform adequate system EQ adjustments by simply using your two ears and a good graphic equalizer. This, of course, assumes that:

1) Your ears aren't destroyed from years in hyper-SPL environments, and

2) If you can still hear, you can correctly pick out anomalies in the response of the speakers in the room by just listening. You must identify the third-octave band to which a frequency aberration belongs and decide if one of the 30 filters can help. Alternatively boosting and cutting each slider on the graphic while hooting into a mic or playing fa-

BY MARK FRINK

—CONTINUED ON PAGE 166

Alanis Morissette

TEXT AND PHOTOS BY STEVE JENNINGS

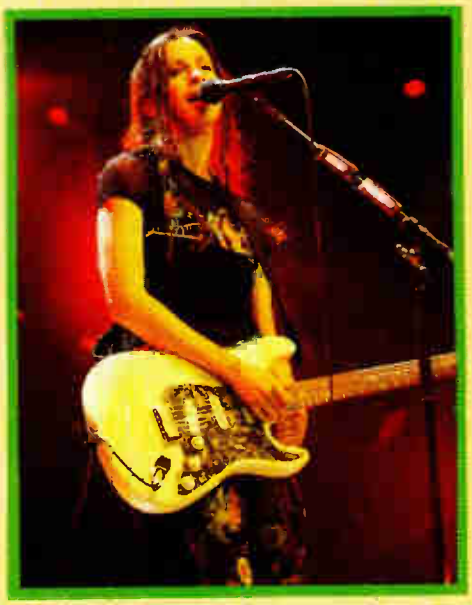
Showco system tech Mike Mason says Gary Novak's drums are miked with Shure SM98s across the toms, Audio-Technicas on the overheads, a B&K 4011 on the snare, a Shure 57 combination on the percussion and a Shure SM91 in the kick. "The kick drum extender gives the kick more low-end resonance and uses a May microphone that's built-in and side-mounted to the head," Mason says.

"For Alanis' vocal I use a Summit Tube Leveling Amplifier," Petruzziello says. "I also have a Sabine Power-Q that is a Feedback Exterminator and much more. It has 12 parametric EQs; I use six of them to contour her vocal (the board pretty much stays flat), then I have the other six as feedback eliminators—I ring it out just before we start soundcheck. Then I have a 31-band graphic EQ for her voice if I need it for emergencies. I use a dbx 901 to take out some peaks and for de-essing.

"During the unplugged/acoustic portion of the show we use an upright bass, bongos and acoustic guitars," Petruzziello continues. "We have a splitter so we can, with the click of a switch, have everything switched to the other inputs. That's really nice. Because we have scrims over the speakers that change the sound, we have a six-band stereo parametric EQ that we use to even it out."

"On my Yamaha board I'm running about 51 inputs with returns and 12 outputs, says monitor engineer Randy "Randbo" Bryant. "Alanis is using the Audix OM-5 vocal mic, which she has loved since the beginning. Audio-Technica mics are also used on the guitars, though Alanis has a Sennheiser 409 on her electric guitar rig, along with Countrymen DIs. We have Shure 57s on the B3 organ, and all the other keys are direct. Alanis uses Future Sonics in-ear monitors with Shure PSM 600 Series transmitter/receivers. Keyboardist Darren Johnson uses in-ears too, but the rest of the band use the Showco SRM monitor wedges."

"I'm using the Midas XL4," says FOH engineer Renato Petruzziello (L), pictured with Showco system engineer/crew chief Mike Allison. "I love the way it sounds. I've used the Midas XL3 on past tours, and the XL4 is a little bit smoother sounding; the EQ is more elaborate, and I love the automation function. I'm running 44 inputs with six stereo returns for effects with outputs left and right. We're not using any delay here at all, just main left and right. And I've got a Yamaha ProMix 01 for the outboard gear. Most of the effects go in there, and it's all programmable; some of the main effects I've kept on the Midas. My rack consists of compressors and gates—dbx, BSS and Klark Teknik units." Effects he's using include an Eventide H3000, a TC M5000, a Yamaha SPX990 and a Lexicon PCM 80 and 480L.



In support of her latest release, *Supposed Former Infatuation Junkie*, Alanis Morissette is out on a year-long world tour. *Mix* caught the gig at the San Jose Arena in San Jose, Calif., where the Showco Prism P.A. included an eight-column grid with down-throws/under-hangs and four centerfills.

—FROM PAGE 164, ROOM TUNING

vorite CDs eventually gets things sorted out. This has been done with varying results since live engineers began setting up concert sound systems, and it's one reason for the success of parametric EQ on mixing boards.

(Third-octave spacing arose long ago on equalizers as a practical convenience supported by a "critical bandwidth" theory, which claimed that the human ear could not discern EQ cuts any narrower. This hypothesis met its final demise when a 4kHz notch was scotched as a mechanism for foiling CD piracy, yet third-octave graphics remain popular.)

It is well-known that by scanning a console's equalizers after soundcheck for cuts or boosts common across many channels, an astute engineer can observe the frequencies at which the P.A. was not equalized quite right. An abundance in the same range across the board indicates a frequency that should have been taken care of at the system equalizer. However, if the system is adjusted with a graphic, it becomes impossible to dig out frequencies completely that fall between ISO centers without affecting adjacent tones. Mix engineers often find themselves compensating for shortcomings of the system graphic by further digging or boosting parametric input EQs to compensate for a system that's still not quite flat. This common practice of using graphics to roughly EQ the system, followed by an hour of soundcheck to adjust the parametrics on every input, is well-established throughout the industry. It's no wonder that 4-band, fully parametric console EQ with narrow filter adjustments is so popular in live sound today.

The use of real-time analyzers with the same third-octave ISO frequency centers as graphic EQs arose to aid adjustments. It then became much simpler having a row of LEDs as a visual aid. This makes adjusting the system EQ less subjective, instills a degree of confidence that scientific method is being applied and perhaps even saves a little time—time that can be invested in fine-tuning all those parametric filters on each input. As input lists grow, soundcheck inevitably takes longer to perform thoroughly.

Something studio engineers have known all along is that if your speaker system is not quite flat, the EQ on your channels compensates to improve the mix. When you try that same EQ on different speakers, the mix is no longer quite right. The same thing happens when a tour goes from one venue to the next and the P.A. is being equalized with a graphic. The mix EQ can be out of kilter at slightly different frequencies each day, and an hour or two must be spent tweaking the parametrics on all the inputs. The front-of-house engineer must verify how each input sounds, both individually and within the context of a mix in the new room. The monitor engineer and musicians must do the same onstage.

There is an alarming tendency today to "over-EQ," both at front-of-house and in monitor systems. One EQ-ninja points out his "every other slider" rule, where if more than half the filters on a graphic are being used, the bulk of the effect is simply to attenuate gain from the system since each affects frequencies under the control of its neighbors. Indeed, if you think of a graphic as a menu of tone control choices, rather than the complete EQ budget, you'll see that a minimalist approach can achieve satisfactory results with more headroom. Purists generally agree that the graphic is a blunt enough tool that it makes sense to use it only on the most offensive bumps in a system's response and then make any finer adjustments on the console's input EQ, seeing as they all get rechecked at each new venue. Either way, the result is that further EQ of the system is absorbed into the process of artistically confirming the inputs and the mix.

Manufacturers of both off-the-shelf and proprietary large-scale systems go to great lengths to provide speakers with smooth and accurate response. There is an abundance of well-designed systems that perform extremely well right out of the box. While many claim that there's hardly any need to EQ, the unpredictable interactions that arise when arraying systems into rooms do not neatly fall onto ISO centers. Once you acknowledge that EQ filters of fixed bandwidth and at fixed intervals offer an imprecise solution, you are inexorably drawn to using parametrics. The problem with parametric system equalizers is that you can no longer simply set them by ear since the menu of choices gets infinitely complex.

Parametric system EQ, along with instrumentation with fine enough resolution and a skilled operator to accurately adjust them, can offer system response that is smoother and flatter. And, hopefully, at this point the response is linear enough so that the mix engineer can make EQ adjustments that are related to

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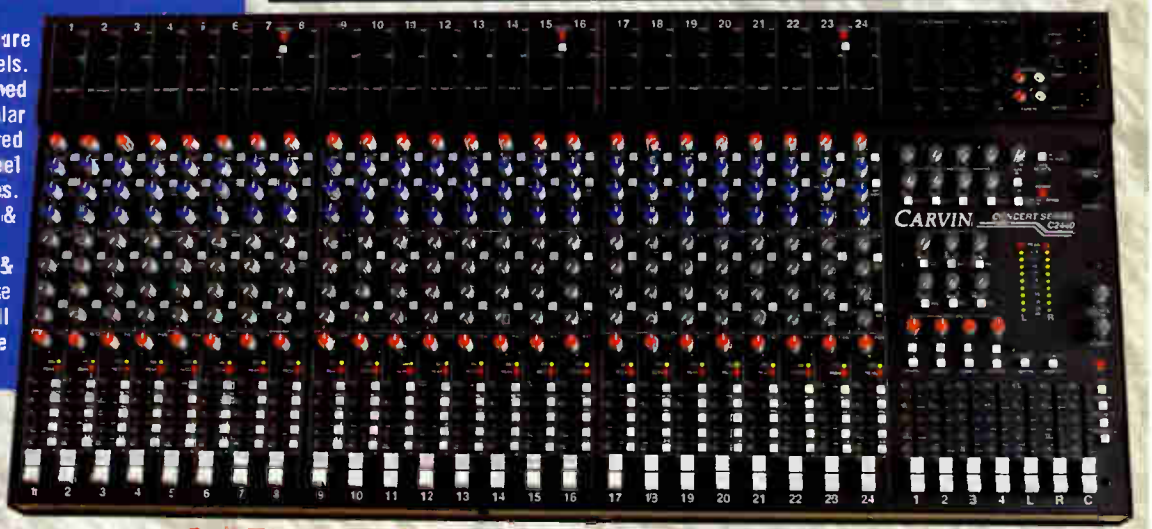

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artistic decisions about the instrument, the choice of mic and its placement. The irregularities of the speakers and room that were "unequalizable" by the fixed filters on system graphics can be precisely smoothed with fully parametric filters to yield a system in which response minimally colors the sounds coming through it. While some speakers and rooms perform better than others, there will be an optimal system EQ adjustment for each combination.

A segment of live concert production will always be using local production, which inevitably entails building a system from new inventory each day and getting the band up onstage to go through soundcheck. The time it takes to install the P.A. and make all the adjustments for a one-off leaves little opportunity for making precise adjustments to system EQ. Simply roughing it in by ear or RTA often must suffice due to time constraints.

However, savings can be achieved when the same consoles and mics are carried from show to show. Time spent carefully tailoring the P.A. to the room results in a system response that allows individual channels to perform consistently from one night to the next. In-ear monitor systems further simplify this. The listening environment for the musicians is stabilized from one night to the next because much of the room is taken out of the equation. More important, by minimizing the interaction of stage sound with the main P.A.'s response in the room, the results of quality measurement and adjustment are more easily heard. The trend of bands carrying in-ear monitors along with their consoles will likely be closely followed by FOH engineers bringing portable FFT measurement systems and relying on quality racks and stacks, either installed in the venue or brought in by local vendors. The benefits for the artist are a smaller production package to cart around and the possibility of safely blowing off the soundcheck, while the audience enjoys a better-sounding concert.

There will always be artists' engineers who simply want a graphic equalizer to touch up the P.A. They shouldn't need to concern themselves with intricacies of fine-tuning their sound system. This is the responsibility of the vendor providing it and the system technician working for the vendor. Aside from the political overhead of working for musicians and choosing the right gear in the first place, the focus and skills needed to mix each show give engineers plenty to worry about without having to invest time and energy into getting the P.A. correctly tuned for the room. Nevertheless, the standard practice for local production and even touring vendors is simply to install the system correctly and rough in the EQ.

That said, the best-sounding systems I have heard were adjusted with a Meyer Sound SIM system by an operator skilled in its use. I have also heard results that were quite good by experienced proponents of the [Crown/Goldline] TEF who were familiar with its well-known low-frequency limitations. As an added plus, the operators using such systems develop a deeper understanding of the way rooms and speakers interact, simply because they have the means of measuring them and practice doing so. Beyond the expense, these types of measurement systems place a higher cost on the improved performance because of the time required to adjust the system and the necessary equipment and skills.

The advent of relatively inexpensive FFT software that runs on personal computers offers high-resolution measurement to a wider market, but the training and the right tools for adjusting the system's response are equally important. It may be awhile before daily use of such software-based tools becomes accepted and established, simply because of the investment required.

We are all attracted to the idea of inexpensive software running on portable computers, since our laptops must be carried for other touring applications anyway. Sound system managers who go beyond this to incorporate dedicated instrumentation into their drive racks for daily verification of their system's response (and who provide skilled technicians to operate them) earn the favor of artists' engineers by incorporating a higher level of service. Today it's not unusual for the visiting engineer to bring in a laptop to tune the system. It won't be long before they show up on riders, just like RTAs used to, and enterprising vendors and venues will incorporate them into their speaker system's EQ rack and train personnel in their operation so they are easily integrated into the day's chores.

The bottom line is the same: Even with a good room, a flat system and fully parametric console EQ, graphic system equalizers will continue to frustrate those who aim for perfection. The hidden cost of using graphic system EQ is the need for better speakers, acoustics and mixing boards. Perhaps the next evolution will be intelligent FFT software that can automate some of the process of precisely matching EQ filters to the system response, letting the graphics be used strictly for the purpose to which they are best suited—a limited menu of artistic tone controls that can quickly be adjusted by ear. ■

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

QUICKTIP

NEAR-FIELDS AT THE MIX POSITION

Zut Alors! It seems obvious, but the mix engineer needs to have the console in a listening position that is representative of what the majority of the audience is hearing. I hear some chuckles. Yes, that does not happen as often as we'd like in live sound, and the size of the control equipment placed in the audience is partly to blame. A 50-channel console, a half-dozen racks and an operator who must dance around to reach all the controls makes for quite an obstruction to patrons trying to enjoy the music. The typical result is that the front-of-house cockpit must be located at the back of the room.

One increasingly popular solution is augmenting a less-than-perfect mix position with a pair of near-field monitors. Transparent, neutral-sounding speakers that use a high-quality digital delay to synchronize them with the arrival of sound from the main speakers offers the operator a good listening environment at the worst seat in the venue, without having to blast audience members who are closer to the stage. It is also then possible to cue up individual inputs without headphones. As with any delay speaker, low-end performance is not critical, so anything from an NS-10 to a JF-80 can work. The improved coherence allows the operator to obtain a quality mix while achieving lower overall sound levels. Near-field speakers on delay lines may soon become as common as headphones and board tape for live sound. *—by Mark Frink*

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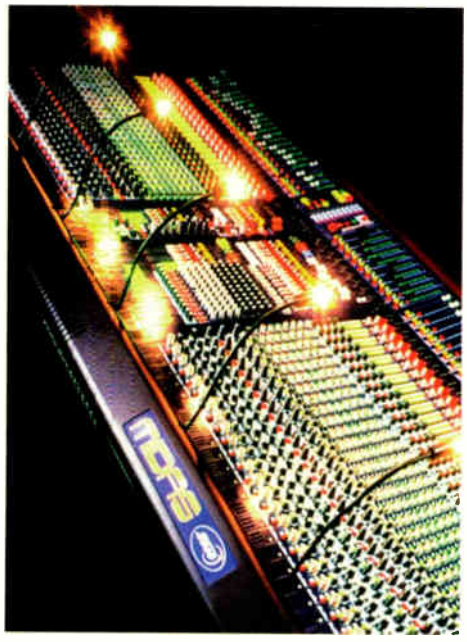

MIDAS HERITAGE 2000

The Heritage 2000 console from Midas (Buchanan, MI) is a cost-effective alternative to the top-of-the-line Heritage 3000 dual-purpose FOH and monitor console. Though the Heritage 2000 includes all of the advanced features and automation of the 3000, its design is optimized for FOH and broadcast mixing applications. Features include 12 group buses, 12 aux buses, LCR master buses and an eight-way matrix section. All fader levels and mutes are fully automatable. A broadcast communications module is supported by comprehensive mix-minus facilities, MIDI control and "audio follows video."

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YAMAHA XS SERIES AMPS

Yamaha Corporation of America (Buena Park, CA) intros two models—the XS250 and XS350—in its new low-cost XS Series of Class AB design power amps. The $599 XS250 delivers 250 watts/channel (4 ohms) or 500 W/ch (8 ohms, bridged mono). The $699 XS350 delivers 350 W/ch (4 ohms) and 700 W/ch bridged mono, 8 ohms. Both three-rackspace units feature XLR/barrier strip inputs, five-way binding posts and barrier strip outs, built-in high/lowpass filtering and stereo/parallel/bridged mono mode switching; rear-mounted controls minimize accidental readjustment. THD is 0.1% at rated power.

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IL&S MULTI-POSITION WEDGE

The MPM 45.60 Multi-Position Monitor Speaker from Integrated Light and Sound (Woodinville, WA) offers 45° and 60° slant angles and 70°x70° coverage. Its Eminence components include a 12-inch woofer and a 2-inch HF driver on a CD horn, passively crossed over at 1,750 Hz. Frequency response is 70 to 18k Hz. Peak output is 120dB SPL with a 200-watt amp. TRS inputs and loop-through connections are provided at both ends of the ¾-inch plywood ported cabinet. Price is $459, in oak or black finish.

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NEXO ALPHA E SERIES

Nexo's (Cotati, CA) Alpha E Series are compact, economic and lightweight speakers. The Alpha E-F full-range cabinet features a 40 to 19k Hz frequency response—the two-way, active system (with passive HF crossover) delivers a peak SPL of 142 dB. The Alpha E-M compact mid/high cabinet is one-third the size of the E-F and includes a horn-loaded 10-inch mid, passively crossed over to a 3-inch voice-coil HF driver. An active mode is optional, and the E-M may be combined with an Alpha B1-18 folded-horn bass enclosure for full-frequency operation. An Alpha E amplifier with integrated controller will be available; otherwise, a dedicated TD controller is mandatory. Optional flying gear for the E Series is compatible with the Nexo Crossbow flying system. Alpha E Series prices: E-F $5,550, E-M $3,100, B1-18 $3,100, TD Stereo Controller $1,540.

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GOLDLINE/TEF DIGITAL EQ

GoldLine/TEF (West Redding, CT) debuts the EQ2 Digital Parametric Equalizer, an affordable, 2-channel digital EQ with integral delay. Each channel has ten bands of parametric EQ, high-pass and lowpass shelving filters and up to 170 msec of delay. Multiple EQ2 equalizers may be programmed from a single computer via a Windows interface and an included RS-232 serial port; users can also select preset curves from the front panel. Features include separate input/output level controls, nonvolatile memory and balanced XLR I/Os (a version with gold-plated RCAs is available). Price: $1,250.

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YORKVILLE PERFORMANCE SERIES

Yorkville's (Niagara Falls, NY) Performance Series loudspeakers—lightweight powered/unpowered full-range enclosures and stage monitors, plus a powered subwoofer—feature custom HF and LF drivers, blue/black carpeting, non-skid plastic feet, perforated metal grilles and metal corners, and are covered by a two-year, transferable, no-fault warranty. Some models include flush-mounted stand adapters. Prices start at $199.

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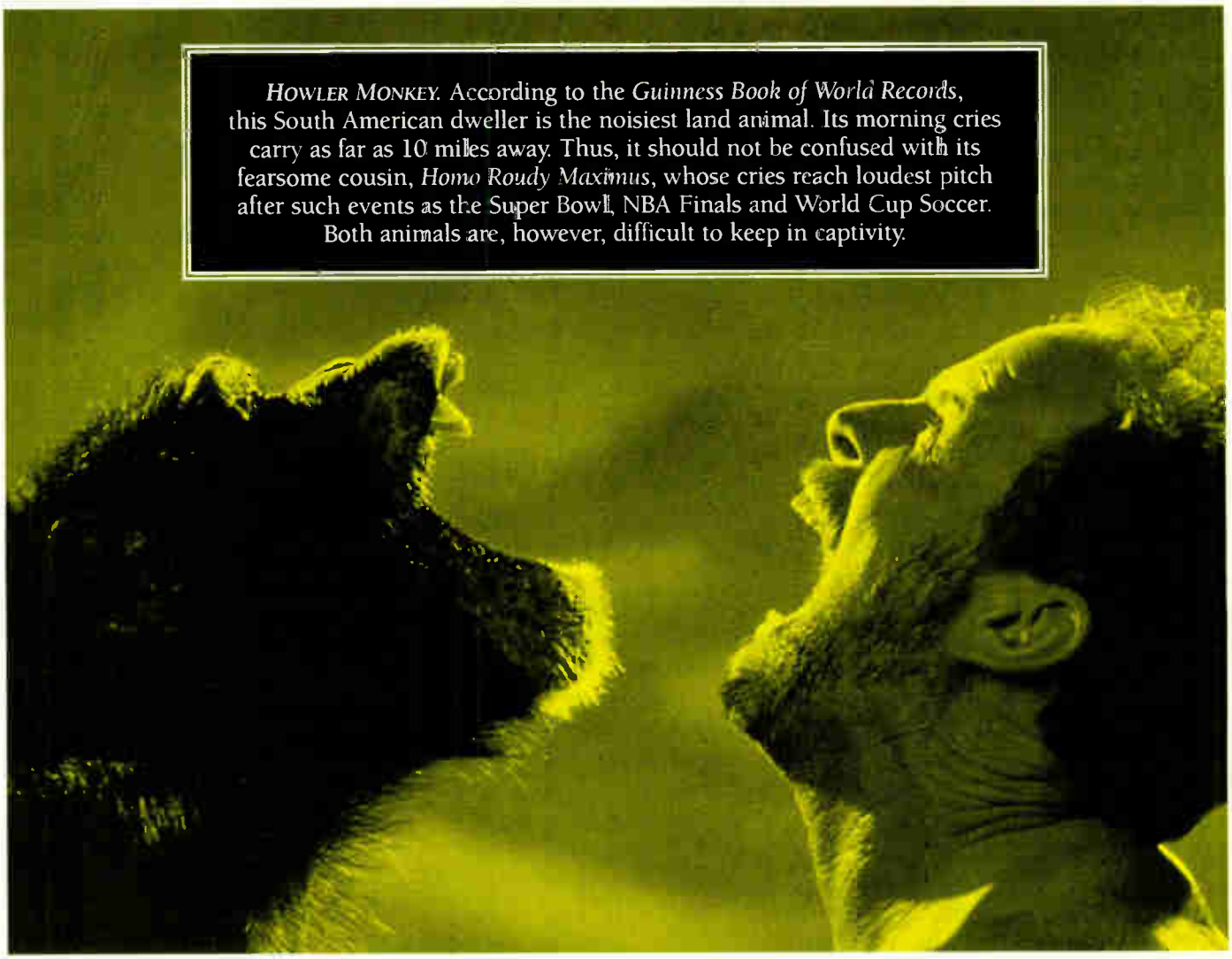

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BY BLAIR JACKSON

RECORDING NOTES

PHOTO: MARTYN ATKINS

TOM PETTY KEEPS IT REAL IN THE STUDIO

by Rick Clark

When Tom Petty & The Heartbreakers released their self-titled Shelter Records debut in 1976, few would have predicted that we would still be talking about the group nearly a quarter-century later. The album languished on the shelves for a full year before one track, "Breakdown," became a hit and began a winning streak that has continued unabated to this day. Both with The Heartbreakers and on his solo albums, Petty has proven to be one of rock 'n' roll's most consistent and enduring artists, with a knack for churning out timeless songs loaded with bright hooks and memorable riffs. The Heartbreakers have rarely strayed far from the sound of that first record, which deftly melded influences such as The Byrds, The Beatles, the Rolling Stones, Bob Dylan and Chuck Berry with Petty's unerring songwriting instincts to craft a truly original group sound. The band's approach to recording has been quite straightforward; Petty's solo albums, such as 1996's multi-Platinum, Grammy-winning *Wildflower*, take more chances in terms of arrangements and unusual sonics.

For The Heartbreakers' latest endeavor, *Echo*, their first since *She's the One*, Petty sought to keep the recording as simple as possible to capture the group's powerhouse rock sound in all its glory. This is classic TP & The Heartbreakers all the way.

"From the beginning, we were kind of conscious that we didn't want to do many overdubs on this record," says Petty. "We pretty much tried to arrange everything down to where the group itself covered all the bases, and that was fun, really."

Heartbreaker lead guitarist/co-songwriter Mike Campbell concurs: "Most of our work was in the songs and not necessarily in the recording process. The tracks are very live. There are some overdubs, but at least 90 percent of the solos happened during the live band takes. For example, with Benmont [Tench], our keyboard player, there was a lot of lifting the hands up off the keyboard and moving over to the organ, or stepping on a button, like you would do live, in the same recorded take. There is a lot of that element in the record; probably more than ever before.

"We're turned on by playing," he continues. "That's where we come from, and that's what we do. We had Steve Ferrone on drums and Howie [Epstein] on bass, me, Tom and Benmont. We had Scott Thurston, who plays with us live, play acoustic

—CONTINUED ON PAGE 174

IVO WATTS-RUSSELL

4AD'S AURAL ARCHITECT

PHOTOS: MATTHEW WELCH

by Bryan Reesman

Back in 1980, Ivo Watts-Russell aspired to create something new and bold in the music world. Excited by the music he was hearing in the late '70s, the one-time record store manager formed 4AD Records, a pioneering British label that has become synonymous with innovation and quality. In her book *Manic Pop Thrill*, Rachel Felder summed it up well: "4AD is virtually the Motown of art bands."

From early 4AD artists like Dif Juz, the Wolfgang Press and The Pixies on up to the Red House Painters and his own current project, the Hope Blister, Ivo (as everyone calls him) has certainly succeeded in generating colorful new music. The major labels have taken notice, snapping up a few 4AD artists. Ivo even signed a 4AD distribution deal with Warner/Reprise back in 1991, an arrangement that recently ended. 4AD artists who have flowed into the mainstream include Dead Can Dance and the Cocteau Twins; the former drew audience members as varied as symphony patrons and Goths, and the latter landed an appearance on *The Tonight Show* a few years back.

The producer/label chief himself recorded three albums with his own personal artistic collective, This Mortal Coil, an ever-mutating roster of label and non-label artists performing covers—and a few originals co-written by Ivo—in a variety of atmospheric settings. The group was striking for its extensive use of all sorts of stringed instruments, the frequent absence of a rhythm section other than drum programming, and processing that gave some vocals and instruments a watery texture. Following TMC's *Blood* (1991), Ivo took an extended hiatus

—CONTINUED ON PAGE 179

KING CRIMSON

VROOMING INTO THE DVD AGE

by Chris Walker

Since their formation in 1969, the British band King Crimson has been questing for new frontiers. Now, 30 years down the line, they've delved into the realm of DVD with *Deja VROOOM*. This innovative and inventive DVD includes 19 musical selections from different parts of their career, performed by a double-trio version of King Crimson and presented in 5.1 DTS surround sound. There's video footage from concerts in 1969, '71, '73 and '95; KC bassist Tony Levin's Super 8 "Road Movies" of the band on tour in the mid-'90s; an interactive game that allows the user to create a "dream" KC band from several different lineups; and insightful commentaries on the group's history and music from Robert Fripp, co-founder, guitarist and only member of every incarnation of the band. There's very little that KC has overlooked on this disc, which intertwines cutting-edge technology with their provocative music.

The band previously had very little involvement in the visual domain, outside of a couple music and concert videos. So why the sudden interest in DVD? "Because it was possible," answers Fripp, while in Los Angeles for the debut of the disc. "The concept of King Crimson as a double-trio appeared to me in a flash, when I was driving by our village church in England. The insight was a trio playing on both sides of the stage. You can't put that on stereo; you have to have something like a surround facility to convey the music as conceived.

"I've heard a number of surround sound approaches with DTS. The music, which is conceived specifically for DVD, is very different from music which is being remastered on DVD. Even the music remastered on DVD

—CONTINUED ON PAGE 183

CLASSIC TRACKS
will return next month

—FROM PAGE 172, TOM PETTY

guitar on several tracks, and that was about it."

As with many of Petty's recordings over the past ten years, much of the tracking and overdubbing was done at Campbell's home studio, with Campbell doing much of the initial engineering. "This was a situation where we were going to go in and learn some songs and try them out," he says. "I'm not really a trained engineer. I just kind of go by ear, but the tape was sounding good, so we put off getting an engineer or producer for quite a while, to sort of keep the vibe we had. This really isn't a full-on professional studio, in the sense of a commercial studio. I've just got some gear in a room, and there is barely enough room in there for the drums. We just set up in there and put it on tape."

In time, Petty and Campbell enlisted engineer/mixer/producer Richard Dodd to record overdubs and mix the project. Then Rick Rubin was brought in to produce along with Petty and Campbell.

"Mike has three consoles," states Dodd, "a small 12-channel Neve sidecar with old 1073s [preamp modules], which he purchased after I used it to track the Traveling Wilburys' second album; a 24-channel Neve console with 1073s; and a Soundcraft 1600, which is the one that I mixed 'Mary Jane's Last Dance' [a hit single off the group's *Greatest Hits* album a few years ago] on. So Mike has 36 channels of 1073 and 24 channels of Soundcraft that he records through now. Just about every microphone that he wants to use has a dedicated channel strip, which makes the recording process for him quite simple once it's set up. It's just a case of selecting tracks, and off you go. He has enough outboard gear to support that, as well."

Having worked on The Heartbreakers' *Into The Great Wide Open*, the Traveling Wilburys and Petty's solo *Wildflowers*, Dodd was no stranger to the

Cool Spins

The Mix Staff Picks Their Current Favorites

Van Morrison *Back on Top* (Pointblank)
Morrison's latest features some familiar sounds and stories, but rarely in recent years has this artist produced such a tight, well-formed package. The horn, guitar and organ-studded arrangements on this self-produced effort are beautifully realized, and Morrison's main instrument, his voice, is in perfect form. In some recent recordings, I have found backing vocalist Brian Kennedy overused, but on this album Morrison's soulful voice is right out front, and Kennedy adds some simple, harmonious enhancements. The string arrangements, by veteran Fiachra Trench, add subtle glory, and keyboardist Geraint Watkins, who I first noticed on Nick Lowe's most recent album, is a powerful talent. And the songs...The title says it all.

Producer: Van Morrison. Recording/mixing engineers (all except strings): Walter Samuel, Brian Masterson. Studios: The Wool Hall (Bath, UK) (except strings), Windmill Lane (Dublin, Ireland). Mastering: Ian Cooper/Metropolis (London).

—Barbara Schultz

Steve Earle & the Del McCoury Band: *The Mountain* (E-Squared)
Here's a match made in heaven—one of music's most literate and passionate songwriters and singers (Earle) fronting the *crème de la crème* of contemporary bluegrass bands. The results are positively electrifying. Earle has written 14 evocative original songs about workin' stiffs, railroads, broken hearts, a young Irish soldier fighting in the Civil War...it's a an incredibly rich collection of songs, all beautifully rendered by Earle and the Del McCoury Band (whose own records are also worth checking out). Though he's fronting a bluegrass band, Earle still sounds like the hybrid rocker-folkie-country guy we know him to be—sort of like the mountain kin of John Prine and Bruce Springsteen. Iris DeMent duets nicely with Earle on "I'm Still in Love With You," and the CD's final track, a tribute to the late, great Nashville bassist Roy Huskey Jr., called "Pilgrim," features a galaxy of Nashville acoustic music greats.

Producer/mixing engineer: Ronnie McCoury. Recording engineer: Ray Kennedy. Studio: Room & Board (Nashville). Mastering: Hank Williams/Mastermix (Nashville).

—Blair Jackson

Paris Combo: *Paris Combo* (Tinder); Les Nubians: *Princesses Nubiennes* (Omtown)
If your view of French music doesn't extend much beyond Edith Piaf and Charles Aznavour, it's time to check out these fine end-of-millennium offerings, both of which show what a truly international country France has become. Don't speak the language? Neither do I, and it doesn't matter

—CONTINUED ON PAGE 186

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band's creative recording methodology. "Richard is a brilliant engineer and mixer. He really makes my life easier," enthuses Petty. "I don't have to worry about anything, because I know he is on top of it. He's very in tune to singing, especially.

"Concerning vocals, I never do more than two tracks in a comp," Petty continues. "The truth is that there is no reason do more than two, because you weren't going to keep that [first one] anyway, right? You did something better than before. If I sing something better than I had, I keep that. But if I don't, then I just try again. You can go mad with all of those comps laying around."

Dodd shares Petty's sentiment. "Today's music is riddled with postponed decisions," he says. "'Let's wait till later' is the way most people think. It's really hard to judge how good something is when you still haven't decided on how bad the take was before it. It's either right or it wasn't. I prefer decisions over using up tracks."

Although the recording of *Echo* was, by and large, a straightforward analog project, Dodd did use Pro Tools for fine-tuning and convenience in the mixing stage. "The whole time we were mixing, we had a full 24-bit Pro Tools

rig that we rented at my facility," says Dodd. "With Pro Tools, I was able to excercise options, like, 'What about if this part happened earlier,' or, 'What if we AutoTuned that?' Rather than guess, I would just try that edit and—*bang!*—done.

"I also saved a lot of backache on one song, where I wanted to re-amp a guitar," he adds. "There's a [Pro Tools] plug-in called the [Line 6] Amp Farm, where you just dial up one of the emulations of classic amps. It's very entertaining and a lot faster than doing the real thing. Of course, we went back and plugged in the real thing, too, but the other way was just fine. It was very close.

"There's one track called 'No More' that actually went to Pro Tools and then went back to analog," Dodd continues. "We had a great take, but there was a place where the song sagged a little bit and they were going to recut. I just happened to mention that one of the things you can do with Pro Tools is edit and put things in time. So I went to this person who works out of the Mix Room, nicknamed 'Blumpy,' who was an expert at doing that. He's an engineer, but he also has a reputation for being very quick and accurate at manipulating tracks in Pro Tools. He's a very nice guy, and he did a great job. In fact, Rick Rubin said, 'Why don't we put the whole track in time, so we could find out what it was like.' So Blumpy did it and it was a brilliant job. But we ended up using just the original four-bar fix he did.

"Interestingly, while he showed that he could 'fix' the tempo of an entire track, it also showed why the band doesn't cut to a click on most of the songs. When the song came back 'right' or 'fixed,' with the same tempo throughout, it was a different song, so to speak. It was completely different. As much as Tom was impressed with how it could be and what it sounded like, the fix turned it into a pop song. The track, as it now starts on the album, starts on one tempo and ends on a completely different one, but it feels like it is the right thing to do. That is the way Tom wanted it."

During the mixing sessions for the album, there was also considerable experimentation with different consoles to see which one suited the songs most. As Dodd explains, "I was given the luxury of taking one song to three studios. I mixed the song without using any outboard equipment or any EQ—just a faders-and-panpots-type deal. I emulated a balance in every studio. I even took the format that I was recording onto with me from studio to studio, so the only thing that changed was the multitrack source machine. I put the three mixes onto a CD, and I didn't tell anybody what studio 1, 2 or 3 were. Everybody [Petty, Cambpell and Rubin] said they liked 1 and 3, which were either Conway or Village.

"I tried to trick myself by random-playing my CD, to find out which one would win. I came to the same conclusion. I liked 1 and 3. Finally, the decision came to Tom. He came in one day and said, 'It's number 1.' So they looked

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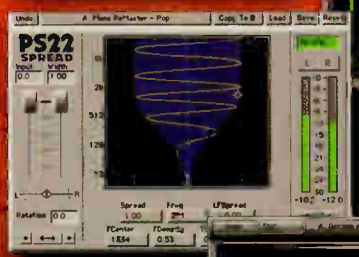

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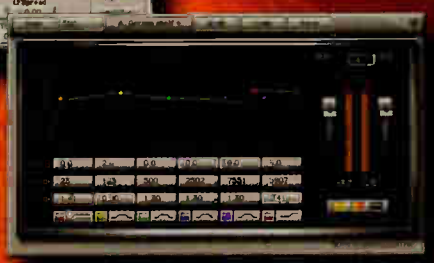

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at me and asked, 'Which one is number 1, Richard?' Well, that was Conway, with the SSL 9000.

"So we go to Conway, and I mix that same song for real this time, and it was great. I mixed another song there, and that was great. It was a similar-type song." Dodd explains. "Then we moved to a song with a completely different approach sonically. It was more open musically, and it proved to be very difficult to mix."

Dodd ended up mixing two songs on the 9000J; the remainder were done on a vintage Neve at the Village. "We pretty much have always used Neve consoles," comments Petty. "I haven't had much luck with SSLs for electric and acoustic guitars. I have never been able to get a mix on them. They just don't come through sweet, like the Neve does for me." Adds Dodd, "The Neve sounds a bit more 'real.' Drums are so transient that they seem to take on the character of the console. But I was surprised that it was guitars that showed up such a big difference."

Another piece of gear Dodd was happy to make use of on this project was a vintage Fairchild limiter at Village. "Typically, I find them very good, but boring," he says. "But they've got one that isn't. This is the best one that I've heard in America. The first one that I heard that I liked was in London in Lansdowne Studios. They had a Fairchild there that made *everything* sound better. I've been looking for that one ever since. Every time I've come across one, however, it is like, 'Oh, another boring old tube limiter.' Village has one with the same magic as the one at Lansdowne. You just plug it right in and everything sounds better, even if it's set to do nothing. Just going through it is magic."

With most projects, Dodd gives himself a "challenge" to work toward. "I almost always do something like, 'On this album, I won't use any 1176s,'" Dodd says with a laugh. "I might not tell anyone, but I do that to prove to myself it can be done. I might say 'no Neves' or 'no Shures.' For this album, we went for no 2-mix processing. We didn't use 2-mix processing on more than half of the album."


PHOTO: MARTYN ATKINS

On *Wildflowers*, Dodd set out to mix the album with no automation, and out of 23 tracks, he used automation on only five, and only two or three ultimately ended up on the album. "For this album, though, I knew I wanted to use automation," he says. "The reason being that I wanted the facility of having some of the mutes automated, so I could turn off some spurious sounds. Benmont would simultaneously play the acoustic piano, Hammond organ and chamberlain, with foot switches and pedals going. He's got his method down, but that meant that, if he had to stamp on a switch or something, and the mics are still open for the piano, which are going to the same tracks, you are going want to, if possible, get rid of that click without destroying the feeling. If that happens at the same time you have a vocal ride to do, then it is nice to have the automation."

Asked if there were any tracks that have emerged as favorites, Campbell quickly replies, "I like this song called 'Room at the Top' and a song called 'Counting on You.' 'Room at the Top' starts sort of quiet and gets really loud; it's hard to describe it. There's a lot of drama to it."

"Like *Macbeth*," interjects Petty dryly.

"Yeah, like *Macbeth*, Tom says," Campbell laughs. "How do you describe a piece of music? You just have to listen to it. It just sounds like us playing."

"There's a lot of dynamic and variance in the tone and attitude of this album, but it's just all played by a rock group," says Petty. "There are no loops and stuff. It's just us playing, which I think is becoming more and more rare."

"At this level of recording, you can do whatever it takes to get the best result," Dodd concludes. "'Which system shall we master to?' 'I don't know.' 'Well

let's do all of them.' That's the luxury. When you put together the cost of the rental equipment, the cost of the studios and everything else, Tom certainly hasn't scrimped. But at the end of the day, it sounds like they just went in and played it, and that's a high compliment. I think that is what the goal was. They played until they got it right. It was all about getting the right mood and the right feel." ■

—FROM PAGE 173, IVO WATTS-RUSSELL

from studio projects, but he has returned with the Hope Blister, for which he acts as "musical director."

Ivo is not a musician, and he has been a producer mostly out of necessity, but he continues to explore his own aesthetic by guiding the musicians he surrounds himself with. Unlike This Mortal Coil, the Hope Blister has a fixed roster: vocalist Louise Rutkowski, bassist Laurence O'Keefe, cellist Audrey Riley, and sax player and drummer Ritchie Thomas. The group's debut album features striking, ethereal folk and romantic ambient pop renditions of songs written by David Sylvian (ex-Japan), Heidi Berry, Alison and Jim Shaw of The Cranes, Brian Eno, John Cale, Neil Halstead of Mojave 3, Chris Knox of Tall Dwarfs, and Slow Blow. Much like the repertoire of TMC, the songs of the Hope Blister are simple, but they are fleshed out with strong atmospheric contrasts, such as when distorted effects gradually engulf the stirring strings of "Spider and I." Some of the songs are purposefully stark—not exactly conforming to a traditional band concept, but floating in space. A good example of this is the dreamy "Dagger," where Rutkowski's vocals soar over swirling ambient drones that morph with swelling and subsiding strings.

"The hope with this album," Ivo says, "was that somebody would respond to it because of that place that it would take you, keep you there and lead you through from start to finish. I like that with music. I never really understood why a song has to end, especially fade out, and be given silence before another song will start up."

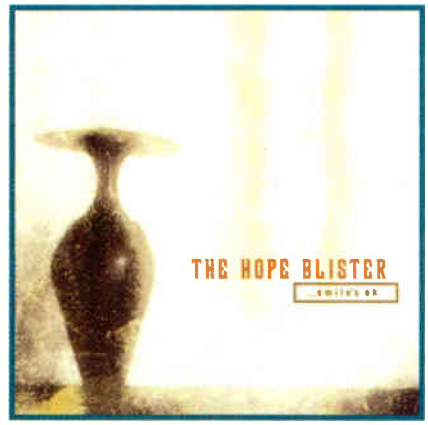
Much like a Harold Budd or Brian Eno ambient excursion, the music of the Hope Blister often suggests other musical ideas. Like the playful shadows created by flickering candles in a dark room, the Hope Blister's music creates subtle nuances and implied spaces. When this topic comes up, Ivo refers to the recent Sheila Chandra release, *ABoneCroneDrone*: "In the liner notes, she says these are drones, and the clashing drones suggest melodies, and all she has done is provide you with some of the melodies that she hears from those drones with her voice," he explains. "There is a temptation to want to make those suggestions tangible by recording them. Sometimes I've got to know when to stop. With each new melody, especially within the context of drones and loops, the way that those relate to each other will suggest a new one." (To satiate his desire to explore different aural possibilities, Ivo recently collected instrumental extractions from this album, which he compiled, looped and "chopped up" for a vinyl release entitled *Underarms*.)

Considering that the Hope Blister is not your typical pop group, creating their latest album, *...smile's OK*, meant shirking standard recording procedure. Even though the group was recording covers, they were still unusual interpretations. "The vocals and the strings were put to the arrangements that we did on bass guitar or just keyboard stuff or samples," Ivo explains. "The basic arrangements and melodic structure

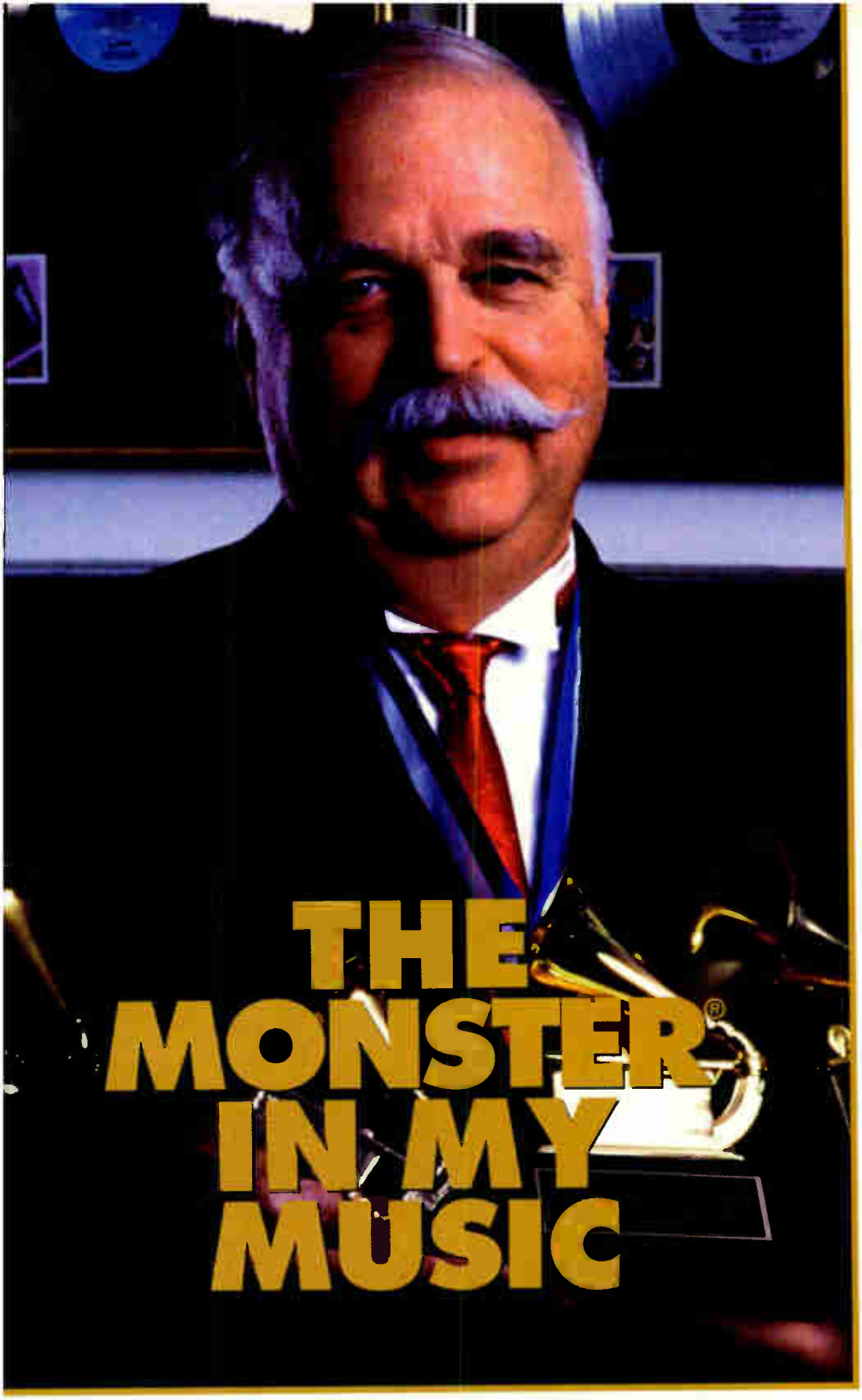
formed the basis for the pieces, then vocals were recorded over those. For the four songs requiring the string quartet, those parts were added after the vocals. The finishing touches came during mixing. The treatments of all those sounds makes it sound like there's more instrumentation than there actually is."

As a way to unify the diverse output on the label, many 4AD albums, particularly during the '80s, were presented with dreamy, surreal, soft-focus photography or art on their covers. The booklet for *...smile's OK* is no exception. But the music contained within each CD package was and continues to be strikingly different. Indeed, the alternative rock of The Breeders, the early Goth stylings of Clan of Xymox, and the slow-moving folk of Red House Painters are quite diverse and not easy to classify, and nearly impossible to lump together. Which naturally leads to the question—when Ivo founded 4AD, was there a goal in mind?

"What's your goal when you ask somebody out on a date?" he asks. "You don't really know. It's an attraction or an interest, and when you make that suggestion, you have no idea whether you'll end up marrying that person or having a disastrous one-off date." He says his initial flirtation with the concept of starting a label was inspired by the influx of intriguing singles he encountered at his record store job in the late '70s. Ivo felt that at that time it was "always worth listening to everything, because somebody somewhere was doing something that you'd never heard before. I just wanted to be part of it. I wanted to find out about the mechanics of making and distributing a record. It was just opportunity and curiosity, really. Gradually, within the first two or three years, a bigger picture evolved of wanting to develop trust from an audience and a degree of label identity, that there might be something worth listening to because it was on a particular label. Wanting to have the opportunity to work with a really good graphic designer, wanting to push the boundaries a bit through the way that records were presented."



Since 1980, 4AD has been responsible for releasing a slew of innovative artists who have challenged the boundaries of popular music. From the lush, ethereal beauty of the Cocteau Twins to the multicultural fusion of Dead Can Dance to the amorphous, romantic sound tapestries of This Mortal Coil, 4AD has already left a strong legacy. One of the main reasons for this is that much of this music is timeless in nature. "I'm pleased that you say they're timeless, because that's definitely been the hope in terms of wanting to work with most people," says Ivo. "If you think that they're doing something that's individual, it *will* stand the test of time. In reality, I think it's very rare that that happens. I think that records are dated by the production or the time in which bands grew out of. The hope is that



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every record you put out is going to be like the Velvet Underground—that they'll still be completely exciting to somebody 30 years later."

Whereas today many artists have sophisticated home studios, in the early days of 4AD, "we had a good relationship with a handful of studios," Ivo says. "We were working with people who were very helpful, and it was pretty cheap. A large number of early 4AD albums, including those by the Cocteau Twins, were recorded at Blackwing Studios in London, which was initially equipped for 8-track recording, but eventually evolved into a 24-track facility. John Fryer was an engineer I always worked with at Blackwing."

Ivo notes that it was economics that originally dictated his becoming involved with production. "By default, I ended up sticking my nose in the production role. It became the type of thing that if I was disappointed at the end of the day, then I had myself to blame because I had been there every day.

"I think a producer is somebody who becomes the extra member of the band for a period of time, and he or she has the trust of the group with all of their ideas," he continues. "They become part of the whole process. I make things up as I go along, and I find it quite hard to be able to convince somebody that this is a good idea that I just thought of three minutes ago. I really enjoyed the whole process, and that's really why I created This Mortal Coil—to allow me to bring people one at a time to the studio, have them to do whatever they do, and then go away. So I wouldn't have them looking down my neck saying, 'That backing vocal needs to be louder,' or 'Why are you using that?' Do your thing and go."

Still, Ivo thinks of himself more as a musical director than a producer, and in that role he's been quite successful. Years after their release, the three albums by This Mortal Coil are still resonant, full of life, warmth and a sense of mystery. And the Hope Blister continues that tradition. For his part, Ivo wants to be involved with discovering music that is new and different.

"I remember being young and hearing music and thinking, 'I didn't know music could do that,'" he says. "Just getting an idea of people's imaginations and experimentation and innovations as opposed to something simply fitting into being marketed or played on the radio. The impact on me as a 12- or 13-year-old of Pink Floyd's *Piper at the*

Gates of Dawn [their first LP] was enormous. I like to think of people the same age today perhaps hearing My Bloody Valentine's *Loveless*, and that having the same impact—that they didn't know that you could do that with music." It all comes down to feeling: "That can be a feeling of a release, of pent-up tension or aggression, or just being transported through a beautiful moment or an emotional setting. It's just something that connects. I don't know why it does it, but it's there, and I'm bloody glad it is." ■

—FROM PAGE 173, KING CRIMSON

benefits from the DTS surround sound. The oversampling with DTS is so impressive—I've heard some 1960s Tamla/Motown, and it sounded like it could have been recorded yesterday. The DTS system is quite apart from any surround sound facility as a way of enhancing music. It's worth doing it just for that, even if the music wasn't originally conceived that way."

Incredible sound and sharp images are well-known attributes of the DVD format, but there are other qualities the KC DVD employs that make the disc unique. On the song "VROOOM VROOOM," for example, the disc features video of all six members of the band captured in sync with a seventh view showing them all together onstage. Any of the musicians can be selected to be seen individually, with their musical part becoming prominent on the center speaker of the surround sound configuration, allowing the listener/viewer to change the visual and musical perspective at will.

David Singleton, an engineer and director of Discipline Global Mobile, Fripp's record company, notes, "I created seven separate mixes for 'VROOOM VROOOM.' I'd assumed initially that it could be done discretely, instead of me having to do seven complete mixes, but it didn't work out that way. Due to space limitations it's the only selection that has this feature." Singleton says that *Deja VROOOM* is his first work in surround.

"The original 48 [tracks of] ADAT were mixed to six ADAT tracks for the 5.1," he notes. "Because the originals were on ADAT, we used an 02R—the Yamaha digital desk—which has surround sound capability. Also you get a digital optical link from an ADAT to an 02R so you don't have to use the D-to-A converters on the ADAT.

"We had a lot of discussions about how to use the surround sound," Singleton continues. "A lot of other projects that have used it seem to have the music in the front three speakers with the ambience or crowd behind you. We felt that the six-piece version of King Crimson always was very limited in stereo; it was quite hard to squeeze them fully into it. So we thought that rather than doing that, what we would do is open it up and effectively sit you down in middle of the sound. Because there are two drummers, it opened up a complete new possibility for panning. So we got one drummer left-front to left-back down your left-hand side, and one drummer down your right-hand side. Once you do that, you've sort of liberated yourself from the standard stereo perspective. The voice is in the center-front, the two guitarists diagonally across the left-front and right-front speaker. The bass should be flat and aptly smack overhead and equal in all four speakers. Trey Gunn, the Warr guitar player, is behind you in the rear two speakers.

L to R: Trey Gunn, Robert Fripp, Bill Bruford, Adrian Belew, Pat Mastelloto and Tony Levin

"That idea was fine, except the way people configure their systems, and where they sit, is a movable feast. Having established that basic panning pattern, we tried to make it so that it made sense to anyone who listened to it, and that it wouldn't change that much when you moved around."

All went smoothly with the project until Singleton started working on the segment titled "21st Century Schizoid Band." "Then all sanity went completely out the window," he says with a chuckle. This interactive section lets KC fans mix and match the rhythm section, vocalist and lead instrumentalist from four different versions of the band ('69, '71, '74 and '96) to create 64 different versions of the group's "21st Century Schizoid Man" (off the first KC album). "That was a mistake," Singleton says wryly. "I just mentioned the idea, because it's something the fans all talk about: 'Who's your favorite singer in King Crimson, guitarist, or drummer, etc.?' So we thought we'll give them the chance to make the band they want to hear. I just made a throwaway comment, and of course the phone rang, and they said, 'Oh yes we really like this idea.'

"It proved all right except there weren't any multitrack tapes of the first band. They'd been stolen. Basically, what you do is take the multitrack tapes and time-compress them until they're playing in time and pitch with each other, so that you can lift vocals, guitar or whatever from one and put it top of the track of the next. For the 1969 band all I had was one stereo bootleg. So we had to try to isolate the parts as best we could out of this mix. It proved to be more of a nightmare than it should have been."

The person who inherited this and other headaches associated with the project was Lisa Mattei from Zomax (formerly KAO Infosystems) in Fremont, Calif. She produced and edited the project and originally pitched it to Discipline Records. "This was a unique project for me on many different levels," she says. "I had a personal bias as far as wanting to work with them. I find them to be a very innovative band, and it's hard to put the rock label on them, because they transcend so many musical genres. I perceive them as being a cross between *Blade Runner* and *Lord of the Rings*. It was a wonderful project to sink my teeth into. The history of the band made it a lot of fun, and I was already pretty familiar with their work. Also, if you're going to pursue a project that is over a year in development and in execution, you better like it."

Compiling and editing the video segments took Mattei four months. During that time she sifted through 52 hours of the band's stockpiled concert material to find the most presentable footage. "I looked for songs that would have multiple angles," she says. "Then I would edit them down and correct them. It was a fairly long process. Selection criteria for considering a song like 'VROOOM VROOOM' were, 'Do I have enough video for each musician, and how stable is it?' Once I narrowed it down, then I would present it to the band to see what they thought. Trey Gunn [bassist] was the easiest person in the band to get a hold of since he was in Seattle and in the same time zone. [Guitarist/singer] Adrian Belew was in Nashville. I'd correspond back and forth with everyone. I'd give tapes to Tony

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LOS ANGELES RECORDING WORKSHOP

[Levin]. Also I gave tapes to Adrian and Trey. We'd all go back and forth discussing the pros and cons of each of the tapes, but in the end it all went to Robert."

The final vote of approval pertaining to any King Crimson-related project always falls to Robert Fripp, who seems to have the energy of ten men and as many projects on the fire at any given time, from KC releases to various solo configurations, his Guitar Craft students and his record label, which now boasts more than 30 artists.

"I stay fresh by doing what is true and not going through the motions," Fripp comments. "Music keeps you alive and is eternal. When the door opens and music walks in the room, a moment in that world is worth seven years here. And that's what keeps me going. Music is time stood still, and within that time you're as young as you like.

"Only now the technology has become available to actually represent the music as imagined. And I'm really more interested in live performances: That's the 'hot date.' But if you're going to listen to music at home, then that's your love letter. Then it would be nice if your love letter could be as moving a representative as the hot date. Take the CD player—it plays multi discs, has a random mode, and is a lot more advanced than tapes/records from years ago. But once you've heard surround sound, you can never go back [to stereo]." ■

—FROM PAGE 174, COOL SPINS

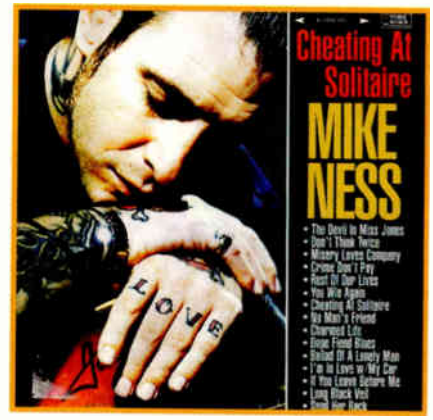
a bit. Paris Combo, a quintet led by the pleasing singer Belle du Berry, is the more "traditional" of the two—its lineage to classic Parisian cafe/cabaret groups and '30s/'40s "hot jazz" groups is apparent on several cuts. But in keeping with the flavor of modern Paris, there are also strong Middle Eastern flavors on a few cuts and some *gitane* influences as well. It's an eclectic romp that swings and soars. Les Nubians are Helene and Celia Faussart, a pair of French/Cameroonian sisters from Bordeaux who specialize in a smooth, eminently listenable "Afropean" hip-hop and jazzy pop influenced by everyone from Arrested Development to Soul II Soul to Miriam Makeba. The sisters' harmony blend is exquisite, and throughout they're backed up by a combination of able live players and the usual beat-box/programmed rhythms. A nice surprise that is already winning converts in the U.S.

Paris Combo—Producers: David Lewis, Alain Cluzeau, Paris Combo. Engineers: Alain Cluzeau, Yannick Cayuela. Studio: Acousti Studio (Paris).

Les Nubians—Producers: Les Nubians, Mounir Belkhir, Lee Hamblin. Engineers: Pascal Garnon, Lee Hamblin, Sophie Masson, Tim Latham. Studios: Studio du Manoir (Lyon), Soul II Soul Studios (London), Studios Plus XXX (Paris), Studio Davout (Paris).

—Blair Jackson

Mike Ness *Cheating at Solitaire* (Time Bomb) Mike Ness' first solo album is a bit more countrified than his work with L.A. punk band Social Distortion, but only a bit. The

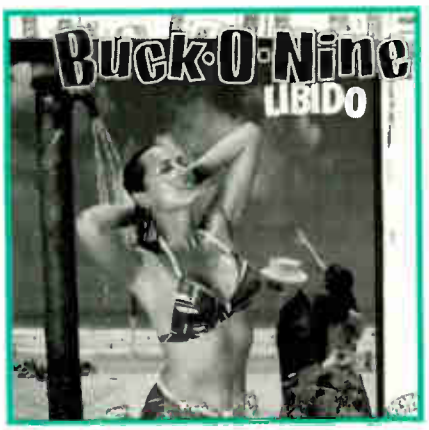


most lovable aspects of Ness' music remain the same: his passionate gravel voice, washes of rhythmic electric guitars, strong songwriting and great taste in covers. In addition to his own tough originals, Ness offers a raucous take on Dylan's "Don't Think Twice" and tender renditions of Hank Williams' "You Win Again" and the country classic "The Long Black Veil." He further shows off his good taste by getting Bruce Springsteen to duet with him on the sinister hard rocker "Misery Loves Company." Also, Brian Setzer's Gretsch is discernible on "Crime Don't Pay," and Billy Zoom of X rocks again on the darkest track, "Dope Fiend Blues."

Producers: James Saez and Mike Ness. Recording engineer: James Saez. Mixing: James Saez and Mike Ness. Recording studio: Ocean Studios (L.A.). Mixing: Bay 7 (L.A.). Mastering: Eddy Schreyer, Oasis Mastering (Studio City, Calif.) —*Barbara Schultz*

Buck-O-Nine: *Libido* (TVT)

The latest CD from the well-established San Diego ska-punk party animals known as



Buck-O-Nine finds the band bopping all over the map stylistically, from exciting neo-Clash workouts to speedy, horn-driven ska and even some quieter, more contemplative numbers. There's lots of variety from track to track and for a group of anarchic f-ups, they play and sing with great precision and skill; obviously, they care about making good records. The challenge for this type of band is always to translate the spirit of their live performances to tape, and though I confess I haven't seen them play, I *can* say that the CD is a high-energy blast from beginning to end. It's great dance music, and the lyrics tackle a number of interesting themes, both social and romantic. You've got to love a band that announces "We're alright, 'cause we do what we do and we do it every night"!

Producers: Stiff Johnson, Buck-O-Nine, Harold Johnson. Recording engineers: Stiff Johnson, Steve Kravac. Mixing engineers: Chris Lord-Alge, Kevin Shirley. Studio: Big Fish (San Diego). Mastering: Gavin/ The Mastering Lab (L.A.) —*Blair Jackson*

COAST TO

L.A. GRAPEVINE

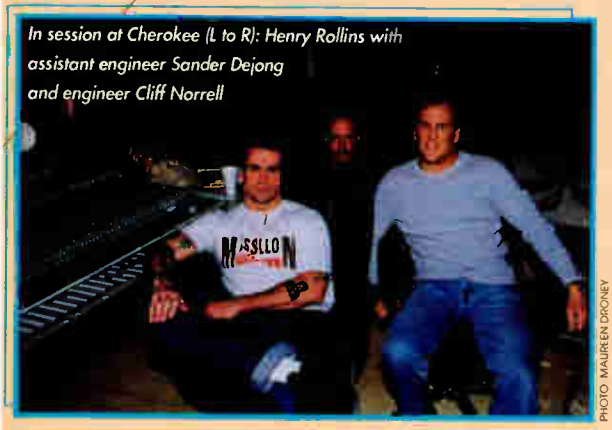
by Maureen Droney

One of the hottest tickets in town during March and April was Henry Rollins' sold out spoken-word series at Luna Park. I caught the show one week, and a few days later I found myself over at Cherokee Studios on a Saturday afternoon, where Rollins is recording his next album of music with engineer Cliff Norrell and assistant engineer Sander Dejong. Sitting in front of the vintage Trident A-range console in Cherokee's Studio One, Rollins, coffee cup in hand, held forth on his spoken-word career, his new record and the current state of music.

Rollins doesn't care for the term "spoken word," and he dislikes the word "poetry" even more. "I just get up there and kind of let it rip," he says. "Is it comedy? Yeah, it's kind of funny, as life is for the most part. All I know is it's one thing I'm able to do 50 to 80 nights a year all over the world, and I enjoy these performances a lot. It comes easily—it's no problem for me to go up and talk my ass off for two hours."

He is similarly elusive when questioned about the kind of album he's currently making for the Dreamworks label. He's no longer working with the musicians who made up The Rollins Band for the past ten years. "I love them dearly," Rollins says, "and I hate to cite musical differences, but they've moved in a direction where I can't keep up with them—an avant jazz thing and some really complicated music. I'm very limited capacity-wise vocally, and I think I'd be holding those guys back. And it goes both ways—I don't want to be contained either. On the last record, I

—CONTINUED ON PAGE 190



In session at Cherokee (L to R): Henry Rollins with assistant engineer Sander Dejong and engineer Cliff Norrell

PHOTO: MAUREN DRONEY

Bob Power at the new SSL 9000 J in Studio D at Sony Music (New York City)

NY METRO REPORT

by Gary Eskow

Urban hip hop fuels the New York recording industry. This month we profile a pair of recordists who have had considerable success in this area of the business.

Producer/engineer **Bob Power**, whose credits include production and mixing work on Erykah Badu's double Platinum debut LP *Baduizm* (the 1998 Grammy winner for Best R&B Album and Best R&B Female Vocal), started out as a guitarist in Westchester, New York. He got a Masters in music from the University of San Francisco and spent six years working as a television underscore composer in the Bay Area before returning to New York. By 1984 he was producing and engineering out of Calliope Studio. "I got into engineering when a staff engineer at Calliope went on vacation for a couple of weeks and the owner asked if I wanted to fill in for him," Power says. "A couple of weeks turned into, well, now!"

"I got involved in hip hop through the Calliope gig," he continues. "The first hip hop record I worked on was the first Stetsasonic record—the single was 'My Rhyme.' This was right at the end of the first wave of hip hop and the beginning of the second, back in the mid-'80s. At that time, rap and hip hop were even more specific to New York than they are today."

"Hip hop rules in New York," Power adds. "Of course, it's a huge factor in other markets as well, but in terms of billable studio hours, hip hop dominates New York more than anywhere else. L.A. is a rock city, and Nashville is Nashville, but if you want to be a successful engineer and producer in this town you have to understand this genre."

Rapper KRS-1 once told me that "race is always an issue," and I felt I had to put the question to Power directly: Has color been an impediment to you in your work as an urban music producer/mixer? "I played in black bands my whole life," Power replies. "My work as a white person in the hip hop field has been a great object lesson: We often let ourselves get confronted by what we *think* is going to happen—in the studio, on the street, wherever—instead of seeing people as human beings. Guess what?

—CONTINUED ON PAGE 192

COAST

NASHVILLE SKYLINE

by Dan Daley

Nashville may be a crazy place to be in the studio business, but it is a caring one, and I'd like to lead with two bits that are worth mentioning because they have nothing to do with consoles, speakers, or mergers and acquisitions.

Engineer Gene Eichelberger is one of Nashville's links between the past and present of the studio business here. He engineered with producer and Quad Recording founder Norbert Putnam for many years on a variety of music projects at the Bennett House in Franklin, Tenn. More recently, as a freelance engineer, he has worked in virtually all of the rooms in and around Music Row, on projects for artists such as Dan Fogelberg, Tammy Wynette, Steve Miller, Neil Young, Jimmy Buffett and Jewel.

Eichelberger went into Vanderbilt University Hospital earlier this year for treatment of recurring liver problems that go back to his childhood, and he's now awaiting a liver transplant. The AES Nashville chapter donated $2,500 last March to Gene from their Engineer Relief Fund. Funds donated were raised via the Nashville chapter's Audio Masters Golf Tournament, which is held every May. Anyone interested in contacting Gene can do so by contacting Vanderbilt Hospital or the AES Nashville Chapter (www.aes.org/sections/nashville/).

In an effort to help out on another front, Emerald Recording held a St. Patrick's Day party, which doubled as a benefit for St. Jude's Hospital. Emerald owner Dale Moore announced at the gathering that it would now become an annual event to help fund the charity.

Peripheral Vision—Nashville is getting prettier around the edges. Turmoil seems to be enveloping the Row with studio closings and consolidations, the almost

—CONTINUED ON PAGE 196

New MCA Nashville artist Alecia Elliott (with flowers) worked on her debut at Recording Arts (Nashville) with help from (L to R) studio owner Carl Tatz, co-producer Jeff Teague, engineer John Jaszcz, co-producer (and label president) Tony Brown and assistant engineer Grant Greene.

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

Sugar Ray mixed their single "Falls Apart" with producer/engineer David Kahne and assistant James Murray at Scream Studios in Studio City...At CanAm Studios (Tarzana) Cafe Tacuba mixed their new album with producer Gustavo Santoallo, engineer Joe Chiccarelli and assistant Travis Smith...Mercury recording artists Downset tracked in Studio A at Sound City (Van Nuys) with producer Roy Z. and engineers Billy Bowers and Nick Raskulinecz. Mike Terry and Sam Storey assisted...Rob Chicarelli mixed a song (produced by Guy Roche) for RCA recording artist Christina Aguilera at Pacifique Studios in North Hollywood...Universal Records artists Stroke 9 worked on their next release in Studio A at Sound Image (Van Nuys) with producer Rupert Hine, engineer Ruadhi Cushnan and assistant Chris Morrison...Beck recorded new material at Grandmaster Recorders (Hollywood) with producer/engineer Micky Petralia and assistant Andrew Alekel...Ron Boustead mastered singles for Lenny Kravitz at CMS Mastering in Pasadena, CA...Recent projects at Oceanview Digital Mastering (L.A.) include a Phil Collins song for the soundtrack to Disney's *Tarzan*, mastered by Joe Gastwirt...Sony Music artists Protein mixed for a new release at Skip Saylor Recording in L.A. with engineer Randy Staub and assistant Ian Blanch...

NORTHEAST

Rustic Overtones tracked for Arista Records at Avatar Studios (NYC) with producer Tony Visconti and overdubbed at Longview Farm (North Brookfield, MA)...In the Euphonix mixing suite at Morning Star Recording (Ambler, PA), Vicki

—CONTINUED ON PAGE 196

PHOTO: PAUL NATKIN

Chicago's Gravity Studios installed the city's only vintage Neve (an 8058) in mid-'98. Recent projects on the board include Veruca Salt recording for DGC with producer Brian Leisgang and engineer Chad Adams, and Sony 550 artist Verbow mixing with producer Brad Wood and engineer John Hiler.

—FROM PAGE 188, L.A. GRAPEVINE

felt a little restrained with the amount of notes and time signatures.

"I really like hard rock music," he continues. "My favorite musical icons, besides John Coltrane, are in the rock world. I'm in awe of people like Monk and Mingus...I've got every Duke record ever seen, and I like Lennon/McCartney, Hendrix, whatever, but for me, Thin Lizzy's *Jailbreak* is a desert island record. Robin Trower, Van Halen with Dave—that stuff is what I listen to a lot...Jane's Addiction, Alice in Chains..."

In light of that, Rollins has hooked up with local rockers Mother Superior, who've become the band on this recording. Instrumentation is simple—drums, bass, guitar and vocal, with piano, keyboards and saxophone making brief appearances. "These guys and I are on the same page musically," Rollins says. "Years ago they gave me their first album called *Right in a Row*...I did liner notes for the second album and mastered it for them, and on the fourth album, *Deep*, I produced. After we were done I said, 'Want to do some music with me?' We rented some rehearsal time just for the hell of it—figuring at the worst we'll kick some blues jams and have a laugh. But we wrote three songs the first night. So we practiced for five days, then came in here for four and recorded ten songs.

"I've seen a lot, and I'm a very harsh critic," Rollins says. "To me most contemporary bands suck. I have no respect—they can't kick it live, they have no sense of musical context or history. They're not familiar with Muscle Shoals, Stax, Motown, Robert Johnson...they have a record collection of maybe 40 records.

"On the other hand, there's people like John Fogerty, Neil Young, Dylan, who comes out of nowhere with *Time Out of Mind* in his 35th year of recording! He means it. Miles Davis, he always meant it—and that to me is lacking in a lot of records that come out today. See, music is pure; the only thing that screws up music is people. Music is waiting in the air for someone to channel it through without stepping on it. Coltrane did not get in the way of music; he was humble before it. Besides being outrageously talented, he did not go, 'I'm the man.' He went, 'The music is the man.'

"I'm not an elitist," Rollins adds. "I'm just this guy out there in the world waiting for somebody in a band to turn me on. That's why I bought the record, because I'm hoping you're going to get me off, and I really, really need it—I want a new favorite band.

"I got lucky with Mother Superior," he says. "This is a band that can't wait to go to practice. They'll play all night if you let them—all they want to do is play or talk about playing. The music for this project was conceived quickly in the spirit of the real deal and we didn't agonize over it—you mix too much you can turn a fresh peach into a can of peaches. The lyrics are good, we got good sounds on tape, and it's a band that knows their instruments. I guess my hope with this record is that people get what a good time we were having making it and enjoy it as much as we did."

Cherokee co-owner Dee Robb filled us in on other happenings at the facility, where recent projects have included Meredith Brooks with David Darling producing and Brian Reeves engineering, The Beach Boys with Al Jardine producing, and Dave Navarro with producer Danny Saber and engineer John X.

Equipmentwise, there's a lot of news. Studio 5 has been a beta test site for Otari's 96-channel Advanta digital console, and according to Robb, the experience has been a good one. "It's been very different for us," he observes. "My brothers and I are audiophiles—I hate to say analog guys, because we use a lot of digital processing gear when we mix—but in general I've usually found that the things I don't like in the digital domain are equalizers and compressors. But we were really intrigued by this console. One of the things I liked, when we saw it set up in a showroom, was that I sat down at it and without anybody really telling me anything, I could make it do something. I was really pleased with the basic ergonomics and the user-friendliness. We were also pretty impressed with the way it sounded there, and when we got it over here and we put up some of our own program, we were very impressed. So our plan is to keep the Advanta; the only thing that isn't sure is if it will stay in Studio 5 or go into Studio 2, which is a much bigger mix room."

Studio 2, at the time we spoke with Robb, was being fitted with a new Otari Elite plus console, a digitally controlled analog desk with 96 automated faders. "We're testing the water," he continues. "Both of these consoles are a pretty different approach from what we've normally done. We like the sound of the Elite Plus, and we also like the idea that it was designed by the two circuit designers of the 550 API equalizer and the API mic pre's. It's a very flexible con-

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sole, and everything is pretty much resettable. We're going to have both rooms up with 5 and 7.1 surround capabilities, and then we'll decide which one has the DSP console."

There's more—those Trident A-ranges in Studios 1 and 3 are being expanded with the addition of two Flying Fader-automated Neve 4876 sidecars. The 4876 modules have, according to Robb, virtually the same circuitry as 10 Series Neves, but with a smaller footprint that makes the sidecars work better logistically.

"In the past we hadn't automated Studio 1," Robb says "because of the way our plant here is laid out. We have a big tracking room, a smaller tracking room and then the other rooms are basically overdub and mix rooms. We tried to keep people getting the tracking done in Studio 1, then moving on to the other rooms to keep the flow of business going. However, in this day and age you have to do everything everywhere. Now, we're going to automate these two sidecars and then you'll be able to plug one or both into either of the Trident consoles."

Continuing the flexibility theme, Cherokee has also purchased two Otari RADAR II hard disk recording systems and has available a 32-channel Pro Tools system. "For us right now," Robb concludes, "it comes down to not just going in one direction or the other but to making intelligent decisions and choosing combinations of equipment that make sense." ■

Got L.A. news? Fax Los Angeles editor Maureen Droney at 818/346-3062 or e-mail msmdk@aol.com.

—FROM PAGE 188, NY METRO REPORT

When those studio doors close, everyone has the same goal—to make the best record, the strongest artistic statement, they possibly can. I'm competent as a producer and mixer, and the people I've worked with have always tried to take advantage of my talents, as they should. Ultimately, my job is to make people's hopes, dreams and vision come to fruition in the most expressive way possible. I've never had problems in the studio based on race."

Power currently operates out of a project studio space he rents at Sony Music Studios on W. 54th St. and also does some consulting for Sony on sonics, procedures and personnel issues. In his space, Power tracks either to a

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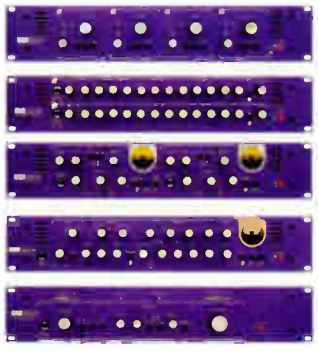

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bank of DA-88s or to hard disk, using Logic Audio. "I love Logic!" he says. "It lets you work on either a very simple or complex level—sometimes both ways at once—plus its time feel is the best, since it has a 960 pulse per quarter note resolution. I'm also a big fan of all the affordable digital consoles. I own an 02R because they were the first on the scene, and it was a ground-breaking piece of gear. It's not a Capricorn, but I'm not sure if a Capricorn is worth a half-a-million dollars more.

"All my pre-production work is done here," Power continues, "and I take the sequences, hard drives (if used for recording), and digital tape directly to the room we'll be finishing in and drop to 2-inch tape. I prefer to take my entire rig wherever we'll be working, rather than drop in my place. The work method of combining analog and digital is critical to me. The thing about analog is that it sounds great when you first drop, but after thousands of playbacks, the snap crackle and pop is gone. Therefore, it's important to integrate digital recording into the process and save wear and tear on the tape. For me, that means using Logic for lots of the tracking. By the way, I have 64 tracks of Pro Tools Mix Plus in my room, with Apogee AD8000 converters. The sound is great—I use Logic as the front end to Pro Tools.

"I've got lots of other toys," Power adds. "I'm a vintage analog freak, and I know how to twist the knobs. Plus I'm a player, so I can get inside the music and people tend to be interested in my approach to the art. I'm involved these days with lots of different kinds of music, but the thread is the same as it always was—the desire to make good music with good people."

I caught up with engineer/producer/artist **Prince Charles Alexander** the day after he tracked Elton John's piano playing on the SSL Axiom-MT at Quad Recording. (Alexander mixed Mary J. Blige's re-arrangement of John's "Bennie and the Jets"—titled "Deep Inside"—and the superstar was happy to make a guest appearance on the track.) A jazz sax player, Alexander dreamt of becoming the next Grover Washington as a kid while growing up in the Boston area—at least until he saw Isaac Hayes in concert. "That show knocked me out," Alexander says, "his showmanship, the theatricality of the whole enterprise. I realized I wanted to add some of that commercial appeal to my work."

After graduating from Brandeis University with a degree in political science Alexander concentrated on building a popular base for Prince Charles and the City Beat Band, the group that he had developed while in school. "Eventually, I put out three albums with my group on the Virgin label, which did quite well in Europe. In the early '80s, rap and funk were duking it out for market share. My group was a funk group. Remember when 'Walk This Way' came out in 1985, the collaboration between Run DMC and Aerosmith? That was the side that sealed the victory for rap.

"So there I was," Alexander continues, "sitting at the desk where I was doing a little part time telemarketing, realizing that I had a major recording company deal slipping through my fingertips. My career was in jeopardy. What was I going to do? I saw an ad for the Center for the Media Arts, and I checked it out. I learned the craft of engineering there."

After training, Alexander took the obligatory interning jobs, and he found that his career as a recording artist helped move his engineering career along. "I used a lot of the contacts I'd gained as a producer for my band," he says. "After coming back from one more lengthy European tour in '87, I made a

decision to just engineer for a while. That was the beginning of a 12-year spurt of activity that's taken me through today.

"To be a successful hip hop engineer you have to understand the artists and their environment," Alexander says. "I'd say that L.A. is more funk-driven; New York is based more on R&B and pop. New York hip hop is based off of the dancing and singing groups of the '80s. The track we're working on now with Mary is a good example. It traces back to Puffy's remake of Sting's 'Every Breath You Take.' Now we've arrived at the blue-eyed souling of hip hop—Eminem is the artist. The white populous has moved from being the listeners of hip hop and are now participating in its creation as artists. Is there a segregationist impulse within the black community that resists this incursion? I think so, fair or not. We don't tend to own banks, or the trucking industry, so there's a desire to hang onto the part we do own—the creative part."

Ark Angel Music is the name of Alexander's midtown project studio. It's currently based around a Mackie 32•8 console, but Alexander plans on replacing it with a Mackie Digital 8-bus in the near future. "As far as speakers go, I'm an NS-10 guy," he says. "I also operate with a core hip hop setup, which includes a multi-ADAT rig, Korg Trinity and Roland 1080 sound devices, and an Akai MPC 3000."

Prince Charles Alexander at Quad Recording (New York) Studio B's SSL Axiom-MT

He's had some success in Europe with artists he's developed (writing material with a team of producers, recording them at his studio and shopping them around), but Alexander practices and plays every day and sometimes yearns to get back into the artist seat. Continuing to build his career as a recordist, though, is a goal that looms large for him. "It's interesting that you're pairing me with Bob Power in this article," he says, "because he's indirectly a mentor of mine! Bob's gone through the engineering thing and is now building a production company from that success. I'm watching him to see what his moves are, and I'm learning from his work. It's helping me become a better producer." ■

E-mail your New York news to New York editor Gary Eskow at scribeny@aol.com.

—FROM PAGE 189, NASHVILLE SKYLINE

clockwork-like disappearance of record labels (real ones, anyway, which are rapidly being replaced by Internet labels), and cutbacks at music publishers, which still account for a lot of demo work in Nashville. But Williamson County, Nashville's affluent neighbor to the south (think of it as Orange or Fairfield County, but with livestock), continues to blossom studios. Readers of this section have already been introduced to the four new rooms at Sound Kitchen, bringing that facility up to six studios. Two other significant facilities have either opened or expanded in the area in recent months, as well.

Bulldog Studios opened earlier this year in the Williamson County seat of Franklin, about six months behind schedule. The delay was due to several factors, including a problem with the flooring in the Tom Hidley-designed surround sound control room. But the biggest problem, says studio owner Trevor Johnson, was getting consistent labor, a problem throughout Middle Tennessee as in many other parts of the country, where unemployment is at less than 4%. (The hardest job in Nashville right now is not having a job.) Delay was also due to the fact that the control room design, executed by Michael Cronin, was so quiet that machinery had to be modified, Johnson says. The studio's first sessions in March, using a Euphonix CS3000 console, went well, Johnson adds, noting that while demand for surround mixing has yet to develop, there has been a surge in Christian recording projects, and their budgets seem to be on the rise.

That's good, says Tacoma, Wash., native Johnson, considering what's going on in country music and in Nashville in general. "I think the label closings are the best thing that could have happened to Nashville, because it's like the stock market crashing—you have an opportunity to buy," he says. Despite the late opening, Johnson says his strategy remains the same: "I put the largest part of the investment into the room, not into the equipment. Gear can come and go—I have a Studer analog multitrack and access to both Sony and Studer digital multitracks, but I didn't want to commit to either one until I see how demand for them shakes out down here—but I didn't skimp on the construction. I think that's going to be a big part of what makes it or breaks it in this area: People are coming from Nashville not just for the equipment but for the whole vibe of the Franklin area. That's becoming a big draw."

Robin Crow, owner of the recently expanded **Dark Horse Studios**, concurs. Crow added a second building to his rustic complex, an 8,000-square-foot, four-story space of unique design, made from timber and lots of glass—142 windows—and sheltering two studios.

The larger one has a 36x28 control room and a 23-foot cathedral ceiling and features a 48-input Trident console formerly located at O'Henry Studios in Los Angeles coupled with a 24-channel Martech sidecar, all linked to a single Flying Faders automation system. The smaller second studio is flexible, with no assigned technology. "One day it's an editing room with Pro Tools, the next it's an overdub studio with either an 02R or a DBA console we have here," Crow says.

Finishing off the structure is a horse barn—complete with horses—on the bottom level. "The place is somewhere between a castle and a treehouse," Crow comments. "It was kind of inspired by Peter Gabriel's Real World Studios, but the setting makes all the difference. People come for the rustic charm the place has. And all the studios have magnificent views."

As for why the periphery of Nashville seems to be doing so well while Nashville itself is reeling, Crow is unsure if there is any direct comparison. He cites the fact that many Nashville producers who once worked frequently at his original studio have gone and built their own personal studios, such as former Capitol head and producer Scott Hendricks, who now runs Virgin Nashville. "But this area has always had a lot of work come in that has nothing to do with Nashville," he adds, noting the pop and R&B work done at the nearby Bennett House by owner/producer Keith Thomas and before him by Nashville's rock and pop genius Norbert Putnam. He says that Dark Horse hosted sessions by Yes last year, with band leader Jon Anderson staying on to collaborate on a project with Crow. "It's hard to say if there's a direct correlation between Williamson County and Nashville. If there is, it's hard to put your finger on. But considering the history of the two, I'd say there's something going on." ■

Send Nashville news to Dan Daley at danwriter@aol.com or fax 615/646-0102.

—FROM PAGE 189, SESSIONS & STUDIO NEWS

Winans mixed a new live album for CGI Records with producer **Steven Ford** and engineers **Glenn Barratt** and **Tom Petroski**...Blue Rose/Rough Trade artist **Joseph Parsons** spent a month tracking for a European release in the B room at **Indre Studios** (Philadelphia) with producers **Ian Cross** and **Scott Bricklin**...**The Geranlums** tracked for a new Elektra release in Studio A at **East Side Sound** (NYC) with producer/engineer **Alan Friedman** and assistant **Fran Cathcart**...Producer **Eric Troyer** and producer/engineer **John Jansen** mixed a tune for **ELO** and **Jose Feliciano** at **Harariville Recording** (Weehawken, NJ). **Matt Sietz** assisted...**Anthony Resta** recently remixed projects for **Guster**, **Missing Persons** and **Annette Kramer** at his **Bopnique Musique Studios** (North Chelmsford, MA)...At **Inner Ear Studios** in Arlington, VA, **Down By Law** recorded for Go-Kart Records with producer **Dave Smalley** and engineer **Don Zientara**...Hip hop trio **The Council** tracked for an upcoming Tommy Boy release at **City Sound Productions**, NYC, with producer **Dominator**, engineer **Corey Folta** and assistant **William Bowen**...Folk singer **Odetta** worked on a new blues-flavored CD for the MC label at **Tiki Recording** (Glen Cove, NY). Guesting on the sessions was Dr. John, fresh from the Jazz Fest in New Orleans...

NORTHWEST

At Seattle's **Hanzsek Audio**, Native American group **Poet Warrior** tracked with engineer **Scott Ross**...Recently at **Wally Sound** (Oakland, Calif.): Future Farmer recording artists **For Stars** finishing up their second album, as well as remixes of **Zombies**, **Sons of Champlin** and **Dan Hicks** for London-based Ace Records, produced by **Alec Palao** and engineered by **Wally**...**Gravelvoice Studios**' (Seattle) owner **Scott Colburn** remixed a home studio project with **Wicker Palate** and mastered a new CD by instrument builder **Dave Knot**...**Egg Studios** in Seattle had **Dr. Explosion** and **Bryan Cohen** in working with **Johnny Sangster**...At San Francisco's **Coast Recorders**, guitarist extraordinaire **Joe Satriani** tracked for his next Epic album with engineers **John Cuniberti** and **Jeff Campatelli**. **Mr. Bungle** tracked a new release for Warner Bros. with engineer **Billy Andersen**, assisted by **Justin Phelps** and **Gibbs Chapman**...Recently mastered by **Barry Corliss** at **Master Works** (Seattle): **Trey Gunn**'s new CD *Raw Power* and **Josh White**'s *Coming Undone*...

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NORTH CENTRAL

At Madjef Productions (Minneapolis, MN), Madjef Taylor mixed for Clientel Entertainment artists Lil Buddy, Steppa, Double L and Igloo Knobs. Also, Taylor and songwriter Billy Steele mixed for Excelsior Records artist Necy for a forthcoming release...Almo Sounds artists The Pulsars recorded for their second release with producer/engineer Joe Chiccarelli at Smart Studios (Madison, WI). Jay Lison assisted...Techo duo Jackpot completed their first full-length with producer/engineer Cal Moore at his Immortal Productions (Canal Fulton, OH)...

SOUTHEAST

Outkast recorded three new, self-produced songs at Doppler Studios (Atlanta). John Frye engineered, assisted by Ken Stallworth...Singer/songwriter Eric Andersen played the last show of a recent tour in Atlanta. The date was recorded, mixed and edited by Wateree Studio engineer Eliott James for a possible CD release...At Southern Tracks Recording (Atlanta) Brendan O'Brien mixed Limp Bizkit's new Flip/Interscope release, produced by Terry Date. Ryan Williams was the second engineer, assisted by Karl Egsieker...

SOUTHWEST

Scott Keeton and the Deviants recorded and mixed their debut for English label JSP at Studio Seven (Oklahoma City, OK) with producer Dave Copenhaver...At SugarHill Recording in Houston, TX, 30FootFall recorded their new self-produced Nitro Records release, *Ever Revolving Never Evolving*, with co-producer Dan Workman...Sister 7 recorded for Arista with engineer Jim Wilson at Arlyn Studios (Austin, TX). Also in were Sire artists The Derailers, with producer Dave Alvin and engineer Stuart Sullivan...At Pedernales Studio (Spicewood, TX), Rogers & Hammerhead recorded with producer Freddy Powers and engineer Bobby Arnold... Tower Of Power mixed for their 30th anniversary live LP on Sony/550 Records at The Soundlab in Tempe, AZ, with producer/engineer Clarke Rigsby. Rigsby also remixed older Tower of Power tracks for release on Rhino Records...At Oklahoma City's AKS Recording, producer/engineer Wes Sharon tracked and mixed the debut release for indie rockers Traindodge to be released on 6X6 Records as well as completing Smarty Pants' first full length effort for Opulence Records. Additional tracking sessions were held at Oklahoma City facility The Devil's Work-

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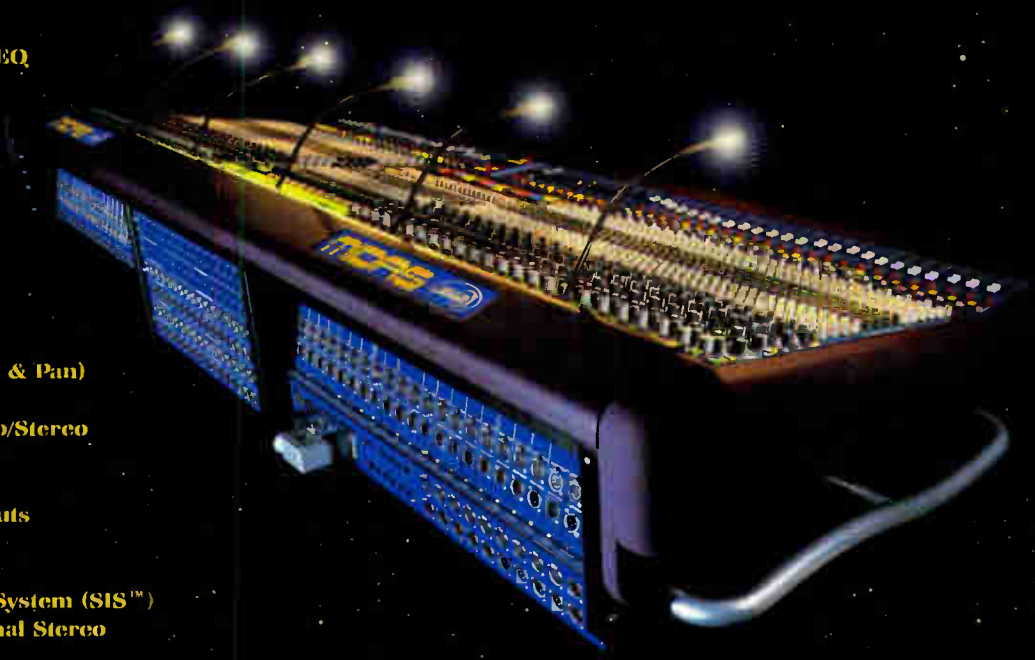

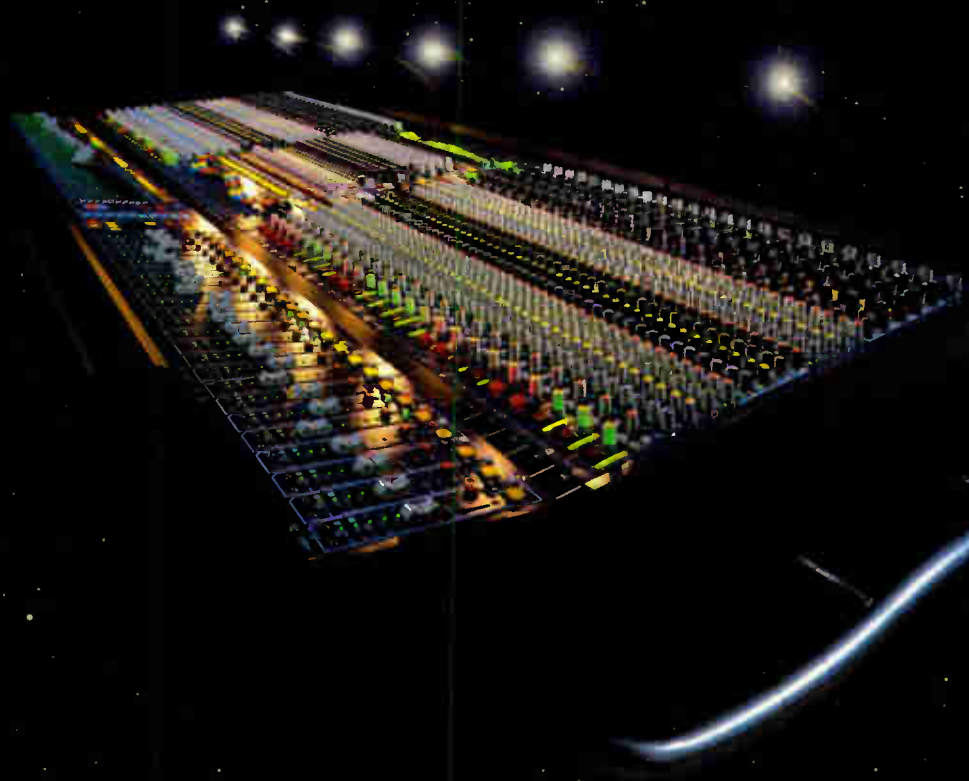

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shop...Virgin Records recording artist D'Angelo overdubbed for a new release at **Colorado Sound** (Westminster, CO) with engineer **Lorne Bregizer** and assistant **Dylan Ely**. D'Angelo was joined in the studio by Def Jam artists Redman and Method Man, who contributed vocal tracks to the project...

STUDIO NEWS

Ocean Way Recording (Hollywood, CA) has begun construction of a large, 5.1-channel surround sound control room and a smaller mixing studio. The new surround room will house a 120-input Sony Oxford digital console. The smaller studio will have an API from Ocean Way Studio B, which in turn will get an 80-input, totally discrete Class A custom Neve board. The new studios are being built in the space formerly occupied by Bernie Grundman Mastering, which relocated to new, expanded facilities nearby...**New York City** studio **Sound on Sound** is building a new 5.1 mixing room, Studio C, designed by the Walters/Storyk Design Group. The room will feature an AMS Neve Capricorn digital console and custom Augspurger monitors...**Kerry Kopp** was promoted to VP of engineering services at **Emerald Entertainment Group** (Nashville)... **Avatar Recording** (NYC) installed a 72-channel SSL 9000 J Series console for tracking and mixing projects...In anticipation of 5.1 mixing, **Middle Ear Studios** (Miami, FL), owned and operated by the Bee Gees, purchased an AMS Neve Capricorn for Studio A. The new console was put to work immediately mixing the next Bee Gees album, set for release early next year...**SF Audio Sound & Recording Studios** (Anaheim, CA) added small-run CD duplication services via a Media Form 5900 CD R tower, augmenting its recording and mastering services...**Picki Music Productions** (Las Vegas, NV) added a new Mackie D8B console (housed in an Argosy console enclosure) and a pair of Mackie HR824 active monitors. The studio recently completed work on a documentary CD on the career of blues great **Little Milton**...Mastering facility **Future Disc Systems** (Hollywood, CA) remodeled its Studio One (with re-design by co-owner Steve Hall and acoustical treatments by Chris Pelonis), adding a new, custom-built console...**Pedernales Studio** (Spicewood, TX) installed a 48-channel SSL 4000 G+ console with Total Recall automation...Los Angeles' **Studio 56** added an Otari RADAR II recorder to its Studio E...Audio and music equipment retailer **Sweetwater Sound** (Fort Wayne, IN) appointed **Lionel Dumond** as manager of Sweetwater Sound Productions, the company's recording studio...As part of a studio-wide upgrade to surround capability for its work in television and film scoring (as well as music recording), **Sound Chamber Recorders** (North Hollywood, CA) installed a JBL Professional LSR Series surround monitoring system in each of its three studios...Remote production and recording company **Watermark Entertainment** (Tampa, FL) purchased an 80-input Amek Rembrandt for its new truck. ■

At The Enterprise (Burbank, Calif.), producer Dave Reitzas was recently working on projects for 3T, Barbra Streisand and Sony Music artist Lara Fabian on the AMS Neve Capricorn in The Arena room.

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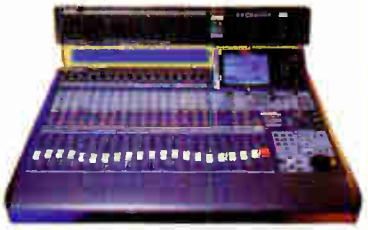

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MPX1 Multi-Effects Processor

The MPX-1 is truly an outstanding multi-effects device. Using Lexicon's Lexchip, it offers outstanding reverb or ambience as well as a separate processor for effects for awesome power in the studio or on the road.

FEATURES–
- Intuitive user interface for easy editing, built-in help.
- Balanced Analog I/O (1/4" & XLR)
- 56 effect algorithms
- Digital Inputs & Outputs (S/PDIF @ 44.1KHz)
- 18 Bit A/D; 20 Bit D/A Conversion, 32-bit processing
- >90dB of Dynamic Range
- Intelligent Sorting by Name, Number, Application, etc.
- Parameter Morphing
- Dynamic MIDI® patching & MIDI automation

COMPRESSORS

PreSonus

ACP88
8 Channel Compressor

Stemming from their popular ACP8, the ACP88 comprises eight channels of compression, limiting and noise gating for a variety of studio applications. It features individual side chain for each channel and it's attractive blue anodized finished lets you show your true sonic colors.

New

FEATURES-
- 8 separate compressors/gates with individual controls.
- Servo balanced or unbalanced inputs & floating balanced or unbalanced outputs.
- Individual side chain jacks for spectral compression and a separate sidechain jack for gate processing.
- Each channel boasts full gain reduction metering, compression threshold indication & gate open/close.
- Front panel buttons include hard/soft knee compression, peak/auto compression, bypass, gate range and link.
- Link feature uses a unique summing bus for multiple combinations of master/slave link setups.

dbx

Model 566
"Silver Series" Compressor

The new Silver Series introduces a 2 vacuum tube circuit design making the 566 no ordinary compressor. Loaded with features including custom designed analog VU meters that monitor tube level, gain reduction, or output levels. Full sidechain functionality, including sidechain monitor, Contour function allows low frequency material to pass through the threshold without triggering un-musical compression effects.

FEATURES-
- Hand selected Premium 12AU7 vacuum tubes
- +4/-10 operation
- Drive control for a wide variety of great tube effects
- PeakPlus limiter on each channel
- Complete sidechain, OverEasy, and Auto function
- Optional TYPE IV Conversion System outputs
- Separate 1/4" sidechain insert send and return

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TUBE MICROPHONES

AKG

SOLIDTUBE
TUBE MICROPHONE

The SOLIDTUBE combines the best of solid state and tube technology to provide a "warm" sounding microphone suitable for professional recording applications.

FEATURES–
- Large diaphragm condenser
- Integrated pop screen surrounds the capsule, reducing excessive pop noise
- ECC 83 (12AX7) vacuum tube which provides perfect transfer characteristics
- Includes elastic shock mount
- Low-cut switch, Ground lift switch

audio-technica.

AT4060

Combing premium 40 series engineering and vintage tube technology, the AT4060 delivers a versatile and competent studio microphone. Low-noise and high SPL capabilities make the AT4060 a premier vocal mic as well as strings, guitars and other demanding applications.

FEATURES-
- 20 - 20,000 Hz freq response
- Dual gold-vaporized large diaphragm elements
- Includes the AT8560 power supply AT8447 shock mount, rack mount adapters and case.

MICROPHONES

SHURE

KSM-32

The new KSM32 side-address microphone features an extended frequency response for open, natural sound reproduction. Suitable for critical studio recording and live sound production, Shure steps up to the plate with another classic.

FEATURES-
- Class A, transformerless preamplifier circuitry for improved linearity across the full frequency range.
- Exceptionally low self-noise and increased dynamic range necessary for highly critical studio recording.
- 15 dB attenuation switch for handling high SPLs.
- Switchable low-frequency filter to reduce vibration noise or to counteract proximity effect.
- Great for vocals, acoustic instruments, ensembles and overhead miking of drums and percussion.
- SL model also features an elastic shock mount which greatly reduces external vibrations.

BPM
CR10

Hand-crafted in East Berlin, the BPM CR10 Studio Condenser Mic features a full frequency response for competition against the best of the best.

FEATURES-
- 1" Gold diaphragm
- Suitable for most guitar and vocal recording applications.
- Includes Custom Aluminum Road Case, XLR-cable, wind screen and elastic suspension.

SAMPLING

AKAI
New

S5000 & S6000 Studio Samplers

Akai is proud to announce its next generation of samplers with the introduction of the S6000 and the S5000. Building upon Akai's legendary strengths, both machines feature up-to 128-voice polyphony and up-to 256 MB of RAM. They use the DOS disk format and .WAV files as the native sample format allowing standard PC .WAV files to be loaded directly for instant playback - even samples downloaded from the Internet into your PC may be used.And of course, both the S6000 and S5000 will read sounds from the S3000 library.

FEATURES–
- OS runs on easily upgradeable flash RDM.
- 2x MIDI In/Out/Thru ports for 32 MIDI channels
- Stereo digital I/O and up to 16 analog outputs.
- 2x SCSI ports standard
- Wordclock connection
- Optional ADAT interface provides 16 digital outs
- .WAV files as native sample format

S6000 ONLY FEATURES–
- Removable front panel display
- User Keys
- Audio inputs on both the front and rear panel allow you to wire the S6000 directly into a patchbay from the back and override this connection simply by plugging into the front.

E-MU

E-mu Systems, Inc.
E6400 Professional Sampler

The e-6400 from EMU features an easy interface that makes sampling easy. Automated features like looping, normalizing and more allow you to flexibly create your own sound palettes or access any of the 400 sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balanced analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.

MIC PREAMPS

Focusrite
Green 3 "Voicebox MKII"

The Voicebox MKII provides a signal path of exceptional clarity and smoothness for mic recording, combining an ultra-high quality mic amp, an all new Focusrite EQ section optimized for voice, and full Focusrite dynamics. The new MKII now includes a line input for recording and mixdown applications.

FEATURES-
- +48V Phantom power, phase reverse, and a 75Hz high-pass filter.
- Mute control and a true-VU response LED bargraph are also provided
- Includes a Mid-Parametric band with controls especially designed to enhance vocal characteristics.
- Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -96dBu
- Dynamics section offers important voice processing functions such as compression and de-essing combined with a noise reducing expander.

dbx 586 Vacuum Tube Mic Pre

The DBX 586 Vacuum Tube Dual Mic Preamp uses hand selected and matched premium 12AU7 vacuum tubes ensure ideal characteristics for a warm, distortion free signal path. Custom designed analog VU meters monitor tube level insert path or output levels well Line/Instrument and mic inputs make the 586 versatile enough to use with virtually any input source.

FEATURES-
- Mic or line/instrument inputs on each channel. +4/-10 operation.
- Drive control for a wide variety of great tube effects
- 3-Band EQ with sweepable frequency
- Optional TYPE IV Conversion System outputs
- Separate 1/4" insert send/return on each channel

JOE MEEK VC1 Studio Channel

The Joe Meek Studio Channel offers three pieces of studio gear in one. It features a transformer coupled mic pre, compression and a professional enhancer together in a sleek 2U rackmount design!

FEATURES-
- 48V phantom power, Fully balanced operation
- Mic/Line input switch
- High pass filter for use with large diaphragm mics
- Extra XLR input on front makes for easy patching
- Compression In/Out & VU Compression meter
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC

MONITORS

KRK SYSTEMS, INC.

M6000/S
Studio Monitors

The KRK M6000/S are designed for close-field monitoring. A smooth frequency response in a compact size make these units portable and efficient.

FEATURES-
- High power handling
- 62Hz - 20kHz, ±3dB.
- Compact and portable
- Low distortion
- Smooth frequency response
- Custom Gray finish.

Hafler

TRM-8
Powered Studio Monitors

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Trans-nova power amp circuitry.

FEATURES-
- 45Hz - 21kHz, ±2dB
- 75W HF, 150W LF
- Electronically & Acoustically matched

MACKIE.

HR824

These new close-field monitors from Mackie have made a big stir. They sound great, they're affordable, they're internally bi-amped. "What's the catch?" Let us know if you find one.

FEATURES-
- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- Frequency Response 39Hz to 22kHz, ±1.5dB

TANNOY

Reveal

The latest playback monitor from Tannoy, the Reveal has an extremely detailed, dynamic sound with a wide, flat frequency response.

FEATURES-
- 1" soft dome high frequency unit
- Long throw 6.5" bass driver
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- Hard-wired, low-loss crossover
- Wide, flat frequency response
- Gold plated 5-way binding post connectors

CIRCLE #136 ON PRODUCT INFO CARD

Ad Index & Advertiser

PAGE	PRODUCT INFO NUMBER	ADVERTISER
114	074	Aardvark
88	054	Absolute Audio
184	121	Acoustic Sciences Corporation (ASC)
92	057	Acoustic Systems
48	024	Acoustical Solutions
182	119	Acoustics First
47	023	Akai
55	029	AKG
IFC	001	Alesis (M20)
99	062	Alesis (Q20)
138	090	AlterMedia
51	027	Amek
80	049	American Gear
11	006	AMS Neve
41	020	Antares
53	028	Aphex Systems
18-19	010	Apogee Electronics
66	037	Argosy
87	053	Ashly
112	073	Atlantis/Augan
212	142	Audio Accessories
201	137	Audix
58	031	Auralex
204-7	138	B&H Photo-Video
194	130	Benchmark Media Systems
79	047	beyerdynamic
54	153	Burlington/Maxell
183	120	Burlington/Sony
64	035	CAD Professional Audio
17	009	Cakewalk Music Software
154	098	Caruso Music
167	108	Carvin
147	095	CD Cyclone
48	025	Conservatory of Recording Arts & Sciences
161	104	Crest Audio
25	013	DAR
71	041	DataViz
151	097	The DAT Store
200	136	Demeter
14-15	008	Digidesign
179	115	Disc Makers
131	080	Dolby
143	093	DPA Microphones
108	071	Dreamhire
68	039	Dynaudio Acoustics
136	086	EAR Professional Audio/Video
149	096	Electro-Voice (EV)
22-23	012	Emagic
6-7	004	Euphonix
129	078	Europadisk
75	043	Event Electronics (RØDE)
157	100	Event Electronics (Darla 24)
158	101	Five Towns College
28	015	Focusrite
108	070	Francis Manzella Design Ltd.
119	076	Frontier Design Group
132	081	Full Compass
105	067	Full Sail
103	065	Genelec
65	036	Gepco
138	089	Grace Design
187	124	Great River Electronics
214	145	Guitar Center's Rhythm City
101	064	HHB Communications (CDR850)
193	129	HHB Communications (Classic Series)
137	087	The Hollywood Edge
198	133	Hot House Professional Audio
77	045	ILIO Entertainments
176	112	Institute of Audio Research
BC	151	JBL Professional
100	063	Joemeek/PMI
171	110	Karpen Steel
134	084	LA Audio/SCV London
178	114	Lafont/Sascom Marketing
106	068	Lawson Microphones
35	018	Lexicon (MPX 1)
97	123	Lexicon (PCM 81)
185	•	Los Angeles Recording Workshop
92	058	Lucasey
26-27	014	Mackie (D8B)
IBC	150	Mackie (Compact Pro)
63	034	Manley Laboratories
21	011	Mark of the Unicorn
145	094	Martinsound
198	134	MediaForce
76	044	MediaFORM
192	127	Mediastore
180	116	Microboards Technology
199	155	Midas Heritage
232	146	Mix Online
181	117	Monster Cable
89	055	Musician's Friend
33	057	Neumann/USA
59	032	Neutrik USA
159	102	Northeastern Digital
73	042	Oram Professional Audio
30-31	017	Otari
113	•	Panasonic
175	111	P. Audio Systems
211	141	Personal Studio Buyer's Guide
210	140	Q Cables
155	099	QSC Audio Products
9	005	Quantegy
166	107	RADIAL
67	038	Rane
154	122	The Recording Workshop
98	061	Rosati Acoustics + Multimedia
78	046	RPG Diffusor Systems
80	048	Russ Berger Design Group
46	022	Sabine
115	154	SAE Institute of Technology
82	•	Sam Ash Professional
13	007	Sennheiser
1	•	Solid State Logic
45	021	Sonic Foundry (Sound Forge 4.5)
107	069	Sonic Foundry (ACID)
187	•	Sony
169	109	Soundcraft
190	125	Soundelux Microphones
91	056	Soundtracs
200	135	Speck Electronics
182	118	Speir Music
39	019	Spirit
93	059	Steinberg
139	091	Studer Professional Audio Equipment
37	060	Studio Audio Digital Equipment (SADiE)
192	128	studio bau:ton
114	075	Studio Consultants
81	050	StudioPro99
57	030	Summit Audio
29	016	Sweetwater Sound #1
234-5	147	Sweetwater Sound #2
236-7	149	Sweetwater Sound #3
238-9	148	Sweetwater Sound #4
69	040	Switchcraft
3	003	Tannoy
49	026	Tascam (DA-40)
197	132	Tascam (DA-302)
213	143	TerraSonde
133,135,137	083	THAT Corp
104	066	Trans Continental Studios
162	105	Utrecht School of the Arts
62	033	Walters-Storyk Design Group
213	144	Waterland Group
177	113	Waves
133	082	Wenger
130	079	Westlake Audio (Orville)
163	106	Westlake Audio (BBSM-10)
123	077	Whirlwind
210	139	Whisper Room
2	002	Yamaha (DSP Factory)
85	052	Yamaha (MSP5)
109	072	Yamaha (01V)
141	092	Yamaha (D24)
191	126	Yamaha (PM Console)
160	103	Zero International
195	131	Z Systems

—FROM PAGE 28, INTERNET AUDIO

rubbish, and another study, paid for by a consumer audio manufacturers' coalition—who presumably had a much smaller axe to grind, since they could go right on selling equipment no matter who won—showed that the vast majority of home taping consisted of people making dubs of records they already owned, for use in their cars and personal stereos, and that in fact people who taped albums at home bought more records than people who didn't.

Nevertheless, the labels, through the RIAA, pushed for a blank tape tax, the proceeds of which would be distributed, through some undetermined formula, to artists who were purportedly hurt by home taping—Michael Jackson's name was bandied about a lot. Frank Zappa, in his autobiography, made the case that the record companies were so hungry for the extra revenue that they were willing to stifle their own artists and accede to the "Washington Wives'" demands to put parental warning labels on albums, if Congress would pass the tape-tax bill. Fortunately, the bill stalled, although some other countries have not been so lucky. As far as the warning labels are concerned, you can see for yourself how effective they have been at keeping offensive records out of kids' hands.

Around the same time, the Motion Picture Association of America (aka the major Hollywood studios) sued Sony, claiming that home video taping of Hollywood movies would kill off all their profits, and as makers of Betamax VCRs, Sony was directly responsible for copyright infringement. The landmark case was decided in favor of Sony, which was not only good for consumers but also ended up saving Hollywood's collective ass, since now hundreds of movies every year which would otherwise show on two screens in Dubuque and then never be heard from again, can at least get back their costs by going straight to video. (Unfortunately, Sony managed to kill off Betamax all by its dumb self, but that's another story.)

And then there was DAT. Today's professional mastering format of choice was originally supposed to be a consumer format, but threats of litigation by the record industry stopped it in its tracks, with the result that only "professional" models ended up being produced. This is why, although you can now find S-VHS editing decks and 4x CD burners (which are a lot more of a threat than DATs) for $250, you will never see a DAT deck for less than $600, and why, unless you're ready to fork over $1,200 or so, you have to deal with that odious SCMS circuit, which makes it impossible to make digital clones of someone else's material *or* copy your own masters.

So it's very much in character for large record companies to be making this massive effort to portray MP3 as the spawn of the devil. But many small labels seem to be gravitating toward it as a way of getting their message out, without having to buy or bully their way into prominent placements in Tower or HMV or on increasingly centralized radio playlists. While the larger labels are hopelessly hung up over nickel-and-dime piracy, the smaller labels see the Net as a marketing opportunity.

Weep not for the record labels. They've always come out ahead no matter what perceived threat has hung over them.

Personally, I view this whole situation as a great opportunity for some constructive and long-overdue realignment of the music industry. But if that's going to happen, and if civil war and extended court battles (whose decisions will no doubt be obsolete by the time they're rendered) are to be avoided, the two sides in this argument are going to have to stop shouting at each other and find common ground. MP3 is not going to go away, no matter how much litigation the record labels initiate, so they'd better find ways to make it work to their advantage. On the other hand, fans of the medium are going to have to get used to the idea that if someone doesn't pay artists for what they do, said artists will go find other ways to make a living.

One point to keep in mind is that MP3 audio is not great. It's remarkably good, considering all the technical flimflammery that's going on, but still, to claim it is "CD quality" is specious. It's certainly good enough to listen to when you jog or drive, but I don't know anyone who seriously considers it the ultimate delivery medium. For many listeners it's more an advertisement for a record, like a slot on a radio playlist, than the real thing. When I hear a new song I like on my car radio, I'm not going to rush home and try to download it from an MP3 site, where it's not going to sound much better than in my car; I'm going to go to the store (or at least the online store) and buy the CD.

The market for the "real" product, whether it's CD, tape or DVD, will continue to be strong, as long as there is a significant difference between it and the "virtual" product. Which, of course, raises the question of what happens when uncompressed audio becomes available over the Internet, but I think that that may still be a long way off. Most of the talk about high-speed Internet access for ordinary folks these days centers around cable modems, which certainly have the potential to make downloading of uncompressed audio practical. But already subscribers are finding that their cable modem connections are operating at speeds nowhere near what the systems are supposed to be capable of, and as more subscribers get online, this will slow down even more.

But even if (or when) Internet audio improves radically, it's not necessarily going to drive record companies into bankruptcy. There are ways that the creators and owners of music can ensure that they are being compensated fairly. The world of business software offers some valuable lessons. While it has not been totally wiped out (especially not in the Third World), piracy of business software is far less common than publishers feared just a few years ago, ever since a couple of well-placed lawsuits made it clear that managers could be held responsible for unauthorized copies of programs on employees' machines. Serial number tracking (of the software, not the computers—but thanks for trying, Bill), site licensing, liberal upgrade policies and Net-based distribution (which make it easy both for consumers to obtain new software, and for manufacturers to keep track of who has what) have proven tremendous boons for software publishers. There's no reason why variations on these practices cannot be applied to the distribution of recorded music.

To make this work, however, the record companies are going to have to realize that they need to provide better value for the consumer's money. The free ride that has let record companies sell CDs for $16, years after the actual

cost of making them has gone down below the $1 mark, may well be over. Of course, putting music on the Net will save them money, because if the delivery system is purely electronic, manufacturing, distribution and packaging costs can be almost eliminated. Rather than scream bloody murder at the whole culture, record companies should create new, fair rules for downloading music, and encourage and make it easy for sites to follow the rules.

The download sites themselves, rather than spending all that energy thumbing their noses at the major labels (and it would be helpful if they stopped referring to the programs that extract audio from a CD as "rippers"), can concentrate on their roles as providers of music they like and want their audiences to hear, regardless of whether it comes from a multinational conglomerate or an indie label in someone's basement. They have the opportunity to become the 21st-century versions of both independent radio stations and specialty record stores, two niches that have been severely depopulated by the growth of corporate radio empires and megastores.

If you ask me whose side I'm on in this battle, I have to admit I tend to favor the MP3 gang. I weep not for the record labels. They've always come out ahead no matter what perceived threat has hung over them. As the media companies continue to suck up everything in their path, so that they not only control what music is recorded and how it's distributed, but also the magazines, newspapers and television shows that tell people what to listen to, anything that attacks that hegemony is okay in my book. Consider that the Sony suit could never happen today, inasmuch as Sony owns both the movie studio and the VCR factory. So the decision over whether to kill home video, rather than being aired in public and decided by a judge, would have been made by an accountant on the basis of how it would affect the company's balance sheet. I don't think this is what even the most conservative economists have in mind when they talk about the "free market."

But you know what? There's a lot more to Internet audio than just the brouhaha over MP3. And while MP3 is getting all the ink, for those of us in the trenches of audio production, it's the other stuff that is much more interesting.

What do audio and the Internet have to do with each other? Well, look at it this way: Do a search in your own mind for "audio + radio." How many ways does audio figure in the context of electromagnetic broadcasting? There's playing records on the radio, but there's also creating jingles for radio stations, and recording and editing announcements. There's music and sound design, as well as field recording and dialog replacement, for TV commercials and programs, which is just radio with pictures. There's satellite distribution of music, and there's also satellite links between studios allowing audio production to go on in multiple locations simultaneously. There are wireless microphones and in-ear monitors in the concert hall, wireless hearing-assistance systems in the theater and, of course, cellular phones.

Okay, now substitute "Internet" for "radio." And consider the infinitely reconfigurable communications paths of the Internet: one-to-many, many-to-one, many-to-many, and one-to-one. Think about all the ways you can use that power for your business: collaborating, outsourcing, marketing, databasing, advertising, contacting and any other verb that involves communicating with people and with machines. Not only are all sorts of things possible, they are going to be necessary, as the Internet continues to become a more ubiquitous part of our culture and more people and companies vie for each others' attention.

Do I know the answers? Heck, I'm just starting to figure out the questions. And a lot of you are, too. That's why I'll be moderating a panel discussion on "Audio on the Web" at the StudioPro99 conference on June 15 and 16, in Universal City, Calif. We're going to try to cover as many aspects as we can of how audio/Internet issues affect the pro audio industry. We'll hear from folks who are invested in MP3 and various forms of Internet radio, and from folks who can help make sure you're getting the best quality out of your Net audio applications, regardless of what you are using them for. And we'll hear from at least one person who says he's even more cynical about all this than I am. Information and schedules on the conference can be found at www.mixonline.com/studiopro99ad.html, or call 510/653-3307 and ask for a brochure. I look forward to seeing you there. ■

Paul D. Lehrman is a composer, educator, consultant and the editorial director of Mix Online. He worries that soon the only "audio on the Internet" will be a busy signal. Check out his latest bad craziness at s2n.org/ballet.

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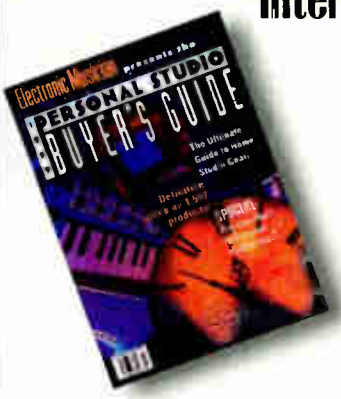

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CIRCLE #141 ON PRODUCT INFO CARD

—FROM PAGE 68

word clock and AES at 44.1, 48 and 44.056 kHz all off of a single crystal. That way, when we interface different types of equipment that expect different external sync signals, we can feed one input source with a video clock, and another with 48 or 44.1 kHz, and it's all still synchronized. The digital outboard gear, for instance, clock their outputs to the AES sync signal we feed to their inputs, so there is no jitter or other clocking error to cause pops and clicks."

MORE HEAT, MORE WIRE

Accommodating many different kinds of sync adds to the complication and expense of integrating digital into a facility's machine rooms. "Our two Capricorn rooms share a central machine room with the master sync generator and distribution," Shimiaei says. "All the audio recorders, such as tape machines, DA-88s and Pro Tools live in there. When we began planning the room, I decided that the audio I/O panel for each machine should also have a section for distributing all the sync information: NTSC or PAL video sync, word clock on BNCs, and AES on XLRs. It makes correct sync setup for each session a lot easier."

But sync is only one of the issues that digital introduces into machine room planning. Another is linking digital systems' control hardware with the "brains" that actually do the audio processing. At Sound One, for instance, the company's MediaNet network allows interconnection among eight Sonic Solutions workstations in editing and mixing rooms. "If someone working on a mix decides they need to make a change to a file," Hale says, "they can walk from the mixing room to an edit room, edit the files they were using in the mix, and then go right back into the mixing room, all without moving around any drives." The network is also used to allow editors easy access to sound effects libraries.

To implement this system, Sound One keeps all the computers, converters and other rack-mounted components in a central machine room; only the computer keyboard, the monitor, the mouse and the audio monitoring system are in the room with the sound editor. "We convert all the monitor signals so they sync on green," he says, "and route them down co-ax RGB. Then we use the Gefen Systems ADB [Apple Desktop Bus] extenders for the keyboard and mouse."

Not surprisingly, the removal of gear from the control room to reduce heat and fan noise means dealing with more heat in machine rooms. "Some of the most significant impact of digital audio on a facility's infrastructure may come not from the equipment or its wiring, but from the heat that these new systems generate," says Berger. "Because the power consumption of digital signal processing gear is relatively independent of signal amplitude, overall average heat generation may be higher. With significant migration of power-consuming equipment from the control room to the machine room, digital audio can introduce enough of a change in the heat load characteristics that existing air conditioning systems may be unable to keep up."

As more equipment is made remote in machine rooms, digital audio can also have an impact on the sheer volume of wiring between rooms. When The Enterprise renovated the two Capricorn rooms, for instance, Shimiaei found the overall volume of wiring increased, so existing wiring management systems that had been sufficient for the rooms' previous analog incarnations had to be supplemented in capacity. But accommodating increased capacity with new troughs or conduits can be a challenge in an existing facility. "New wiring routes can have a serious impact on acoustical construction, compliance with local fire code and coordination with the existing cable systems," cautions Berger. "The acoustical problems can be significant if the systems are not carefully designed."

Berger says the components of a wire management system may include raised access or "computer" floors, cable troughs, raceways, conduit and cable trays and ladders. "These different types of wireways" he says, "generally represent a compromise among flexibility, capacity, ease of installation and maintenance, acoustical performance and cost. For example, access flooring offers the greatest flexibility and capacity, but usually also the highest cost and the greatest detriment to sound isolation

and room acoustics."

Whichever system is used, the handling of wiring within the system is generally similar to the approach taken with analog. "Think of the digital wire as being the same as line level analog," Van Hoy says, "and don't do anything with it that you wouldn't do with line level analog. I have yet to see any issue with running a great deal of AES cable in the same conduit as video and analog audio."

That reassurance notwithstanding, Sound One does take some special steps with the wire carrying digital signals. "We've been dressing our cables to avoid long parallel runs between the analog and the digital," Hale says, "the same way we do between control cables and analog audio cables. So far we've avoided any problems."

As for hum, EMI and other types of noise problems that can plague analog wiring, Shimiaei acknowledges that "AES is less susceptible to hum than analog," but points out that "all those grounds are going to find their way into the analog ground, and if that's not dealt with correctly you will end up not only with hum but with clock leakage, which is a lot more offending. So proper grounding remains an extremely important issue for digital, perhaps even more than with analog."

Shimiaei adds that digital devices are much more susceptible to minute power spikes, resulting in data loss. "We put everything on uninterrupted power supplies, including the clock generation and distribution system, the control surface and the DSP racks."

At every step, the introduction of digital systems into the audio production mix requires awareness of differences, both obvious and subtle, from analog requirements. With digital largely a moving target, Hale says the smart approach is to "plan for the future as much as you can. Leave space in your rooms, racks, patchbays and wire trays for the next generation of recorders and consoles. Install excess HVAC and low-harmonic, regulated power to accommodate both current systems and future systems. It's impossible to anticipate every future sample rate, wiring format or equipment purchase. But build as much flexibility as possible into your physical and electronic environment, and when those changes come you'll have them online in less time and for less money." ■

Philip De Lancie is Mix *'s new technologies editor.*

—FROM PAGE 108, HOWIE B.

was almost like the back row had the best view. The best sound was in the back, as well.

It's amazing how much sound what is basically just a trio and a singer can put out in a big place. The Edge alone is like a whole band.

He is. I learned something really interesting from Ry Cooder about that. I did the music for *The End of Violence* the week before I went on tour with U2. I was a little bit frightened, and I was asking his advice because he's played a lot live. And he said, "Concentrate on them as a band, and make them play quiet. The quieter they play, the more air they will move." And I didn't really understand what he was saying at first. It wasn't until I got into the tour that I realized what he meant. The first thing that happens on a tour is that each of the musicians comes up to you and says, "Turn me up! Turn me up!" [Laughs] And they were standing on this huge stage miles from each other and wanting to play as loud as they could. So in the end what we did was everybody got turned *down* and we moved them closer together and created a little circle, which they could then step out of, and that brought them together more as a band. It was a simple thing, but it came from Ry Cooder's advice.

I know I'm not alone in having a hard time keeping up with what's happening in the clubs, whether it's trip hop or techno-ambient or drum and bass. What's happening in the clubs right now? My sense is that everything is becoming more and more eclectic.

That's right. It's all over the place. It's brilliant. The sets that I do are always fairly eclectic, and they have been for as long as I've been DJ'ing.

What's a typical set for you?

I might start off with big beat, then maybe go to German techno. From there I could go into Italian lounge music, into English drum and bass and back into big beat. It can go quite a few ways. The club scene is very open right now. In London it's big beat and drum and bass mostly. There's also a hybrid of those two.

I'm not familiar with big beat.

It's hip hop, but going at 120 bpm. It's like house hip hop a bit. It's usually got lots of guitars in it. It's very up and has a tight edge to it. It's difficult to define all these things because every week there's someone that's taken it a step further. Right now, The Propellerheads are the band that are on the big beat vibe.

What are you working on now?

I'm working with a band from Paris called Les Negresses Vertes. They're brilliant. I'm halfway through an album with them. We started in this 1920s theater in Paris that's not being used any more; set them up in there, brought my studio over. Actually, we set two studios up. We made a pre-production room and also made a recording room. The recording room was the theater. We did the pre-production on the little Fostex, rehearsing and rehearsing and working on arrangements. And then when we got it right, we'd move upstairs, soundcheck and record. We did that to 16-track 2-inch. It's a great wee project I'm excited about.

I assume that when someone wants to work with you they're expecting you'll do some interesting sonic touches with them.

When they ask me to produce them, they're trusting me to really work with them. There aren't going to be ground rules like, "All the songs have to be under three minutes," or "All our songs are verse-chorus, verse-chorus." If that's what they want, then I'm not the right person. It might well end up that the music turns out that way, but if I'm given that restriction, there's no point in having me there. There's lots of guys to call for that kind of record, but it's not me. This band, in particular, has given me some beautiful space, and I think they're livin' large because of it.

You've worked all over the world. What are your favorite studios?

Ry Cooder introduced me to Ocean Way. That's a fantastic studio. Another one I liked was Fantasy Studios [in Berkeley, Calif.]. We rehearsed U2 in there for a week. There's a studio in the south of Spain called El Cortijia where Björk recorded her third album. I've recorded a few albums there; it's a beautiful room. In England I love Milo Studios and Whitfield Street. AIR Studios in Lyndhurst is fantastic, too, though I'm actually fond of their smaller room more than the big, big one. The smaller room has this custom Neve that is the greatest-sounding desk ever.

What's your current favorite piece of new gear?

It's called the Notron. It's a 4-channel sequencer that's outrageous. I'm always looking for new stuff. But you know what, rather than coming in with new gadgets all the time—though I do that, too—what I'm looking for is a good new idea. Gadgets don't help unless you've got good ideas. ■

—FROM PAGE 151, OTARI RADAR II

level rises as the amplitude of the waveform increases. This helps to locate an edit point at the beginning of a waveform.

Editing is simple and straightforward. To edit, you mark the in/out points with the dedicated buttons either on-the-fly, by scrubbing or numerically. Once the in/out marks are set, you can cut, copy, paste, move, slide, loop, insert, reverse, undo/redo and listen. The onboard soloing function allows you to audition any number of tracks that you wish to edit quickly. This is a fast way to identify edit points and problem areas without moving away from the remote. There have been projects where I will cut and paste all 24 tracks, cut sections of songs, and fly, fly, fly parts all over. During mixes, one of the worst things that can happen is lip smacks exciting the reverbs and creating those aggravating little clicks. Gone. This process can be time-consuming to mute and dangerous to erase from the tape, but all that has changed. Mark the in, jog, mark the out, down arrow to audition (down arrow plays between in/out marks, left arrow goes to in point, right arrow goes to out point) press Erase, press Track, press Enter. Gone. If you don't like the edit, Undo. Undo acts globally. If a record punch-in is performed and the previous take was better, it can be undone. The ability to undo multiple actions really sets hard disk recording apart from tape. With the right amount of RAM installed, up to 99 levels of undo/redo are available. This also applies to all editing moves.

QUESTIONS AND ANSWERS

A frequently asked question is, "Why install one more system?" In my studio, I have analog 2-inch with Dolby SR, Alesis XT20s, Tascam DA-88s, and Pro Tools and Sonic Solutions systems. Where would a system like the RADAR II fit? After a few mixes, I knew. In many of the studios where I have mixed, when they receive an analog, ADAT or DA-88 tape, tracks are bounced over to the Sony PCM-3348 recorders. Ultimately, this saves time on sync lock, rewind lock, and any problems you might have with ADAT or Tascam transport tape-handling, dirty heads or tape shed. Generally, this would be the standard for a facility, especially if it owns a digital deck and console. I feel the RADAR II will be most at home here. It can save thousands of dollars of wear and tear on tape-based systems while offering most of the advantages of HD recording system.

My preference is to start off analog with the basic music tracks and then move the project to the digital domain. This allows me to get the dynamic range on the acoustic instruments and vocals, less the noise floor. Personally, I have not found the sonic qualities of the Sony 3348 pleasing. The RADAR II reinforces that opinion. Recently having the 3348 alongside the RADAR for a surround mix on Travis Tritt allowed me to compare the sonic differences of both machines. On the RADAR, high-frequency transients were smooth and the width of stereo sources were natural and open, but the 3348 lacked the high-frequency content and the round, full low end. I am sure it might have been a more favorable comparison if this had been Sony's much-improved new 3348HR, but that would also bring up editing speed, size and price.

The RADAR II, compared to an analog source, translates very well. This could be credited to the quality of the Crystal chipsets used for A/D and D/A conversion. By the way, for digital-to-digital transfers, I use an Otari UFC-24 (Universal Format Converter). This unit can handle 24-to-24 transfers of AES, ADAT Lightpipe, TDIF, PD from any source to any source. The UFC-24 has solved most of my transfer problems over the past year. I have transferred from all these formats to the RADAR without a problem. As a future upgrade, Otari will be offering a board for the RADAR that will have multiple channels of AES/EBU as another source of I/O.

I can say that the RADAR II has been virtually crash-free. Data has been safe, secure, and the construction is very roadworthy. The sound quality, reliability, and Otari's history and reputation will make the RADAR II at home in many commercial studios, post houses and project studios everywhere. At $24,950, what can you find that compares in functionality and audio performance? It's here, immediately available, and it works.

Otari Corporation, 8236 Remmet Ave., Canoga Park, CA 91304; 818/598-1200; fax 818/594-7208; www.otari.com. ■

Michael Denten is a producer, engineer and owner of Infinite Studios in Alameda, Calif.

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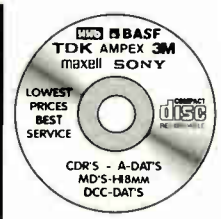

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CIRCLE #146 ON PRODUCT INFO CARD

—FROM PAGE 20, ELECTRIC GUITARS

right up to one inch from the grille. Ah, but you already know that one, don't you? Okay, try it at different angles. Cut a hole in the grille so you can put it *in* the cone itself (be careful—if the moving cone hits the mic, I won't take your call). On open-backed cabinets, try shoving it in between the speakers. Stay away from the power transformer, but try putting it real close to the output transformer to see how it likes direct magnetically induced audio (results may vary). Try *two* mics. Yeah, I know, you already know this, too, but this time don't put them in symmetrical locations. No two places on a guitar amp sound the same.

2) Lay the amp face down on a carpeted floor, with one end propped up on a couple of two by fours, so the air space under the amp is a wedge. Vary the wedge height and mic placement. This type of loading dramatically alters the amp's sound and can be tuned easily by merely raising or lowering the high end of the wedge.

3) For dual-speaker mono amps like Twin Reverbs, replace *one* of the speakers. Don't use the correct replacement part. Use any speaker that is *not* a match but is within the ballpark for impedance, efficiency and power handling. This is a very powerful trick. It smooths out the hot spots (standing waves and resonances) and generates a valid dynamic stereo source—simply close-mike each driver.

4) Try the old Edward Van Halen trick: Plug your amp's AC cord into a Variac variable power transformer and turn it down to 90 volts or so. This will lower all the voltages in the amp, making it softer and easier to drive crazy. This is a very easy way to get lots of new sounds out of your amp, each more messed up than the last. I like this much better than the old (and dangerous) trick of pulling out half the output tubes.

5) Are these tricks a little too simple and self-evident for you? Okay. This one's perfect for you, then. Drain your pool. Take your amp down to the deep end and set it up facing the shallow end. Put mics everywhere. Have fun. I have done this on more than one occasion, and the resulting ambience and acoustic reverb are stunning, reactive and smooth as glass. Throw mattresses and sofa cushions in for damping if desired. It works great until the neighbors call the cops. This is part of why I live in the woods.

I forgot to tell you that if you drain your pool and it is square or rectangular, fill it back up and forget it. This only works on free-form pools. Actually, that's the whole point—no straight walls, no parallel faces.

THE AUDIO PATH YOU PROBABLY NEVER THOUGHT OF USING

Now we get to the freaky stuff. Solid-body electric guitars offer a world of enhancement tricks that you might not have imagined. Or maybe you did think of them but immediately decided they were far too lame to try. If so, you were wrong.

You generally plug solid bodies in and never think about what they are doing *acoustically*, don't you! But since you built the room described in Part One, you have the guitar well-isolated from the amp and other pesky noise, so you can try this stuff.

When I was a kid touring with my black Twin, I had no appreciation of the incredible number of variables that determine what a guitar amp sounds like.

Here we go. Mike that guitar. In stereo. Make the player sit on a stool so he won't move too much, and put a mic up near the head stock, facing the strings. Add another one facing the strings at the 12th fret. Now you can mix the strange stuff you get from these feeds with the feeds from the amp mics, and again, new worlds will appear before you.

Of course, the trick is in the isolation booth. It allows you to use the high gain needed to get these mechanical string sounds up to a useful level without being overwhelmed by outside noise (like the screaming amp). And you might want to tell the player not to breathe, or at least to breathe quietly. Oh, yeah. You have to use very well-fitting closed cans, or playback leakage will kill it all.

Whenever you do something this weird, you know people are going to ask you *something* when the song is released, either how it was done or *why* it was done. I used this on a very successful European album a few years ago, and people still ask how it was done. I guess it worked.

There is an obvious variation of this that you have probably thought of but may not have taken as far as it can go. You simply mike the strings in the picking/strumming area. You come in real tight, with one mic directly above the low E and the other right under the high E. When done properly, this gives you an amazing stereo spread (along with disastrous explosions if the player hits the mics). I use this a lot. Players tend to offer considerable resistance to this until they hear what it can sound like, then they get real happy and you get another two-week block.

A variation of this variation is to stick a piezo—or even one of those tiny boundary mics—onto the body. Mic placement is critical, so I suggest trying many locations if you try this at all. Actually, I think this is the original mike-a-solid-body trick, and miking the strings without direct body contact was the new thing I tried in Finland halfway through a three-month-straight winter night session.

While all this may seem like a lot of trouble...well, it *is* a lot of trouble. But I think you will find enough places for the new sounds you can get to make it worth your while.

And even if you don't, your obvious dedication to creating unique effects and furthering the art of electric guitar recording will impress your clients and supply endless hours of charming (if not disturbing) bar room banter. ■

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SIA SMAART PRO

SMART IDEAS FOR LIVE SOUND TWEAKING

SIA SMAART Pro is a powerful Windows-based software tool for setting up sound system components to achieve optimum performance. Here are some hints and tips that make SMAART Pro more powerful.

CHECK YOUR SETUP

Using a SMAART Pro measurement system involves patching a number of signals, including EQ inputs, EQ outputs and microphones, to the computer. Getting it wrong is easy and is not always immediately obvious. This is a major time-waster, so check your setup!

THE EQ OVERLAY METHOD

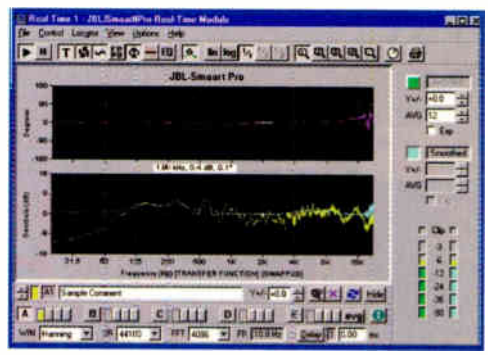
Save the transfer function of the room and system by referencing your microphone to the output of your equalizer in a register. Next, change your reference and measurement channels to compare the output of the EQ to the input. Swap the transfer function inputs in SMAART Pro to see the inverse EQ curve (so cut filters push the trace upward and boosts go downward). Overlay the inverted EQ curve with the saved room/system curve and use it as a guide for placing filters.

Don't try to EQ every little bump in the system/room response curve. Go after the big humps. When setting up EQ filters, the rules below have generally served me very well.

- Use only cut filters. Boosts don't sound good. The exception is when you need to overcome high-frequency absorption, using wide, gentle boosts.
- Filters narrower than ⅓ octave may be useful only in a limited area. Filters can drift, or the situation that caused you to set a filter may change. If the filter is too narrow, it will no longer be correct when something changes!
- Massive cuts are not bad. Don't look at the numbers, look at the screen. Then listen to what you have done. If it sounds right, it is right.

AVERAGING

Too few averages and the data may not be good. Too many and you might be waiting too long to see what you need. Also, too many averages with a large FFT and Windows can run out of memory. For measurements of equalizers, I use 2 to 8 averages, depending on the signal. For pink noise 2 to 4 averages works well, while for music, 4 to 8 is better. However, for measurements with a microphone, between 8 and 32 is a good place to start.



SMAART Pro combines acoustical analysis and sound system optimization.

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Sampling rate and FFT size determine the highest frequency you can see and the frequency resolution. At 44.1 kHz, a 4k FFT gives you just over 10Hz resolution and an HF limit of 22 k. This is fine for mid- and high-frequency measurements but doesn't provide enough resolution for low frequencies. Sampling at 8 kHz with a 4k FFT gives you 2Hz resolution, which is much better for low-frequency work. You can avoid making these decisions by using the Fixed Point Per Octave feature.

BEWARE OF COMB FILTERS

Multiple paths between the loudspeaker and microphone cause comb filtering, which can make getting accurate measurements difficult or impossible. Use the linear frequency scale for tracking them down. If you see evenly spaced notches, you are looking at comb filters. Solutions include moving the microphone so that it isn't seeing reflections or putting something soft on the floor (or wall) to absorb reflected energy.

USING THE DELAY LOCATOR

The Delay Locator can be a little tricky at first. You have to be careful with setup and the length of the time window. I run the reference signal at about -12 dB on the meters with the microphone slightly higher. Make the window 4 to 8 times the expected delay. Estimate the delay before you make the measurement, and if things don't look right, check your setup!

Another important note is that each doubling of the number of averages (frames) used in Delay Locator improves the signal-to-noise ratio of the measurement by 3 dB.

MEASURING DELAYS

If you are outdoors in the wind and the path is long, the issue of "motion" arises. Path length actually changes during the measurement, which makes getting a good impulse response difficult. You need to make the measurement system less sensitive by lowering the sampling rate to reduce high-frequency content. Delay time is the accumulation of phase, so eliminating the highest frequencies keeps phase changes smaller. And contrary to expectations, more averages can actually make things worse. ■

BY ALEXANDER "THORNY" YUILL-THORNTON II

Alexander Yuill-Thornton II has been involved with sound system design and optimization for 15 years.

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You won't find any other mixer manufacturer admitting this dirty little truth: For years, expensive outboard mic preamplifiers have yielded better sound than the preamps in any size mixing console including "status mega-consoles." In fact, if you happen to have numerous extra thousands in cash lying around, we urge you buy an esoteric mic preamp or two or three right now.

But if your equipment budget is slightly more down-to-earth, we'd like you to enjoy the benefits of the most extensive analog engineering project in Mackie's history: The new XDR™ Extended Dynamic Range mic preamplifier.

Now for the first time, you can realize the full potential of the world's finest condenser microphones with an affordable compact mixer: Room ambiance so detailed you can practically hear the carpet pattern...high frequency resolution that defines cymbals, triangles and bells down to the molecular level... midrange that's as gentle and fluid as a warm bath...and tight, authoritative bass with intoxicatingly rich harmonic texture. In short, you can now achieve an aural panorama that's breathtakingly realistic, excitingly vivid and truly 3-dimensional.

You probably think we're laying it on a little thick—until you hear the XDR™ mic preamplifier in person. It really does have...

- The **lowest harmonic distortion** of any compact mixer mic preamp in existence (for example, ten times less THD than our previous VLZ™ series).
- **Lower Equivalent Input Noise** in the critical +20-+30dB operating range than most $2000 preamps.
- Over **130dB of dynamic range** to handle hot 24-bit/196kHz outputs from digital audio workstations.
- **Astonishing bandwidth** without RFI side effects. Not only are XDR™ mic preamps flat within 1/10th of a dB across the bandwidth of any known microphone but they're only 3dB down at 1Hz and 192kHz!

Warm, natural sound
0.0007% THD
130dB dynamic range to handle 24-bit/196k digital input sources
Lowest E.I.N. at real world gain settings
Impedance independent
Near DC-to-light bandwidth
The best RFI rejection of any compact mixers in the world

- **Controlled Impedance Interface.** Use the XDR™ mic preamp with mic/cable impedance combinations anywhere from 50 to 600 ohms and get the same ruler-flat frequency response.

There are also XDR™ benefits you won't hear:

- **The best RFI** (radio frequency interference) **rejection** of any compact mixer... without attenuating high frequency response.
- Comprehensive **protection against "hot patching" and short circuit damage** — a critical feature even some high-end mic preamps lack.

The mixers are pretty cool, too. XDR™ mic preamps are the latest major enhancement to our industry-standard CR1604, MS1402 and MS1202. For more information, call toll-free, log onto our web site or visit your nearest Mackie Dealer and hear the new VLZ™ PRO Series. Think of them as $2000 mic preamps with superb mixers attached.

MS1402-VLZ™ PRO
6 XDR™ mic preamps
14x2 • 4 stereo line inputs • 6 mono mic/line inputs •
extra ALT 3-4 stereo bus

CR1604-VLZ™ PRO
16 XDR™ micpreamps
16x4x2 • 16 mono mic line inputs
• 4 sub groups
• rotatable I/O pod

MS1202-VLZ™ PRO
4 XDR™ mic preamps
12x2 • 4 stereo line inputs • 4 mono mic/line inputs •
extra ALT 3-4 stereo bus

CYNIC'S CORNER. Did we just slap a new buzzword on our "old" VLZ mixers? Emphatically NO! We spent two years and a quarter of a million dollars to produce the first no-compromise mixer microphone preamplifier design. XDR™ is a quantum leap ahead of anything but the most expensive outboard mic preamps. Plug a high-quality condenser mic into a VLZ Pro compact mixer and you'll hear the difference. Run a side-by-side comparison with a $1000-per-channel esoteric mic preamp and you'll be blown away.

MACKIE®

www.mackie.com 888/226-9842

MADE IN WOODINVILLE WASHINGTON, USA BY GENUIN: MACKOIDS

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The First Integrated Professional 5.1 Monitoring System With THX® Approval

No Off the Shelf Parts. No Off the Shelf Thinking.

The All-New JBL LSR Monitors are, quite literally, just that. Highlighted by a long list of performance-tailored components and customer-inspired features, they're like no other systems on the market today. The entire line, including the LSR32 3-way, 28P 2-way and 12P Subwoofer, is a technical triumph; resulting in new standards and performance levels for a rapidly emerging multi-channel recording industry.

Performance-Tailored Components

Revolutionary transducer designs, optimized network topologies and innovative materials are some of the reasons why the LSR line is being hailed as 'the world's most advanced monitor'. JBL's all-new ***Differential Drive®*** woofer permanently dispels the notion that better linearity, higher power handling and greater dynamic accuracy are somehow an unobtainable, evil triangle. ***Dynamic braking*** produces truly accurate bass at higher SPL's with maximum reliability. Composite materials, including ***Carbon Fiber*** in the woofer as well as ***Titanium*** and ***Kevlar®*** in the high and mid frequency components, insures performance that is always optimally maintained.

Not Just A Better Spec... A Better Monitoring System

While all companies boast about their specifications, JBL went one step further. To guarantee that every component of the LSR family worked together for optimal performance, LSR development employed JBL's unique 'system-engineered' design philosophy. Simply put: the entire line was researched and refined as one, with an overall performance goal in sight. What this means to you is a monitor and subwoofer that work together as a system; delivering stunningly uniform and accurate performance in both stereo and multi-channel applications.

LSR 32
12" 3-way mid-field monitor with rotatable Mid/High Elements.

LSR 28P
8" 2-way close field monitor with bi-amplification and active filtering.

LSR 12P
12" Active Subwoofer with Bass Management System.

JBL PROFESSIONAL

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To find out more about the revolutionary LSR Monitors, visit JBL Professional at www.jblpro.com