New Products at NAMM · Jazz Producer Bob Belden · All Access: Rob Zombie

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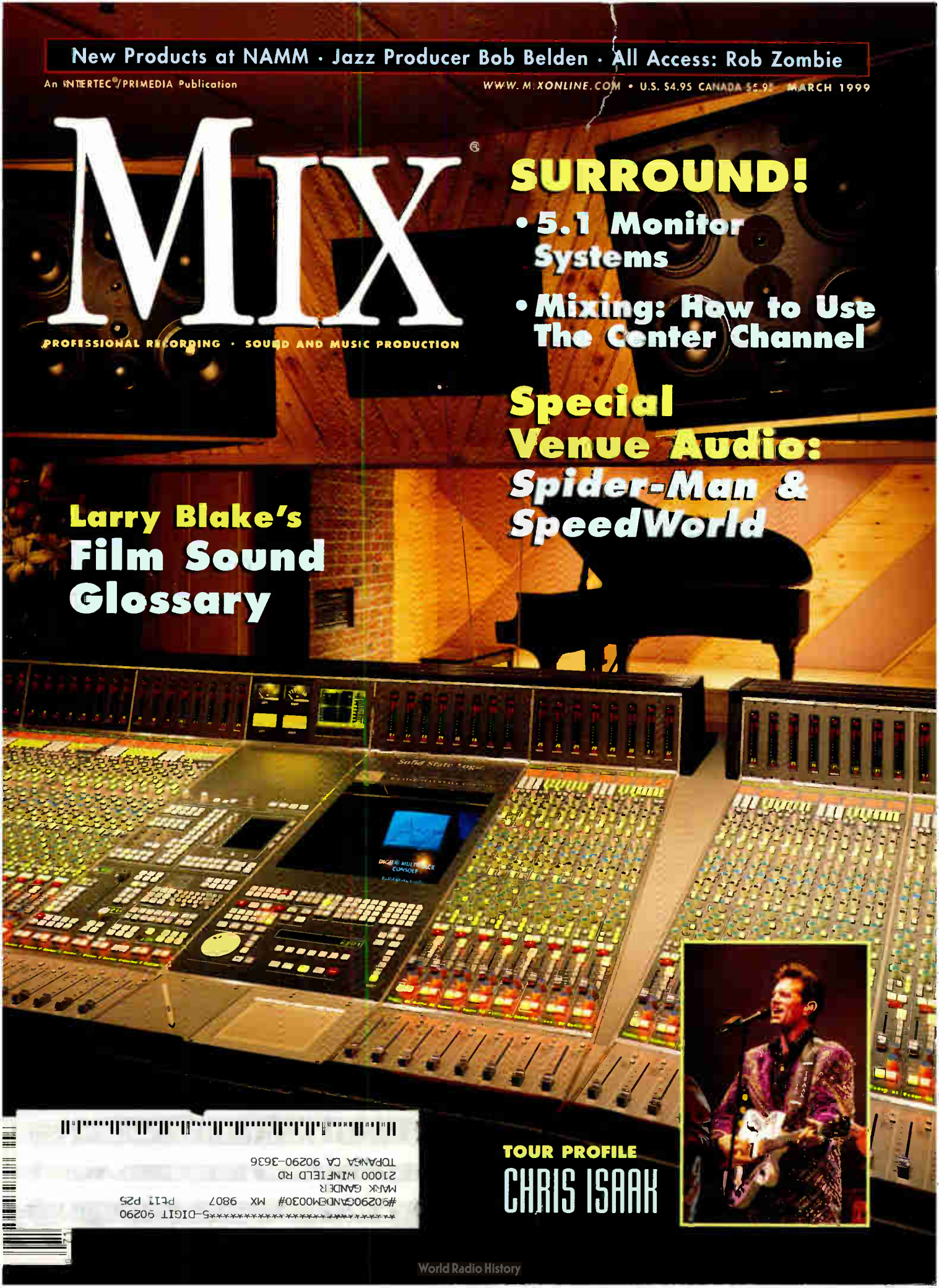

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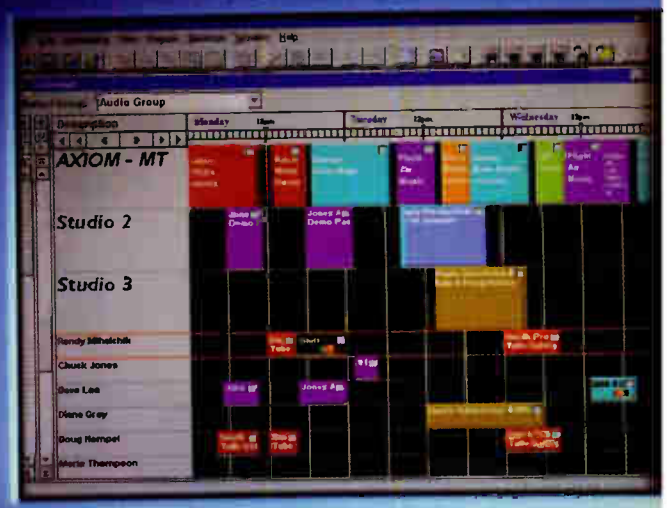

Bookings screen courtesy ScheduALL
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PHOTO: VALERIE PHILLIPS

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On the Cover: New York City's Quad Recording, a five-room, all-SSL complex designed by owner Lou Gonzalez, took delivery late last year of the first Axiom-MT in North America and promptly put it to use on sessions with Mariah Carey and others. For more, see page 76. **Photo:** Dave King. **Inset:** Steve Jennings.

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FROM THE EDITOR

UNSOLVED AUDIO MYSTERIES

The world is filled with unsolved mysteries, but riddles such as crop circles, the construction of the pyramids and the disappearance of Atlantis seem like child's play compared to some of the unexplained phenomena swirling around pro audio. For example, consider some of the following questions...

Why do people buy high-performance audio gear and then connect it with the cheapest cabling on the planet?

A guitarist might spend thousands on amps and vintage instruments; drummers invest in massive 12-piece kits with ten cymbals and a gong; and a pro keyboard rig can easily cost $15,000 or more. So why do vocalists usually settle for whatever $99 mic they're handed as they walk out onstage?

Why do some engineers think the concept of spending more than $1,000 on a pair of quality reference monitors (on which all audio decisions will be based) is extravagant, while they barely flinch at laying out $3,000 or more for a signal processor or tube microphone?

Why do artists who insist on hiring the finest engineers then tell them how to mix the album?

Wireless systems offer amazing possibilities for onstage action, but does that bass player who never moves more than three feet from the amp really need to go wireless?

Why do most label A&R reps hate the first mix they hear, when a second tape (based on their suggested "changes") gets approved a week later, even though it's the same tape? And why does a label that balks at a $50,000 recording budget routinely approve music videos at $200,000 a pop?

Why do digital equipment manufacturers specify state-of-the-art DACs into their designs and then destroy the signal quality by routing the converter's output through a cheesy 29-cent stereo op-amp?

Why do musicians producing their own CDs save money by skipping professional mastering (typically the least expensive stage of a project)?

And last, but certainly not least, why does the sound always stink at most audio trade show events and demos?

The answers to these and similar questions don't come easy. But as we edge toward the brave new world of high-resolution, multichannel audio, it may be important to evaluate some basic issues before we can seriously approach new ones, such as: Can 24-bit/96kHz resolution really meet the challenge of capturing the subtle nuances of a kick drum sample from a TR-808 drum machine? Or: When mixing a 5.1 music project, does routing the ride cymbal to the far left front and panning the hi-hat to the right surround at the opposite corner really enhance the product?

Food for thought...

George Petersen
Editor

BPA INTERNATIONAL SPARS ABP American Business Press

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FEEDBACK

LOOKING TOWARD "AUDIO 2000"

I loved "The Fast Lane Meets Insider Audio" (*Audio 2000*, Jan. 99)! Paul Lehrman's and Stephen St.Croix's articles are the first places I go when I get the latest issue. Thank God the two of you weren't in the same room during the interview. Talk about spontaneous combustion!

On a serious note, I thought both of your views were very insightful, and I completely agree with your assessment on the future of recording studios. I am personally gearing up for distribution over the Internet. I never could get the major labels to even look down here at me anyway, so I might as well start shopping my stuff directly to the user! I haven't really settled on a format of choice yet, though. RealAudio is fast but *very* lossy, and I don't like the almost "flangy" sound on some clips. .WAV files are out. Too big, too long to load. I have recently been doing some MP3 files. They DL as fast as RealAudio, but to me they sound better and cleaner. Who knows what the future will bring? I just want to be in there somewhere.

Bob Ketchum
Cedar Crest Studio
cedarcrest@oznet.com

UNDERSTANDABLE COMPRESSION

I receive a few key publications about audio and seldom find an article that thoroughly covers the basics of any topic in such a clear and understandable way as as Barry Rudolph's article about using compressors ("Understanding Compressors and Compression," Jan. '99 *Mix*). I immediately photocopied it several times and handed it out to several of my staff and volunteer mixers and made it mandatory reading. He created a useful training tool for those of us who mix as well as train others to do so. I would look forward to reading similar treatments of other audio mixing processors and processes.

Tim Bergeron
Technical Director
Calvary Chapel of Philadelphia

CONSUMER VS. PRO

I'm a pro musician who, I suppose, qualifies as an audiophile (subscriptions to *Stereophile* and *Mix*, speakers worth more than my car, etc.). But I'm curious: When I read recording magazines, the only transducers reviewed are near-field studio monitors, and *Stereophile* or any number of high-end audio magazines review consumer audiophile loudspeakers.

Why hasn't anyone pitted, say, studio near-fields against a two-way design from Totem, Dunlavy, NHT or other high-end manufacturers? Such overlap in function/purpose would seem to be crying out for critical listening evaluation and measurement. Is there any good reason why the two camps appear to be so segregated?

Matt Treder
mtreder@waystation.com

EDITOR'S REPLY

There are a number of reasons that studio monitors and home speakers must be viewed differently. For example, one of the basic functions of a studio monitor is to highlight any flaws in the mix so that problems can be corrected before a CD goes to market. The main function of a consumer speaker is to make the music sound as good as possible. Also, most compact, two-way studio monitors are designed for listening in the near field—typically with the user sitting a meter or so away from the speakers in a tightly defined sweet spot, which is hardly a preferred listening position in the home environment. These are some of the reasons why companies that sell consumer loudspeakers—such as JBL, Tannoy, NHT and Yamaha—market distinctly separate products for studio applications.

—George Petersen

DEBUNKING FOH DIGITAL

Our company serves in two major capacities: live sound reinforcement and installation, primarily for the church market. I have recently been deeply troubled by a practice and philosophy that seems to be becoming widespread in this industry.

On many occasions we are finding churches that are installing digital consoles for front-of-house applications. On some occasions a church staff member has heard that this is a good idea, but more often, large and reputable consultants are recommending it. These are not large-format consoles designed for FOH use, but the lower-end, software-driven varieties with one or two knobs per channel, max: the kind of console I would love to have in my studio, but which would send a chill down my spine to use in a live situation.

The logic seems to be: "If Sister Sally is going to sing a solo, we can just store her EQ settings and recall them every time she sings." Same for the band, orchestra, choir and various other elements in the worship service.

This idea strikes me as misguided in a huge way. I have yet to speak with a professional sound engineer who wants to mix live sound with menu-driven layers of software on a limited interface. Yet, consultants are touting these units, often multiple units chained together, to churches who often face limited budgets and a short supply of trained operators. Not to mention the fallacy of a production environment that stays so stable from week to week that "we could just punch up what we did last time."

I don't believe it is the manufacturers who endorse this practice. I haven't seen an ad from Mackie, Ramsa or Yamaha that promotes their fine products as "the latest/greatest thing" for live sound. And these same companies are bringing fantastic new equipment to the live sound market. But whatever the source of this urban myth, I would like to see it addressed and dispelled before more churches and other organizations fall prey to this bad advice.

Eddie Walker
Sound Foundation Inc.
erwalker@aol.com

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CURRENT

EXPOLATINA IN MIAMI

Intertec Publishing, a PRIMEDIA Company, and *Mix en Español* will sponsor ExpoLatina, a trade show and educational conference for Spanish-speaking audio, video and lighting/staging professionals from both Latin America and the United States. The new venture, which will be held May 5-7 at the Miami Beach Convention Center, promises to further satisy the growing information needs of the huge Latin American market, covered in-depth the past five years by *Mix—Edición en Español*. The audio seminar portion of the event—consisting of a dozen presentations over three days—is being developed by *Mix*'s director of special projects and former publisher, Hillel Resner.

"The 'Sound Track' at ExpoLatina offers something for just about everyone," Resner says. "We've brought together some of the industry's most knowledgeable people to address a variety of topics, from microphone techniques and DSP to studio design and audio for large outdoor events. In addition, we've enlisted several top manufacturers who do a lot of business in Latin America to both demonstrate products and present seminars on a number of critical topics."

A highlight of ExpoLatina, which is being produced by the same group that stages Lighting Dimensions International, will be the "Music Producers Forum," presented by the Latin Academy of Recording Arts & Sciences (LARAS). An offshoot of the National Academy of Recording Arts & Sciences, which presents the Grammy Awards, LARAS was founded in 1997 to represent the Latin music community. The Music Producers Forum will bring together some of the biggest names in Latin music production to discuss recording techniques and play samples of their work.

For more information or for registration materials, call 303/220-0600; fax 913/967-1900; or visit the Web site at www.etecnyc.net.

GENUINE MUSIC COALITION

Liquid Audio, along with 48 record labels, software, hardware and MP3 vendors, rights societies, music retailers, music content Web sites, Web development companies, broadband providers, consultants, artists and producers, announced the formation of the Genuine Music Coalition. The mission statement of the coalition is to use the new "Genuine Music" open standard enhancements to digital music formats to provide digital authentication of the origin and ownership of music.

"Liquid Audio is playing a leadership role in helping the industry preserve the quality and authenticity of music distributed on the Internet and helping create a market for legitimate content," said Gerry Kearby, CEO of Liquid Audio.

Members will display a new "Genuine Music" mark logo in every piece of legitimately encoded content sold or freely distributed on the Internet. This will allow consumers to distinguish between pirated and legitimate content.

This effort will be aligned with the efforts of the Secure Digital Music Initiative (SDMI) and is not intended to be a substitute for the security to be provided by SDMI.

For further information, including a list of participating companies, visit www.liquidaudio.com/press/.

CHRIS STONE EXITS MPGA

Music Producer's Guild of the Americas executive director Chris Stone has decided to step down after announcing that the guild has achieved its initial goals ahead of schedule. The MPGA has gained 160 members and 32 corporate sponsors in 18 months.

"When MPGA founder Ed Cherney approached me in August of 1997, and asked me to help him make the MPGA a reality, I told him I thought it would take until the millennium to accomplish these goals," says Stone. "We had no idea what excitement we would generate in the audio engineer/music producer community and among the leading pro audio manufacturers. It has been simply phenomenal."

Stone suspended his active role as executive director on February 1.

—CONTINUED ON PAGE 16

TEC AWARDS PROCEEDS DISTRIBUTED, SITE CHOSEN FOR '99

The Mix Foundation for Excellence in Audio has announced the distribution of proceeds from the 1998 Technical Excellence & Creativity Awards, held last September in San Francisco. A total of $31,500 was given to charities and organizations involved in hearing protection awareness and scholarship programs for audio students. Fifty percent of the proceeds were distributed to the Hearing Is Priceless campaign (co-founded by the House Ear Institute and *Mix* magazine).

The Mix Foundation also announced that the 15th Annual TEC Awards will be held Saturday, September 25, at the Marriott Marquis in New York City and promise to be the biggest TEC Awards yet.

For ticket and sponsorship information, contact Karen Dunn at (925) 939-6149 or KarenTEC@aol.com. ■

STUDIOPRO99 PANELISTS SET

StudioPro99, to be presented by *Mix* on June 14-15 at the Universal City Hilton in Los Angeles, has announced a stellar lineup of panelists. Subtitled "Emerging Technologies and the Future of Audio Production," the conference will feature more than 50 noted industry figures addressing technical and business topics.

Among those confirmed are producers and engineers Rob Cavallo, Don Gehman, Sylvia Massy, Dave Reitzas and Al Schmitt; mastering engineers Dave Collins and Steve Hall; studio designers George Augspurger, Peter Gruneisen, Chris Pelonis and Vincent Van Haaff; film re-recording mixers Ted Hall, Paul Massey and Shawn Murphy; and numerous other experts in a host of specialized fields.

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INDUSTRY NOTES

Richard A. Lindemuth was appointed president and chief executive officer at **Quantegy Inc.** (Peachtree, GA). Lindemuth formerly served as president at ITT Business and Consumer Communication and president/CEO of Robinson Nugent Inc...**Beyerdynamic GmbH** (Heilbronn, Germany) appointed **Jerry Spriggs** general manager of its U.S. subsidiary. An industry veteran and long-term AES member, Spriggs will be responsible for directing all of beyerdynamics' U.S. operations...**Josephson Engineering** (San Jose, CA) announced an alliance with **AudioControl Industrial**, wherein AudioControl will handle manufacturing and marketing of the Josephson Series Five microphones...Surrey, UK-based **Soundtracs** announced that it has reached an agreement with **SADiE Inc.** to jointly develop a digital mixer combined with a 24- or 32-track hard disk recorder and editor in a single unit...**Antares Audio Technologies** concluded a merger agreement with **Cameo International Inc.**, which will result in Cameo being absorbed into Antares. Cameo Int'l, the nation's largest independent distributor of software plug-ins, was founded in 1997 by Neil RiCharde and Denny Mayer. RiCharde will become Antares' VP of business development, and Mayer will become VP of sales...**Apogee Sound Inc.** (Petaluma, CA) promoted two members of its sales team. **Timothy Thornton** takes the position of VP of sales. Thornton is a 12-year industry veteran and was previously general manager at both Gulf Coast Sound & Lighting and Pace Sound & Lighting, both in Houston. **Federico Serrano** was promoted from director of Latin American sales and marketing to director of international sales...**Akai Digital** (Ft. Worth, TX) tapped **John Mozzi** to fill the newly created position of director, post-production division...**JBL Professional** (Northridge, CA) recently held an open house to debut its new "Factory of the Future." The company has added a custom manufacturing facility and a new engineering development laboratory to its manufacturing operations plant....**Ove Arup and Partners** announced that a new **Arup Acoustics** group was added to the multidisciplinary engineering firm's San Francisco office. Arup Acoustics will be led by **Kurt Graffy** and **Larry Tedford**...**QSC Audio Products Inc.** (Costa Mesa, CA) announced that construction of its new 80,000-square-foot building is on schedule. Move-in should be completed by May...**Robert Belt** was appointed regional manager, Southwest region, at **TOA Electronics Inc.** (South San Francisco). TOA celebrates its 25th anniversary this year...New York City-based **soundbusiness** announced the appointment of **Mary Moyer** to vice president of marketing/client relations...**Nexo**, a European loudspeaker manufacturer, opened a corporate headquarters in Cotati, CA. **Jim Sides** was tapped to head sales and distribution activities for Nexo USA...**Lausser & Vohl** of Stuttgart, Germany, has been honored by Austin, Texas-based **White Instruments** as International Distributor of the Year...**SWR Sound Corporation** recently moved from Sylmar, CA, to 9130 Glenoaks Blvd., Sun Valley, CA 91352. Phone: 818/253-1797...**Lucid Technology** (Lynnwood, WA) announced the expansion of its tech support hours. Technicians will take phone calls between 6:00 a.m. and 5:00 p.m. Pacific time. U.S. customers can phone toll-free at 888/349-3222; international callers dial 425/743-3173...**ATM Fly-Ware** announced that Michael Tremain has left Marketing Concepts to form **Tremain Marketing Group**, which will handle the territories of Kansas, Nebraska, Missouri, Iowa and southern Illinois. Both companies will continue to represent ATM Fly-Ware in their respective territories. ■

—FROM PAGE 12, CURRENT

C.A.S. HONORS CANTAMESSA

Production sound mixer Gene S. Cantamessa was selected by the Cinema Audio Society to receive its Career Achievement Award. The award is given to members of the sound community who have made an outstanding contribution to the craft of sound mixing.

Cantamessa's career spans five decades; he's received three C.A.S. nominations, seven Oscar nominations, three Lyra nominations and Emmy nominations. He received an Oscar for *E.T.: The Extraterrestrial*. Other credits include *Close Encounters of the Third Kind*, *Blazing Saddles* and *The Big Chill*.

MASTERLAB OPENS IN ORLANDO

Former Marilyn Manson drummer and founding member Lucas, and business partner Trace, "International Mastering Whiz Kid," have opened a new mastering facility in Orlando, Fla.

The five-room complex is devoted to premastering, product assembly, disc quality control, mastering and replication of all-format CDs and DVDs. The A room at the complex features a 24-bit/96kHz Sonic Solutions system. The duo announced plans to open facilities in New York and Los Angeles later this year. More information is available at www.masterlab.com.

ALLEN SIDES SELLS THREE ROOMS

Allen Sides, owner of ten Ocean Way recording rooms in L.A. and Nashville, has sold three rooms and the building at 6000 Sunset Blvd. The rooms were purchased by Cello Studios, LLC, and were renamed Cello Studios. The facility will be under the direction of producer John Porter.

Sides will continue to operate Ocean Way studios at 6050 Sunset, along with the two rooms at Ocean Way/Record One in L.A. and the three studios of Ocean Way/Nashville.

UPCOMING SHOWS

NAB99 takes place in Las Vegas April 17-22. For registration and other information visit www.nab.org/conventions/ or call 732/544-2888 for fax-on-demand.

The 106th AES convention takes place at the MOC Center, Munich, Germany, from May 8-11. Visit www.aes.org/events/106 for updates. ■

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Expensive automated digital mixing console	$250,000 and up *(the sky's the limit)*
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The world's best-sounding DigiRack™ Plug-Ins included *FREE* with Pro Tools *(a $1,000 value!)*	
Total System Cost	**$73,560†**

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†Additional financial structures are available. All prices are subject to change without notice.

Studio photo courtesy of DubeyTunes Studios, San Francisco.
Photo by Bill Schwob

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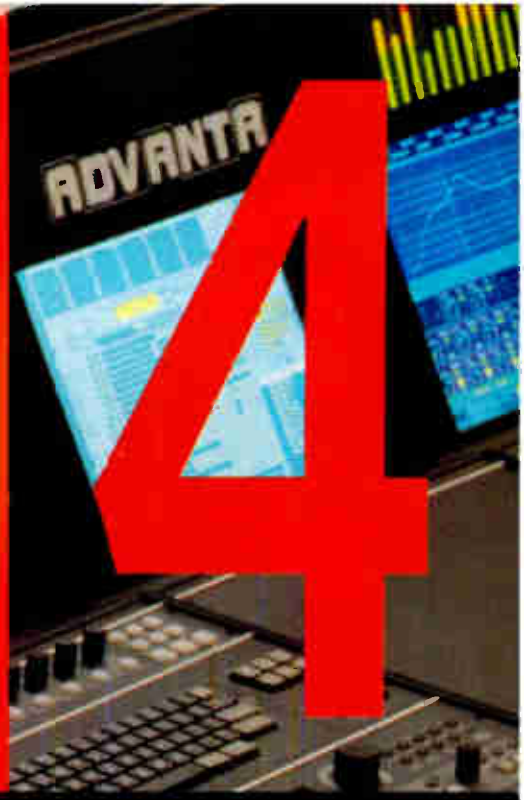

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R&D in cooperation with Sanyo Kogyo, a member of the Otari Group.

MOSTLY DATA

HOW LOW CAN YOU GO?

ILLUSTRATION: NATHAN CITA

A CLASH FROM THE PAST

A few years ago, I told you not to do it. I said I wouldn't do it until they fixed all the horrible things wrong with both the idea and the implementation. I told you to stay away from it like the plague—and apparently you did. So did the buying public.

And rightfully so, for these things represented technology at its worst—technology gone mad. Any new product that actually *sounds* worse than the product it replaces is very, very wrong. And any new format that offers a wealth of new features but still sounds worse than the current format is just, well, *wrong* as well. No matter how attractive, how convenient, how cute, I don't believe that users should accept being dramatically *downgraded* when they buy NewTech of any kind.

I had listened to my first Sony MiniDisc at one of those mall micro-tech mini-stores—the Edge, I think. In a noisy mall, with the woman I came in with pulling at my arm saying, "Come *on*, you don't need *that*," and the woman who managed the store saying, "Come on, you *need* this. Wouldn't you like to be the first to buy one? We haven't sold one yet." I had a listen. And even standing between two women, both talking directly at me, with a background of 300 screaming kids, I heard that something was very wrong with the way this thing sounded. I put it down and left.

Subsequent research confirmed what I had suspected—the compression techniques were horrible, and for me, unbearable. I don't like "good" lossy compression, and this was *not* good lossy compression.

JUMP TO TODAY

I was happily sitting at home, doing something or other (I think I was accidentally testing to see if the rear piston of the new twin-cam Harley engine will fit in the front cylinder), when a Mr. Edmund Pirali called and said, "You're not gonna believe this, but a friend just got a new MiniDisc recorder and it sounds okay!" Now, had almost anyone else made that call, I would

BY STEPHEN ST.CROIX

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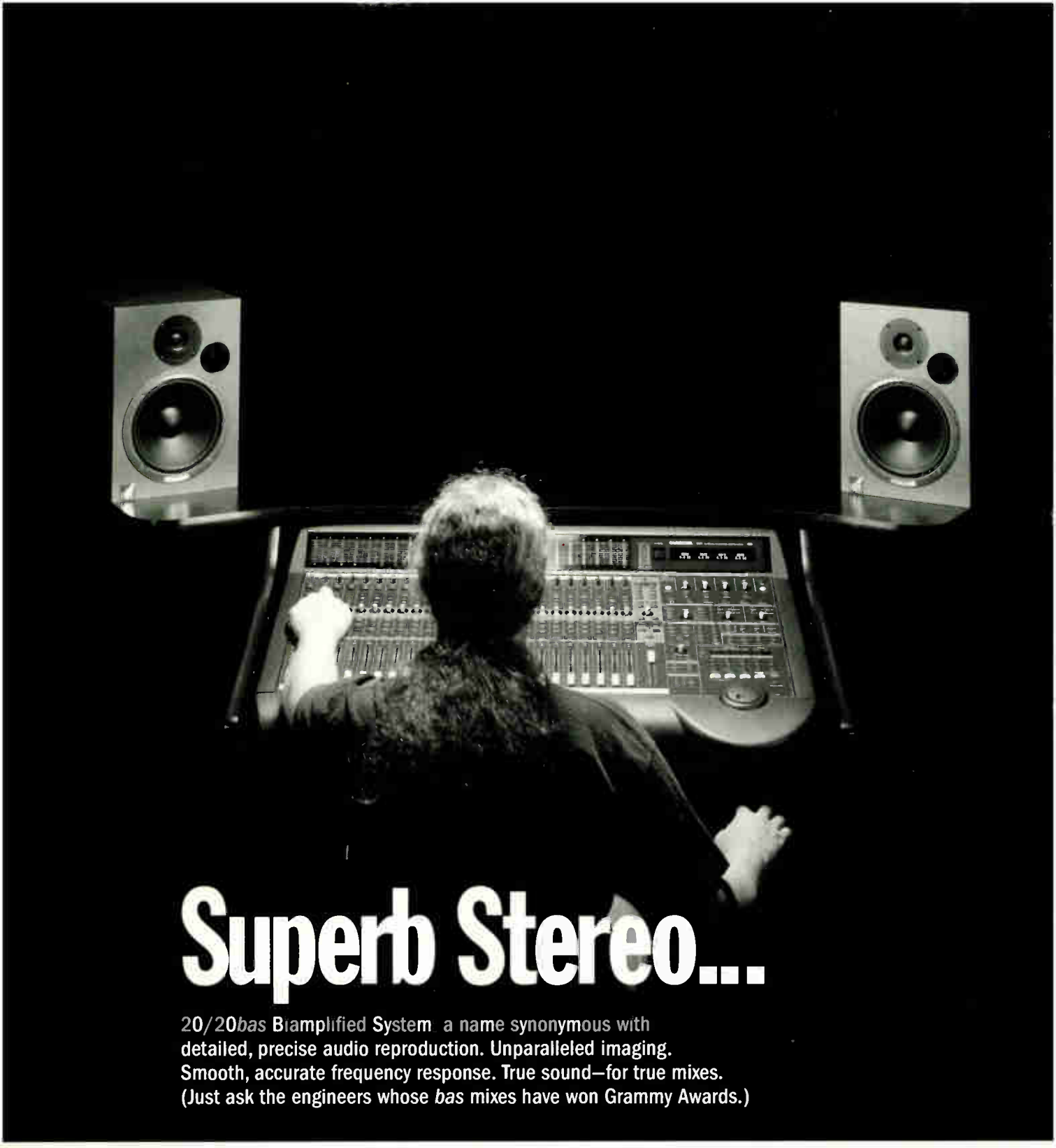
To qualify to receive a free TASCAM CD-RW5000 you must buy a DA-38 and TM-D1000 from an authorized U.S. TASCAM dealer between December 26, 1998 and March 31, 1999. After you take delivery of the equipment, mail a copy of your fully paid dealer receipt complete with serial #'s direct to TASCAM, Dept. FREE CDR, 7733 Telegraph Rd. Montebello, CA 90640. For your protection we suggest mailing by certified mail. TASCAM will ship prepaid directly to you a CD-RW5000 FREE!! All requests must be received at TASCAM by mail, no later than April 30, 1999.

CIRCLE #011 ON PRODUCT INFO CARD



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20/20*bas* Biamplified System a name synonymous with detailed, precise audio reproduction. Unparalleled imaging. Smooth, accurate frequency response. True sound—for true mixes. (Just ask the engineers whose *bas* mixes have won Grammy Awards.)

20/20*bas* Biamplified System.

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Expand your stereo 20/20*bas* system to full-blown surround with the addition of center, right-rear, and left-rear *bas* and our new active **20/20 System Subwoofer**™—a thundering 15"/250W monster featuring our unique dual input/dual crossover design. Simultaneously monitor the discrete Dolby™ Surround LFE (Low Frequency Effects) channel while extending the low-end response of each *bas* satellite.

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EVENT ELECTRONICS

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have laughed and thanked them for the joke and gone on with my profound mankind-enriching project. But it was Edmund, my main reference friend. We all have a few people whom we can ask to listen to something when we aren't totally sure ourselves. Maybe we have a cold that day, or we might have just slipped up a bit, or maybe pushed too hard and become too tired and lost perspective, maybe. Well, you know, there are a dozen reasons for these reality checks. So, because *he* had said this, I had to at least entertain the possibility that these things had improved, the improbability of such an event notwithstanding.

So, I eventually called him back and asked for more details about the toy. Some time after that, I called and interrogated the owner, and later I searched the Web and found all of the MiniDisc recorders made (very few). Later, I even went to Circuit City to see what they looked and felt like in person, and some time after that, I went to Best Buy to see them there.

All this took, oh, I don't know, about five hours. Come on, give me a break, it was a *work* day, I had to multitask just to get it done that same day at all. So now it's Friday night and I'm sitting at home with a Sony MZ-R50 MD recorder and ten blank discs.

I came away from the shopping experience with a haunting feeling that, once again, I had stepped over the line into the Twilight Zone. At Circuit City,

It fascinates me that something once so ugly could come back so cool.

I went through *four* salesmen. I asked each if they were familiar with MiniDisc players and recorders, because my questions were going to be difficult. Each vehemently assured me that they were very well-versed on the subject. None of the first three could answer the following techno-stumper: NiCad, Nickle-metal-hydride, or Lithium-Ion batteries? Two of them said they would go find out and *never* came back. The fourth salesman—and he made the whole experience special enough to make me want one—happily picked up one of the little portable MD recorders, aimed it at a large desktop MD recorder, and, while looking me straight in the eye, said, "This is the remote for the big one." He *meant* it! Stunned speechless, I had no choice but to leave and buy elsewhere.

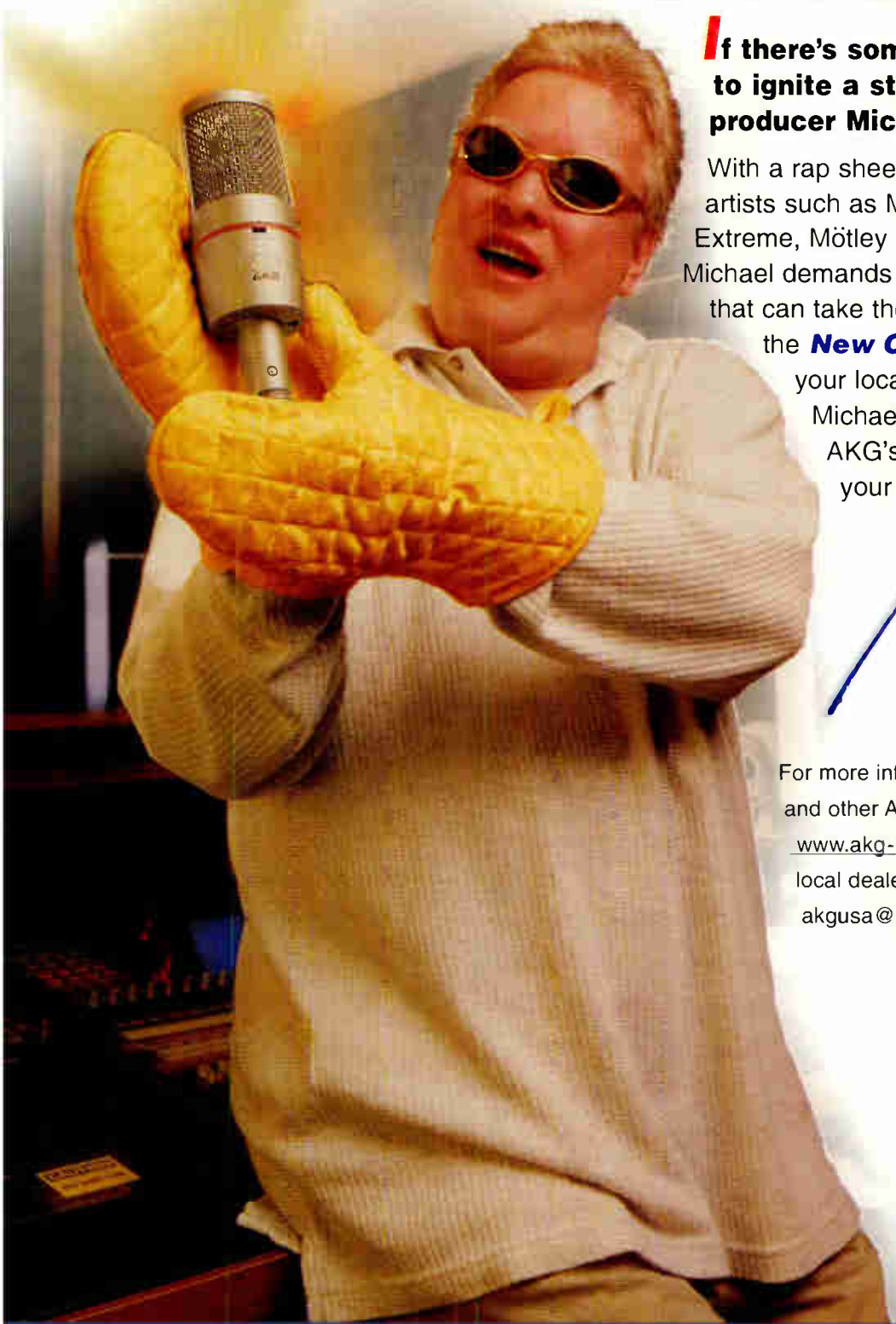
THE STORY OF A MAN AND A TINY SILVER THING

Here I sit with this alien micro-artifact on my lap. When I was a kid, my grandmother had a hearing aid larger than this thing. No device ever made for human use has had buttons as small as the ones on this. Physically, it's beautiful, and the media has a very high Jetsons factor. *Every* one of the six surfaces has controls. The *wire* to the earphones even has a scrolling LCD screen and more controls on it.

Sony sells a huge number of MD recorders to radio stations to replace carts. NPR bought a bunch for interviews. For me, it's cute pocket technol-

—CONTINUED ON PAGE 193

THE NEW C4000B MICROPHONE IS TOO HOT TO HANDLE!



If there's someone who knows how to ignite a studio it's engineer/ producer Michael Wagener.

With a rap sheet that includes fiery artists such as Metalica, Queen, Skid Row, Extreme, Mötley Crüe, and Janet Jackson, Michael demands a condenser microphone that can take the heat. That's why he uses the ***New C4000B*** from AKG. Contact your local dealer to find out...what Michael Wagener already knows. AKG's new C4000B will ignite your recordings too!

M. Wagener

For more information on the new C4000B and other AKG products, visit our website at: www.akg-acoustics.com, visit your local dealer, write us or e-mail us at: akgusa@harman.com.

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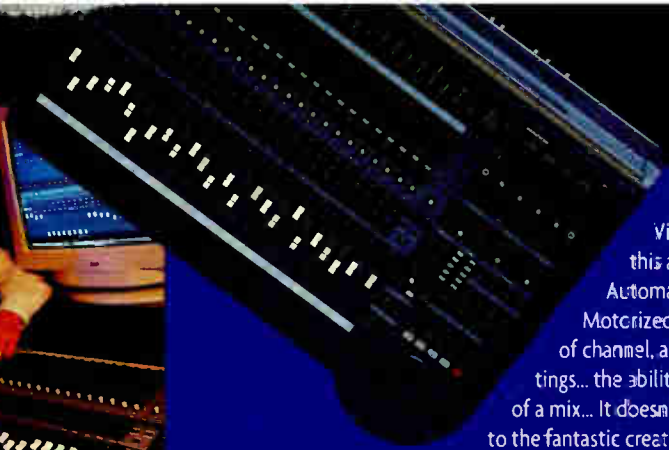
MICHAEL DeLORENZO

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."

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

SUPERB SOUND

MUSCLE SHOALS CITY LIMIT

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

WALTER AFANASIEFF

You'd think with more than 100 million album sales to his credit, we could have treated pop producer **Walter Afanasieff** better. But even his dazzling production credits and deposit at a local retailer couldn't land him a D8B until recently. Was the 9-month wait worth it? As Walter's engineer **David Gleason** says (in his unmistakable British 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

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

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CIRCLE #015 ON PRODUCT INFO CARD

RECALLING A LEGENDARY PLAYPEN

A REVISIT WITH BELL LABS

Where does the spark of creativity come from when new tools and systems are designed? Is it from freedom, or from pressure? Can an engineer, working in an environment free of deadlines and milestones, come up with anything useful? On the other hand, can that same engineer, working within the tight structure of a fast-moving, results-oriented corporation, bring a truly innovative perspective to a design? What would happen if an engineer were to strike out in an entirely new direction and work in an artistic field for a period of time? Conversely, what would happen if an artist were dropped into a laboratory and given carte blanche to tap the brains of the tech-heads and to play with the machines?

For those of us who consider ourselves artists, and who work with technology all the time, these might seem strange questions. After all, combining art and technology is what we *do*. Balancing freedom and structure is what we live with every day. We're constantly being called upon—or call upon ourselves—to do that left-brain/right-brain dance that requires being creative at the same time that we're mastering sophisticated technological tools.

But once upon a time, the worlds of the artist and the scientist were quite different. People wore different hats, and it was only under the rarest of circumstances that they trod on common ground and, if they dared, exchanged headgear.

In the companies where audio and music software and hardware are designed today, artists trained in technology and engineers with artistic hankerings work side by side. The artist who blithely goes through an entire career ignorant of the technological tools of his or her trade strikes us as a sad anachronism, and the technician who doesn't spend at least some down time fooling around with graphics, animation or music seems to us terribly one sided.

But not too many years ago, engineers who admitted to having

BY PAUL D. LEHRMAN

ILLUSTRATION: JAMES YANG

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Use the DDP to get the tone you've always wanted

Try this for a great guitar sound:

Gate:
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- Ratio at 1:4
- Attack at .1 mSec
- Hold at 40 mSec
- Release at 54dB/Sec
- TCM Time at 3 mSec

Compressor:
- OverEasy knee #3
- Auto attack and release - On
- Threshold at -10dB
- Ratio at 4:1
- Gain at 6.5

Parametric EQ:
- Band 1: 200Hz Boost 3dB
- Band 2: 8kHz Cut 2dB
- Band 3: 4kHz Boost 5dB
- Tape Saturation Emulation: Warm

Limiter:
- Threshold at 0dB
- Attack at .1 mSec
- Release at 130dB/mSec

Use the DDP to:
- Bypass the inferior A/D converters found in computer based recording cards
- Improve the quality of your tracks by recording "hotter"
- Gate noisy guitar rigs

Smooth Out Your Vocals

The DDP lets you set em on top of the mix, or blend em in

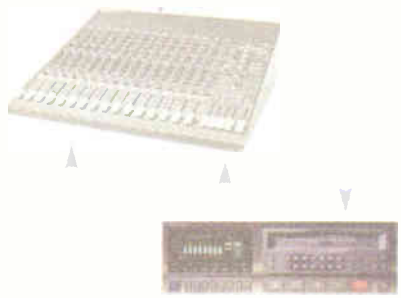
On your next vocal session try this DDP setup:

Parametric EQ:
- Band 1: 100Hz Cut 3dB
- Band 2: 25Hz Cut 12dB
- Band 3: 20kHz Cut 11dB
- Tape Saturation Emulation: Light

Compressor:
- OverEasy knee #4
- Auto Attack/Release: On
- Threshold at -17dB
- Ratio at 2:1
- Gain at 3.5

Gate:
- Threshold at -50dB
- Ratio at 1:2.6
- Attack at .1dB/mSec
- Hold at 38 mSec
- Release at 88dB/Sec
- TCM time at 1mSec

De-Esser:
- Frequency at 4.6kHz
- Amount at 45%



The DDP improves vocals by:
- Taming those harsh "esses"
- Controlling vocal levels
- Gating out background noise
- Providing comprehensive vocal processing in a single unit

Save The Planet  It's The Only Market We've Got

Apply Within.

Fatten Up Your Drums

Get that "fat track" sound you're looking for

Try this for a great kick sound:

Gate:
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- Ratio at 1:15
- Attack at .4 mSec
- Hold at 12 mSec
- Release at 92dB/Sec

Compressor:
- OverEasy knee #3
- Auto attack and release - On
- Threshold at -9dB
- Ratio at 5:1
- Gain at 6.5

Limiter:
- Threshold at 0dB
- Attack at .7 mSec
- Release at 120dB/mSec

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- Type IV™ allows you to capture the incredible dynamic range of a drum kit
- TCM™ Transient Capture Mode allows more accurate dynamics processing on percussive sounds
- Using the ultra-fast Gate improves drum track separation

DDP

Let's face it. Til now there were some audio processing chores (like compression) that just had to be done analog to sound right...right?

Please welcome to your rack the dbx DDP. It's the world's first 2 channel compressor/limiter that has all the warmth, life and mercy of an analog box with the precision converters you, (the modern recordist), MUST HAVE for your digital recording applications.

Finally, a 24 bit digital box that glows with the classic characteristics of dbx® compression that has been processing the hits for over 25 years. Take a run through the parameters, it's REAL easy... you'll see all the standard controls you'd expect, plus quite a few more. 10 steps of OverEasy® on the compressor, not just on/off. Transient Capture Mode™ (TCM), a fully parametric EQ, De-sser and Tape Saturation Emulation™ (TSE) are all standard on the DDP.

Mix It Down

Bypass the on-board converters on your DAT or DAW and add sensible processing at the same time

When you're ready to finish it off:

Gate:
- Threshold at -60dB
- Ratio at 1:3.5
- Attack at .1 mSec
- Hold at 18 mSec
- Release at 100dB/Sec

Compressor:
- OverEasy knee #1
- Auto attack and release - On
- Threshold at -10dB
- Ratio at 2.4:1
- Gain at 7.0

Limiter:
- Threshold at 0dB
- Attack at .1 mSec
- Release at 160dB/mSec

During Mix-down the DDP can:

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musical aspirations, or musicians who were willing to pick up a soldering iron, were rarities. When those people started to come together, a revolution began. And nowhere was that revolutionary fervor felt more than at Bell Laboratories.

Bell Labs, the research arm of AT&T, the erstwhile American local and long-distance telephone monopoly, was founded in 1925 in Murray Hill, New Jersey, about 20 miles from New York City. From the beginning, it was the site of some of the most important technological developments of the century. The transistor was invented there, and so was the laser. So were the digital computer, the fax machine, cellular phones and UNIX. Bell Labs scientists discovered the background radiation left over from the Big Bang, and they were also the first to successfully synchronize film and audio. Manfred Schroeder, who developed the algorithms that are used in all of today's digital reverbs, was a researcher at Bell Labs, and Michael Noll developed at the Labs a three-dimensional force-feedback device, which is now a crucial part of what we call "virtual reality."

A rare look inside the Bell Labs of decades past was provided at a public meeting held a couple of months ago at Cooper Union, an art school in midtown Manhattan. Ten digital pioneers who worked at the facility in the '60s and '70s came together for a reunion. The meeting was presented by a small but ambitious outfit called Arts & Sciences Collaborations Inc. (ASCI), in conjunction with Bell Labs' present-day parent company, Lucent Technologies, and several other sponsors. The participants talked about what they did at the Labs, demonstrating seminal projects and works from that era. Perhaps more importantly, they talked about how the philosophy and unique cast of characters that made up this protean think tank nourished their creativity. This atmosphere made it possible for them to conceive projects that, in a more conventional setting, an infinite number of engineers working on an infinite number of computer terminals would never have come up with.

It was during World War II that Bell Labs went from being the home of a dedicated bunch of communications engineers to a broader-based think tank. "The place exploded," explained Jerry Spivack, a pioneer in interactive graphics and the first of the alums to speak at the meeting. "Scientists were pulled from universities all over the country to work on radar. To attract them, AT&T needed to provide a fluid environment. Then, after the war, it stayed that fluid. We felt like we were in a period of unending growth, and in the next decade, the race to the moon gave us a lot of excitement and vision.

"AT&T considered us a national treasure," he continued. "People were studying everything that had anything to do with communications—frog mating calls, for example. We were told, 'Don't even think about money—this is research!'"

For artists who work with technology all the time, balancing freedom and structure is what we live with every day.

The facility was situated near a nature preserve, and scientists were encouraged to walk in the surrounding woods and think. But it was also very spread out, with different people working on entirely different problems right next to each other. "In order to go anywhere, you had to pass other people's offices," recalled Spivack, "and there was always something strange going on in there, so you'd poke your head in and see what it was."

Of course, not every project had totally positive consequences: "We did one exhibit with polyurethane," he laughed, "which when we were setting up, we realized it would kill the audience with its fumes. Sort of gave new meaning to the phrase 'knocking 'em dead!'"

But there was more to Bell Labs than just a coming together of the best scientific brains. "The powers-that-be wanted to extend the capabilities of the technology," said Spivack, "and they felt the best way to do that was to bring in artists. We needed artists to think about what the technology *meant*." At the same time, those engineers who had artistic sides were encouraged to let them emerge. Elsewhere this never would have been allowed to interfere with their "real" work. Said composer Laurie Spiegel, "There were all these informal chamber-music reading sessions going on."

Max Mathews, today hailed as the father of computer music, held the title "Director of Acoustic and Behavioral Research" at the lab until 1985. In his comments at the meeting, he noted that Cooper Union was a particularly apt place to hold the event because the first public concert of computer music took place there in 1960. "There was a phalanx of New York police to protect the equipment," he recalled, "in case there was a riot."

Mathews created his first computer music in 1957, "terrible bloops for 17 seconds," he recalled. In response to the difficulty he had organizing the sounds, he wrote the first dedicated musical computer language, MUSIC I. In 1960, he used physical modeling (!) to create the rendition of "Bicycle Built for Two," made famous in the movie *2001: A Space Odyssey*, as the last thing the HAL 9000 computer utters before it undergoes a lobotomy. Not long after that, he designed GROOVE, the first interactive computer music system, which used a computer to generate voltages, which in turn controlled analog synthesizer modules.

"By day, the computers were used for speech research, and by night, music research," Mathews explained. He could give passes to people who wanted to work overnight, and one of those was composer Emmanuel Ghent, who was also on the panel. "When Ghent's marriage broke up, and he remarried, I gave him the computer as a wedding present," said Mathews, "so he wouldn't have to come in and work all night."

Ghent talked about his work with the machines controlling both music and theatrical lighting dimmers, about developing a music-notation generator, and about how he used random number generators to create music, in the first experiments in computer-driven algorithmic composition. "Some random numbers sounded better than others," he recalled. "If I were a better programmer, I would simply have

—CONTINUED ON PAGE 221


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HOT HITS FROM WINTER NAMM

Mackie SRM450

BY SARAH JONES, CHRIS MICHIE AND GEORGE PETERSEN

From January 28 through 31, 1999, more than 61,000 music industry pros packed the cavernous Los Angeles Convention Center for the winter expo of the National Association of Music Merchants (www.namm.com), where 1,200 exhibitors showed the latest in audio and music gear. Outside of Roland's entry into the digital console market (see sidebar), the big "gotta-see-it" hits were few; however, this show had no shortage of cool technologies. Here are some slick debuts that caught our attention.

Peavey (www.peavey.com) and **Cakewalk** (www.cakewalk.com) unveiled StudioMix™, a moving fader hardware control surface that integrates with Cakewalk 8-track digital audio recording/MIDI editing software. The console includes MMC transport keys, jog/shuttle wheel, four user-definable softkeys and tactile control of volume, pan, sends, returns, track arming, mute, solo, chorus/reverb, etc. This "studio in a box" package retails at $899. Keep an eye on Peavey for similar advanced products (and alliances) in the future, in both pro and MI markets.

Peavey/Cakewalk StudioMix

Coming soon to near-fields and hanging clusters everywhere: Having conquered the consumer subwoofer market, **Velodyne Silicon Systems** (www.velodyne.com) has its sights on the pro OEM market with a lightweight digital Class D amp available in mono 100/250/600/1,250-watt modules having an astonishing 97% efficiency! Could your next speakers sport a "Velodyne Inside" sticker?

24/96 AND ALL THAT...

If there was a buzzword *du NAMM*, it had to be "24/96." **TC Electronic** (www.tcelectronic.com) is shipping the $2,995 Finalizer 96k, the newest generation in its Finalizer mastering processor line, offering 24-bit/96kHz resolution and a hardware upgrade path (Bravo, TC!) for owners of earlier units. TC also showed a 24/96 upgrade I/O card for its flagship M5000.

Arguably the most powerful standalone pro audio signal processor ever made, **Eventide's** (www.eventide.com) Orville supports up to four analog and four digital inputs and outputs simultaneously, with "anything-to-anything" routing and 24-bit/96kHz capability. Besides UltraShifter™ formant-correct vocal processing, Orville offers reverbs (mono/stereo/4-channel), dynamics, EQ, multi-effects, 87 seconds of delay and up to 174 seconds of sampling with time compression. Price? $5,595.

Quantum, from **dbx** (www.dbxpro.com) is a digital mastering processor with multiband compressor, limiter, expander, gate, parametric EQ, de-esser, normalizer and 24/96 capability—all from a one $1,999 box. Quantum also features the Type IV 24/96 converters used in dbx's acclaimed Blue Series, with a choice of dither options and TSE™ Tape Saturation Emulation.

Eventide Harmonizer Orville

Tom Oberheim's new company **SeaSound** (www.seasound.com) showed what was clearly the DAW bargain of the show: "Solo," is a complete 2-channel DAW (sans PC or Mac) that includes PCI card, software (or use your own), cables and a two-rackspace box with line, hi-z instrument and mic inputs with phantom power, line/mic input mixing with pans, channel inserts, LED metering, MIDI interface, monitor mixing, headphone amp, control room volume pot, S/PDIF I/O and 24/96 converters. Price: an awesomely low $599.

Antares (www.antarestech.com)

Auto-Tune—see last month's *Mix*—has eliminated the need for vocalists to sing on key. Now the company shows the AMM-1 Microphone Modeler, which uses spectral modeling to simulate different mic sounds. Plug any reasonably full-range mic into its preamp input and select your choice of classic and vintage mics at the touch of a button. This could do to mics what the SansAmp did to guitar amps! Ships this summer.

Speaking of mics, **AKG**'s (www.akg-acoustics.com) new C4000B is a 3-pattern, large-diaphragm condenser mic priced at $848, with windscreen and shockmount.

ANALOG LIVES!

Analog signal processing is alive and well. **Focusrite**'s (www.focusrite.com) Compounder brings the company's well-known Class A circuit designs into a stereo compressor/limiter/gate priced at a tempting $899.

HHB (www.hhb.co.uk) showed two new lines of tube signal processing. Designed for the project studio, the Radius Series includes the Radius 10 4-channel preamp, Radius 20 stereo 4-band parametric, Radius 30 stereo compressor, Radius 40 voice processor (pre/compressor/expander/EQ) and Radius 50 preamp/compressor. Intended for more demanding applications, HHB's Classic Series has the Classic 60 stereo compressor, Classic 70 stereo parametric and Classic 80 2-channel preamp.

Tube-Tech's (www.tcelectronic.com) new CL 2A is an all-tube, dual-channel (stereo linkable) opto-compressor that puts two classic CL 1B compressors in a two-rackspace chassis. Retail: $3,195.

SOFTWARE SOLUTIONS

One of the cool new software apps shown at NAMM was **Emagic's** (www.emagic.de) Waveburner, a new Mac application for mastering Red Book Audio CDs. Price: $199. Emagic also released Logic Audio Platinum and Gold 3.7, featuring extended support for Yamaha's DSP Factory.

Arboretum's (www.arboretum.com) Harmony formant-based harmony software features up to eight-voice harmony generation, graphical editing, automatic pitch correction (with vibrato preserved) and adjustable formants. List: $349.

Steinberg (www.us.steinberg.net) showed a version of Cubase VST that works with the Rocket Network API (www.rocketnetwork.com) now available to application developers—allowing multiple users to use the Internet as a live connection to join in on projects. Cubase VST with the RocketPower module should be available next quarter.

Be Inc., maker of the multimedia-optimized BeOS operating system (www.be.com), demoed its fast new Version 4 system. So far, 26 music and audio developers, including Opcode, Sonorus, Lucid, Steinberg, Emagic, Arboretum, Aardvark and E-mu, have announced plans to bring to market audio applications for the BeOS. The applications will begin shipping within the next three months.

A growing number of third-party developers have been announcing support for **CreamWare**'s recently announced Pulsar platform, including Metric Halo, Sonic Timeworks, Spectral Design, Wildcat Canyon and NemeSys. And Windows users are celebrating **Digidesign**'s (www.digidesign.com) announcement that it is now shipping the PC version of the Pro Tools MIX system.

Waves (www.waves.com) announced the Pro-FX suite of DSP plug-ins for Digidesign TDM systems, including UltraPitch, a six-voice formant-corrected pitch shifter; SuperTap, a six-voice multitap delay; MetaFlanger for vintage tape flanging and phase emulation; and MondoMod, which combines AM (level), FM (frequency) and stereo rotation (panning) into a single modulator. Price: around $700.

TC Works (www.tcelectronic.com) introduced TC Native Bundle, a package of three plug-ins for DirectX applications, including TC's popular Native Reverb and Native EQ Works plug-ins, plus the new Native DeX compression/de-esser plug-in. Native DeX includes a Key plug-in for ducking and performs analog emulation using TC's proprietary SoftSat algorithm. The bundle is $599 or $299 each.

Minnetonka (www.minnetonka-audio.com) announced it has licensed Dolby AC-3 encoder technology for its new SurCode software for encoding 5.1

SIX HIP PICKS YOU MAY HAVE MISSED

Akai's Chord Finder

Keep forgetting the fingering for that tricky F=13aug9 (or maybe just a D) chord? Get **Akai**'s new compact guitar chord finder. This keychain-size, battery-operated unit has a tiny LCD screen displaying any of 905 chord patterns on a six-string/four-fret grid. Retail: $19.95.

Sabine (www.sabineinc.com) made a splash at NAMM with the True Mobility Wireless System, the first wireless microphone system with Sabine's FBX Feedback Exterminator and Targeted Input Processing built in, as well as a neat front-panel battery recharger for the mic transmitter! Wireless mics with integrated signal processing: Is this the debut of a new product category?

Triggerable via MIDI, drum pads or audio signals, the slick new DM Pro from **Alesis** (www.alesis.com) is a 20-bit, 16-channel multitimbral drum module offering 64-voice polyphony, with 16 MB of sounds—1,664 sounds!—and the ability to import new sounds through ROM expansion cards. Retail is $899.


Korg ElecTribe Rhythm Synthesizer

Korg (www.korg.com) wowed us with its ElecTribe DSP analog "dance tools," with the ElecTribe•A Analog Modeling Synthesizer and ElecTribe•R Rhythm Synthesizer. Designed with recording or live performance in mind—or just creating cool sounds on-the-fly—these are thick, hip, funky and phatt. Slammin'!

A cool new P.A. solution: **Audio Composite Engineering**'s (www.audiocomposite.com) 1200 Series Downfill Kit is designed to suspend one of the company's Model 1250 loudspeakers as a downfill below JBL's HLA Series 4895 or 4897 speakers, using JBL-style connecting bars fitted with Aeroquip L-Track hardware.

Save your back! **Ultimate Support Systems**' (www.ultimatesupport.com) new TS-90 and TS-99 speaker stands feature Telelock, an adjusting collar that makes it easy for one person to lower, raise and lock in place heavy speakers and lighting equipment by clicking the collar ring to raise or lower settings. ■

ROLAND
V-MIXING SYSTEM

Just when you thought the small digital mixer market was settling down, Roland unveils a remarkable new system that may change the way you think about "small" digital consoles. Taking a lesson from the Euphonix school of mixer design, Roland's V-Mixing System combines a control surface tied to rackmount DSP and I/O processing, located up to 200 meters away. And in addition to offering "traditional" 12-channel (VM-3100) and 20-channel (VM-3100pro) 8-bus configurations, a 25-fader VM-C7200 or 13-fader VM-C7100 console surface can control one or two VM-7200 or VM-7100 processors for up to 94 mixing channels.

Features include 24-bit ADCs/DACs, 5.1 surround mixing, moving fader automation, 999 scenes/locators, nine mute groups, 24 fader groupings, dual-channel delays, 4-band parametric EQ, real-time spectrum analyzer, MMC recorder transport controls and 32 to 48kHz sample rate conversion. Eight assignable output jacks or 24 optional Multi-Outputs offer a possible 48 channels of multitrack recording plus 46 additional channels of simultaneous mixing.

Roland VM-C7200

Options include I/O expansion boards providing 24-bit I/O for a total of 24-in/24-out audio on a single board; ADAT/Tascam interfaces and a cascade kit. The V-Mixing processors have two stereo multieffects, expandable with three additional effects boards for up to eight stereo or 16 mono channels of automated effects processing. Deliveries are expected late summer. ■

surround recordings, accepting the master as six .WAV files. Retail: $995.

Newcomer **Sonic Timeworks** (www.sonictimeworks.com) showed 64-bit DirectX editing and effects plug-ins. The 4080L reverb, Model 88 (phaser), 6022 delay and Timeworks Mastering EQ are currently available; prices for these effects start at an incredibly low $79.

SPEAKERS: NEW IDEAS, NEW PLAYERS

Roland's (www.rolandus.com) powered, bi-amped DS-90 digital reference monitors include both analog and S/PDIF inputs. Connected to one of Roland's VS-1680/VS-880EX workstations (or VM-3100Pro and VM-7000 Series digital mixers), the DS-90s emulate a wide range of studio reference monitors for checking mixes on simulations of various pro and consumer speakers, including a "white-coned" near-field. Retail: $595/each.

Event Electronics' (www.event1.com) new affordable reference monitors feature bi-amplified designs (75/25-watts). The P5 has a 5.25-inch woofer and 20mm silk dome tweeter. The P6 has a 6.5-inch woofer and 1-inch tweeter.

Designed to complement its M1 Active™ Biamplified Reference monitors, the S1 Active™ Subwoofer from **Alesis** (www.alesis.com) features an internal 250-watt amp driving a long-throw, 8-inch woofer going down to 40 Hz. The system may also be driven passively. Price: $499.

Jumping into the loudspeaker business by purchasing RCF and Fussion, **Mackie Designs** (www.mackie.com) is now a contender in live sound. Among the five new Mackie-branded systems is the SRM450 for stage monitor or pole-mount use, with a molded cabinet, hanging points and 300/150-watt amps driving a 12-inch woofer and 1-inch HF driver. The MAS 1530 is a three-way, active system (15-inch woofer, 6-inch horn-loaded midrange and 1-inch HF) with matching SRS 1500a 15-inch powered sub. Mackie also showed passive two-way systems.

Mackie's **Fussion Audio** showed the 3000 three-way active system with trapezoidal cabinet and three integrated amps. The 1800SA/1800S is an active sub with two 18-inch woofers and a 3,000-watt amp. The low-profile (10.5-inch high) 800wa is designed for stage-monitoring where sight lines are critical, with two 8-inch woofers, 1-inch HF driver and onboard 250-watt amp.

Digital Designs (www.ddaudio.com) had an $800, 80-pound(!), 18-inch woofer with a massive air-cooled magnet and a flat-panel, carbon fiber "cone."

Selenium Loudspeakers (www.selenium.com) showed woofers with quartz composite fiber (QCF) cones. Developed for humid conditions in Brazil, the QCF drivers are moisture-resistant and virtually puncture-proof: DJs and club owners take note!

Fostex VM04

ALL MIXERS LARGE AND SMALL

Midas (www.evi-audio.com/midas) has already taken orders for a score of its new 48-input, 24-bus Heritage 3000 dual purpose FOH/monitor consoles, profiled in last month's *Mix*.

No word on pricing, but **Manley** (www.manleylabs.com) previewed the Manley 16x2 Mixer, a tube-based rackmount unit with 16 line or mic inputs (with pan/solo/mute), direct outs on each channel and large VU meters. Everybody needs one of these!

A digital mixer for less than 300 bucks? **Fostex's** (www.fostex.com) new VM04 is a 4-input mixer with 20-bit A/D/As, built-in EQ and 24-bit DSP effects, 20 mix-scene memory, backlit LCD screen and S/PDIF out. Retail: $299!

Small, powered P.A. mixers were everywhere! **Mackie's** PPM Series range from six to eight inputs, featuring two amps, and a clever "break switch" that disables all mics when the band takes five, while leaving the CD/tape input active. The AMX6 ($695) and AMX10 ($895) from **Akai** (www.akai.com) were notable for their extremely low weight—only 17 lbs. **Yamaha's** (www.yamaha.com) 10-input EMX860ST Powered Mixer ($899.95) has three power amplifiers for stereo P.A. and a monitor system. **Nady** (www.nadywireless.com) showed a new range of products including rackmount mixers (10/12/14/16-channels), compact mixers (4/16-channel models), and stereo and mono powered mixers. And **Wave Distribution** (www.wavedistribution.com) is shipping the ETEK NoteMix, a 14-channel stereo mixer built into a laptop-sized chassis. The 200 watts/channel MA400 model is $999.

Winter NAMM swings back to Los Angeles next year, with a triumphant return to the Anaheim Convention Center slated for 2001; but in the meantime, this year's Summer NAMM comes to Nashville July 23 to 25. See you there! ■

Midas Heritage 3000

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The Center

BY K.K. PROFFITT

Next to copy-protection threads, few subjects are more hotly debated in certain circles on the Internet than the proper way to use channels and speakers for mixing in surround. Though I usually spend more time talking to machines and chatting via e-mail, *Mix* asked me to play "talk show host" and ask some noted producer/engineers about how they incorporate the center channel into their surround mixes. You'll find widely divergent opinions and some food for thought in the following excerpts from my conversations.

FOR YEARS WE'VE BEEN TAUGHT TO CENTER-PAN KICK AND BASS. BUT WHEN MIXING TO SURROUND—WHERE THE CONSUMER'S CENTER CHANNEL MAY BE NONEXISTENT, OR MERELY A LIMITED-BANDWIDTH "TV-TOP" SPEAKER—THE RULES BREAK DOWN. FIVE TOP ENGINEERS DISCUSS THE CENTER-CHANNEL DILEMMA.

IN THE BEGINNING

Let's start by talking about some of your projects.

Michael Bishop: I have some projects that are coming out soon on DTS-encoded CDs. Telarc just put together a DTS sampler of classical, jazz and blues 5.1 recordings. It contains a number of early experimental recordings. Another one is the Ray Brown Trio with guest Ulf Wakenius, a Swedish guitarist who plays for Oscar Peterson. That CD is called *Summertime*. Finally, there's the Dave Brubeck Quartet's *So What's New*. It's all new compositions.

Elliot Scheiner: The last surround project I did was a Roy Orbison record; I think it was his last live performance, *Black and White Night*. It was recorded at least ten or 12 years ago. It was fun for me to mix because the music is so wonderful, and it was nice to put it in that format.

Tom Jung: We've done three big band projects in discrete DTS, all of them set up a little differently, all of them mixed a little differently, while we experiment through this whole thing. They include *The DMP Big Band Potpourri*,

channel

ILLUSTRATION: TIM GLEASON

The Center Channel

The DMP Big Band Glenn Miller Project and *The DMP Big Band Salutes Duke Ellington.*

Nile Rodgers: We've done a live Chic project in 5.1. This is a tour we did a few years ago before Bernard Edwards passed away. There's a stereo version coming out in America on my label, Something Else MusicWorks.

Kevin Beamish: The first surround album I did was Reba McEntire's album in DTS format, *If You See Him.* It's on its third hit ["Wrong Night"], and the first two releases, "If You See Him If You See Her" with Brooks & Dunn and "Forever Love" were Number One. I actually recorded and mixed the whole album in stereo and then did the 5.1 mix at a later date. Everything on that album was done at Starstruck Studios in Nashville. Another one I did is Colin Raye's *The Walls Came Down.* I didn't record it, but I mixed it in stereo and subsequently did the surround sound 5.1 mix.

I'M VERY CAREFUL ABOUT HOW I USE THE CENTER CHANNEL IN THAT ANYTHING I PUT THERE IS DUPLICATED SOMEWHERE ELSE. I WILL HAVE A PHANTOM CENTER CHANNEL BETWEEN LEFT AND RIGHT IN FRONT WITH A DUPLICATED CENTER-FRONT, BUT THEN PERHAPS 6 DB DOWN, SO IT DOESN'T BUILD UP TOO BADLY. —MICHAEL BISHOP

THE CENTER CHANNEL

Okay, let's get right to the point. What are your thoughts on the use of the center channel in mixing?

Jung: I mix with five matched speakers, as most engineers do, I think. One thing I mixed with the bass solid in the center channel—I think it was the first big band thing I mixed, the *Glenn Miller Project.* I walked into a home theater demonstration at CES where there wasn't a center channel, and they were playing Glenn Miller without the bass in the center. So I'm saying, "Aw, man, we gotta rethink this." I love the bass in the center channel. First of all, most left and right speakers end up in corners, which is horrible for exciting the room. So, of course, you're exciting two corners now while trying to make a phantom channel out of these two speakers. It just makes so much more sense to me to have the bass localized. I think you get a higher-quality bass when you're not feeding the playback room from a corner. And the beauty of it is—I mean, this is a subtlety that I get off on [chuckle]—when you move off-center, the bass doesn't follow you. It stays in the center, and that's something we've never been able to have before.

The Glenn Miller Project was mixed more discretely because at the time it was done—probably three years ago now—I didn't have the tools to do what I can do today. With the 02R you can assign something in the center, you can assign something to phantom, and you can vary between phantom and center. Today, with more elaborate panning, I'll use center speaker to the left speaker in the stereo image, the center speaker to the right speaker in the stereo image, and I'll also use left and right: a combination of three frontal stereo images. If you're listening on three equal speakers in the front, it works well. You'll get a very controlled image, particularly when you're not sitting in the middle [and it will work in less optimal situations]. This is used on *The DMP Big Band Potpourri.*

The other thing I did on that one is actually to bring the band around a little bit more, kind of wrap it around, not behind you, but almost between left front and left surround, and right front, right surround—say, 180 degrees—the front hemisphere, if you will. I've encouraged people who listen to our CDs to comment on it, and it's surprisingly almost overwhelmingly positive. They liked the wrap-around. It does connect the front to the rear a little more. This includes panning and positioning and the returns of certain effects.

Bishop: I always use the center channel, in hopes that if people don't have matched speakers now, sooner or later the people who are playing 5.1 music recordings will come around to have equal speakers. But I'm very careful about how I use the center channel in that anything I put there is duplicated somewhere else. I will have a phantom center channel between left and right in front with a duplicated center-front, but then perhaps 6 dB down, so it doesn't build up too badly. That way, if the center channel is nonexistent, I'm finding that there are people playing 5.1 recordings on computer multimedia systems that have no center front. That's pretty weird.

Beamish: I'm one of those who is very cautious about using the center channel. It's not just because of certain systems' lack of matched speakers; even if someone has a completely matched system, you still have to be real careful. It puts so much focus on anything you put in there—a little bit of lead vocal or lead vocal effect, sometimes a little kick drum, snare drum, a little bass maybe. If you're doing a real dynamic panning effect, you might sweep it through the center channel, but that's it. Just real limited amounts. To be honest, I could probably do without it. Surround sound to me is more equivalent to quad. It's a difficult decision as to how to use it and when; just be really cautious. It's not like in film, where you need the center for a dialog channel. If you're not careful, it will get in the way of your surround sound mix.

[In my mixes], left and right still try to stay true to the original stereo mix, and then in the left and right surround, sometimes there will be discrete things; like if there are two or three guitar parts or an organ part and a piano part, they can be discrete. But for the most part, it's ambiences and reverbs in the rear. That's the way I do it.

Scheiner: Normally, I do put a little bit of lead vocal in the center. On [Steely Dan's] *Gaucho,* it wasn't dedicated to the center. We didn't use much reverb on any of their stuff; the vocal was primarily in left and right front. Anything

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The Center Channel

that I want a little more emphasis on, I'll put in the center, which doesn't amount to many things: bass, snare, kick and usually lead vocal. It's so unimportant. I'm doing it that way because it's there, but as Alan Parsons points out, there might be some systems in somebody's house where they don't have a center channel, where they don't have the room, the TV's sitting there. They can't figure out where to put the speaker, so they've chosen not to put a speaker there.

I don't put too much of anything in the center channel anymore. I made a mistake with The Eagles, and on one song, I put Henley's voice just in the center speaker. This was the first time I had ever mixed in 5.1 and I didn't think about any of the possible ramifications of putting it in there—as far as people having the ability to really "eyeball" this vocal on the center speaker, just turn everything off and go, "Uh-huh, uh-huh, I can hear a punch there." So I won't ever do that again.

Rodgers: My engineer, Gary Tole, and I talk about this all the time. Even though we've been recording together for a long time and I don't do any projects without him, when we were working on this live project in the studio, we argued. We have almost totally drastic views, almost completely opposite.

I feel that if you're doing a mix for 5.1, you should be mixing it for people who have those systems. Why do it if you're not going to play it back in the medium that it's meant to be played in? So the point is that if I'm using the center channel in a 5.1 mix, I want to use everything that's there for me. For example, we just did a live record. Something that would be interesting in that situation is trying to transport the listener to the environment. If you're sitting in an audience, there's interesting stuff happening from your whole aural perspective. There's stuff going on in front of you, behind you, all over the place, so it's nice to put certain types of ambient effects in the center channel: applause, fidgeting around, whatever.

Gary Tole: Well, I would agree with what Nile said, that 5.1 is a new medium. There's a new DVD-Audio format coming out, why not mix it to the way you'd want it to be, so that people will hear what you hear in the studio? In my opinion, there isn't any hard and fast rule for using the center channel. It's what works, and a lot of times with the center channel and voices, it gives you a depth and a perspective that you just can't get out of a stereo mix. In the stereo mix, when you put something in the "center," it's not in the center. It's coming out both channels—it's a phantom. Now we have the capability of spreading out that spectrum. I would say it's a truer stereo spectrum, because now you have a center in it; you get depth that you couldn't get out of stereo before.

THE IDEA OF A STEREO MIX WITH STEREO REVERBS—EVERYTHING KIND OF WASHES INTO THAT STEREO. IF YOU USE A DRY VOCAL IN THE CENTER, OBVIOUSLY YOU CAN'T USE ANY STEREO REVERBS MIXED DOWN TO MONO BECAUSE THEY JUST TEND TO PHASE IN THE MIDDLE.
—KEVIN BEAMISH

EFFECTS

Some people say, "Don't use reverb in the center channel, you'll get comb filtering when combining that with left and right." How do you feel about that? Do you leave the vocalist or instrument naked? What kinds of effects are useful?

Beamish: If you put too much of anything, specifically lead vocal, in the center, it really focuses your ear on it. That might work for somebody's records and mixes, but for mine, which are more three-dimensional anyway, even in stereo with utilizing significant amounts of reverb, to just put a dry

vocal in the center sounds naked and unnatural.

The idea of a stereo mix with stereo reverbs...everything kind of washes into that stereo. If you use a dry vocal in the center, obviously you can't use any stereo reverbs mixed down to mono because they just tend to phase in the middle. You could use a mono reverb, I suppose, but you could say it's basically not necessary. I leave the vocal dry in the center and use very little bits of it. Same thing applies to the kick drum and snare drum. Bass seems to do a little bit better than all the others because there's not that much attack on it.

Scheiner: I keep it dry. Everything that I put in the center I keep dry. As long as the center speaker is there, I'll put something in it, but not very much.

Tole: Since most of my stuff is live, I only add a little ambience. I did a mix with Patti Smythe for the *Armageddon* soundtrack. The way I mixed it since we weren't on a Capricorn or a console that was set up for it was by busing and panning. I kept the vocals in the center channel, and all the effects I pretty much kept in the left-right spectrum. Some of them I panned, like if I had certain instruments panned off to the side and I wanted all of them discrete in the environment, I'd just pan the reverbs that way, too.

Rodgers: I was thinking as Gary was talking, that I like to think of every song as its own performance. I don't like to think that I'm going to have a uniform approach to anything and it's always going to be that way. If I'm working with an artist where the vocal has its own sense of dynamics and perspective, I may want to heighten that or lessen that depending upon that performance and what the instruments are doing. You would think that with a format like 5.1, it would really lend itself to artistic interpretation of a performance. In other words, you could really enhance an artistic performance. To me, that would be the cool thing. The artistic approach to music has always been the most important thing to me. When you can expand on a performance or when you can create some additional magic, that's where it's at, and that's why I'm totally excited about 5.1.

Bishop: I never intentionally put reverb on the center channel because of the strange mixture that can happen, since not everybody puts that center channel where it needs to be, which is equidistant from the listener. That center front channel should be in the middle of an arc in front of the listener. Right now I'm working on the 5.1 version of another Ray Brown Trio record with a lot of guest vocalists. And that guest vocalist is not only a phantom center but also rock-solid in the center channel. But about 6 dB down. The reverb is in the left and right, not in the center, and it's also continued into the surrounds. But I have to be very careful about how I'm using the center because, for one thing, nothing can ever exist only on that center front channel. It may not exist on some systems, or, as many have pointed out, it may only be a 3-inch speaker under the TV. And all of us who have been working in this awhile have made that mistake of dedicating something to that channel until you hear it on some multimedia system, and boy is that a shock.

Jung: The key to using reverb is not to put the same reverb in the center channel that you put in left and right. When I'm using my overhead channel, I have six discrete channels with noncorrelat-

ed reverb. Someone should make a 6-channel reverb.

MIKING

What about miking? How does that affect the center channel? With a single vocalist you might choose one technique, but with other situations what would you suggest?

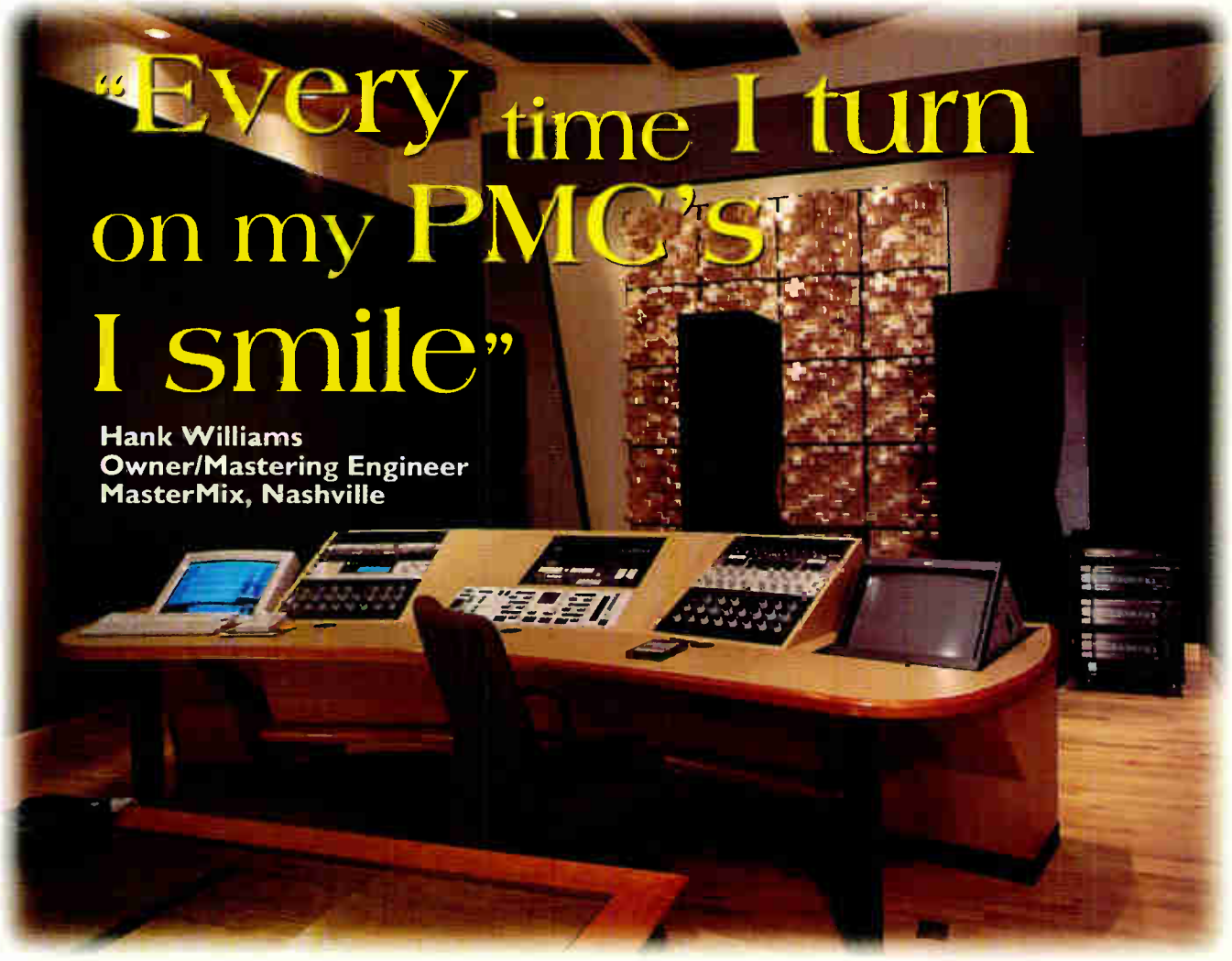
Bishop: Working with a vocalist, I would do it simply with panning and busing in some instances, and with a phantom center as well. For instance, on a Maria Muldaur CD that we also have coming out in the DTS format [*Southland of the Blues*], there's some instances where I'll take the lead vocal and put it into all the channels—a bit in center front and also into the other four speakers to bring it into the center of the room, but anchor it a bit toward the front as well, so it will have some solidity. There are times when you want it to float around, so you do that all with panning. In the orchestral recordings, I mike specifically for the center channel. That's the typical left-center-right pickup, but I do have to distribute some of that center microphone between left and right front because in an orchestral recording, if you lose that center front channel due to a deficient center speaker, it's pretty awful.

THAT LEFT-RIGHT SPEAKER ANGLE

What about the angle of the left and right speakers with regard to the center? I know there has been a lot of controversy concerning this on the Net. The new THX PM3 small-room guidelines are geared more toward a narrower angle (like the traditional mix rooms for film), while a lot of other people say that having a center channel gives stability in the front, so you can split the left and right speakers wider. Still others say that splitting them wide destroys the image; in fact, a recent article in the AES Journal discussed improving stereo imaging by closely spacing the speakers with a ten-degree angle rather than the 60-degree angle long preferred by audio engineers mixing in stereo. What are your feelings about this?

Beamish: To be perfectly honest, I have the dimensions of a setup that I use that I just came to, not by scientific theory, mathematics, physics or anything else, but by the fact that it sounded right. The bottom line is that when this product gets to the consumer, there is no standard. You really have to think about where you're going. It's nice to have perfect monitoring, but the idea of surround sound is people at a party in someone's living room being able to get the essence of the mix whether they're standing in the front or in the back. I've found that with regard to the angle issue, the left and right surrounds sound better with a narrower angle than the left and right fronts. I've got 86 inches from the center of the left front to the center of the right front, and I've got 72 inches between left and right surround.

Jung: Well, it's funny you should mention that because just last week I was becoming unsatisfied with 60 degrees. I don't think it's making use of the three front channels. My basic criterion was that if I moved left and right 40 degrees from center (an 80-degree angle), do I compromise the stereo image, and the



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The Center Channel

answer was "yes." So I came back and I'm around 38 degrees now (76 degrees between left and right). I played around for a couple of days just finding that right spot so the stereo was at the outer limit when I wasn't using the center channel, so I had a really good phantom center. Yet, I wanted to get the left and right out as far as I could so I could make the whole frontal stereo, the three-speaker front, have even more control. Currently, I feel good about that because I do feel that the 60-degree angle between left and right is a little too narrow if you're actively using the center channel. Of course, you also have the surrounds out at 110 degrees, so it makes all the more sense to open up the fronts a little bit.

Scheiner: I've never mixed any other way than with 60 degrees. I don't think it's going to make a big difference. I believe the surrounds are going to be different in everybody's house. How many homes are going to have enough room to put speakers in the rear?

Bishop: I tend to go with the 60-degree setup but end up moving things around a bit. We have so many different control room setups since all of our recordings really are on location, whether we're doing a jazz recording in a club or an orchestral recording in a hall. First, I set up the left and right front so they sound correct in stereo. I'll play a stereo recording through that to get proper imaging and then go to a reference 5.1 recording and check everything. I have to first get the left-right working correctly, since any good 5.1 recording does rely on phantom images. If you can't get the imaging correct between left-right-front, you're not going to have any good phantom images. The surround is really where I see more movement of speakers. Many people have surrounds on walls in the rear, or even worse, up in the ceiling. That's going to be pretty difficult as we're getting more into recordings that are made particularly for surround as opposed to stereo.

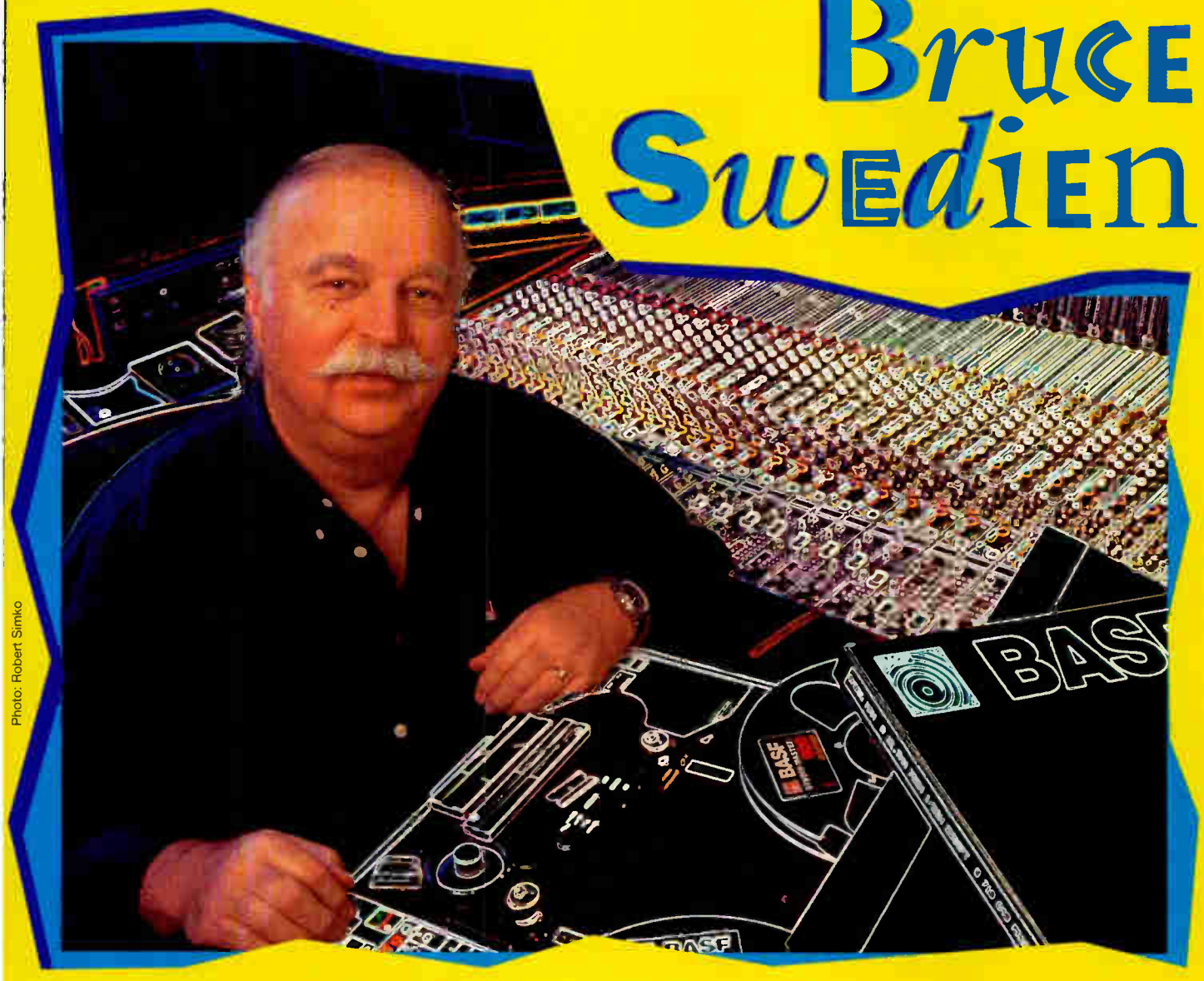
In some of the classical things, as we're looking for things that are suited to surround, some of the 16th-century Gabrielli pieces that were meant to be performed in the round, they're just ideal for that. We're recording with the Mormon Tabernacle Choir. There are orchestral pieces with antiphonal choirs where they'll have the main group in the front and the answering groups from the sides or rear. There were a lot of pieces that were written that way and were meant to be performed that way. We've been able to record them, but nobody could ever play them back at home, and that's what's broken all this open—having a reliable playback medium.

CODA

A big thank you goes to Pascal Sijen, who added background material. Although it was beyond the scope of this discussion, it certainly helped me to formulate the proper questions. As Michael Bishop said, "It's only one speaker, but it's sure causing a lot of trouble!" For those who still like to experiment and get into trouble, the center channel remains a focus of attention and a rich area for exploration. ■

K.K. Proffitt is chief audio engineer for JamSync, a Nashville studio built for the purpose of mixing and listening to audio in surround.

Bruce Swedien



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Such is the world of many consumer surround systems, where the "wow" factor wins out over accuracy as the key design goal. These systems may cost just a few hundred dollars or several thousand, but their job is the same: Create a dramatic, immersive aural experience.

Surround monitoring systems used in *production* roles need to do more than just shake your internal organs with every explosion or downbeat. They must also be very accurate, serving up "nothing but the truth" in several different areas. These desirable characteristics of surround monitors are very similar to those for regular stereo monitors, with a few twists.

by Loren Alldrin

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First, a good surround system for production must present a flat, minimally colored frequency response. A trustworthy frequency response is crucial for properly balancing instruments, effects and dialog. As with a stereo monitoring system, mixes done on a less-than-accurate surround system won't translate well to other playback systems.

With the increased localization options available to the mixer, a surround system must deliver pinpoint imaging accuracy. Only when a surround monitoring system is designed (and installed) properly will it deliver reliable positioning cues. Crossover design (and amplifier design, in active systems), cabinet bracing, driver selection, room placement and much more contribute to a surround system's localization accuracy.

Finally, a surround system needs to deliver the goods in the lowest octaves of the human perception range. Home surround systems are getting better and better, and surround listeners expect dramatic, *deep* bass. If a mixer can't tell what's going on in that crucial bottom octave, his or her mixes may lack the sofa-rumbling power they need to compete in a bass-hungry market.

THE COMPONENTS

You'll often hear surround monitoring systems labeled with the moniker "5.1," which is shorthand for "five speakers plus a subwoofer." The five main speakers in a surround system are the left front and right front, the center speaker and the left-rear/right-rear surround speakers. With traditional film mixes, the front left and front right speakers carry the bulk of the program material, operating in much the same role as a standard stereo pair. The center speaker's main role is delivering strong, accurate voice-range projection. Left-rear and right-rear speakers deliver the ambience and spatial cues that give most surround mixes their all-encompassing, immersive realism. That last "point one" in 5.1 refers to the subwoofer, which usually covers the range from about 30 Hz up to 100 Hz or so (which, in bandwidth terms, is closer to ".2"). In some surround configurations, the subwoofer relieves the full-range speakers from the chores of reproducing deep bass. In others, the sub responds to a specific mono signal that carries low-frequency effects (LFE) and music.

But a surround monitoring system is much more than just five speakers and a sub. Individual speakers

must perform well in their individual roles while seamlessly complementing every other component. You can slap together your own 5.1 monitoring system with a hodgepodge of speakers, but the results may be far from optimal.

In the early days of surround sound, the rear speakers were often of much lower fidelity than front left and front right speakers. The result was an unmistakable sense of sound coming from behind the listener, but the true "wrap-around" sonic effect was rarely achieved.

Today, most surround systems use a rear speaker design with a sonic fingerprint much more like that of the front pair. Many surround systems use four or five identical speakers, to ensure a seamless blend from one speaker to the next. Such a careful matching of components is the only way to go beyond "front and back" sound to a true 360-degree surround effect.

THE SURROUND MARKET

When you begin researching a surround monitoring solution for your studio, the options begin to add up fast. Decisions you'll need to make include whether to go with passive or self-powered speakers, how big (or loud) the system needs to be, what sort of subwoofer is best for your room, how much control you need and how much you want to spend. For most users new to the surround market, these decisions will prompt some serious head-scratching.

To ease the buying angst, a handful of manufacturers are selling ready-to-go 5.1 monitoring systems with many of the options already nailed down. These systems should plug in, power up and please the ears with a minimum of fuss. Several are THX-approved right out of the box. Countless other manufacturers make speakers well-suited to surround applications, if not expressly marketed as such. Contact these manufacturers directly for more information.

In the next few pages, we'll look at packaged 5.1 monitoring solutions introduced in the past year. These new products represent a serious effort to meet the unique needs of those engineers recording and mixing surround projects for music, film or TV/video release.

Unveiled at AES, the SCM0.1/15 High Power Sub Bass from ATC is designed specifically for surround applications, with internal 1,000-watt amplification said to produce SPLs to 124 dB with response down to 18 Hz (-6 dB) from a 2x2-foot cube. Onboard signal processing provides for easy setup with phase, level, lowpass and contour controls. Lowpass frequencies are adjustable to include the recommended 150 Hz for Dolby AC3. An optional multichannel control unit allows routing any of the five main channels into the sub, with full gain and phase control, for low-frequency support any or all of the monitor channels. The SCM0.1/15 can be combined with any ATC monitors, but for most applications, the company's mid-sized SCM-20A PRO is recommended.

Bag End offers a 5.1 surround system made up of five of their new MM-8H reference monitors and one INFRASUB-18 ELF subwoofer. The MM-8H monitor is a passive coaxial design with an 8-inch woofer and 1.75-inch aluminum high-frequency compression driver. A proprietary passive crossover assures time alignment within 25 microseconds between high- and low-frequency drivers. Designed to be used with an ELF subwoofer, the compact MM-8H offers a frequency response of 95 to 20k Hz.

The INFRASUB-18 subwoofer uses a direct-radiating 18-inch driver, 400-watt amplifier and ELF (Extended Low Frequency) circuit to generate low-frequency output from 8 to 95 Hz. According to Bag End, the system offers time-coherent output beyond the limits of human hearing (8 to 20k Hz). The Bag End surround system has a list price of $7,155.

Details were sketchy at press time, but Digital Designs should be shipping

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*John Meyer holds numerous patents including a low distortion driver/horn combination which is utilized in the UM-1P, and one for the perfectly aligned phase response through crossover (zero-pole crossover) utilized in both the UPA-P and UM-P.

its new surround systems by the time you read this. Essentially, users have a choice of various two-way monitors based on the company's DD161 speakers, but with an improved new 28mm dome tweeter coupled to a 6.5-inch woofer. Several dipole models will also be offered. System LF is handled by sub box with eight 6.5-inch woofers in a single enclosure. Pricing is TBA.

Dynaudio Acoustics is bundling its newest BM6A, BM15A and BX30 speakers into several surround sound configurations. The BM6A, an active two-way design, offers a 7-inch woofer and 1-inch soft-dome tweeter. Dual 100-watt internal amplifiers offer peak SPLs of over 115 dB at 1 meter (two cabinets driven). The BM15A uses a 10-inch woofer with 200 watts of low-frequency power; maximum SPL jumps to 119 dB at 1 meter. The BX30 is a self-powered subwoofer with 12-inch front-firing woofer and 150-watt amplifier. The BX30 is well-suited to surround applications thanks to its variable crossover, bass management features (80Hz, 95Hz and 120Hz LFE mode) and 360-degree phase adjustment.

Dynaudio's entry-level surround solution (the Artist's System, priced at $8,999) offers five BM6A speakers for left front, right front, center, left rear and right rear. The Engineer's System ($10,399) replaces three BM6As with larger BM15As in the left front, right front and center positions. The Producer's System ($11,299) uses BM15As for all five full-range speakers. All three active surround configurations use a single BX30 subwoofer.

Unveiled at AES, Event Electronics' new subwoofer is designed to complement its 20/20bas biamplified two-way monitors. The appropriately named 20/20 System Sub puts a single 15-inch woofer in an enclosure with a 250-watt amp and input routing for five speakers. The $999 sub features a blend/discrete switch so the five other channels can run either full bandwidth with natural rolloff in the 28 to 40Hz range or by blending the satellites with a 20 to 80Hz tunable crossover, with the sub handling any lower frequencies. The 20/20bas speakers are $500 each or $999/pair.

Beyond 5.1: The big news from Event comes with next month's launch of its Tria Surround Unit, a complete $2,999 package set up for 6.1 surround monitoring, with six powered satellites and a dual 8-inch powered sub. Best of all, the system includes a hardware remote switch providing solo or mute of any channel, along with a master level control: Just connect the TSU to one of today's surround-ready digital consoles for a complete mixing package—right out of the box.

Genelec offers two surround configurations of its 1029A active close-field monitor and companion 1091A active subwoofer. The Genelec 1029A is a biamplified near-field design with 5-inch woofer and 0.75-inch metal-dome tweeter. With 40 watts per driver, the 1092A is capable of greater than 100 dB SPL at 1 meter. The 1091A active subwoofer uses a single 8-inch driver coupled to a 70-watt internal amplifier for better than 103 dB SPL in the 45 to 80Hz range.

Genelec's smallest surround system ($4,298) uses five 1029A speakers for left front, right front, center, left rear and right rear. Two 1091A subwoofers handle deep bass chores for the whole system; there is no support for the LFE (low-frequency effects) channel with this configuration. A step-up system uses five 1029A speakers, a 1091A sub and a redesigned 1092A subwoofer (dual 8-inch drivers). The 1092A handles deep bass from the left front, right front and center speakers, as well as the dedicated LFE matrix output. A single 1091A subwoofer reproduces the bottom octaves for the left rear and right rear 1029A pair. This configuration, which will handle more strenuous monitoring chores in larger rooms, has a list price of $5,749.

New from Hafler is the TRM6 Active Monitor Speaker System, which is similar to the company's TRM8, but smaller and cheaper; a pair of the two-way, biamplified powered speakers is $1,390, or $695 each. Comprising a 6.5-inch polypropylene cone woofer and a 1-inch soft-dome tweeter powered in a magnetically shielded cabinet, the TRM6 features a frequency response of 55 Hz to 21 kHz ±2dB and peak output of 120 dB. Hafler just unveiled two powered subwoofers for use with its TRM6 or larger TRM8 monitors. Both subs incorporate 200-watt Class G/Trans•ana amplification, a 40 to 110Hz adjustable crossover point, variable input sensitivity and balanced XLR/unbalanced RCA inputs. The TRM10s has a 10-inch woofer and is priced at $695; the 12-inch TRM12s is priced at $795.

HHB Communications is now shipping its Circle 5 studio monitors, available in active and passive configurations and featuring an 8-inch woofer and fluid-cooled, soft-dome tweeter. The active Circle 5 includes a 2-channel ampli-

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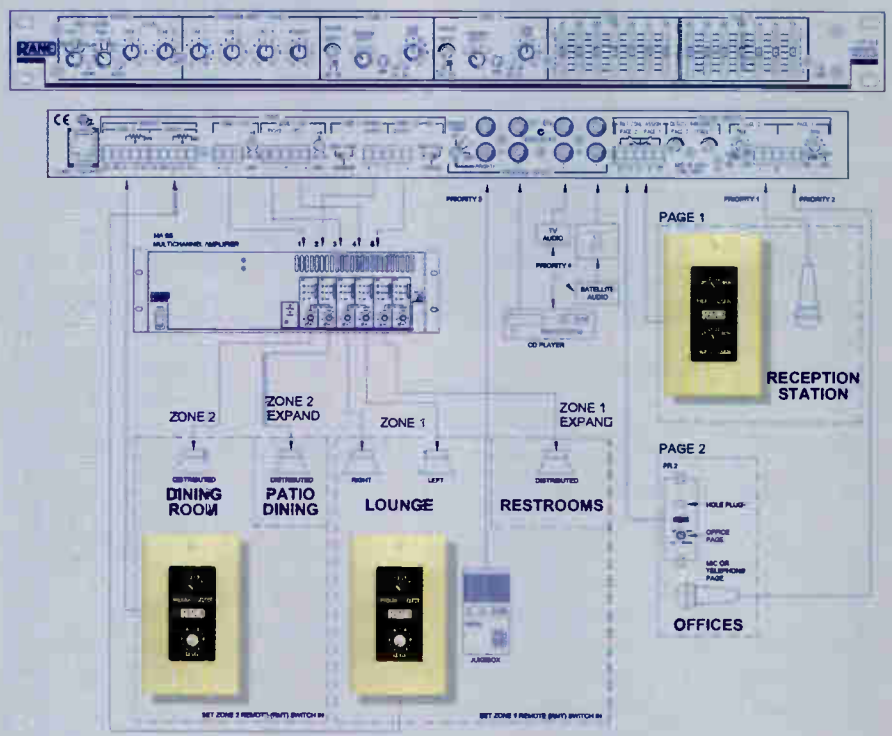

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fier that delivers 120 watts to the woofer and 60 watts to the tweeter. Prices are $1,399 (active) and $749 (passive). At the Winter NAMM show, HHB unveiled a 5.1 surround monitoring package priced at $4,895 that includes five active Circle 5 monitors and the new Circle 1 powered subwoofer, which features a 100-watt power amp and onboard 5-channel active filtering for the satellites. The Circle 1 is also available separately for $1,398 for use with other monitor systems.

Hot House (Highland, NY) offers a range of 5.1 surround systems comprising the company's bi-amplified ARM 265 and passive crossover PRM 165 reference monitors, in conjunction with one of Hot House's five active subwoofers. (Customers are encouraged to consult with the manufacturer in order to arrive at the optimum configuration.) The ARM 265, which offers flat response (±.75dB) over a 9½ octave range, includes twin long excursion 6.5-inch woofers and a 1-inch recessed dome tweeter in a rear vented cabinet. Frequency response is 30 Hz to 20 kHz. Cabinet measures 25Hx14Wx12D inches, weight is 52 lbs., and the units are priced at $6,499 per pair.

The Hot House PRM 165 contains one 6.5-inch woofer and a 1-inch recessed dome tweeter in a 12.5Hx8.5Wx13D-inch cabinet weighing 25 lbs. Recommended amplification is from 100 to 200 watts per channel into 8 ohms. Frequency response is 49 to 20k Hz ±1.5 dB. Price is $1,299 per pair.

Hot House offers five active subwoofer systems, ranging in price and peak SPL ratings from the ASB110 ($2,999/118 dB) to the ASB215 ($5,999/128 dB). All models include fully overlapping, independently adjustable highpass and lowpass filters, phase invert, LF contour and level match controls, and both balanced and unbalanced inputs and outputs.

The newest near-field/surround monitors from **JBL** use the company's Linear Spatial Reference (LSR) technology to deliver consistent sound in a broad range of conditions. The LSR32 and LSR28P full-range monitors and LSR12P subwoofer were the first speakers approved under THX's new pm3 small-room certification program. Users can build surround monitoring configurations around five of the LSR32 or LSR28P speakers, plus one LSR12P subwoofer.

The LSR32 ($999) is a passive three-way design with 12-inch woofer, 5-inch midrange driver and 1-inch composite tweeter. The LSR28P ($999) is an active two-way speaker with 8-inch woofer and 1-inch composite tweeter. The LSR12P self-powered subwoofer mates a 12-inch front-firing woofer to a 200-watt power amp. The LSR12P ($1,099) has bass management for various surround configurations, and includes a discrete LFE input for 5.1 applications.

KRK (distributed by Group One, Farmingdale, N.Y.) introduces three new 5.1 surround monitor configurations based around the company's Exposé E7, E8 and V8 speakers. All three systems offer precision-matched speakers (to within 0.1 dB), active electronics, video shielding and self-powered KRK Rokbottom subwoofer.

KRK's E7 and E8 reference monitors are both two-way designs with dual 140-watt fully discrete amplifiers, high-frequency attenuation controls and 1-inch dome tweeters. The E7 uses a 7-inch Kevlar woofer, while the E8 uses an 8-inch Kevlar woofer. The V8 is an active two-way design with an 8-inch Kevlar woofer, soft-dome tweeter, 130-watt low-frequency and 70-watt high-frequency amplifiers, and high-frequency trim control. List prices of the E7, E8 and V8 surround systems are $7,930, $9,280 and $4,370, respectively.

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round solution comprising the MPS-150 MAIN monitors, MPS-150 SUR surround monitors, MPS-350 SUB subwoofer and LFE-4 bass management controller (system price $6,950). The MPS-150 MAIN holds down the left front, right front and center duties. This compact full-range speaker is available in several physical configurations and offers switch-selectable directivity and stacking options. A proprietary phase-focused crossover assures precise sound imaging.

The MPS-150 SUR surround speaker offers direct, dipole and tripole output options, allowing it to achieve the diffused-yet-accurate sound required for realistic surround effects. These cabinets offer a front-radiating 5-inch woofer and 1-inch tweeter, complemented by full-range 3.25-inch cone mid/tweeters mounted in the left and right baffles. In combination with the LFE-4 bass management controller, the MPS-350 SUB subwoofer delivers flat bass response to below 20 Hz, with an option for *rising* bass below 20 Hz. The MPS-350 SUB uses a 350-watt amp driving a pair of long-throw 12-inch drivers in a push/pull relationship.

NHT Pro/Vergence has announced several surround packages based around its S-00 subwoofer ($750), which features a long-throw 10-inch driver in a vented box with a 250-watt power amp. The M-00 surround system combines the S-00 sub with five M-00 compact, powered two-way speakers. The mag-shielded M-00s have a 4.5-inch woofer and a 1-inch soft-dome tweeter in a sealed, cast aluminum enclosure with 75-watt power amp. M-00s are also priced singly at $350/each. The M-00 can also be used as either a center channel or as surrounds in a larger system using the S-00 sub with NHT Pro's flagship $1,900/pair A-20 speakers (two-way monitors with integrated 250 W/channel power amp/crossover) for the L/R pair.

PMC (The Professional Monitor Company), distributed by Bryston, offers a variety of systems designed for surround applications, in both nonpowered and powered versions (with Bryston amplification, of course). The IB1S ($4,500/pair, non-powered) mid-field monitor, is a three-way design using transmission-line technology for extended bass reproduction, lower distortion and higher output. The IB1S combines a stiff carbon fiber/Nomex woofer with soft fabric mid- and high-frequency dome drivers. Recently, PMC has introduced "low-profile" versions of its IB1S, TB1S (two-way 7-inch) and LB1 (two-way 4.5-inch) speakers, further expanding the suitability of PMC systems in post applications. The XBD subwoofer is available in 12- and 15-inch transmission-line versions as well; the SB100 sub uses the same 10-inch driver as the IB1S.

Shedworks TLC offers the TLC V.1 surround monitor system ($2,250 retail). All five speakers are identical, and feature a three-way design with 6.5-inch rear-firing woofer, 5.25-inch midrange driver and 0.75-inch neodymium tweeter. The passive TLC V.1 uses a sealed enclosure and delivers bass down to 40 Hz. For DVD multichannel mixing, Shedworks also offers the Bass Management box ($890).

Quested debuts a new surround package targeted at music and film soundtrack production. The system includes five Quested VS2205 self-powered near-field speakers and a VS1112 self-powered subwoofer. The VS2205 uses two 5-inch woofers and a 28mm soft-dome tweeter in a lightweight, low-profile enclosure. Quested recently upped the amplifier power output for the VS2205 to 100 watts for bass and 75 watts for high-frequency; monitors now deliver 108dB maximum average SPL.

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The Quested VS1112 subwoofer offers left, center, right summing and discrete effects channel inputs. The VS1112 has a built-in 400-watt amplifier for 103dB max output down to 15 Hz. The new Quested 5.1 monitoring system has a list price of $11,000.

Tannoy (distributed by TGI North America, Kitchener, ON) offers several 5.1 system packages. The Tannoy Reveal Active 5.1 System consists of five Reveal Active Loudspeakers and one PS110 Subwoofer; retail cost is $2,745. The Tannoy System 600A 5.1 System consists of five System 600A Active Loudspeakers and one PS115B Subwoofer; retail is $5,285. The Tannoy System 800A 5.1 System consists of five System 800A Active Loudspeakers and one PS115B Subwoofer; retail is $6,285. Tannoy sells speakers individually and has several more 5.1 systems available.

The Reveal Active Loudspeaker combines twin 50-watt amplifiers, a shielded 6.5-inch bass driver and a shielded 1-inch soft dome tweeter, with a frequency response of 65 Hz to 20 kHz and a capacity of a maximum SPL of 114 dB.

The bi-amplified System 600A features a dual concentric 6.5-inch drive unit and dual 70-watt amplifiers. Frequency response is 44 Hz to 20 kHz and maximum SPL is 107 dB. The System 800A is similar, but features an 8-inch dual concentric drive unit and two 90W amplifiers. Frequency response is 44 Hz to 20 kHz and maximum SPL is 110 dB.

The Tannoy PS110 Pro active subwoofer features a 10-inch long throw transducer that offers low frequency extension (-3 dB at 31 Hz) while maintaining the ability to produce high SPL (110dB peaks) in a compact footprint.

New from Westlake Audio is the Lc265.1 ($1,347/each), a dedicated center-channel speaker system. This three-way design uses dual 6.5-inch woofers with a 5-inch midrange and a 1-inch coaxial tweeter, and its passive crossover gives the option of bi-amp or bi-wire operation. Response is rated at 48 to 18k Hz. The speaker can be used either as a center channel with other Westlake systems, or five Lc265.1s can be used as satellites in a surround system paired with a sub system such as the 8.1SW ($4,250). Westlake has also unveiled a matching subwoofer, the BB10SWP, for use with its larger BBSM10 monitors. ■

Loren Alldrin is a Nashville-based freelance writer, engineer and producer.

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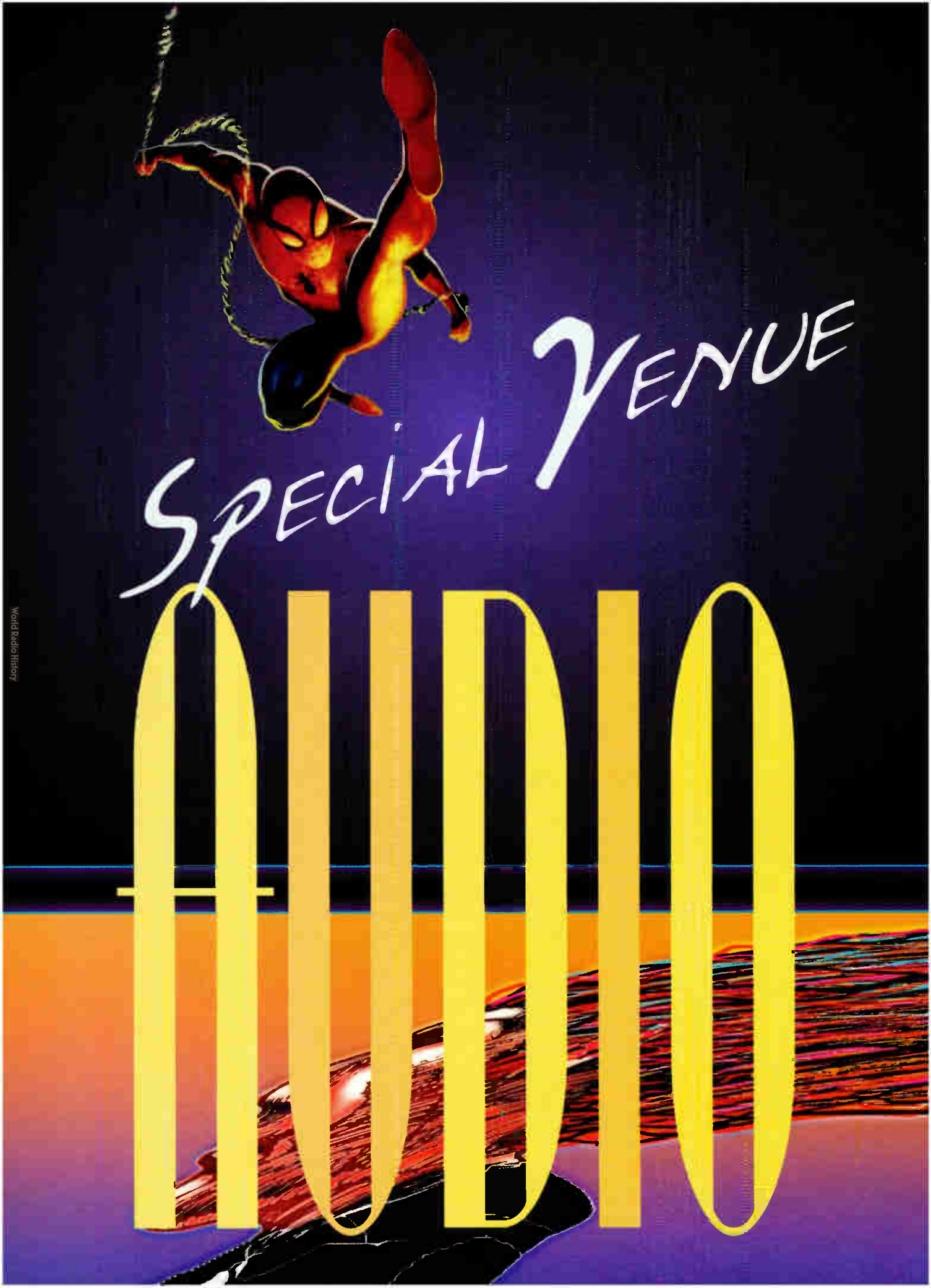

A virtual scene from the 133-degree screen inside the car at Sahara SpeedWorld

Riding the Multichannel Track

by Philip De Lancie

The familiar wooden roller coaster continues to have its enthusiasts, but for many of today's thrill junkies, wind on the face and the clatter of a car on the tracks just isn't enough. Today's theme park attractions and "location-based entertainment" tend to be increasingly high-tech affairs, harnessing sophisticated motion, visual and audio systems into a coordinated attack on the riders' senses. Because sound is a crucial component of the overall experience, we decided to take a look at the art of "special venue audio" through the lens of two high-profile projects.

The tracks for Sahara SpeedWorld in the Sahara Hotel & Casino in Las Vegas were created by Dimension Audio of North Hollywood, Calif., to convince players that they are speeding along a racetrack at 220 miles per hour. Meanwhile, "The Amazing Adventures of Spider-Man" is set to open this summer on Marvel Super Hero Island in the new theme park, Universal Studios Islands of Adventure, at Universal Studios Escape in Orlando, Fla. Audio for the attraction was handled by Soundelux Showorks of Orlando. Each setting posed its own challenges in sound design and delivery; read on to see how the production team for each approached delivering maximum thrill-power to the "guests" of their respective attractions.

THE ILLUSION OF SPEED: VIRTUAL RACING AT SAHARA SPEEDWORLD

How do you make people feel as if they are hurtling down a race track at 220 miles per

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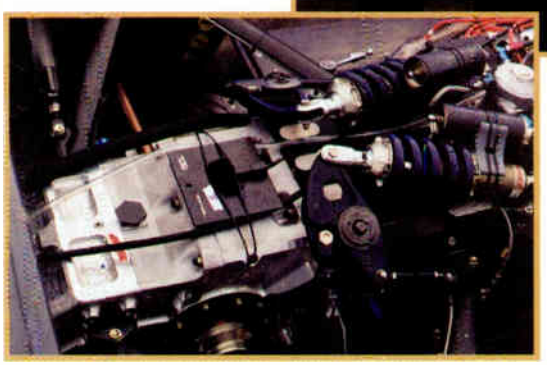
hour when they are actually sitting in a darkened room? And how do you create the illusion that they are not simply alone on the track, but racing against 23 other drivers? At Sahara SpeedWorld in Las Vegas, the answer lies in replacing engine horsepower with computing power, surrounding the driver with an exhaustive collection of real sounds from the track, and continuously updating the sound field based on the positions of other drivers in the virtual race. When he tackled the job for Dimension Audio, sound designer Alan Howarth found out that this is much easier said than done. "It's one thing to create realistic playback for picture," Howarth says, "but when you add the fact that you need real-time audio response to the interaction of 24 cars, the complexity goes up enormously."

The Sahara SpeedWorld attraction, created by Illusion Inc., is designed to replicate as closely as possible the feeling of being in the cockpit of a real race car on the track. To participate in a virtual race, a driver climbs into a ¾-size replica designed to emulate Indianapolis 500 cars.



Top, a section of the 24-stall queue at Sahara SpeedWorld. Above, Matt Waltan of Illusion Inc. and Alan Howarth (right) perform a last-minute flight check on a miked-up Indy car at the Disney World 200. At left, a Crown PZM mic was used in early tests for miking the engines.

Each of the 24 cars lives in its own stall with its own video projection, lighting and 16-channel audio playback array, not to mention vents in the dash blowing air in the driver's face. "Each vehicle uses five PCs—off-the-shelf 200MHz Pentium II machines—that create the illusion of racing," Howarth says. "Three are dedicated to animated 3-D graphics, driving three video projectors that are on a 133-degree screen that goes out to your peripheral vision. One PC is dedicated to operating the six-piston hydraulic motion platform, which translates racing data into realistic G forces. And one PC is dedicated to interpreting the racing data to control audio playback."

Dimension, which specializes in audio for location-based entertainment, was hired by Illusion Inc., the vendor/installer contracted by Sahara to create the attraction. "Illusion approached Dimension because of the Taylor Array Processor System patented by Dimension's owner, Steve Taylor," Howarth says. In the same way that each pixel in a video display sums to make a complete image, and the number of pixels translates into resolution, the Taylor Array Processor System (TAPS) uses multiple speakers in a deformable planar array to create a 3-D sound image. "The disbursement of sound energy across multiple speaker channels gives phenomenal 3D audio playback," explains Howarth.

"The TAPS array is all around you when you are in the vehicle," Howarth continues. "For each vehicle, you have eight audio channels dedicated to your own car: Two channels are front left/right, two channels are mid-car, two are rear left/right, one is dedicated specifically to the engine, and the eighth is dedicated to two 'bass shakers,' one in the seat and one attached to the steering wheel, giving you audio interpreted as vibration."

The remaining eight channels, fed to speakers mounted on the wall of the bay, are dedicated to the virtual world of the driver's surroundings, including the four nearest cars in the race. A host network constantly polls the status of each car. The engine speed, RPM, gear shift, tire squeals and even collisions of other cars are interpreted for the relative locations and used to determine the sound in each player's "immersive" (off-car) audio channels. The software for translating the racing data into audio playback control information was written in DOS by Dimension's Carlton Blake.

"Let's say your car is going 100 miles per hour, and another car is approaching you from the left rear at 120," Howarth explains. "There will be a Doppler shift between the cars, as well as a real-time pan from the back left channel, across the mid-channel of the wall and out through the front channel,

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all with the appropriate volume envelope fading in from the distance and back out."

To gather the raw material needed to create the composite sound field, Howarth spent a good deal of time at the track, capturing both the onboard sounds of individual cars and the sounds of one car passing another. "We strapped DAT machines on these Indy cars, and had real Indy racers drive around at 200 miles an hour, three DAT machines on each car, because the TAPS theory is to record using microphone positions that correspond with the speaker placement. So we placed the mics where there would be speakers in the vehicle: two in the dash, two on the driver, two in the engine compartment, one near the transmission and one near the exhaust manifold. We would just start all the machines, then seal them up and have the guy drive around for 45 minutes, and then we would see what we got."

The SPL was so high in the higher gears that they needed substantial experimentation with padding and microphone selection to avoid severely overloading the DATs. "We used condensers in the cab," Howarth says, "but ultimately for the successful recordings in the engine compartment we used dynamic microphones—Sennheiser 421s. There was so much voltage coming off those mics that we plugged them without pads directly into the line inputs of the DAT machines."

Working at the time trials of the Disney World 200, Howarth even managed—inadvertently—to collect authentic crash sounds. "My machines were strapped onto a car that was in a wreck," he says. "The tapes did survive, but I lost a DAT machine and a pair of Sennheisers. I was recording from the sidelines, so I did get the collisions on a pair of shotguns. But the collision sounds are actually surprisingly undramatic, because the engines shut down at impact to prevent fires."

After the field work, Howarth massaged the raw recordings into shape for delivery, choosing takes and creating loops for continuous sounds such as engine noise. The delivery medium for the sounds on-site is RAM-based sample playback. "Given the number of sound layers that need to fire simultaneously," he says, "playing from a hard drive was not effective." After a survey of available sample playback units, Howarth chose the Emulator 6400 from E-mu Systems. ("It has 128 megabytes of RAM for sample storage, and support for 128 voices going to 16 discrete outputs," he explains.)

Using a sample-based approach also allowed Howarth to take MIDI controller data such as amplitude and pitch and put it to work in modeling realistic simulations of dynamic events such as acceleration and deceleration. "Initially we thought of using MIDI as the interface to the samplers, because that is the standard interface," Howarth recalls. "But we realized that MIDI was way too slow for this degree of complexity. So E-mu brought to our attention an emerging protocol called SMIDI, which is MIDI over SCSI. The data exchange is 100 times faster than MIDI. And there was at least the kernel of technology in the Emulators themselves to allow them to be controlled by this SMIDI data coming in through their SCSI ports."

Initial mockups of the complete system revealed delays caused by the system generating too much MIDI controller data for even SMIDI to handle. But by thinning out the MIDI data, and thoroughly tweaking all aspects of the attraction to wring out bottlenecks, the team was able to get the ride up to speed in time for a $1 million race involving celebrities and real Indy drivers that was scheduled for opening day. "We were on 24/7 for the last two weeks," Howarth says, "camping out at the Sahara."

The payoff for Howarth and the rest of the team came at the end of the opening day, when they turned to the real Indy drivers for feedback on the day's experience. "They talked to us just like I had heard them talk to their pit crews when I had been at the

(Front) Marvel Super Hero Island Show Producer Scott Trowbridge; (second row) Soundelux president Tony Miceli, Pete Lehman; (third row) John Osowski, Scott Mosteller, Jay Aldrich, Brian Cloud, Matt Gall; (back row) Jeff Bobbin, Shawn Siquiera, Carl Hartzler

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track," Howarth recalls. "They talked about the way the thing handled, the acceleration, the power. They bought into the simulation so much that as far as they were concerned these were real cars. For us, that was a huge win."

MIXING SPIDER-MAN "ON-THE-FLY"—LITERALLY

"The Amazing Adventures of Spider-Man" is designed to draw the rider into the middle of a multisensory experience as they move through the ride. In this case the experience, set in New York City, centers on a battle between the arachnid hero and evil foes who attempt to make off with the Statue of Liberty. Describing the ride, director Scott Trowbridge says, "It is one continuous four-and-a-half-minute experience. We start at the Daily Bugle building, and we get sent off into the night to help solve this crime. In the course of our journey, we are outside on the streets of New York, inside warehouses, down in the sewers, in Times Square, and flying above the city through the skyscrapers.

"We knew right off the bat that this attraction would involve an audio/acoustic experience that had never been done before," Trowbridge continues. "It is very complex in terms of how the different pieces of the audio system all talk to each other and interact. And the structure itself is not just a single box; there is actually a series of different acoustic environments—from sewer tunnels to up in the open air—all of which need to be dealt with as part of an integrated system to deliver a completely seamless and believable experience to the ears of each of the guests."

To handle the complexities of sound design, scoring and playback system design, Universal turned to Soundelux Showorks. "In most production for film and video," Trowbridge explains, "the sound design and the hardware design are handled completely separately, because you are mixing to play in 50,000 theaters, all of which are going to have different sound systems and acoustic environments. But since we are building the environment specifically for the sound design, we can make sure that they complement each other. We went to Soundelux because we were confident that they had a very strong understanding of the hardware design working hand-in-hand with the sound design and music composition."

The Spider-Man ride has been in planning, construction and production for four-and-a-half years. Soundelux was hired about two years ago. "We brought them in early on," Trowbridge says, "to help us during the planning stages in thinking about the timing and overall pacing of the experience. We are dealing with some very complex timing issues involving movement of a ride vehicle and synchronization of lots of film elements, special effects and other large, moving objects. We had Soundelux develop a scratch track—'animatic' is what we call it—which is a very rough blocking out of what the attraction would be. It's almost like a radio play that we could use as a timing reference. So from the time we started getting serious about production, audio was the master to which everything else was slaved."

Primary responsibility at Soundelux fell to sound designer, composer and mixer Pete Lehman, who worked with senior project manager Scott Mosteller

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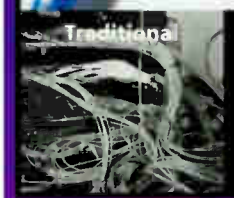

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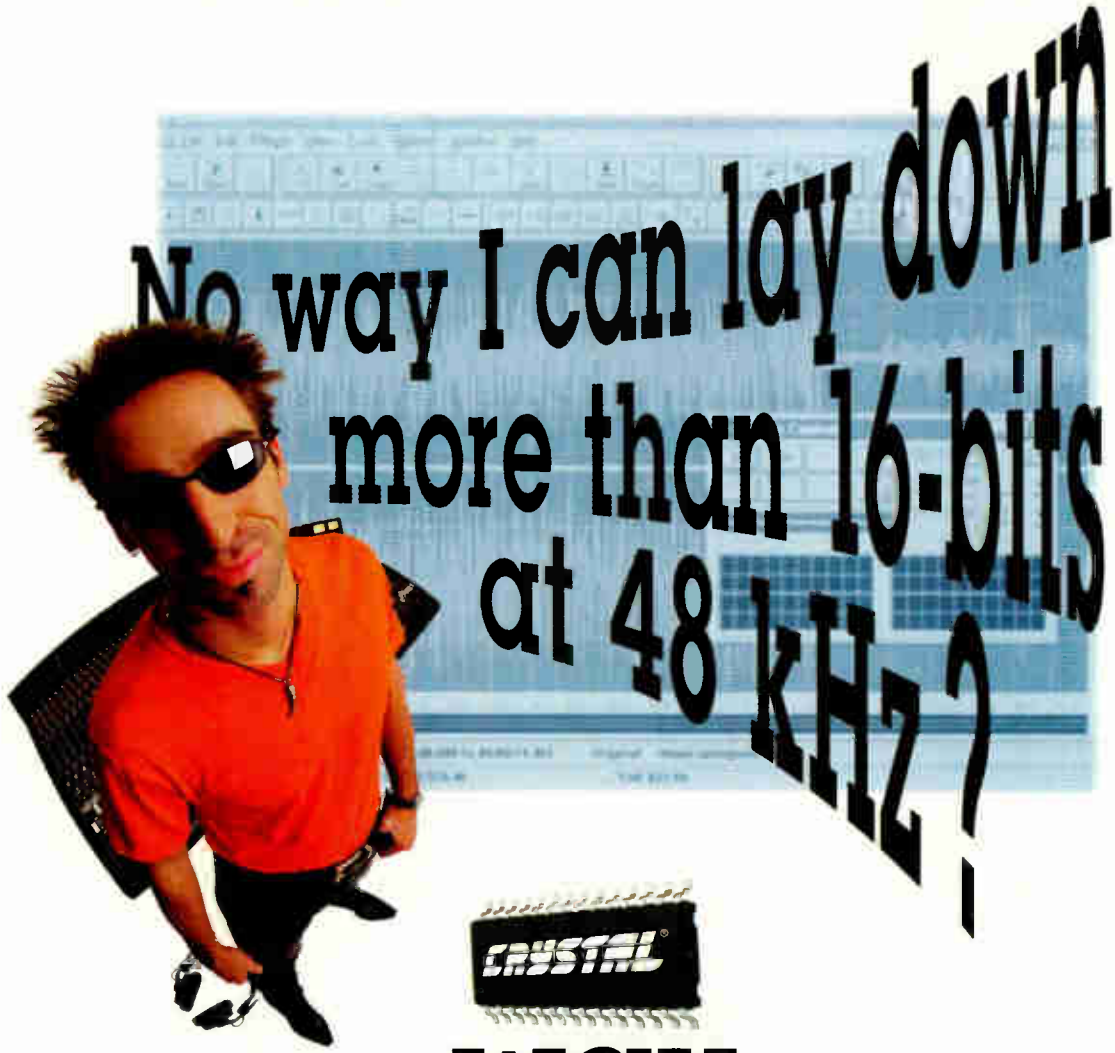
to meet Universal's requirements. "At first," says Lehman, "Universal just asked us to help mock up a couple of scenes to see if their ideas were going to work the way they thought. They delivered us picture for the scenes, and I designed the sound, which included dialog and effects, not much music. Then we went into a warehouse they had set up with a couple of screens and a prototype of the ride vehicle. We brought in Tascam DA-88s and a Yamaha 02R and a bunch of prepared material, and we sat in the vehicle to mix sound for these scenes. We tested a lot of different things both creatively and in terms of hardware, such as the actual speaker components and the placement of the playback system. We were also testing 3-D imaging of audio—how to get things to image as if they are onscreen instead of in the car. It's hard to do much with processing because the vehicle holds 12 people, and that kind of processing is so sweet-spot dependent."

This proof-of-concept stage, Trowbridge says, influenced the final design of the vehicle, the sound delivery configuration and the building interior in terms of the control of crosstalk from one sound environment to another. "There are sound barriers between some of these spaces," he says, "and even some doors that open and close specifically to isolate one space from another. It's your adventure, so we don't want you hearing what the cars behind or ahead of you are doing."

The final configuration chosen for playback involves both on-vehicle and off-vehicle speaker systems. These are used to open the sound space out in the direction of action taking place around the riders or onscreen, as well as to support additional effects. "You have a playback system on the vehicle," says Soundelux chief engineer Travis Meck, "and a playback system for each location in the venue that the vehicle moves through. So you are hearing a synchronized combination of audio in the car and audio in the venue." The configuration of the systems varies from scene to scene, with



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The components and locations of the offboard system were specified and installed by Soundelux's systems division, based on results from the proof-of-concept. "We gave them an idea of what we thought would work as far as different types of drivers and locations," Meck says, "and then they continued the design in conjunction with Universal." There are about 200 speaker locations throughout the building. Routing, delays, and playback channel compression and EQ are handled by a Media Matrix MainShow system, a computerized DSP-based live-sound processor.

As for the onboard speakers, Trowbridge says they are "in a known location relative to the guests' ears, so we can create some pretty fantastic effects. We took a system from Richmond Systems and developed it further for our own onboard purposes. It does ten channels of playback with routing, mixing and delay on-the-fly."

While the playback system was under development, Lehman was working with the script designing sounds for additional scenes and for events that do not have accompanying picture. "I would nail down the sound design," he says, "do reviews with Scott to be sure that Universal was happy with the creative direction, and then update the scratch track, making it into more of a final show track. We worked with temp dialog, which we just recently replaced with final. And the final effects have been created on and off over the course of the last year. I am still finalizing some of that now in preparation for our final mix in January."

One consideration Lehman faced in sound design and composition was that a real-time physical event like a ride is not timed as reliably as a soundtrack is to a film. "It's not a TV show, where you press play and it runs for half an hour," Trowbridge says. "There are times when things may go awry. The sound system and sound design have to take into consideration the possibility that the ride vehicle might pause someplace because there is a problem elsewhere in the ride, and we don't want your experience to go dead when that happens. So we have built in some extra sound for those times, as well."

Because the audio is being created for a specific environment, the final mix will take place on the ride itself, where the sound system has already been installed. Lehman estimates that the three-week mix will involve about 20 locations on the ride. To prepare for the final, a one-week technical mockup was held on site last fall. Universal's safety concerns about extensive cable harnesses trailing the vehicle led Meck to investigate the possibility of a wireless mixing solution. As it happened, the Digidesign ProControl console control surface was just making its debut and turned out to be the solution Meck was looking for. "It's a mixing console," he says, "but it still gives us the flexibility of being able to deal with elements on a track-by-track basis without worrying about predubs to external decks. If there is something Pete needs to change, we are not stuck with going back to premixes; we just change it

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right there as we go along."

The ProControl is used with the Pro Tools 24 MIX Plus system. "Our mix rig is a 64-track Pro Tools system with 24 channels of I/O and major DSP power," Lehman says, "with all the plug-ins that we can get our hands on. We use wireless Ethernet for the ProControl, so we can plop it down into the mix vehicle on a little wooden platform that we built. The Ethernet communicates commands to the Pro Tools system in a rack room on the other side of the venue. Then the actual mixed audio for the onboard sound comes back wireless for monitoring, while the offboard audio comes back to the speakers through the regular wiring patched in the machine room."

The attraction entails a continuous series of audio events, but because the channel configuration and offboard speaker layout varies tremendously from place to place, the final product is not one long mix but rather more than a dozen shorter pieces. "We end up with literally hundreds of .WAV files," Lehman says, "which are each loaded into several Anatek hard disk playback devices." Timecode is not used to synchronize playback of the files because Universal needs to allow some leeway for variations in the movements of the vehicles and the attraction's physical objects, many of which are huge and cumbersome. Instead, a sensor-based ride control system relays the location of these vehicles and objects to an overall control system, which in turn uses trigger devices to play back audio, lights and effects.

"As with any attraction like this," Trowbridge says, "the audio and music are really the glue that binds all the different elements together and smooths over the seams to create a complete experience. Once our work is done, we'll open the doors, bring in some test audiences and make sure the attraction is delivering the kind of experience we want to deliver. Then we all walk away and go to Tahiti." ■

Philip De Lancie is Mix*'s New Technologies editor.*

CD-R

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CIRCLE #048 ON PRODUCT INFO CARD

QUAD RECORDING STUDIOS

ON THE COVER

There is something genuinely comforting about walking into Quad Recording Studios after leaving the hustle of 7th Avenue ten floors below. The wood is worn and warm, the rooms are generally spacious by New York standards, and the vibe reflects the sense of creative fun and down-home work ethic of the five-room facility's owner, Lou Gonzalez.

Make no mistake, Quad is Lou Gonzalez. He will speak freely and humbly of his stellar staff and the talented people he "has the opportunity to work with," but the comfort level begins at the top. Born in Queens, Gonzalez "ran away" to work on a farm in Maine. He milked cows, baled hay and learned to drive on a Farm-All tractor, pulling a hay wagon. After getting an EE degree at the University of Maine, he returned to New York and engineered for radio. Stints as a staff engineer, Broadway engineer and jack-of-all-trades maintenance tech followed, and 22 years ago he opened Quad as a one-room facility, largely financed by a Sesame Street album.

PHOTO DAVE KING

At the Axiom-MT, from left: Lou Gonzalez and his amazing technicolor dreamcoat; COO Robbie Norris; night manager Dave "Roz" Rozner; and studio manager Mark Springer.

While Quad has thrived for more than two decades in a tough market, recording and/or mixing such multi-Platinum projects as Madonna's *Erotica*, No Doubt's *Don't Speak* and Metallica's *Load*, Gonzalez has never abandoned his very personal owner/operator approach. He designed, built and wired all of his studios, and he prides himself on being able to fill in at any job in the facility, from reception to chief engineer.

So three years ago, when he began thinking about purchasing a digital console, Gonzalez led the research team. "What bothered me the most about what was available at the time was the ergonomics," he says. "Sound was a definite issue, but what struck me was that everything seemed very alien. I know what it feels like to sit in front of a console for hours and hours, and I want to be able to play comfortably in my own rooms."

Quad already owned two SSL 9000 J Series boards, along with two 4000s and a 6000. After the initial scouting reports, he approached SSL and asked for a digital board. He and some of his engineers visited the factory and provided input, and a year later, Quad purchased the first Axiom-MT in North America. Installation took place late last year.

"When you sit down in front of this machine and start to play with it, and you realize all the new opportunities there are to mess with sounds, it grabs you," he says. "When it came in, I wanted to make sure that I was up to speed, so I sat there for hours and hours over the holidays when everybody else was trying to take the week off. Now I envy everybody who gets to sit there and do sessions. I sit home biting my nails waiting for them to finish so I can get in and play some more."

Studio B, which houses the Axiom-MT, has been booked solid since the debut, with sessions ranging from Saturday Night Live tracking to Lauryn Hill to Mariah Carey. Visiting engineers have raved about its familiarity and resemblance to a 9000, not to mention its warm sound. Dana Jon Chappelle, who is mixing Mariah Carey's next release, called it "warm and smooth. I'm loving the way it sounds. I think our ears like the coloration that analog equipment imparts, and this board seems to mimic that coloration in a very appealing way."

Gonzalez, meanwhile, was attracted to the fact that the board is shipped 5.1-ready. He also appreciates its automation and reset features. "Every time you do a recall on an analog console, you have to tweak things," he explains. "Mariah Carey did a bunch of work a week or two ago, and she had to do a recall five days later. We came in, patched up the outboard gear, loaded the mix, pressed Play, compared it to the DAT, and it was dead-on. Didn't have to touch a knob. So you don't have to be thinking in terms of mechanical moves, you can be thinking in terms of your ears."

The tools may change, but the Gonzalez attitude does not. He's regularly seen in jeans, a bolo tie and a brightly decorated denim jacket; he plays piano and a bit of country fiddle, and he has his sights set on opening a Nashville facility some time in the future. He's at an age when many of his friends are tired of their jobs and looking forward to retirement, which he has a hard time understanding.

"I get up in the morning and say, 'Wow!' I get to go down and hang out with folks I like and sit there and play with equipment," he says. "I love this. I mean, I just got to work with Peter, Paul & Mary. That made it for me. I grew up with these people. They had to do a new song, and you know what? It was Peter, Paul & Mary. They were here and I was in heaven." ■

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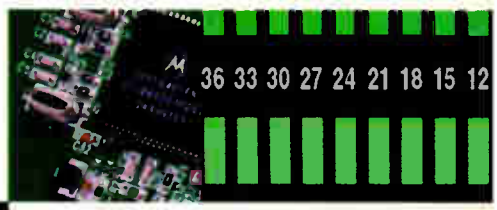

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CIRCLE #049 ON PRODUCT INFO CARD

KNIT NOISE

KNITTING FACTORY MEETS KRAMER


Studio manager and engineer Sascha von Oertzen in the control room

When avant-hip music club the Knitting Factory moved to spacious new digs in the TriBeCa area of Manhattan in mid-1995, owner Michael Dorf took the opportunity to install a Mackie and DA-88-based studio in the basement, with tielines to the stages. Over the next couple of years, the studio was used to record a wide variety of the stunning, often challenging shows that the venue is known for and was put to work on releases for the club's affiliated Knitting Factory Records. Then, in late 1997, Dorf bought noted indie record label Shimmy-Disc from its financially beleaguered owner, New York-based artist/recordist Kramer. The deal included a passel of gear from Kramer's now-defunct Noise New Jersey studio. The equipment was installed in the Knitting Factory's studio, after some extensive renovations.

The control room in the Knitting Factory basement had to be rebuilt to accommodate Kramer's Trident Series 80B, Sony JH-24 2-inch 24-track and MCI JH-110 ½-inch 2-track. "We moved the door and knocked a wall down so we could have a separate room for the tape machines and an amp rack," says engineer and studio manager Sascha von Oertzen, who has been at the Knitting Factory since mid-'97. "It was heavy construction work because these were sand-filled concrete walls in a small space." The studio shut down for a month-and-a-half while construction was under way, reopening in April '98 under the new name of Knit Noise.

In its new incarnation, the studio has continued to do double-duty, recording a variety of projects during days and tracking shows at the club nights. (The night before *Mix* spoke to von Oertzen, she had helped track a Lou Reed show.) Next to the control room is a small iso booth, and the club's 250-capacity main performance space—which has 18-foot ceilings—serves as a large tracking room for the studio, as does the smaller AlterKnit stage. Both rooms are tielined and offer a high degree of isolation. Two other smaller spaces are wired for recording as well, and all the spaces have video feeds to the control room.

Though the two DA-88s continue to be the recording format of choice for live shows, von Oertzen is enthusiastic about the improved quality she's getting with the Trident and other pieces from Kramer's collection (including an array of Neumann and AKG mics, UREI and Yamaha processors, an EMT plate and an assortment of tube compressors). She says that in general the new gear has made the studio better-suited for different kinds of recording, including Kramer's work.

As part of the deal he made with the Knitting Factory, Kramer often records at Knit Noise and does A&R for the revived Shimmy-Disc. (In the '80s Shimmy was renowned for releases by Ween, The Boredoms and Kramer's own projects, including Bongwater.) He is more than happy to be free of the hassles of studio and label ownership, and he's making the most of his new role. "Almost everything I'm recording and producing right now is collaborative," Kramer says. "There are bands and artists on Shimmy-Disc who I do work with in the studio [including the Blue Whale, King Missile and Drazy Hoops], but really I'm much less interested in producing now and much more interested in being an artist." (He's also exploring completely new horizons, including becoming a member of the prestigious Actor's Studio and studying under noted director Arthur Penn.)

Kramer used Knit Noise (and much of his old gear) to record basic tracks and live shows for a forthcoming collaboration with Daevid Allen, Hugh Hopper and Pip Pyle, dubbed Brainville and due out this spring on Shimmy-Disc. "The best drum sounds I have ever gotten were in the last few months in the main room at the Knitting Factory," says Kramer. "I've never had a smoother time getting an excellent drum sound than in that room." Kramer also works a lot at his own ADAT-equipped project studio nearby (where he and Jad Fair recorded a new release for Shimmy-Disc) because he likes the privacy and because the Knitting Factory, being a working club, gets pretty busy. Still, he says, "This entire, beautiful live room isn't used for soundcheck until 5, so it's wide open for recording during the day."

Von Oertzen says that about two-thirds of the Knitting Factory Records releases to date have been recorded at Knit Noise, including a wonderful album she engineered for "out" sax player Briggan Krauss, as well as new or upcoming projects from Steve Dalachinsky, William Hooker, Joe Morris, Uri Caine and Matt Dariau's Paradox Trio. The studio is also hosting an increasing number of projects for out-of-house clients. And then there's that unending stream of amazing live shows. "It is just a nice facility now," von Oertzen says, "especially for mixing and for live recordings. It's a really nice venue where, if you want to, you have the possibility of making a high-quality live recording that you can release." ■

BY ADAM BEYDA

Adam Beyda is an associate editor at Mix.

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BOB BELDEN

JAZZ MEETS POP

Saxophonist, arranger, producer—you'd have to look a while to find someone who brings as much to the table as Bob Belden (maybe back to Quincy Jones when he had his big band in the studio in the 1960s and '70s). Belden has put his jazz stamp on the music of Sting, Prince, The Beatles, even Puccini's opera *Turandot*—his work was the inspiration for the Blue Note Covers Series. Belden has released 13 albums as bandleader; among his most recent is a reworking of Carole King's classic album *Tapestry*.

Belden won Grammy awards in 1993 and 1994 for his production work on the McCoy Tyner Big Band's *Turning Point* and *Journey*. He won Record of the Year in Japan for Jacky Terrasson/Cassandra Wilson's *Rendezvous* and a 1996 Juno Award (Canada) for Renee Rosnes' *Ancestors*. In 1995 he arranged Herbie Hancock's *The New Standard* and classical flutist Patrick Gallois' electronic take on Vivaldi's "The Four Seasons," and did horn and string parts for Incognito's hit album *Beneath The Surface*. In the past year Belden produced Ed Palermo's *Big Band Zappa*, Straight Ahead's *Dance of the Forest Rain*, a Freddie Hubbard tribute by Tim Hagans and Marcus Printup called *Hubsongs*, Bernard Purdie's *Soul to Jazz II*, and The Hollywood Bowl Orchestra's *Always and Forever*, among others.

Belden grew up in the unlikely location of Goose Creek, South Carolina. He attended the Brevard Music School in North Carolina before heading for North Texas State University and the One O'Clock Band. He was introduced to the studio there, and soon joined Woody Herman's Thundering Herd, then to New York to begin a producing career by doing television spots.

With a great sense of history and the current marketplace, Belden has also become a popular choice for producing reissues. He won a Grammy in 1996 for *Miles Davis/Gil Evans: The Complete Studio Recordings*. He also did Miles' *The Complete Studio Recordings 1965-68*, the recent Miles Davis *Bitches Brew* four-CD set, the Weather Report catalog (including a new boxed set), Herbie Hancock's Headhunters and many other jazz and fusion classics.

PHOTO: JAMES HASTINGS 1994

As a producer, what's an ideal project to work on?

If I find somebody that wants to make a sentimental, warm album like Joey Calderazzo did with *Secrets* on Audio Quest, I say, "Hey, let's go." I'm a horrible, incurable, sentimental romantic. It's the kiss of death in New York critical circles, but I truly believe that when music can make you cry it really goes beyond notes on the page and somebody playing an instrument—it's an act of God.

This Hollywood Bowl Orchestra record, *Always and Forever*, is totally romantic and it was a pleasure. You can sit down and listen to this 90-piece orchestra play the romantic tear-jerker themes from famous movies. You don't have to do much to coax emotion out of it. If the conductor knows what he's doing then you just let him do what he does.

There are two sides of a recording. There's a spiritual side that a

BY ROBIN TOLLESON

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the new legend

CIRCLE #051 ON PRODUCT INFO CARD

lot of people romanticize: "Oh, listen to this take—it's magic and it's the next 'Kind Of Blue.'" But the reality of it is that most record dates are approached on a technical level. Can you put the cats in a mood so that they don't worry about the fact that they're in a studio; they don't notice it? You put them in a mood to create and take a chance and find themselves, and that's really where it's at. Sometimes they're looking for someone to say, "Well, this one has *the thing*. There are some notes here and there that aren't happening, some little flaws, but it's got the fire, got the feeling."

They also want to know that you can fix things, that you can cleverly create correctness. Sometimes there'll be this perfect take that is marred by a flaw somewhere. It's generally at the last minute, when people are trying to slide into the groove and somebody hits a clinker or goes to the wrong chord, so it's helpful to be able to fix things like that. The technology has really got a great advantage.

Actually splicing something in...

Or doing an insert, fixing an ending. We've been able to edit in and out microseconds to take out distortion. On one particular record we had to fix bass parts like you wouldn't believe. We've taken parts here, parts there, just to correct something that we could never get right. Editing is an art form. I worked with an artist who had 45 edits on a record, and they all worked. These days, with digital editing, you can do so much to make things right.

What are some of the other problems you encounter in the studio?

A main problem is that musicians do not frequent recording studios on a regular enough basis to be completely comfortable with the environment. When you do a session with younger musicians you have to make sure that what they're playing and hearing is what they want. Sometimes their inability to adapt to that artificial environment is the difference between a good take and a bad take and a good day and a bad day.

It's important to get people comfortable and focused on the studio. Go to a good enough studio that the engineer has enough control and the artist has enough control and you can do what it is you set out to do. Jazz history has a myth that the studio is a stale environment, and yet 99.9 percent of what we know about jazz comes from the studio. *A Love Supreme* was done in the studio; *Kind of Blue* was done in the studio.

I understand that after your Woody Herman Band stint you began producing for ESPN.

You'd learn how to produce a session because there were so many elements that had to come together. In TV and film they were very cost-conscious, because lots of money was riding on it—big union orchestras where ten minutes of overtime was $5,000—so there were pressures. You'd see how teams created the music. You'd have copyists and music supervisors and contractors and arrangers and conductors and concertmeisters all working together to go into the three hours and do a TV movie. You dealt with synchronization of picture and music, you learned what preparation really did for a session. I worked with fastidious people, and it taught me the value of preparation and organization.

Producing a record is a mystery only in the sense that you don't know what kind of music is going to be made until you get in and kick it off. I wouldn't take a commission from the studio for the work I'd bring in. I'd ask for recording time. So from the moment I started working at ESPN, I was constantly going in to record. Wallace Roney and I did two quintet dates. Then I did a big band date in '85, then a record with Joe Chambers. I did eight or nine albums of material. I was constantly recording stuff and rehearsing on a regular basis with Jeff Hirshfield, Jay Anderson, and eventually Marc Copland, with Jim Powell and Gary Smulyan every Wednesday for years. And that eventually became the big band I put together. After I did the Sting session [*Straight to My Heart*] it became easy to convince people that I could pull it off, because when you manage a large group of people it's an indication of your ability to organize things.

You have a gift for reworking pop material into the jazz idiom.

When I was with Woody Herman we had an album that we were promoting called *Donald, Walter, and Woodrow*. One half was Steely Dan material and the other half was Chick Corea's "Suite for a Hot Band." And the response we got from the students was amazing. Anytime we played something that was on a pop level, it just went over, no matter if it was abstract. And we turned these tunes into something like late Coltrane if we could, and kids would go nuts. So I'm thinking, this is a great way to communicate to people you don't think are already converted to your cause. It's a way to do things that can't be compared to anybody else.

When I attack a tune there are very few precedents. When Herbie and I were discussing the list that Verve laid on us for *The New Standard*, it wasn't, "Oh man, my favorite tune is this, we should do this." It was like, "Well, there are no fingerprints on these tunes. If the company feels strongly about them let's try to give them what they want, at the same time satisfying the artistic side of the musicians that are involved." And if there's no fingerprints you can do anything. They can say, "I like the original better," and then you haven't won that person over, but you get a chance to really experiment with things, like doing "Purple Rain" with a pedal steel. In 1993 it wasn't exactly used that much, but if you've got Holly Cole singing it you can pretty much put anything behind it. You're given a little deflection.

There's a song on *Tapestry* called "Where You Lead," and I just turned to (guitarist) John Hart and said, "Twin Peaks." So he turns the vibrato on his amp on. He knew right away what I was talking about—it's a cultural symbolism of our time and it comes in handy when you're trying to give a guy a cryptic direction without saying, "Turn your vibrato to seven." It's communicating in a personal way to these cats.

Tapestry was a symbolic record for the first generation of the power girl thing in the '60s and '70s. That record had a power to it, but beyond that it was sort of the sweet sound of our time. I was reticent about *Tapestry* because it's an older piece, but it got me in the studio and we did two other records.

It translates well, and those melodies really hold up.

Yeah, and you only need a portion of them to get the message across. You only need to do it once and everybody knows. "You make me feel..." Smooth jazz's problem is that there's

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(producer, engineer extraordinaire)

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He was also impressed by the expanse and depth of the stereo image they create. Elliot says, "I don't know how they do it, only that they seem to do it better than anyone else. Very, very clear. Everything is distinctly audible and natural. It's pretty amazing how they open up a mix."

So should you go out and buy a pair of Exposés today just because Elliot Scheiner uses them exclusively? No, but you owe it to your next project to run down to the nearest KRK dealer and get a demo for many of the same reasons.

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nothing of substance behind the melody, and it's hard to make a record that has some feeling behind it, that's not designed necessarily to put people in a buying mood. We didn't exactly go all the way with it, because the last track we take into zone-ville. But this is how we are.

I've used the same basic guys since 1993, and we've managed to cover all kinds of weird artistic bases. We're establishing an identity, a group sound, a studio band like Steely Dan. We did a record of Beatles music last year, and the year before that we did Vivaldi's "The Four Seasons," and the year before that we did Blue Note classic tunes, and the year before that we did Prince ["When Doves Cry," "Metro Blue"]. We can do anything we want to.

My idols in music were always Wagner and Alban Berg, people like Bartok and Stravinsky who took care of business and never said "I can't" about something. I remember in one three-week period I worked on the Radio City Music Hall Christmas Show and Straight Ahead, for Atlantic. Every idea I come up with, I can follow through from ground zero to the finished product. Arrange it, contract it, produce it and play half the instruments.

You're a very popular reissue producer. Do you enjoy that work?

I describe it as getting paid to listen to music. The key of reissues is not only being able to assess the value of classic material, but to also understand what's hot in the collector market, what's hot in the producer tip. Nowadays you can reissue things specifically to encourage people to lift tracks, because the companies make money off of that. So if you put out a Donald Byrd or a Lonnie Smith or a Lou Donaldson, in one hand you may say this is funk music, or it's not really hard-core bebop. They didn't go in there with the Holy Grail to make an artistic album, but these guys making the rap records love these intros. They love these parts. You might sell a few thousand, but you might get ten times that money from license fees, because it just happens to be the music of the time.

Now Columbia has started up a fusion trend in reissues, where electric music is getting a little more dignity in the reissue market. GRP is doing it, and Blue Note is putting out some of their electric stuff. The post-alternative rock crowd is looking for different stuff, and jazz guys are bored with straight ahead, so they're rediscovering Mahavishnu and Weather Report.

Do you get assignments for reissues where you say to yourself, "I can improve that"?

Sonically, yes. Because at Columbia they would make the record, then mix it down to a 2-track master, then take that 2-track master and EQ it, compress it for LPs, make it a certain way to make an LP work. When you first made CDs, people had this feeling that CDs weren't warm-sounding at all, and a lot of times

they would compensate for that by changing the EQ and adding reverb. They would always take the LP and try to create the warmth of an LP master.

But we found that when you go into 24-bit mastering and beyond, the snapshot that the system takes of the music as it passes by the tape head has more depth to it, more detail. You find out that the original recording was fantastic, and that mastering might have taken something away from the music, or added something that wasn't there. But we find the tape of the mix that the musicians were in the studio listening to, and that tape is generally the most honest reproduction of what they intended their music to be. We're making CDs, not LPs, and with this new technology it's like spy planes. With 24-bit, you can hear the environment the musicians recorded in more effectively because there's more information being processed every moment. There's a greater element of the sound of the tape now, so you can hear what they really intended.

The mastering has changed now?

It's a different type of mastering. We're not trying to re-create the memory of the LP. That was just the delivery system at the time. With CDs and 20-bit mastering, if you find the original tape, you can create the sound of that studio. Because the tape recorders in the '50s were good, the tape heads were great. When you're remastering Miles Davis or Chet Baker you go to the cleanest, most accurate generation for your source material, and then you get an idea how many times something has been copied and used as a master tape.

For instance, there's a track on *Four and More*, "Joshua." On the master tape there's a splice in the piano solo; the entire piano solo is a different tape stock. What it was, something happened to the piano solo—they were making a copy, something happened, dropout. So rather than go and remix the piano solo they took the LP and made a copy onto tape, spliced that in the master, using tape. This obviously happened in the '70s and the tape they used had to be baked. So we had to pull off that reel of piano solo, bake it, insert it back in, there it was.

They had lost a generation.

Yeah, and when they replaced it they used tape that turned out to be defective. We just remixed *Bitches Brew* [Miles Davis], and there's a piece called "Pharaoh's Dance" that has a lot of edits. We called the original master take, put it up and looked at the edits, the actual physical edits on the tape—to make sure we knew we were going to duplicate it exactly the way they did it.

I mean, it's phenomenal. You can research it to the point where you can just hold history in your hands. It's a trip to sit there and hold the *Kind of Blue* session in your hands or pull out a *Bitches Brew* reel that nobody's ever heard. The thing is, we're trusted to get it right. So you go and find every take, you make sure every tape that you need is there. You've got to determine if you've got enough tapes for the project, and if it's the right thing. You gotta A-B stuff, you gotta have a relationship with all these people in order to really be able to do the right thing. You have to know the studio, know the equipment, know what the potential of the equipment is. You have to know when to rein the engineer in from doing too much, or encourage him to do a little more, because he doesn't want to desecrate a masterpiece.

There's so many different personalities involved in this business. I'm the guy who actually enjoys being with the technical people more than the management people. I'm more comfortable

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with mastering than I am with a record company. I'm more comfortable being with the assistant at the studio, because we're there to do the job. You have a task and you finish it, you get it done. And there's a subtle challenge of actually doing it in the time you said you'd do it for the price you said you'd do it.

Do you have favorite studios?

I love Avatar Studio C. C has a unique ability to do almost any situation in jazz. I did the Patrick Gallois "The Four Seasons" there with my multi-keyboard band. We just did Marcus Printup there on a no-headphone date, where you just do it natural, just hearing it the way it is. And we did Conrad Herwig's *The Latin Side of Coltrane* there. It's ideally designed for jazz, with interconnecting glass panes and doors that can be formed into small rooms or opened up. And I love Sony Studio D because it's got a great Neve board and one of the best lounges in the world.

For me the best kind of lounge has a wide-screen satellite television. Because when you mix, man, you don't want to sit in there listening for two hours while the guy scopes it out. You want to go in there and hear it, and go, "Oh okay, I like it, let's do this," or, "I don't like it." But you don't want to sit there and go, "Okay, now that you finished the bass drum let's hear the tom tom EQ."

I like Clinton A because it's got a big live room sound and a beautiful Neve board. When you do live-to-2-track there with everybody in the room you get a real earthy jazz sound. Bill Stewart's records were done there, and Kevin Hays' last record, and those were both done live-to-2-track analog.

I like 2-track analog SR, and 16-track 2-inch 15 ips analog. And I like 48 digital. 24 analog is the basic, but you can do so much with 48 digital. We did the reissue of Charles Mingus in France, and we took that from a 2-inch 16-track analog master and we dropped it into a 20-bit, 24-track Sony digital. And we did all our editing to another 20-bit, 24-track digital Sony, and mixed it to a 24-bit optical. We put that record together like Mingus would have wanted, like classical music, like modern symphonic work, and Sony's a place where you can do that kind of stuff.

Do you have favorite engineers?

I've got four whom I work with most of the time—Jim Anderson, David Baker, James Farber and Scott Noll. But I like Peter Darmi, Joe Ferla, Bob Katz is cool at Chesky. I like Paul Moss on the West Coast. Who can not like Al Schmitt, who can not like Phil Ramone? So many cats are so good, especially in pop engineering.

Pop engineering is almost like painting. It's incredibly difficult for someone coming from the jazz side of things to get a pop vibe, because you just don't have the time in some cases to really get it right. I did the Prince record, and we would sometimes spend two days on a mix. We were doing 72-channel mixes. On "Diamonds And Pearls," Phil Perry was singing 15 vocal parts with 30 instruments on it and a double rhythm section. Sometimes we get a little sick. But it's fun when you can go into the studio and do a 72-track mix.

We went out to the West Coast last year to do some tracks just because I wanted to go to the Village Recorder. They have a live chamber that's controlled by a concrete door opening and closing into a room with glass and metal on a concrete floor, and they stick a mic and a speaker in there. You can bring the live sounds into it too by opening the door. ■

Robin Tolleson is a freelance writer and musician living in Marin County, Calif.

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DAVY SPILLANE

HIGH ABOVE THE "SEA OF DREAMS"

The west coast of Ireland: It's the stuff of poetry. Many people would trade most of what they have to live out there on the spectacular green, wind-whipped edge of the world. But how many people could make a living out there? Not too many, but count Davy Spillane among the talented few. Spillane is an in-demand musician who has played Uilleann pipes and/or low whistles on recordings by Van Morrison, Elvis Costello, Kate Bush, Bryan Adams, Sinead O'Connor and others. He also contributed to the scores for films such as *Rob Roy* and *Michael Collins* and helped develop the music for the ridiculously popular *Riverdance* show. And for the past several years, he has operated a studio, Burrenstone, in his home out in beautiful County Clare.

Spillane has been an important part of Ireland's music scene since he was a founding member of the band Moving Hearts in the early '80s. (That group also included Donal Lunny, Christy Moore, Eoghan O'Neill, Brian Calnan and Keith MacDonald.) Later he began releasing solo albums, starting with *Out of the Air* in 1988. By the time he had written material for *A Place Among the Stones* (Sony, 1996), his home studio was up and running—at that time equipped with a Spirit by Soundcraft console, which he later replaced with an Amek Einstein—and he recorded and mixed the album there. Over the past few years, his studio setup has evolved, and his latest effort, *The Sea of Dreams,* was also recorded and mixed almost entirely at home, with some remixing done later at Notes On studio in New York City.

The Sea of Dreams is a ravishing collection in that way that Irish pipes and whistles can be: sometimes sweet, sometimes anthemic, and don't spare the reverb.

Spillane's writing and playing are extremely emotional. All of the songs are instrumentals (including a version of "My Heart Will Go On"), except for two that Sinead O'Connor sings: an original called "The Dreaming of the Bones" (lyrics by O'Connor) and a surprisingly fresh version of "Danny Boy." *Mix* spoke with Spillane about the recording of this homemade CD when he was in New York just after the album was released.

Tell me about how the material for this record evolved.

I live in the west of Ireland, about 15 minutes' walk from the cliffs. It's a very beautiful place, and that has a big effect on me. Landscape is important; it contributes a lot of what music you're doing, I believe. I have a studio in the house, so it evolves here from day one. I write all the melodies, and we kick things around.

The Sea of Dreams is a sensitive record in terms of the emotions that are on it; it's very open. Of all the music I've done, it seems to me that the slower music was the stronger music, so that was a choice I made on reflection. It just seemed stronger and more valid, more affecting. So I developed this music over the last couple of years since the last record, *A Place Among the Stones.*

When I write music, I procrastinate a lot, and these melodies come out of the pain of procrastination. I procrastinate about stuff forever and a day, and then I'll craft it pretty quickly.

How long did you spend writing material for this record?

Not a hell of a long time writing it; I wouldn't say more than ten days end to end, but it took a long time to arrange and record and produce and deliver, mainly because of interruptions like *Riverdance* and various other work I was doing.

When did you start?

About three-and-a-half years ago.

Tell me about some of the people who worked with you on this record.

I had an electric band going for many years that included the musicians that are on the record. Greg Boland is the guitarist and co-producer with me; James Delaney, keyboard player; Tony Molloy, bass player; and Paul Moran on percussion. Myself and Greg would work away arranging it, the stuff I put together, and we wrote some

—CONTINUED ON PAGE 92

BY BARBARA SCHULTZ

LACQUER CHANNEL MASTERING

Toronto, Ontario

Toronto's Lacquer Channel Mastering is among the longest-standing mastering studios in Canada. And over its 22-year history, there has been one real constant for this facility. Chief engineer George Graves has been there for 20 years, doing the bulk of the mastering work for a diverse clientele, including The Tragically Hip, Holly Cole, Rush, Loreena McKennitt, Public Enemy and LL Cool J. "George is really the centerpoint of Lacquer Channel," says the studio's communications manager, Ron Piovesan. "It's because of him that we have the reputation that we have. He started in the States, and now he's known all across Canada, as well as in the States."

Above: Equipment in Lacquer Channel's Studio B ranges from a Neumann VMS 70 disc-cutting lathe to the Sonic System. Below: Chief engineer George Graves.

Graves began his mastering career at Century Records and then RCA in the early '60s. ("But I was interrupted by my military service, where I worked as a cook preparing and serving mashed potatoes and pastries to over 200 soldiers!" he says.) In 1971, he began working for Doug Sax at The Mastering Lab in L.A. After three years, he moved to Canada to work at the now-defunct JAMF (Just Another Mastering Facility), and he moved over to Lacquer Channel in 1978. "When I moved to the fledgling Lacquer Channel, it was about three years old and was just cutting lacquers for vinyl in a small room at Phase One Recording Studios in Toronto," Graves says. "Since that time, Lacquer Channel Mastering has grown into its own facilities with two fully equipped mastering studios, each capable of editing and mastering music for vinyl, CDs and Enhanced CDs."

The two studios were designed by Group 1 Acoustics of Toronto and are equipped with Sonic Solutions systems, State of the Art CF 750 monitors and custom Neve mastering consoles. "The Neves have been with us since '75, when we were at our previous location," Piovesan says. "With the technical assistance of Kirk Eliot, George had the boards rewired and rebuilt to get the type of sound he wants out of them. So they're very much Lacquer Channel boards. And clients love them. We get offers for our Neves all the time."

"Like many high-end mastering facilities," Graves says, "I like to think we have a good balance between old-style and new-style mastering. All our mastering is done in the analog domain, but we do go digital for editing and for adding compression. I take the music off the ½-inch or ¼-inch tape—or DAT, depending on the client—and go through my Pultec EQP-1A EQs, Sontec Parametric Disk Mastering EQs and Dolby 740 Spectral Processor. These are built into our custom Neve mastering consoles. I switch domains using Apogee 1000 DA/AD converters and add digital effects using a Lexicon 300L."

Because Graves is really the heart and soul of the place, his approach to mastering work essentially defines the facility. "I'm very candid," he says. "I tell people what I can and cannot do. It's strange, because some people have an exaggerated sense of what can be done at the mastering stage, so they come in and expect miracles. Then there are artists who have no concept of what can be done while mastering, so they constantly think I'm performing miracles. I want to make the artist as familiar as possible with

BY BARBARA SCHULTZ

what I do, so I try to take the mystery out of mastering."

One of Graves' pet projects is attempting to demystify mastering for younger bands making their first recordings. Lacquer Channel Mastering's Project Evaluation Program allows young artists to bring their source tapes into the studio, sit down with Graves, ask questions and hear a few examples of what a mastered version of their recordings would sound like—all for free. Of course, this is partly a marketing plan, because the hope is that the artists will decide to hire the studio, but it also gives new artists a great opportunity to learn about the process from one of the most experienced engineers in the business.

"We're also fairly flexible as far as rates," Piovesan says. "We take into consideration what a band can afford and what they need done. This is because George is a very strong supporter of local music. He really enjoys both Toronto music and Canadian music in general. He likes to see a local act that he's worked on do well across Canada, and he really gets something out of seeing his act make headlines."

To further boost the Toronto music scene, Lacquer Channel Mastering has produced a compilation CD of local bands titled Audio Channels Vol. 1. The CD is distributed to radio stations and offered for sale. Other services at Lacquer Channel Mastering include rental of some of the studio's Studer, Ampex and Otari analog tape machines, and audio restoration. Visit the studio at www.lacquerchannel.com. ■

—FROM PAGE 90, DAVY SPILLANE

together. Well, actually, the writing credits for co-writing usually had to do with arrangements. I write the melodies, co-arrange it and then go about the recording process. We usually do that together, myself and Greg with a sequencer, and then when we have it shaped up the way we want it, we'd get our musicians in to place all the sequences.

And then there's Colin Boland, who was the engineer on this album—on my last two albums. He's the brother of Greg, and they're both the brothers of Andrew Boland, who runs Windmill One on Ringsend Road in Dublin.

What's the studio like?

I've got a house overlooking the Skella Bay down to Kerry. It's the same level as the cliffs. It's got a huge vista, a 60-mile horizon. The house is an L-shaped, domestic house, but I've also got my pipe-making workshop, where I make musical instruments, and the studio. It's all on a slant, where the control room is higher than the music room, and it's all going with the slant of the mountain down to the sea.

How did you begin making your own pipes?

Well, in the very early days of playing, when I was still only about 16, that came about out of trying to keep my pipes working. Then I got access to a workshop and it grew into a full-fledged apprenticeship for a master pipe-maker. His name is Johnny Burke, a famous pipe-maker, and that was always running in parallel to my musical events. I'd do it really intensely for a while, and then I'd be back on the road again, and then I'd do another very solid week. It's kind of like studying in your spare time.

Do you build pipes for other people?

Oh, yeah. I have orders from America and lots of different places. I sent a set of pipes to Moscow awhile ago, and there's an aircraft controller in America that wants a set of pipes, as well.

Is it surprising to get orders from so far afield? It's an unusual instrument for people to play.

It is unusual, but it's nice. It's only a sideline for me at the moment, but I make them to a professional standard, and I enjoy it.

Back to your studio: Did you design it yourself?

Yes. I have a fair bit of knowledge of that. I've kept it and upgraded it as I've gone along myself, and I wired it myself.

How long have you had a working studio?

Five years now, maybe longer. I made all the last album in it. This one here was remixed in New York, but it doesn't make any difference. The mixing quality was actually probably as good if not better on the last album.

What type of equipment do you have now?

I had a Spirit desk when I first started, but then I got a Super E Amek Einstein, and it's quite a comprehensive desk. Now I'm moving into [Yamaha] 02Rs, with really good mic preamps. I'm getting the [Amek] 9098RN, and I'm using them straight to tape. I've gotten rid of my ADATs. I've got very good mics—I've got the Sony C800G valve mic, I've got a stereo AKG C-24—and nice mic

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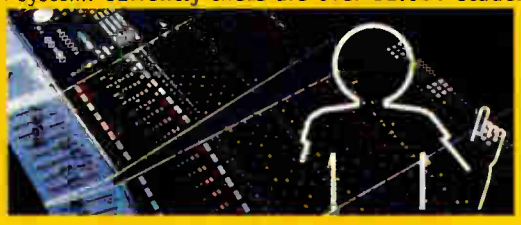

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preamps, and I'll be going straight into the hard disk with them. And I'm using [MOTU] Digital Performer as my multitrack; I haven't recorded anything on that yet, but I'll be heading into that now.

How did you decide to make the change to recording to hard disk?

It's because of the preamps. You're going through, like, the preamp slices of an extremely expensive desk. It takes care of any reservations about the desk's converters. You're going straight to your hard disk with really very good mic preamps, which is like using an amazing, expensive desk and just monitoring all back through the 02Rs, which they're really properly best at. I have no reservations about recording with them through their preamps either, but I'll record maybe B and C instruments through them—DI stuff like guitars, basses and maybe secondary mics. And I've also got some high-end outboard: Eventide 4000s, Lexicons.

What are the monitors?

The speakers are Meyer HD-1s and ATC 100As. The HD-1s and the subbass were made for Mike Oldfield, actually. He just got a second system, so he gave me them. That's a really nice system, and I have the ATC 100s because I like them as well, even though they're not too dissimilar [from the HD-1s] in some respects. The ATCs are very subtle; they're beautiful speakers.

Is this the setup you used on Sea of Dreams***?***

No. The 02Rs and the Mark of the Unicorn are for the next recording onward. This record was recorded and mixed with my previous setup, which was the ADATs and the Einstein desk.

How did you lay down the tracks for Sea of Dreams? ***What do you record first?***

The first thing we do is discuss the album, and we'd mark out, very roughly, how different the tempos of the tracks were going to be from each other, and what the whole mood was that we were trying to achieve with the record, plus the time signatures the pieces were going to be in. We'd try to map out, song by song, a click track in the very basic time signature, with a little feel in it maybe. We use that as a skeleton. Then we busk away at designing what the guitar accompaniment should be, or the percussion. We'd have all that mocked up without recording it anywhere, not even on the sequencer.

Then we'd start compiling. Percus-

THE FIRST CHINESE NATIONAL AUDIO EXPO

by Jan Paul Moorhead

Last summer, Jan Paul Moorhead, chair of the Music Synthesis department at Berklee College of Music (Boston) and Bill Scheniman, the chair of Berklee's Music Production and Engineering department, traveled to Beijing for China's first-ever Audio Expo. Their job there, as in the United States, was to educate audio students. But just as important was the cultural exchange between audio professionals. Mix *asked Moorhead to share a few recollections of the experience.—Eds.*

At the Recording Arts Institute of Beijing, Berklee College's Jan Paul Moorhead (left) teaches some basics of studio design with the assistance of translator Rebecca Zhou (seated).

About our trip to China...to paraphrase Will Rogers' quote, "If I had visited for a week or so, I could have told you a lot, but I was there for a year." Well, we were there for an extraordinarily intense six days (with about four days of travel there and back), almost all of which was spent in Beijing. I still find it difficult to explain what it was like, even though I've had months to sort it out!

This was to be China's first National Audio Expo, sort of a combination of NAMM, AES, NAB and CES. It was to be held at the Recording Arts Institute of Beijing (RAI), the premier teaching organization for recording and broadcasting in the People's Republic of China. Unfortunately, an all-important approval from a high government official wasn't granted, so the show went on without exhibits; only the seminars and workshops were conducted.

I was first contacted in April by Professor Wong Ming Chen, president of RAI, through an intermediary here in the States. Professor Wong knew of Berklee College of Music, where I chair the Music Synthesis department. As negotiations continued through July, I suggested that Bill Scheniman, chair of Berklee's Music Production and Engineering department, would be a welcome addition to the presentations. By August, after what seemed like endless preparation and bureaucratic fooling around, we were on our way.

When we touched down in Beijing, I noticed uniformed men standing on boxes every 100 yards or so around the perimeter of the airport. That was the feeling of the entire trip: Even the most normal activities and situations were strange and subtly different.

The cliche "China in Change" was everywhere. From the narrow vista presented by my hotel window, I counted 17 giant cranes fading off into the early morning smog. And the cuisine! From the remarkable and delicious to the remark-

—CONTINUED ON PAGE 97

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sion performances would be from a Roland R-8 drum module with the sequencer. Then we'd start putting down maybe acoustic guitar and some guide top lines. Then we'd layer it and build a bit more. Then when we had it where we want it, across the whole album, we'd get the musicians down to the place. Before the musicians come in, the album would be just low whistle and pipes, maybe acoustic guitar and some small electric guitar, the R-8, and my Kurzweil S1100, and that's it; there'd be only like two real things on it.

We did this in three- or four-day bouts. We wouldn't work together for more than four days at a time. Then we'd wait a good few weeks. That gave us a lot of time to digest the stylistic decisions we made to see if we still liked them, and it was also a process of rejection, because maybe some things would turn out to be too indulgent.

And then we'd have the sessions [with the musicians], which would be more celebratory—the more spiritual, if you want, overdubbing event. By the time the guys came down, we'd all know the field we were playing in, and then it started to happen.

Do the musicians then play together at that point?

No, they come down individually.

How do you mike Uilleann pipes?

There's a few different ways. What I've taken to doing now is using the AKG C24. I hadn't got that during the making of the record. And the Sony 800G is a great mic for the low whistle. Record a low whistle with that in the middle and two 140s on either side. It depends on how the phasing's going.

With the pipes, I'd have them stereo miked with the 140s. The two of them would be within maybe three-and-a-half feet of the pipes.

Can you describe the different parts of the action that you need to capture?

That comes down to player technique. It's like a singer on a microphone. Sometimes there's that flange-y thing where I play vibrato and I physically move the instrument across one mic more than another. I'll use it to shade or pan across. I also go in and out of the mics to give the Uilleann pipes something that they don't naturally have, which is volume dynamics. They're pretty much an on or off type of thing—or they can be. But my technique, without actually evoking technically a big flange sound, can give you a bit of help with dynamics to raise the emotional intensity of a note. If I'm holding a note, as I reach the note that's being held, to push an emotional intensity I tend to maybe head closer to the mic, and I start pushing it. It's just a style of doing things developed over a lot of studio work with a lot of different people.

Speaking of working with other artists, I wanted to ask about the tracks that you recorded with Sinead O'Connor.

We sent her the album as it was at the time, and she chose stuff that she wanted to do. So she said she'd like to write [words for] "The Dreaming of the Bones."

Davy Spillane (right) recorded **The Sea of Dreams** *in his home studio, Burrenstone.*

Then I chose "Danny Boy" and asked her to sing it. I wanted to take something that was perceived as being very hackneyed and do a really, really sensitive, beautiful version of it that redeemed it from its reputation. I just had a vision of her singing it so tenderly, and then it just exceeded my expectations. I wanted it to be beautiful, so that somebody'd say, "Ah, 'Danny Boy.' I haven't heard the track, but Jesus, how could he possibly have 'Danny Boy' on his album?" Then they'd hear it and go, "Jesus, that was gorgeous."

Those vocals were recorded in London in Whitfield Studios. The rest of the track had already been done at my house. They used an old vintage Neumann for her voice.

There's something about her voice that works really well with your pipes.

And with the low whistle, as well, especially, on "Dreaming of the Bones." She said that to me in our communications; we really both recognized something serious happened there, and she said she thinks it's one of the strongest things she's ever done, which I'm really only saying because I'm very honored about it, and excited at the fact that she really wants to work flat out with me now, co-writing stuff.

That would be something to look forward to.

Well, I'm excited about that because it's a combination that just works so easily. There's a great compatibility there with the harmonics of the whistle.

I'm also a fan of a particular type and particular qualities of reverbs as an instrument, which we used on this album, as well. As you know, it's a big issue within recording—kind of a subjective issue. Certain reverbs that create some harmonics for the whistle really help stitch the voice and the instruments together. Some of that reverb on the album, they're like massive reverbs, but they don't get clouded at all. I don't think they do, anyway. They're huge, but there's not a huge amount of it in the mix.

Did you use reverb during the recording process, or was that added in the mix?

That would be set up in the recording process. That was all specially crafted, and it's very special to me in that respect. It takes awhile to get down to designing stuff like that on a track.

And it was remixed at Notes On Studio in New York by Roy Hendrickson?

Yes. Because it was in a different environment, I took the Meyers with me, so that helped. Roy did a good job on it, but it was different from the album I delivered. The album I delivered was much colder.

Colder how?

[The album I delivered] wasn't as warm, and it wasn't as hopeful. It was more desolate. And the remixes—they weren't just remixes; some of the arrangements were changed. There was riching things up and enlarging things and adding more keyboard parts. That went down between us and the record company. And some of it I genuinely like; I'm now very much glad it happened. The mixes I had were like the Antarctic emotionally, and in that respect the album emotionally was significantly stronger, but it wasn't necessarily as pleasant-sounding.

—FROM PAGE 94, FIRST CHINESE AUDIO EXPO

able and exotic: Chinese chitlins, fried chicken feet, jellied duck feet, and a canine delicacy that Bill's wife dubbed "poodles in noodles."

We spent the first day getting set up at RAI, which is in the Chaoyang district on the western edge of Beijing. Installing software on Chinese computers was an adventure all by itself. Not enthused about running "plug 'n' play" in Mandarin, I gave them their first look at Win98. It took us a moment to get the hang of working through our interpreters.

L to R: Professor Wong Ming Chen, and Berklee's Bill Scheniman and Jan Paul Moorhead sampling regional cuisine.

We were impressed with the students' level of technical/scientific audio knowledge. Practical experience, aesthetic issues and the commercial aspects of the studio business were less strong. In the West, we commonly expect a certain amount of musical knowledge from producers and engineers. The current Chinese approach appears to be more technical, with little experience in music itself. This led to a lot of last-minute rewriting of carefully prepared lectures! Our two lectures that sparked the most interest were about how business is conducted in the West. The infrastructure of professional relationships and organization of roles in the production process is quite different for them. In particular, the idea of the entrepreneur, an individual owning the means of production, is quite foreign to them. This is largely due to the amount of available capital. Studios in China are primarily government enterprises.

The home studio is a concept whose time may soon come in China. Economic progress in China can be measured by change in status symbols—from the bicycle to the refrigerator, to the washing machine, and, recently, the color TV. Currently, home entertainment systems (karaoke) are very popular. One might expect that, with an increase in leisure time and cash for the upper middle classes, the home studio might be the next step for some families.

There clearly are opportunities for development in the burgeoning audio industry in China. However, it is not for the faint of heart. Undertaking this venture will take much patience and understanding of the culture. ■

But there's no antagonism about that. It was remixed, and there were compromises made, of course, but I was happy to come by them, and I don't think it's a terrible thing. I wasn't compromised by the compromises that were made. You have to compromise when you're working with people, especially when they're your record company and they work in America, and there is a difference, culturally.

What made you record the song from Titanic*?*

Well, the record company, basically. It's listed as a bonus track, annexed off from my album tracks. The record company have a marketing bonus track in there, and it's obvious what that's about. My own personal hope was that it didn't compromise the record. And overall, I don't think it has. Though on its own I thought the track was funny because it was done as a tongue-in-cheek promo initially. It wasn't destined for the album or recorded for the album. It was recorded during the Bryan Adams tour while the film was out.

You've worked with quite a lot of pop stars. What have some of the highlights been over the years?

Oh, it's all been highlights. I'm not trying to be smart, but they are. They're highlights because they're different—varied personalities and very varied musical backgrounds, musical genres. That's as good as it gets, to have that much variety.

Which projects were most enjoyable?

I think the Kate Bush things. That was pretty good, 'cause it was very East European, and the music I had to play was difficult. Some of it was formidable. A lot of people get me in to play like a sax player; she had me in quite structured, so I appreciated that. I was enormously knocked out by her production, and musical ability was really serious. And I enjoyed all the rest of it, too. Steve Winwood—I liked working with him. But it's unfair really to single people out. It's very stimulating work. I've got this list of people I was involved with, and they create variety in my life, and some of the things are more to my personal taste than other things, but it's all part of my work, and they're not necessarily the things I'm proudest of.

And outside of even analyzing that, that whole category is still only like a quarter of my involvement in the music business, because I have my bits of film scores and TV, and then I have my big albums I call them, my Davy Spillane albums, where I really put myself on the line. And I love all that. I particularly am enjoying the technology aspect [of my career] now. I like my studio as a workspace, and I really appreciate what the technology does for the likes of me. I remember what it was when you needed $800,000 to just start recording anything.

Are you keeping your studio private, for you and your bandmates, or is it available for commercial projects?

It's a commercial studio so much as it's available for projects, but it's not a revolving-door recording studio, even though I'd like that to develop. I'm looking forward to turning it into more of a commercial studio. I've got a lot of accommodation above it, and it's a really classy old house. The house is 200 years old, and it's stone-faced and arches over the windows. It's in a most magnificent place. It's overlooking the Aran Islands. The studio has a boat launch in the bay, and you can take the boat to the Aran Islands in an hour-and-a-quarter. ■

Associate editor Barbara Schultz is the editor of the International Update section of Mix.

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BY TOM KENNY

POST SCRIPT

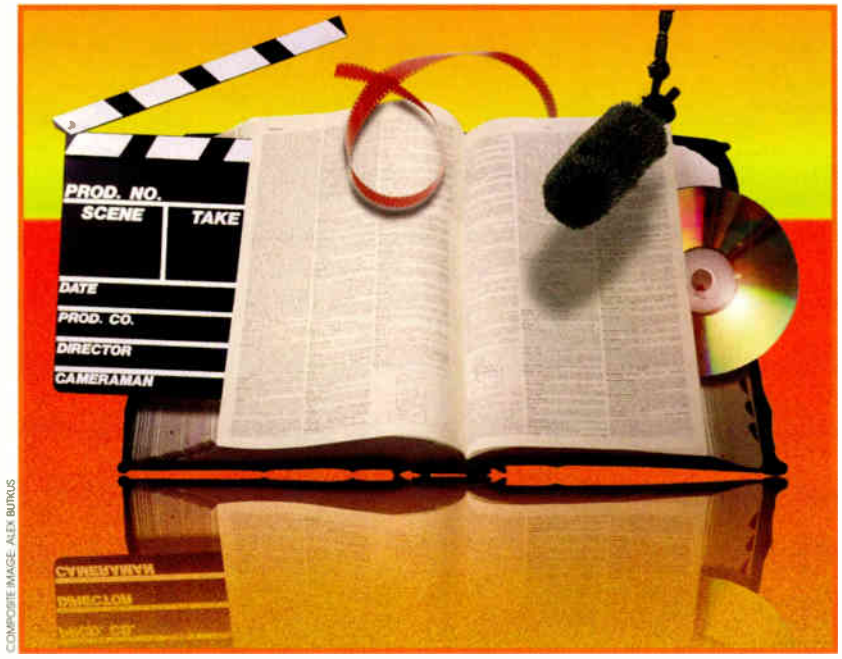
SOUND FOR FILM

"WHAT'S A BINKY?"

LARRY BLAKE'S FILM SOUND GLOSSARY PART ONE, A TO D

by Larry Blake

One of the most common requests that I have had over the years has been for an all-encompassing, one-stop glossary of the arcane film sound terms that pepper my column each month. Without further ado, here it is, or should I say, here is part one. Part two, covering E–Q, will appear in the April issue, with R-X in May. (I know of no Y's or Z's in film sound vernacular.) Clip this, save it, and put the three together in May.



COMPOSITE IMAGE: ALEX BURKUS

(Note that when you see a word in SMALL CAPS, this means that it will be defined elsewhere in the glossary—sometimes, alas, in a different issue.)

A-2, A-4, A-7 *See* VOICE OF THE THEATER. (Sorry, you'll have to wait until May.)

AB REEL Term for a 23-minute or less (max 2,050 feet, including head and tail LEADERS) reel of film that is shipped to theaters and that may originally comprise two "1,000-foot" edit reels. Projection reel 1AB would have been reels 1 and 2 during editing and mixing. In the event that reels 1, 2 and 3 together add up to less than 2,050 feet, the first projection reel might be called 1ABC, although this is rare. Sometimes films are edited in AB reels, a practice that is becoming commonplace due to the reduction in number of 35mm MAG FILM UNITS, which are very cumbersome to deal with as 2,000-foot loads on editing benches. However, reel length is no problem with the picture on video and sound on digital audio workstations.

AB reels should not to be confused with AB-roll printing, in which the camera negative is checkerboarded into two strands, allowing for simple optical effects such as fades and dissolves to be made when making original-negative prints (*see* EK NEG) or INTERPOSITIVES. This process is not limited to two (A, B) rolls but can be as high as desired. Thus, a camera negative cut in four strands would go up to a "D" roll.

AB reels are also known as "big reels" or "2,000-foot reels."

ACADEMY CURVE/ACADEMY MONO The name of the standard mono optical track that has been around since the beginning of sound for film. Standards were codified in 1938, although it has "improved" slightly over the years. The response is flat 100-1.6 kHz, and is down 7 dB at 40 Hz, 10 dB at 5 kHz and 18 dB 8 kHz.

ACADEMY THEATER The Samuel Goldwyn Theater at the Academy of Motion Pictures Arts and Sciences on Wilshire Blvd. in Beverly Hills. Considered the best-sounding theater in the world. Contrary to popular belief, voting for the Best Sound Oscar doesn't take place as a result of Academy members having seen the nominated films there. (All nominated films are indeed screened at the Goldwyn Theater during the month-or-so voting period subsequent to the announcement of that year's nominations in mid-February.)

A-CHAIN The part of the motion picture reproduction system in a theater that contains the sound transducer (such an OPTICAL analog track reader or digital sound format decoder), preamp, noise reduction and matrix decoding (if applicable). The B-Chain comprises the main fader, room EQ, crossovers, amplifiers, speakers and influence of room acoustics on loudspeaker response.

ACMADE British manufacturer of EDGECODING (*op cit*) machines. The company so dominates the market that edgecodes are often referred to as "Acmade codes."

AC-3 Dolby Laboratories'

—*CONTINUED ON PAGE 103*

SOCK PUPPETS RULE

MTV'S "SIFL 'N' OLLY" TAKES MINIMALISM INTO THE KITCHEN

by Dan Daley

Sifl 'n' Olly, a show peopled by ragamuffin sock puppets with a soundtrack that's literally recorded in a kitchen, fits in with MTV's minimalist leanings; in addition to costing virtually nothing to manufacture, it not only looks like it was made for adolescents but also made *by* them. But its very simplicity also recalls the early days of children's television programming. If paths had crossed at a different time, it could have Shari Lewis and Lambchop up there every night, singing about carrots and reprising Blue Oyster Cult's "Don't Fear the Reaper." On *Sifl 'n' Olly*, life's lessons are conveyed in a way that straddles the line between the childish and the childlike.

Sifl 'n' Olly creators Matt Crocco and Liam Lynch started dreaming up comedy together when they were in the seventh grade in Ohio. They would make up show formats and record them to a cassette boom box, complete with songs off records as their backdrop. They were prefigurations of Beavis and Butt-head, sans music videos to criticize. "The names are totally meaningless," says Crocco of *Sifl 'n' Olly*. "We would just sit around making them up then like we do now, and we picked two names from back then."

The two continued to make their brand of ad hoc comedy cassettes as they grew up, and as the small but loyal core of fans they played them for grew, so did their

—CONTINUED ON PAGE 108

From left, Liam Lynch (Olly), Brian Hardin (Icky Starmaker) and Matt Crocca (Sifl) in Hardin's kitchen production studio.

COMPOSER PROFILE

PAUL ROBB

SONGS, SPOTS AND SCORES, OH MY

by David John Farinella

Paul Robb, between laughs, explains why he's concerned about winning two Clio awards for his work on a BMW television campaign. "Again, here I am suffering from the same thing that happened with Information Society. The first thing I ever tried was a booming home run, and I am going to be living up to that probably for the next ten years," he says alluding to his success with the pop-techno outfit he fronted in the late '80s; their song "What's On Your Mind (Pure Energy)," became a Number 3 hit. "Everyone will be saying, 'Yeah that spot was okay, but it wasn't as good as those BMW spots in 1998.' When you win two Clios for the first commercial you have ever done, it tends to build up some expectations."

PHOTO: RALF STRATHMANN

Former Information Society front man Paul Robb in the "Wreck Room," where he assembles scores for the small screen and big screen.

Rather than becoming a slave to those expectations, Robb has turned to a number of different composing possibilities. Whether it's his two band projects, Brother Sun Sister Moon and Think Tank, or the scoring work he completed on the October Films release *Orgazmo*, Robb is busy. Of course, these opportunities did not come in overnight. After Information Society disbanded, Robb found work with MTV, re-scoring for the network's international syndication market. At the time, MTV only had a blanket license to use music within the United States, so any type of programming that was going overseas, like *Real World*, *MTV Sports* or *Road Rules* had to be re-scored. It was a tremendous learning opportunity.

"I liked it in the sense that

—CONTINUED ON PAGE 112

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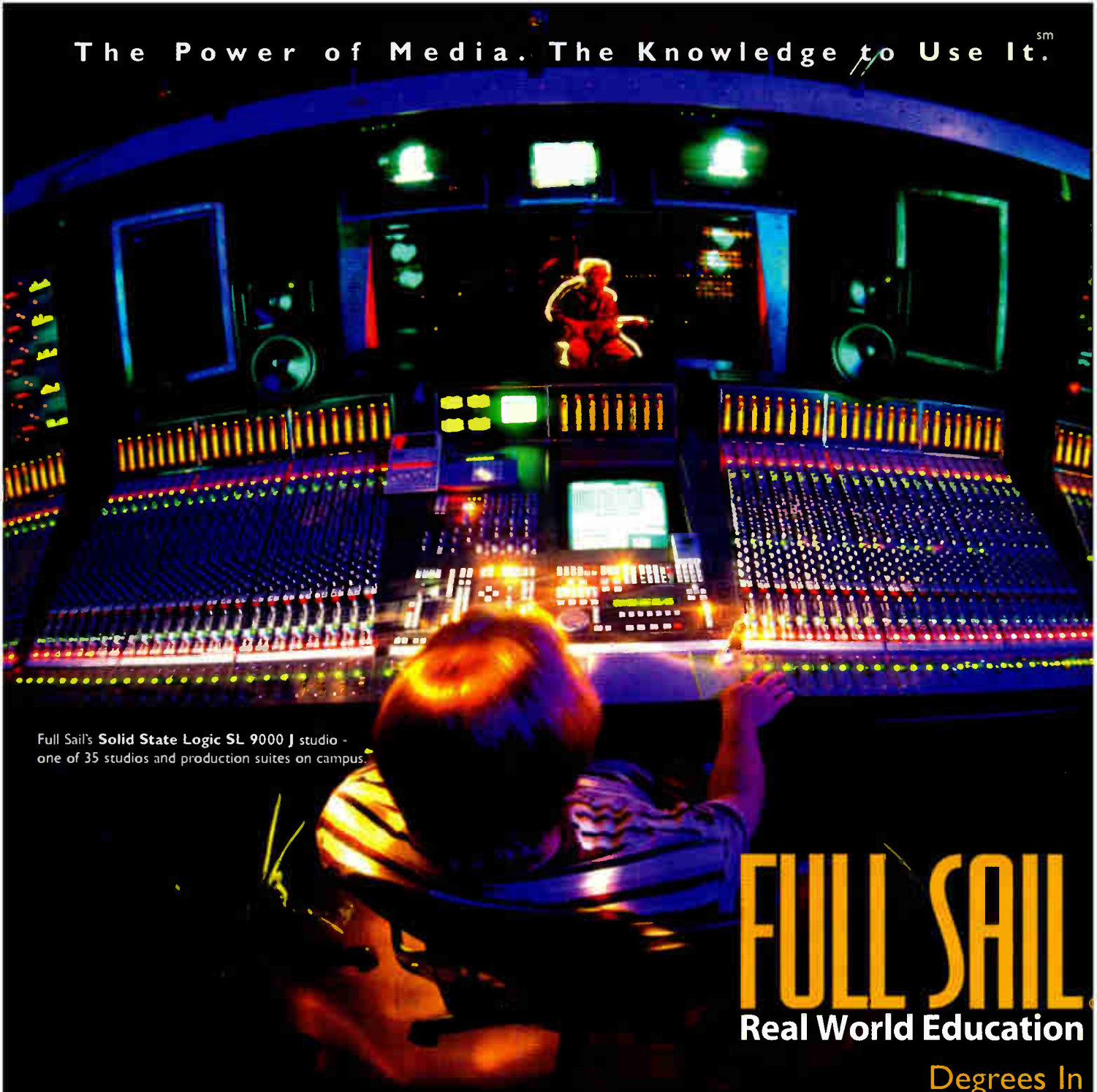

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Credits: Co-Producer/Programmer, Stevie Wonder's Grammy Award-winning single "For Your Love". Motion picture and television credits include: *Get on the Bus, Jerky Boys, VIP, Walker, Texas Ranger.*

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—FROM PAGE 100, FILM SOUND GLOSSARY

low-bit-rate coding system that is used in its 5.1-channel DOLBY DIGITAL film, broadcast and consumer video formats.

ADR Automated Dialog Recording. The act of recording another reading of a PRODUCTION TRACK in post-production. Usually the actor will be looking at the picture on a screen and will be hearing a series of beeps in a headphone giving a countdown to the beginning of the line. *See* LOOPING.

AIRLINE VERSION A remixed (and possibly re-edited) version of a film that contains no curse words, sex or violence. Airlines are an even tougher "room" than the broadcast networks, and a version that passes the airline censors will almost always "fly" on TV.

"ALL-DIGITAL" An advertising claim used frequently in the '80s. Now considered obsolete and rude.

AMPEX Former manufacturer of videotape recorders, analog tape recorders and magnetic tape products. Name is an acronym based on the founder's name: Alexander M. Poniatoff EXcellence.

ANAMORPHIC The camera/projector lens system which "squeezes" an image (usually to a 2:1 ratio) onto film during shooting, and unsqueezes it during projection. The viewed image has an aspect ratio twice as wide as what was recorded on film: If the image on the print is 1.2:1, the screen will be 2.4:1. *See also* CINEMASCOPE, FLAT, 'SCOPE.

ANSWER PRINT The composite print of a film with final mixed track and final picture timings. In many contracts the delivery of the answer print is specified because it means that post-production has ended and RELEASE PRINTING can begin, although the release printing is usually done from an INTERNEGATIVE. Should always be distinguished in conversation and film labeling from a BLACKTRACK answer print, which contains no soundtrack.

ASPECT RATIO The width-to-height ratio that an image is intended to be shown in, most commonly expressed as width relative to height which has been scaled to 1 unit. Standard television screens are 1.33:1, U.S. theatrical films are 1.85:1 and ANAMORPHIC films are 2.4:1. Ratios are also sometimes expressed as whole numbers; in this manner TVs are 4x3 and the new widescreen TVs are 16x9 (or 1.78:1).

A-TRACK The primary dialog track cut by the picture editor. The B, etc. tracks would be used for overlaps.

A-TYPE The original Dolby NOISE REDUCTION process, introduced in 1965 for professional recording. A-Type splits a signal into four bands for processing, while B-Type noise reduction, introduced in 1968 for home use, only affects high-frequency hiss above 5 kHz.

AVID Nonlinear picture editing system.

BABY BOOM a) The nickname of the Dolby 70mm process that dedicates two of the six tracks on a 70mm print to low-frequency information below 250 Hz. No longer used due to the existence of a dedicated subwoofer track in digital release formats. b) Post-World War II period of vigorous sexual activity followed by frequent childbirths. Generally considered to end in 1963.

BACKFILL To edit fill between words so that the whole length of a scene (including sections where the take or angle in question is not being used) is continuous.

BACKGROUNDS Sound effects that sonically define the time and place of a location. Referred to as "atmospheres" or "atmos" in the UK. "BGs" are considered sound effects and should not be confused with ROOM TONE.

BAKE OFF Hollywood colloquialism for the meeting of the Sound Branch of the Academy of Motion Picture Arts and Sciences in which the members hear ten-minute clips of the seven films that have made the semifinals of the Best Sound Effects Editing award.

B-CHAIN *See* A-CHAIN.

BENCH Film sound slang for the editing table, which consists of rewinds handling reels of 35mm picture and MAG FILM, a sprocketed synchronizer that keeps the reels in sync (in addition to providing a count) and a "squawk box," which is used to hear the tracks played back from heads mounted on the synchronizer.

BINKY Film sound slang for a mixing "top sheet," indicating the layout and content of PREMIXES. The layout is usually one column per premix.

B INPUTS Additional set of inputs to a console channel that allow either additional (but not simultaneous) tracks to be assigned to a console, or, more commonly these days, a different source of the same information that is appearing on the A inputs. This latter technique allows a sound editor to work offline on a sequence while the mixer is adjusting overall EQ and level in automation while playing back from another copy. The material is recorded to tape (after switching inputs) when the editor is finished.

BLACKTRACK PRINT Silent ANSWER PRINT of a film, made from the original camera negative. The first answer prints are

usually "black track" in order to proceed with the color timing, even when post-production sound is not finished.

BLIMP Solid cover for a motion picture camera designed to contain camera noise completely. A "barney" is a padded cover designed to reduce camera noise while still allowing hand holding and portability.

BNC Blimped Newsreel Camera. The 35mm Mitchell Camera model, which was the industry standard for over 30 years. *See* BLIMP.

BOOM a) The pole that holds the microphone when recording production sound. b) An outmoded name for the channel containing low-frequency enhancement. *See also* BABY BOOM.

BROOM To not use a sound during a mix. "Site brooming" is when a director rejects a whole group of effects, often causing days of work to go down the drain.

BTSC Broadcast Television Systems Committee. The FCC committee that decided upon the MTS standards for stereo television sound in the United States.

BUZZ TRACK Alignment film used to set the lateral alignment of the "slit" in photographic (optical) sound reproduction systems.

C.A.S. Cinema Audio Society. Los Angeles-based organization of film and television recording personnel; founded in 1966..

"CAT 43" The Dolby Laboratories device that turns a Cat. No. 22 Dolby A-Type NOISE REDUCTION card into a 4-band "noise fighter." The precise frequencies of the bands are optimized for production sound problems and differ from those used in standard noise reduction applications. In 1991 Dolby formally introduced the SR-based 2-band version called the Cat. No. 430.

CHAIN The group of equipment (frequently including a DIP FILTER, GRAPHIC EQ, de-esser and compressor) that a re-recording mixer will have patched together in series, either inserted in a channel, on a console bus or in a REASSIGN bus. *See* IRON.

CHANGEOVER PROJECTION *See* PROJECTION.

CHANNEL A complete, self-sufficient recording setup. A "production channel" would include a recorder, mixer, microphones, headsets, etc. A "transfer channel" would include a ¼-inch tape deck, a 35mm mag recorder, a RESOLVER and a monitoring system.

CINEMA DIGITAL SOUND The name of the theatrical reproduction format introduced by the Optical Radiation Corporation, a division of Kodak, in 1990 (for the film *Dick Tracy*) for digital sound on 35mm or 70mm prints. The format lasted two years and is now obsolete.

CINEMASCOPE WIDESCREEN camera system developed by Twentieth Century Fox, which was responsible for popularizing the ANAMORPHIC format.

CINERAMA Widescreen system comprising three 35mm cameras/projectors running in interlock with 7-track MAG FILM.

COMOPT Laboratory term for "composite optical print."

COMMAG Laboratory term for "composite magnetic print."

COMPOSITE PRINT Film print that contains a soundtrack.

COMTEK Salt Lake City-based company that makes portable wireless transmitters and receivers. "Comteks" have become the generic name for wireless headphone feeds to directors and for wireless timecode feeds to slates.

CONFORM a) To re-edit sound elements to match a new version of the picture edit. b) To assemble sound elements (from their original sources) to match their location in a picture edit, often with the assistance of an Edit Decision List supplied in a computer-readable file.

CONTAINER Film sound slang for Dolby Laboratories' peak limiter designed specifically for controlling the dynamics

of program material during SVA (*op cit.*) printmastering.

CPS Acronym for "cycles per second," cycles being the obsolete term for what is now referred to as Hertz (Hz).

CROSS-MOD Short for "cross-modulation test," which is a means of determining correct exposure on a TRACK NEGATIVE to result in minimum distortion on a positive print. Tests are conducted to determine the relationship of specific optical cameras to specific laboratories.

C-TYPE *See* SPECTRAL RECORDING.

CUE SHEET A track sheet for mixing that gives locations of edited sounds on a track-by-track basis, either in film footages or in timecode numbers. *See also* BINKY.

CUT EFFECTS Sound effects that are PULLED from a sound library and edited; usually as opposed to FOLEY, which is recorded in sync specifically for each film.

DAILIES Uncut footage shot each day during production. If picture editing is on film, with picture and synchronized MAG FILM, those elements when edited together become the WORKPRINT and WORKTRACK.

DBX NOISE REDUCTION system for analog recording. Type I is used for professional applications, while Type II was optimized for lower-speed consumer use. The name, properly spelled as dbx, refers to founder David Blackmer.

DECODING *See* ENCODING/DECODING.

DIGITAL DUBBERS Film industry name for multitrack (usually eight channels per unit) digital recorders that use removable hard drives or magneto-optical drives as the recording medium. The term is partly a misnomer because previous film sound terminology had used "DUBBER" to distinguish from "recorder."

DIP FILTER Parametric equalizer with an extremely narrow bandwidth ("Q") and that is designed to remove noises, such as those from a camera or a light, whose offending frequency range is very narrow.

DIRECT POSITIVE A PHOTOGRAPHIC SOUND recording that, when processed, results in a track that can be played and edited. A now-obsolete process.

DISCRETE Refers to a 1:1 relationship of recorded tracks on a print and the resulting number of speaker channels. For example, a 4-track magnetic print will be reproduced through four channels—left-center-right-surround—in the theater. (Obviously, the surround track/channel has more than one speaker.) Discrete playback is often contrasted with matrix ENCODING/DECODING.

DISCRETE 6-TRACK Traditionally means the five-speakers-behind-the-screen system made popular by the TODD-AO 70mm process (although it was first used for CINERAMA). In the current vernacular, though, discrete 6-track sometimes means six nonmatrixed tracks, assigned left, center, right, left-surround, right-surround and subwoofer.

DLT Digital Linear Tape. Tape-based computer backup format developed by Quantum Laboratories.

DME Dialog, Music, sound Effects. The three basic food groups of film soundtracks. Originally referred to the 35mm 3-track master mix of ACADEMY MONO films.

DOLBY DIGITAL The 5.1-channel digital format created by Dolby Laboratories. In current usage applies both to the company's 35mm theatrical format (which contains the data printed optically between the sprocket holes) and its video formats (such as DVD, laserdisc and DTV). First used in 1992 for *Batman Returns*.

DOLBY PRO-LOGIC The Dolby Laboratories trademark used for home surround decoding devices that meet more stringent standards and offer such features as band-limited pink noise for aligning channel balance, plus a separate, matrix-derived center-channel output.

DOLBY, RAY M. The founder and sole

owner of San Francisco-based Dolby Laboratories.

DOLBY STEREO Many meanings! In the broadest and most common sense, the trademark that appears on movie prints, advertisements and posters means that a given film has been released in prints that employ Dolby A-Type NOISE REDUCTION encoding.

There are two tracks on 35mm *stereo* optical prints, referred to as LT and RT, which are matrix-encoded to contain four channels of information. The 4:2 ENCODING is done during the PRINT MASTERING, with the 2:4 decoding occurring at the theater. *See also* ULTRA-STEREO, DTS STEREO.

In their standard form, Dolby Stereo 35mm prints are encoded with A-TYPE noise reduction. Beginning in 1987, Dolby Laboratories has made its SPECTRAL RECORDING (SR) process available on 35mm stereo optical prints, with the advantage of greatly reduced optical noise and increased low- and high-frequency headroom.

All of the stereo optical prints—Dolby Stereo (A-Type), Dolby SR, DTS Stereo and Ultra Stereo—occupy the same area as standard mono optical prints and are capable of mono-compatible performance. The exact degree of mono-compatibility is mix-dependent.

Dolby Stereo on 70mm usually means four DISCRETE primary channels (left, center, right, surround), with the left-center and right-center tracks dedicated to "boom" information below 250 Hz. The four primary tracks are normally A-TYPE encoded, although selected films since 1987 have utilized SR encoding on 70mm prints.

The first Dolby Stereo film was *Liszomania* in 1975. The first Dolby 70mm BABY BOOM film was *Star Wars* in 1977.

DOLBY SURROUND The Dolby Laboratories trademark used for surround-encoded material on non-film uses such as videocassettes, videodiscs and television broadcasts. Also, for home surround decoding devices that do not have matrixed center-speaker output.

DOLBY SURROUND EX The digital release format developed by Dolby Laboratories and THX for use in the upcoming *Star Wars: Episode One—The Phantom Menace*. Three surround tracks are derived by matrix-encoding them in the two previously existing surround tracks. Should not be referred to as a 6.1-channel format because the additional surround channel is not a discrete, recorded channel.

"DOLBY WAS JUST HERE" Standard answer by projectionists to the question, "When was the last time this theater was aligned?"

DOUBLE SYSTEM a) Projecting a film with the picture, on 35mm film, in interlock with the soundtrack, most commonly on MAG FILM. b) Film or video production that utilizes sound recorded on a separate tape recoder, such as a DAT or NAGRA. This holds true even if the video recorder is also recording sound. *See* SINGLE SYSTEM.

DOBLY The system that would have saved Spinal Tap's *Smell the Glove* album from oblivion.

DOWNMIX A mix derived from a multichannel (usually 5.1) source to create a compatible version of fewer channels. Common use today occurs in consumer Dolby Digital products to play back a 5.1-channel DVD either via Dolby Pro-Logic decoding or in standard two-channel stereo (for headphone listening). In those instances, an LT-RT or an LO-RO, respectively, are the result.

DS4 The name of the original Dolby Laboratories recording/monitoring unit used by re-recording stages during a DOLBY STEREO mix. Prior to the 2-track PRINT MASTER, the unit is used for 4:2:4 monitoring purposes, encoding a 4-channel composite mix into two tracks and decoding it back into four channels.

Later variations in the Dolby product line include the SEU4 and SDU4 units, which offer, respectively, the ability to encode and decode print masters, although without either the CONTAINER or the optical track simulation featured in the DS4. (A SPU4 unit is available to add those capabilities to studios that have SEU4/SDU4 units.) The DS10 contains a magneto-optical recorder for theatrical DOLBY DIGITAL mixes. It also records the LT-RT SR-encoded print master.

Neither the DS4, DS10 or SPU4 can be purchased, rented or leased; their use is free for use on films that have paid the appropriate license and trademark agreements.

DTS The 5.1-channel system developed by Digital Theater Systems of Westlake Village, Calif., that utilizes a CD-ROM interlocked to a 35mm or 70mm print with timecode. Audio on the CD-ROM utilizes apt-X 100 low-bit-rate coding. First used in 1993 for *Jurassic Park*. *See also* 70MM.

DTS STEREO The SVA encoding process developed by Digital Theater Systems.

DUB In the most general sense, to dub is to copy, although in film sound vernac-

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ular it has acquired many similar shadings. It can refer to the act of replacing dialog (usually via the ADR process), either in the original language or in a foreign language. "Dubbing" is also the common name for RE-RECORDING, at least insofar as Hollywood and New York are concerned.

DUBBER Film sound term for a playback-only MAG machine. Previously known as "dummies." *See* DIGITAL DUBBER.

DUBBING EDITOR The term for a SUPERVISING SOUND EDITOR in the U.K.

DUB MASTERS *See* FINAL MIX.

DUO-BILATERAL The technical term for the variable-area photographic soundtrack format used for almost all 35mm mono and stereo soundtracks.

More the next two months! If I'm missing any, you can always reach me at P.O. Box 24609, New Orleans, LA 70184; fax 504/488-5139; or via the Internet: swelltone@aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that film sound terms are often mispronounced, albeit in a charming manner.

—FROM PAGE 101, SOCK PUPPETS RULE

technology, graduating to a 4-track cassette deck. Both Crocco and Lynch eventually landed in Nashville. Lynch went off to college in Europe, and while at the Liverpool Institute for the Arts in 1995, he took one of the tapes, edited it and married it to a VHS tape of some sock puppets as a Christmas gift for his partner back in the States. He also sent a copy of it to MTV Europe, which promptly asked for more one-minute snippets to run between videos and shows.

But the real payoff came through persistence. After four months of phone calls, one finally made it through to Brian Graden, the executive behind *South Park* and the new president of programming for MTV (USA). *Sifl 'n' Olly*, the product of two fertile, young minds, was about to make the transition from home video to big-time broadcast. But in doing so, they were able to maintain DIY production values that gave the show its character. Integral to the process was their relationship with Nashville engineer and music producer Brian Hardin.

Crocco and Lynch had become friends with Hardin from their early days in Nashville. They affectionately refer to him as The Enabler because he seems to share their affinity for randomness and innocent comedy, and his slacker-esque philosophy and auteur approach to music production proved a good fit. The Washington, D.C., native had come to Nashville 16 years before to attend Belmont University's recording program, where he eventually became student studio manager and producer/engineer on nearly 1,000 songs (including a few with then-up-and-coming artists such as Pam Tillis and Little Texas) over the course of the four-year program.

Upon leaving school, Hardin did some typically Nashville sorts of sessions with artists like Jerry Lee Lewis, Hank Williams Jr., George Strait and Kenny Rogers, as well as lots of Christian records and a few pop records with Ziggy Marley, Steve Winwood and Belly. The predictability of most of that music soon wore thin for him, however, and, as he puts it, he "abandoned all need for security and invested in producing music that was a lot less predictable, like punk, alternative rock, dance music, hip hop and rap." But Hardin seems to have hit his stride with *Sifl 'n' Olly*'s creators. "There is nothing anal-retentive about the audio to this show, or any other aspect of

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EFX Studios
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The Enterprise II
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it, for that matter," he explains. "Making things sound perfect or using traditional techniques always takes a back seat to allowing randomness and creativity to come through." His mottos: "Most great inventions are created by accident"; "Creativity should be emotional and free-flowing, not logical and contrived"; "I strive for progress rather than perfection."

CHEAP 'N' CHEESY IS FUNNY

Sifl 'n' Olly is recorded in two ad hoc studios in Hardin's home on Nashville's west side. The songs are recorded in the kitchen, which looks like a cartoon of a pimped-out whorehouse, complete with spinning disco ball and jalapeño lights; dialog is done in the basement, which has just a bit more isolation. "We're not too worried about things like leakage," says Hardin. "On the downbeat of the very first show, there's the sound of a car peeling out. That came in through an open window while we were recording the song, and we just left it there. In fact, we made it louder." It's not unusual to hear the occasional telephone ring buried in a track.

In addition to a stove and refrigerator, the 20x12-foot kitchen—chosen because Hardin says it's the best-sounding room in the house—has a Yamaha 02R digital console and 32 tracks of Tascam MDMs (one DA-88 and three DA-38s), with KEF C55, Sentry 100 and Yamaha NS-10 monitors. The 34x17-foot living room is filled with a '70s Gretsch drum kit, Mallory upright grand piano, '70s Yamaha portable organ with a ribbon slide bar, vintage tube Leslie, and many other guitars, amps and percussion instruments. The 25x17-foot basement studio has an old Fostex 450 console, which Hardin thinks is one of the funniest pieces of equipment ever made. "It should have 'Mattel' written on it," he says. "If it ever caught fire it would produce toxic fumes." On the other hand, he notes, "There's a certain musicality in cheesy gear. It has a 3-band parametric EQ with a well-placed Q that any idiot can grab and make sound good. Great gear can make things sound clean and professional, but you don't need top-of-the-line equipment to make things sound interesting and flavorful."

That sentiment is reflected in the rest of the *Sifl 'n' Olly* audio arsenal, much of which is stored in kitchen drawers. Basic tracks and the songs themselves are generally constructed simultaneously. Spontaneity is the key to the show's humor. The trick is to be capable of recording any instrument within seconds. Crocco (Sifl) and Lynch (Olly) will

pick one of the half-dozen Casio or Yamaha keyboards lying around the room. They'll randomly choose a preset, musical style and tempo from the collection of onboard parameters, and play a few chords, making up lyrics as they go along, much the same way they did 20 years earlier as kids. Songs are typically written, produced, recorded, overdubbed and rough-mixed within 30 minutes. "No one has any idea what's going to come out," says Hardin (whose predilection for both the bizarre and the cheap is evident in a record he produced recently for a 7-foot-tall rapper named Cheze Boy and in the tentative name of the studio, The Cottage Cheese). "All they know is, they're writing a song about carrots. Every piece of equipment is simply a creative catalyst."

Hardin records everything. As he puts it, "Tape is cheap, and spontaneity is hard to come by." On playback, they decide if the performance works; if not, they take another pass, or use it as the basis for overdubs—usually of equally offbeat and bizarre instruments, with a special fondness for children's percussion toys and electronic instruments, elevating Fisher-Price products to the status of pro audio outboard equipment.

Hardin has used an assortment of classic microphones on their voices and instruments, though, and the venerable Shure SM58 is generally the choice. "It takes an enormous amount of abuse, and its proximity effect lets it go from very full-sounding to very thin very quickly," he explains. "It's a funny-sounding microphone."

This on-the-fly process also allows for prolific output. In preparation for the new season, they recorded some 40-plus songs in a single week. Each song was surrounded by the show's dialog, recorded in the basement studio and then edited in Pro Tools, in the kitchen. Crocco's and Lynch's voices are recorded straight to tape; an Alesis Midiverb is added during the mix to both Sifl and Olly, while guest voices always remain dry, with the exception of an SPX90 used as a vocal harmonizer. "The contrast between the lead socks and the other socks is very stark and bizarre on-screen, which is another way to make it funny," Hardin says. "The SPX90 is a funnier harmonizer than an H3000 or the one on the 02R, just because the graininess of the converters is more electronic-sounding, offering a colorful, flavorful, cheesier sound."

Rather than developing sonic layers, more complex sounds are created by stringing instruments through a series of effects—usually cheap ones, like guitar stomp boxes and small guitar amps. The kitchen is a dense amalgamation of instruments and black boxes, all within easy reach. "The whole thing is set up so that I can set up combinations of stuff in about 20 seconds," Hardin says. "If one combination doesn't do it, then I can have another combination up in another 20 seconds. The whole thing is about spontaneity. Having done all those low-budget sessions over the years certainly helps my speed." Hardin also adds sound effects from a Sound Ideas library, using an Ensoniq ASR10, Cubase VST and Pro Tools. Mixing is through the 02R; mastering is through a TC Electronic Finalizer to a Sony timecode DAT.

Video recording is done, appropriately enough, at another "Crescent Fresh" home facility, this one in Los Angeles, where the audio is played back from the timecoded DATs. But post-production on *Sifl 'n' Olly* is as minimal as the show itself. What shows up on screens in prime time is pretty much straight out of the kitchen, with little technological garnish. A million dollars' worth of pro audio equipment would be kind of incongruous with a bunch of singing socks, anyway. ■

—FROM PAGE 101, PAUL ROBB

it forced me to create music in a style that I would not otherwise have been able to do, or not have wanted to do," he explains. "So it extended my horizons in that sense. It also allowed me to accumulate a gigantic library of cues, which I have gone back to reference. It was kind of like scoring kindergarten actually, because I got to see what the music editor or director had put under various scenes, and then I got to do my own take on it. It's pretty fun, too, because the longest cue was about 60 seconds, so I never had to get all finicky and bent out of shape about any particular piece of music—as opposed to the 'music world,' where one song can take you a year to deal with.

"It also taught me how to put music to picture, which I had never done up to that point," he continues. "Not just the mechanics of it, but the, if I dare say, the art of it. Not that *MTV Sports* is exactly the most subtle use of music in the world, but for my style I think it kind of worked out pretty well."

To work up his scoring assignments Robb has assembled a home studio—he calls it the Wreck Room—that blends the old school MIDI gear he started with back in 1987 and some more up-to-date recording devices. For example, in the

midst of a Mackie 32•8 board and two 24•E expanders is a 286 PC that runs his vintage main sequencing program. "I have been in the process of learning a new sequencer because I have been using the same sequencer since 1987 and people are starting to laugh at me," he explains, "even though I get all defensive about it and I point out to them that I can do almost anything they can do and usually in about one-tenth the time."

One thing conspicuously absent from Robb's studio is a hard disk recording system. Sure he has the standard arsenal of rackmount modules, including Yamaha SPX90, Lexicon LXP-1 and just about the entire E-mu Proteus family, but he's got the hardware and not their plug-in counterparts. "A lot of people who do what I do don't do it that way," he explains. "I think it's kind of a function of the fact that I started in this game rather early. As a matter of fact, I'm pre-MIDI. I bought my first synthesizer in 1980. I remember when MIDI first came out. I kind of just ignored it. I didn't understand what it would do, and one of my friends who was more technically adept than me said, 'Well, for one thing it will let you play two sounds from two different keyboards at the same time.' I said, 'Well why would anybody want to do that?' So obviously I learned the error of my ways pretty fast."

Included in his studio are synthesizers such as the Roland MKS-70, two MKS-50s, a MKS-80 and D-50; Yamaha TX-81Z; four Oberheim Matrix 1000s, E-mu Orbit and Morpheus, and a Casio VZ-10M. Sample players include Kurzweil 1000AX+, Roland U-110, Oberheim DPX-1, E-mu Proformance Piano and Proteus (as well as the Proteus 2 and 3), Alesis NanoBass and samplers, including a Casio FZ-10M, two Akai S-1000s and three Akai CD-3000s. He also turns to E-mu Procussion, Roland R-8M, Alesis DM-5, Roland BD-1 and a Roland SPD-11 for drum sounds.

His old-school sequencer is Voyetra, a DOS-based system, although he's recently purchased and is trying to learn how to use Logic Audio. "You know, people are trying to change velocity or things like that with these giant tinkertoy kind of graphical interfaces, using a mouse to bring a ball into a hole or something like that. In the meantime, I have just changed a number from 127 to 80 and it's done."

Because film work brings such a high profile, Robb's biggest gig to date has been *Orgazmo*, a spoof of the porno industry and superhero action mindset by *South Park* creators Matt Stone and Trey Parker. He says he lucked into it. "Of all the strange accidents that have happened in my career that have led me down various odd paths of the industry, the *Orgazmo* story has to be the oddest of all," he explains. He got a call from the old Information Society drummer who had a friend who had lunch with a friend who had just gotten a deal with Fox television to develop a pilot. When the friend mentioned he knew the old drummer of Information Society, the budding Hollywood star flipped, and the phone rang at the Robb residence. "My friend Ed called me and said, 'You know a friend of a friend of a friend wants you to do music for a pilot for Fox,'" Robb says. "I was just sitting there thinking, 'Yes, yes, yeah. I'm sure. How many times does this kind of thing happen? Trent Reznor wants me to do a remix; I heard it on the Net.'"

The first round of pilots was bumped by Fox, but sometime during the winter of 1995 they sent him another pilot they had done. It was a little animated short titled "The Spirit of Christmas," which became one of the biggest sensations in Hollywood that year. The success of that short, of course, and the following series enabled Parker and Stone to line up financing for *Orgazmo*, and they wanted Robb to do the score.

"It turns out when Trey Parker wrote the script, he was writing in the music cues as he went, and all his music cues said something like, 'This place would be good for a song by Information Society,' or 'put Information Society here.'"

So spotting the film was a relatively easy process. But when Robb got back to his studio (which was then in Minneapolis), it was an entirely different matter. "I was completely flying by the seat of my pants," he remembers. "At that point, I had never scored a feature film, and most of the other people they were hiring were actual film industry people. Those people don't want to take the time to tell you how to score a film if you have just been hired to score a film. So I was in a situation where I would not dare ask anybody or say, 'Excuse me, by the way, I don't have any idea what I am doing.'"

He worked it out the old-fashioned way of just doing it until he was told it was wrong and then changing everything. In hindsight, he thinks that getting the equipment together was much easier than figuring out how to write the cues. "It was challenging because there wasn't all that much room for my own personal style of music, and a good percentage of the cues were tongue-in-cheek. In other words, the music was supposed to conform to an action music cliché or a porno music cliché, so that was very challenging for me to come up with something that was good but kind of bad," he explains. "The yardstick of whether it worked or not was: Is it kind of embarrassing? It was a difficult line to negotiate between, 'Okay, this one is supposed to be kind of cheesy, but this one is real.' That was a little training course in the psychology of movie-making."

Now that he has the experience of pop music stardom, advertising spot success and feature film exposure, Robb has had a chance to see where he feels most comfortable. Ultimately, he explains, he'd like to be known as a songwriter. "When I do soundtracks, a lot of times they are undeveloped parts of songs," he says. "I'm never going to be your Danny Elfman or your John Williams that can sort of knock off symphonies or faux-symphonies. To tell you the truth, I'm not so sure that style has that long to live anyway. I'd like to bring a kind of electronic mindset and more post-modern mindset to film scoring, one that doesn't rely on pseudo-romantic orchestra music." ■

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

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JBL LSR 28P AND LSR 12P

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Look back 20 years and you'll find that one name ruled supreme in the field of studio monitors: The JBL 4311 was king, and every studio had a pair. In the years that followed, JBL continued to introduce innovations in studio speakers—most notably the Bi-Radial horn—but as JBL's focus shifted to developing touring and P.A. systems (such as the Eon and HLA Series), the company began losing market share in studio monitors to a host of competitive compact systems designed for near-field listening applications. Now with its LSR series, JBL is poised to regain the

throne with a superb series of studio monitors designed for stereo or 5.1 applications.

The newest entries in the LSR (Linear Spatial Reference) line are the $999 LSR 28P two-way monitor and the $1,099 LSR 12P subwoofer. Both are powered systems with onboard Class A-B amplification: 260 watts driving the LSR 12P, and a bi-amped 200+70 watts pushing the 8-inch woofer and 1-inch dome tweeter in the LSR 28P. The system is equally at home in a 5.1 (LCRSS+sub), LCRS, left/right stereo or left/right stereo+sub(s) environment.

BY GEORGE PETERSEN

DYNAMIC BRAKING

The Lab Analysis sidebar has more details about the drivers, amps, active crossovers, system design and specs, but there are a few points worth emphasizing. For one, all of the drivers in the LSR Series are designed from the ground up for these monitors—there are no "off the shelf" drivers used, and all components in the LSR line are specifically intended for monitoring applications. The LSR 28P's front panel features an Elliptical Oblate Spheroidal (EOS) tweeter waveguide that shapes the HF dispersion into a wide, smooth 120°x60° (HxV) pattern. The woofers in the full-range cabinets and sub are based on JBL's Differential

Lab Analysis: JBL LSR 28P Powered Monitors

by Robert Baum and John Schaffer

PHYSICAL CHARACTERISTICS

The LSR 28P cabinet is a rear-ported, bass reflex design. The baffle is a massive 1⅛-inch-thick composite consisting of a woven carbon fiber front skin, foam core and a Fiberglas rear skin. The remaining five sides are black painted MDF. Both the woofer and tweeter are recessed, and all mounting bolts are mated to T-nuts. The rear port is oval in cross-section, and both ends are flared. Inside, the cabinet is stuffed with real Fiberglas.

The 8-inch woofer is a ceramic version of the Differential Drive. The drivers in this series incorporate two voice coils on a single bobbin—not coils wound on top of each other, as on some automotive subwoofers, but two voice coils (actually three—there is a shorted winding centered between the two active coils) separated by a length of bobbin.

Two coils require two magnetic gaps. Imagine a typical loudspeaker motor cross-section. If you cut a ring into the back plate that was the exact size of the top magnetic gap, you would have two identical gaps. The trick is to keep everything concentric and centered. The LSR 28P's cast alloy motor case does just that and has heat sink fins on the back side to assist in cooling the coil. The basket is cast alloy, and a sculpted cast alloy trim ring sits on top of the basket rim to reduce diffractions. The cone is a slight curvilinear composite of polypropylene-graphite terminated by a half-roll rubber surround on the outside and a 1.5-inch voice coil. The 5-inch diameter spider is flat, and terminations on this unique driver are 0.205- and 0.250-inch male tabs.

The tweeter is a 1-inch hard dome loaded by a cast alloy EOS (Elliptical Oblate Spheroidal) wave guide—in layman's terms, an oval-shaped faceplate with wider dispersion in the horizontal plane. JBL states that the dome is a titanium composite; it appears to be a formed titanium foil with a dampening, stiffening, grainy black coating on the front side. The diaphragm assembly looks like a scaled-down version of the company's compression drivers. The dome and diamond rhombic patterned surround is one continuous piece. A round wire coil is wound on a Nomex former. This diaphragm assembly is mounted onto a butterfly, which also serves as a heat sink; this butterfly is then mounted onto the backside of the faceplate/wave guide. The pole piece is slightly extended above the surface of the top plate. It is also quasi-vented; there is a through-hole in the pole piece, but it's sealed off by a decal on the back plate, creating a chamber that is damped with foam. Oddly enough, the

—CONTINUED ON PAGE 121

Secrets of the DAW Masters

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(Brian Foraker, *Heart, Yes, Kiss*).

Plug-Ins For Audio Production

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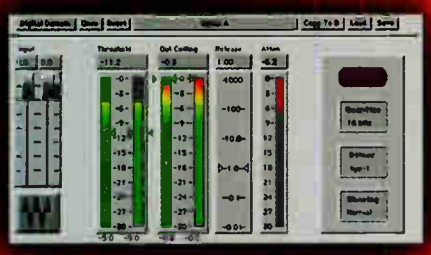
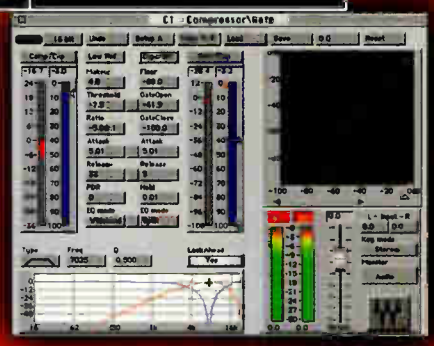
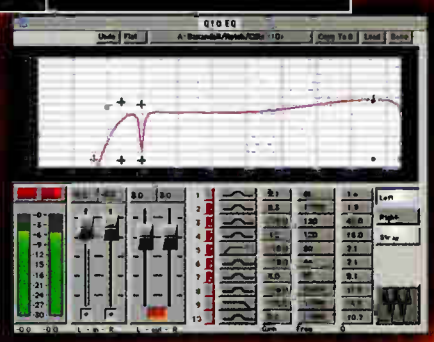


C1 UNPARALLELED PARAMETRIC COMPANDER



True Verb DEDICATED ROOM / SPACE EMULATOR

Q10 SURGICAL EQUALISATION



All processors shown are in the TDM Bundle (+2 more), the Native Power Pack (+1 more), and the Gold Bundle (+7 more). Check our web page for demos and details on 23 supported Mac & PC platforms.

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From the standpoint of connectivity, the LSR 28Ps can handle just about anything. The balanced inputs are Neutrik Combo ¼-inch TRS/XLR, with +4 dBu at the XLR and -10 dBv at the TRS; the TRS jack also accepts an unbalanced input with no problem. A recessed pot for continuously variable attenuation (up to -12 dB of cut) is provided. The pot has no detents or click stops (and I hate these on monitors, as they make exact level matching between monitors impossible without using test gear). An 8-switch DIP next to the pot provided all the flexibility I needed. The first switch defeated the rotary pot (whoopee!), while the next two (marked -4 and -8 dB) provide a choice of -4, -8 or -12 dB of attenuation. Other DIP switches allow LF tailoring at 150 Hz for bass alignment (0 dB at 24 dB/octave, or 0 dB/-2 dB/+2 dB at 36 dB/octave). These allow the user to compensate for minor room anomalies and nearby reflective boundaries, such as walls, corners, etc. In a semi-free-field environment (on stands behind the console) the LSR 28Ps sounded fine with the DIP switches in the "flat" no-roll-off position.

Other DIP switches are provided for cutting or boosting the HF output by ±2 dB. Again, I preferred the monitors in the flat position, but if you work in an extremely reflective or absorptive environment, these cut/boost switches would be useful. I liked the fact that they tailor in gentle ±2dB steps (on other monitors, the ±3dB steps often seem too much) and operate as smooth, wide-shelving filters beginning at 1.8 kHz.

The LSR 12P subwoofer has a similar input gain adjustment system to the LSR 28P's and offers XLR connections for the left/center/right LSR 28Ps. This configuration offers numerous possibilities and allows the user to set up full-range LCR front speakers or bandpassed fronts with the subwoofer providing the dividing network. The subwoofer may also be driven directly via a +4 "sub direct" XLR input. A clever ¼-inch footswitch jack allows the user to disable the sub for monitoring check purposes or to switch the system between modes: from stereo say, to Dolby Pro Logic playback. The subwoofer also has -2/-4dB DIP switch attenuators that can be used separately or together to modify bass response to meet room needs.

Despite its small (16x13x12.75-inch) dimensions, the LSR 28P weighs in at a hefty 50 pounds, so watch your meter bridge if you plan console-top mounting. A safer alternative is JBL's optional SS2-BK monitor stands, which are adjustable from 44 to 79 inches and have a 110-pound capacity.

NATURAL REPRODUCTION

I began testing the system by listening to stereo mixes of favorite CDs (mixed by myself and others) on a simple setup using two LSR 28Ps in a near-field position, about five feet apart, in an equilateral triangle arrangement without the sub. I was immediately struck by the natural character of the reproduction—there was no edginess at either frequency extreme, and the 1.7kHz crossover region was smooth as glass. Unlike many other monitors I have used over the years, the LSR 28Ps do not require

any adjustment, period—you simply need to plug these in and go.

Next I added the sub, and the transition from the LSR 28Ps to the sub was natural as well—no boominess, and the bass was well-damped and solid without sounding artificial or overblown. I should add, however, that the LSR 28P's bass response on their own is respectable, only rolling off below 50 to 60 Hz, so anyone who is looking for a powered two-speaker system would be right on track starting off with two LSR 28Ps and then adding a sub or extra channels as needs (or funds) expand.

To check out long-term power handling, I fed the system from a gnarly rock CD, turned the volume up full and left it on with the looped CD playing for three hours. I later returned and found, to my surprise, that not only was the system still functional, the amp heat sinks on the back of the speakers were only slightly warm! A quick measurement confirmed that the speakers are indeed capable of a REAL 108+dB SPL long-term reproduction, although you'll have to supply your own ear protection. The system provides tons of headroom, and there was no compression or dynamic shifting when it was pushed.

When I set up the system in surround mode, a few things became clear: The imaging was rock-solid and was reminiscent of that reach-out-and-touch realism of a system like the UREI 809s. However, the LSR 28Ps sounded very natural and uncolored, even off-axis, creating an almost seamless surround mix environment. With the L/R front speakers set up 60° apart, the center on-axis and the two surrounds set back 110° from center, I really felt in control of my panning moves, and playbacks were handled with pinpoint accuracy.

If you think I seem enthusiastic about the LSR 28P/LSR 12P system, you're right. Here's a combination of power, accuracy, imaging and natural reproduction that I've never heard from a JBL monitoring system, and at a retail of $999 each ($1,099 for the sub) this package is equally affordable to the project room or large studio. So, ask yourself: Have you driven a JBL lately?

JBL Professional, 8500 Balboa Blvd., Northridge, CA 19329; 818/894-8850; fax 818/830-7802. Web site: www.jblpro.com. ■

George Petersen is the editor of Mix.

—FROM PAGE 116, LAB ANALYSIS: JBL LSR 28P POWERED MONITORS

foam expands outward toward the diaphragm, applying a continuous force to the back side of the diaphragm.

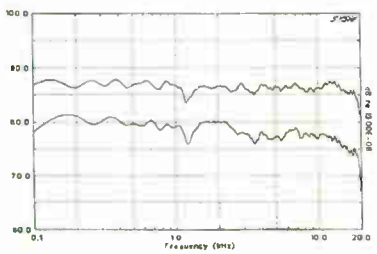
The self-powered bi-amplified design delivers more than 200 watts to the woofer and 70 watts to the tweeter. The amplifier features a toroidal transformer, double-sided PCB with plated through-holes and a heat sink that occupies more than half of the rear baffle. The Neutrik Combo input accepts both XLR and ¼-inch connectors. Next to the input are a series of DIP switches that allow the user to attenuate the input, bass alignment and high-frequency level. All of our measurements were made with the controls defeated or in the "flat" position.

ACOUSTICAL CHARACTERISTICS

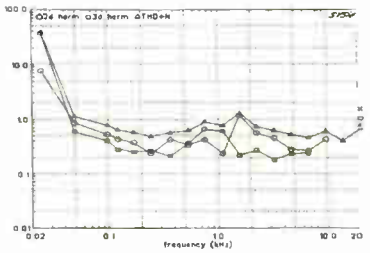
The JBL LSR 28P is a true reference monitor. The acoustical characteristics of this powered monitor are nothing less than astonishing, and this speaker exhibits the best frequency response of any monitor we have tested. Over its entire bandwidth, the LSR 28P is flat to within ±1.5 dB. Only after 18 kHz does the on-axis response begin to fade. Off-axis response is tightly controlled, and after 2.5 kHz it only drops -3 dB out to 18 kHz, and that roll-off is exceptionally smooth. Time response is classic. If you were to draw the perfect transient, it would look a lot like the LSR 28P's. After proportioned initial impact spikes, the overshoot resembles textbook decay—after that there is nothing, revealing that the alignment of the two drivers is perfect.

The LSR 28P's distortion measurements are also very good. Only for one data point right around the edge hole frequency of the woofer, where the surround (edge) and the cone are operating out of phase, does the THD go beyond 1%. For the rest of the audio spectrum, the THD is maintained at around 0.5%. The self-noise ("spectral contamination") of this monitor is very low. When noise is more than -50 dB down from the input signal, the figures are considered pretty good. At some points, the LSR 28P's noise floor approaches -60 dB down. ■

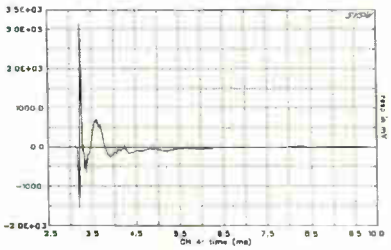
John Schaffer and Rob Baum are test engineers with Menlo Scientific, an independent acoustic lab based in Berkeley, Calif. For more on testing methodology, refer to the Feb. '98 issue of Mix, *or visit www.mixonline.com.*



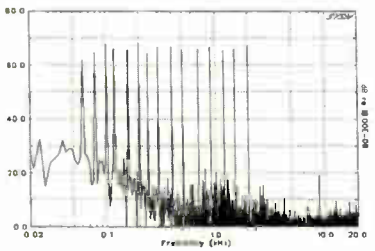
On- and off-axis frequency response: On-axis response (top trace) is flat within 1.5 dB to 18 kHz. Off-axis response (bottom) is also exceptionally flat.



THD averages about 0.5%, except slightly above 1 kHz, where it reaches 1%. The Δ trace indicates THD+N; the ○ trace shows second hormonic distortion; the □ trace is third-order distortion.



Impulse response: The LSR 28 exhibits ideal impact and decay response characteristics.



Spectral contamination is very low; the noise floor reaches -60 dB.

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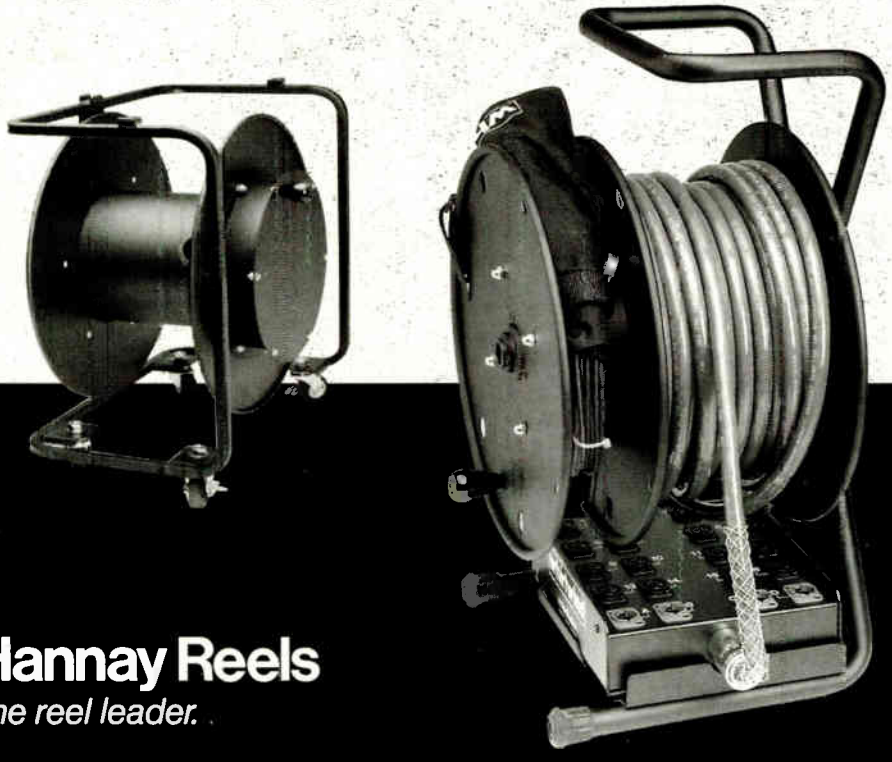

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CIRCLE #084 ON PRODUCT INFO CARD

DOLBY DP569 AND DP562

MULTICHANNEL DOLBY DIGITAL ENCODER/DECODER

While an increasing number of studios are gearing up for surround production, listening to the six discrete 5.1 tracks is definitely not the same as hearing the product as it sounds after passing through the encode/decode chain. Up until now, many producers skipped this vital step, due to the cost of hardware. And although the price of a Dolby Digital reference encoder has dropped from $50,000 to $30,000 to $19,600 over the years, it was still on the pricey side for studios that needed an encoder only occasionally. Now, with its DP569, Dolby has brought the cost of a professional reference encoder down to an affordable $5,000, while offering more features than did the product's predecessor and fitting the unit into a single-rackspace chassis. The DP562, a companion reference decoder, is $3,600.

Since its debut in 1992 with the film *Batman Returns*, Dolby Digital (AC-3) has been used on hundreds of films. AC-3 provides six channels of surround sound information in the 5.1 format, using the psychoacoustic phenomenon known as auditory masking and both inter- and intra-channel redundancy for the efficient storage and transmission of digital audio.

But beyond its application in feature film presentation, Dolby Digital has been used on laserdiscs, and it is the audio format for DVD-Video, SCTE digital cable TV and the audio standard for ATSC digital broadcast TV. Dolby Digital also allows tailoring the number of channels and bit rates for various applications, such as 5.1 (at 384 to 448 kbps) for consumer surround or two channels (at 192 kbps) for stereo programming. More than 7 million consumer products equipped to decode programs with Dolby Digital audio are already in use, from DVD players to set-top boxes.

The DP569 supports encoded bit rates from 56 to 640 kbps and channel configurations from mono to 5.1-channel surround sound. LTC and VITC timecode inputs allow automatic configuration changes in a broadcasting environment. Disc authoring facilities can also use timecode to encode separate program segments accurately and create single encoded soundtrack files; serial control via an RS-232 port is also available for customized automation applications.

Designed to complement the DP569, the Dolby DP562 decoder provides state-of-the-art AC-3 decoding for reference monitoring of 5.1 Dolby Digital tracks as well as 4-channel Dolby Pro Logic decoding. The DP562 also has a mode for monitoring "downmixed" signals, where a 5.1 Dolby Digital input is automatically mixed down to a 2-channel (Lt-Rt) Dolby Surround signal and then is processed through the unit's built-in Pro Logic decoder. This allows engineers to hear what end-users would experience if they listened to a 5.1 transmission or source received through a 2-channel decoder and a Pro Logic decoder-equipped playback system. Other DP562 modes offer the ability to listen to multichannel material in multichannel, stereo or mono systems, LCR systems without surrounds, or surround systems that lack a center channel.

The DP569 has a single AES digital output, three pairs of AES digital inputs (for channels 1/2, 3/4 and 5/6) and another AES input for use as a clock reference or for multiplexed AES bitstreams containing multiple Dolby Digital signals. Previously encoded Dolby Digital audio bitstreams pass through unchanged—and automatically, if the DP569's bitstream detection feature is activated. Matrix encoding on Dolby Surround input signals is also unaffected. The DP562 decoder has one AES digital input that accepts either PCM or AES audio in IEC 1937 format; outputs are three male XLRs carrying the 5.1 signals as three stereo pairs. A headphone output and balanced analog outputs (routed through onboard 20-bit DACs) on XLRs are also standard on the DP562.

The front panels on both units have channel activity LEDs and alphanumeric LCDs showing status parameters. Front and rear panel serial interfaces, along with application software, make it possible to configure and control the DP569 from Windows 95/NT-equipped PCs or other remote devices. The DP569 includes a record utility that acts as a data packer, stripping out any redundant extra zeros from the AES3 output, and putting the data into the ".AC3" format for multimedia applications.

For more information, contact Dolby or check out the company's Web site, which has extensive information about Dolby Digital, AC-3 coding and other aspects of surround sound.

Dolby Laboratories, 100 Potrero Ave., San Francisco, CA 94103; 415/558-0200; fax 415/863-1373. Web site: www.dolby.com. ■

BY GEORGE PETERSEN

MARTINSOUND MULTIMAX

MULTIFORMAT MONITOR CONTROLLER

Without the facility to monitor six or more channels clearly and transparently with one gain control, mixing for surround sound on your favorite console can become a major chore. Whether your choice of console is a vintage Neve, API, Trident, or even an 02R with "surround capabilities," Martinsound's new MultiMAX Multiformat Monitor Control System offers an excellent solution to the problem of multichannel monitor control.

MultiMAX offers the capability to monitor in 7.1, 5.1 and LCRS multichannel formats, as well as stereo and mono. An LCD readout in the center of the rackmount unit's front panel provides an easy-to-read window that shows the current monitor configuration and monitor level. The Level/Select knob controls both the level and movement throughout the setup directory and the setup menus. All the internal parameters can be adjusted by using the Level/Select knob in conjunction with the Setup and Exit switches located next to the LCD.

The front panel is easily readable and pretty much self-explanatory, even for someone with limited knowledge of film mixing. MultiMAX can be used to monitor a set of main speakers (Main Front Monitor switch) or easily switched to a set of alternate speakers (Alt Front Monitor switch). This is a tremendous help for engineers like me who carry their own speakers from one studio to another. The listener may select from two surround systems, such as directional or diffuse surround speakers (Alt Ls Rs switch), and can select stereo near-field (Near-field switch) and small mono TV speaker systems (Mono switch). All switches are conveniently positioned on the front panel.

However, in order to understand the front panel, the non-film mixer needs to understand a couple of things. When an encoder/decoder process such as Dolby Digital or DTS is in use, the processor output should be inserted in the monitor chain via the Wide Return input. A front panel switch marked Wide In will then select the discrete mix being monitored, and Wide Return will select the processed signal. This function is very useful when mixing through a processor in the studio, rather than in an audio post room, many of which are equipped for monitoring the effects of a processing device. (It is worth noting that many of the "surround ready" mixers now available do not provide for A/B comparisons between discrete and processed mixes.)

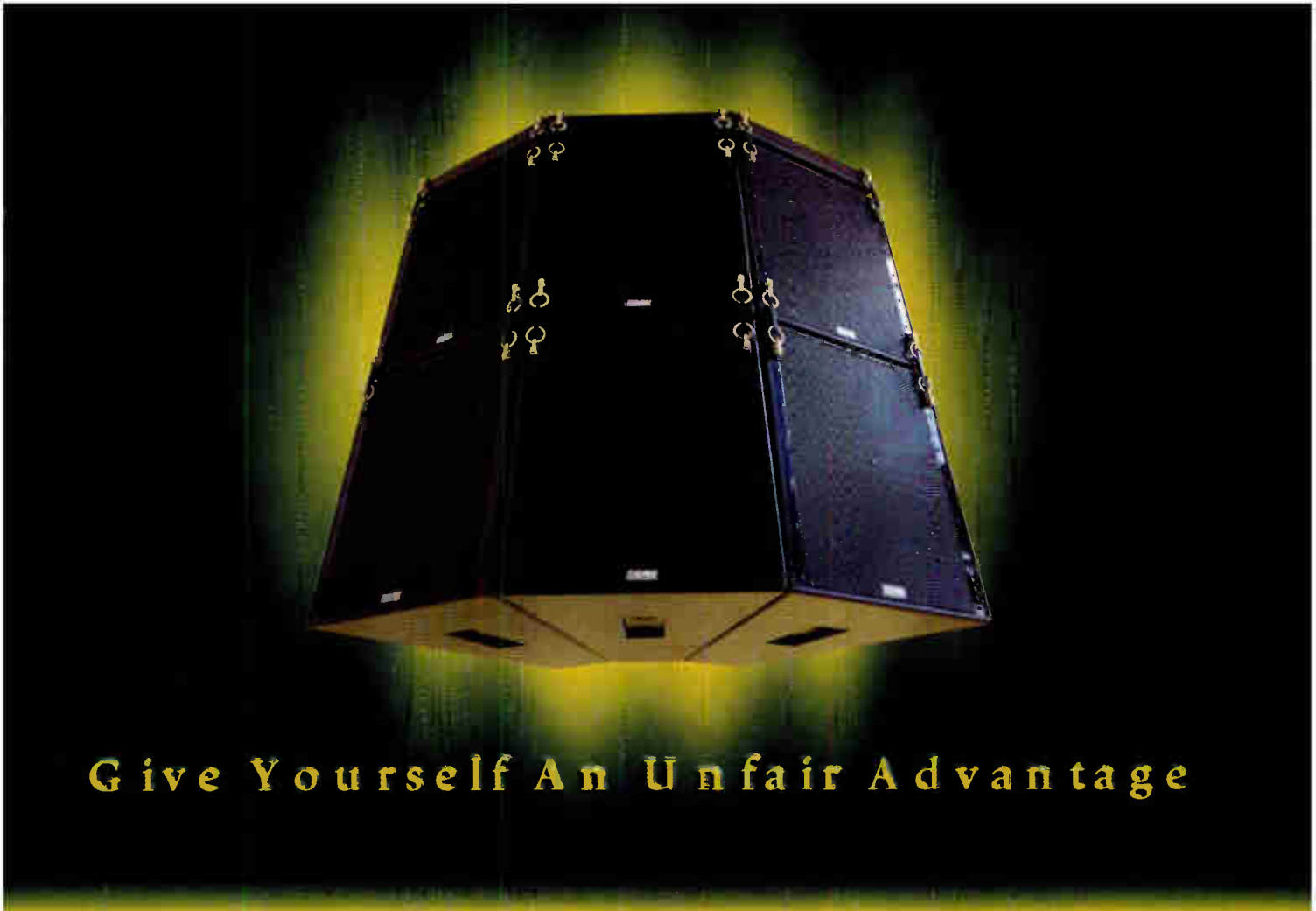
Film mixers will appreciate that the MultiMAX's Wide In selector can accommodate inputs from up to eight console buses, the recorder playback outputs and three premixed (stem) playback machines all up to eight channels wide, plus "monitor only" inputs from a mono production track and the monitor outs of the console. As a result, you can monitor a stereo mix with ease when not doing surround. I believe that Martinsound has covered all the potential bases in this area, though I didn't have to use many of the system's extensive features when mixing in standard 5.1.

BY JOHN JASZCZ

SIMPLE SETUP

The task of creating a 5.1 mix from material that I had previously mixed in stereo on an old Trident 80B, while at the same time creating some new 5.1 material from scratch, gave me the opportunity to put the MultiMAX through its paces. The physical setup was simple in principle, since all MultiMAX connections are via D-sub connectors. Of course, you will have to create or buy the necessary interfaces between D-sub and patchbay. But, all in all, the connections were simple and obvious, and I had no need to open the manual.

For me, the hardest task at the beginning of a 5.1 mix session in a new room is positioning the speakers. Once the demanding task of correct placement is complete, I usually find that running pink noise through the system is the next greatest obstacle. Not so with the MultiMAX! Once you have picked the format you are mixing to (5.1, 7.1 or LCRS), you simply open the Trim/Noise pages via the front panel LED and Level/Select knob and set up pink noise for each speaker. Further, as soon as the Trim/Noise page is selected, the dim and cut switches automatically come on—a welcome feature for the ears. The pink noise generator is similar to the one in the Dolby CAT 85C card, which makes for a widely understood setup standard. The Noise page even provides a filtered noise signal for correctly setting the LFE (low-frequency EFX) subwoofer level. MultiMAX also in-



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cludes a meter connector, which allows you to add dedicated meters of your own choice. The meters will automatically follow the source being monitored.

My experience with the MultiMAX was limited to a discrete 5.1 mix. I was already familiar with the sound of the console I was working on, and the first thing that I perceived was the fact that there was no noticeable degradation of the signal through the MultiMAX. The sound was clean, transparent and quiet. The manual states that the Dim and Master level controls use digitally controlled attenuators instead of VCAs, and I must suppose that these contribute to its unobstructed clarity.

MultiMAX includes a Bass Management feature that redirects bass signals from the main speakers into the LFE subwoofer in order to convey a realistic representation of the full-bandwidth mix. The Bass Management feature also allows you to redirect the LFE signal into the mains system, which is particularly useful if you have full-range speakers but no sub. This is one feature that I didn't use but should have; during mastering it became evident that this bass management system would have been extremely helpful in maintaining a controllable low-end curve when not using full-range speakers. As I found out, if you are mixing to 5.1 without a subwoofer it can be next to impossible to get the correct bass response unless you are using full-range speakers. Live and learn!

MultiMAX also provides a Downmix function for collapsing a surround mix to stereo. The setup menu allows the user to determine the levels of the center and surround channels to be "folded back" to the stereo mix. Although it was not the ideal stereo mix, with a limited amount of rebalancing, I was able to use this Downmix for a stereo mix comparable to my 5.1 mix. I say comparable because if I were mixing in stereo, I might take it to another place altogether; however, the Downmix did have the same overall feel as the surround mix.

Isolating a speaker or a combination of speakers was easy and convenient; the front panel offers both solo mode and on/off switches for the individual speakers. MultiMAX may also be connected to a console's Solo In Place and Dim controls through the console's logic outputs. A remote control unit is being manufactured at the time of this writing; I was told that it will connect through a serial communications port and access all of the MultiMAX's available parameters. Martinsound's brochure also states that computer control and other functions will be added in the future.

The design team that came up with this box should certainly be congratulated for including just about every detail imaginable to make any existing desk usable as a multichannel post-production console. For the price of $2,795, not including remote, the MultiMAX delivers an abundance of features in a small space and offers exceptional ease of use and sonic clarity.

Martinsound, 1151 W. Valley Blvd., Alhambra, CA 91803; 626/281-3555; fax 626/284-3092. Web site: www.martinsound.com.

(The author would like to thank Omni Sound and Steve Tveit, Gear For Days, Underground Sound, Mastervision, Greg Jampol and Tom Clark for their support; and Grant Greene, Mark Baldwin, Scott Heyniger and Mike Nowak for their creativity.) ■

John Jaszcz (pronounced "Yosh") is a freelance mix engineer based in Nashville.

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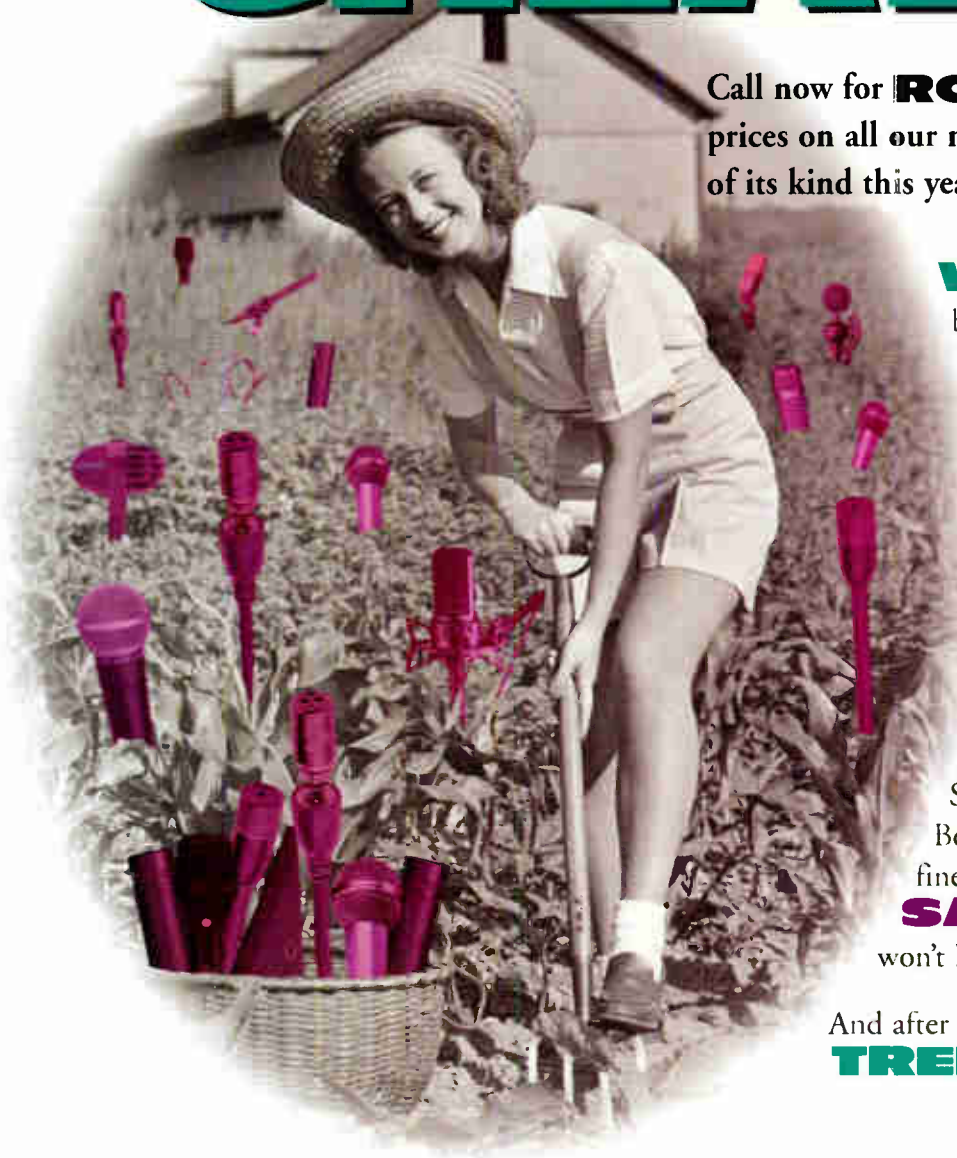

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CIRCLE #087 ON PRODUCT INFO CARD

CEDAR X SERIES

DIGITAL AUDIO RESTORATION MODULES

CEDAR (Computer Enhanced Digital Audio Restoration) Audio Ltd. was founded over a decade ago to create and market PC-based systems for cleaning up sound stored on tape, vinyl and film. Since then, the UK-based company has diversified and now offers standalone rackmount units for audio restoration, as well as plug-ins for SADiE and Digidesign's (NuBus) Pro Tools workstations. CEDAR for Windows is the third generation of the company's software-based systems.

CEDAR systems have been used to restore thousands of vintage

recordings, and users have garnered numerous awards along the way. Five years ago, *Mix* tested CEDAR's flagship DC-1 Declicker and CR-1 Decrackler, which provided excellent performance, although at prices of $13,795 and $16,500, respectively. When CEDAR introduced its X Series—which retails for less than half the cost of the previous systems—we were anxious to put the new boxes to the test.

The X Series consists of the DCX Declicker ($5,995), the CRX Decrackler ($6,495) and the DHX Dehisser ($6,895). All are single-rackspace units and can be used separately or may be daisy-chained. Each unit incorporates a 40-bit, 50MFlops floating-point processor, and, unlike other CEDAR hardware, all of the X Series units operate in the digital domain only (no internal A/D or D/A converters). All three are equipped with both S/PDIF (coaxial) and AES/EBU digital I/O, and provide 24-bit I/O resolution at any sample rate from 30 to 50 kHz. The obvious advantage of eliminating A/D and D/A circuitry is reduced cost, but it also reflects a reality of the audio restoration marketplace: More often than not, material to be worked on is first archived to some digital media before restoration begins. This is especially true in cases of deteriorating tapes, discs or cylinders where there may only be one or two plays left on the original media. Obviously, extra converters become a redundant expense when two units are daisy-chained, which is a typical setup. Users who need A/D and D/A converters may pick and choose from the vast selection of third-party converters on the market or simply rely on existing converters in their DATs, consoles or other signal processing. To further reduce cost without compromising quality, the X Series products have no provision for MIDI, SMPTE or RS-422 control; my guess is that most users don't need these anyway.

SIMPLE OPERATION

The DCX Declicker removes up to 2,500 clicks/scratches per second. A signal modeling algorithm analyzes the input signal over several milliseconds and uses that information to replace each click with an interpolation based on that resonant model. Operation is simple: Apply an input signal and then adjust the unit's sensitivity control to determine the amplitude of the clicks to be removed. Too much DCX processing can distort the signal, but the unit's simple interface makes it easy to establish the optimum processing level.

The CRX Decrackler removes artifacts such as vinyl/shellac surface noise and high-density, small-amplitude noise such as mild distortion and buzz. The CRX takes the input signal and splits it into two components: One is essentially a clean, desirable signal, while the other half has both the degraded signal and the residual part of the clean signal. Once an interpolator circuit removes the noise from the second half, the two parts are recombined, free of the crackle. Designed to be used after the DCX Declicker, the CRX uses a two-knob interface that is fast and intuitive.

The DHX Dehisser is designed to reduce broadband noise, such as tape hiss. Due to the pervasive nature of these artifacts, the processing is more complex than click or crackle removal. The DHX tracks variations in the noise content by examining the noise fingerprint every 1,024 samples. This avoids compressing incoming transients, while distinguishing between actual noise and other components of the signal, such as reverb. To use the DHX, merely tweak the level, attenuation and variance knobs until the desired effect is reached.

X Series processing happens almost instantaneously, in near-real time. In the case of the DCX and CRX, the delay is slightly over a frame (38-49 ms); the DHX typically has a processing delay around 180 ms—still less than ¼ of a second. The X Series units do not have any ability to store presets or parameters (back to that minimum price/maximum power philosophy) but non-programmability is hardly an issue with the X Series' minimal-knob interface.

SURFACE NOISE PROBLEMS

I began by testing the X Series with some difficult material—a number of fairly trashed pre-1925 acoustic 78s with ample surface noise prob-

BY GEORGE PETERSEN

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lems. One of the discs also exhibited damage along its outer grooves on one edge, a result of fungus once having digested the vegetable material in the disc itself. After cleaning the discs, I played them back through an Esoteric Audio Ramses 78 player (using its 71.29, 76.59, 78.26 and 80 rpm pitch-correction presets) routed through a custom phono preamp (essentially a stock outboard phono preamp but equipped with a switch for bypassing the RIAA equalization circuit), and I stored the recordings on a 20-bit Alesis M20 deck with the AES/EBU I/O option. Because of their condition, these tracks were a challenge, to say the least. Tape hiss wasn't a problem here, though, so the DHX wasn't needed on this project. I just daisy-chained the DCX and CRX to the M20 and monitored through a Stax D/A converter and Meyer HD-1 speakers.

In less than a minute, I had the controls adjusted for optimum quality. The effect was dramatic. It didn't exactly sound like a pristine 24-bit/96kHz recording, but it sparkled and jumped back to life, with more than 85% of the noise artifacts removed. Any remaining deficiencies could have been touched up with some gentle mastering EQ and/or some wave-tweaking on a workstation system—however, the CEDAR units were working in (near) real time (certainly much faster than loading tracks into a DAW), and it was gratifying to hear the results almost immediately.

On the next track, where the original disc was in better condition, the effects of over-processing were apparent. However, once I'd backed off the controls a bit, the results were equally amazing. The lesson here is that the X Series processing is not a "set and forget" procedure—for best results, each recording has to be tweaked individually. On one disc where most of the grooves were nearly gone, no amount of processing could save it.

I then transferred some mid-'70s LPs. Their condition wasn't bad, but they had been pressed on inferior vinyl and had many clicks and pops. Here, the difference between the original disc and the CEDAR version was night and day—the DCX Declicker really shined, removing nearly 100% of the pops without leaving any audible artifacts.

Next up, I used the DHX Dehisser to restore the sound from a vintage (early '70s) ½-inch black-and-white reel-to-reel videotape. The tape hiss was hideous, which made it nearly impossible to pull up the dialog, especially in sections where the levels were low. I had previously nearly given up on this project, as conventional methods—gating, EQ and my vintage Burwen noise-reduction unit—couldn't handle the job. But the DHX removed nearly all of the hiss and made the track more intelligible without destroying the character of the original track or dulling the sound. On music tracks played from an analog cassette, the results were equally impressive, though in this case the original recording was of higher quality. The DHX maintained a constant phase relationship between the tracks and kept the soundstage intact. Nice!

CEDAR's X Series provides a remarkable set of tools for audio restoration in a compact package that is easy to use and flexible enough to handle a variety of audio problems. Retailing from $5,995 to $6,895, these are not inexpensive, but at less than half the cost of its predecessors, the X Series makes CEDAR-quality processing available to a wider market of audio producers and facilities.

CEDAR Audio USA, distributed by Independent Audio, 43 Deerfield Road, Portland, ME 04101; 207/828-0024; fax 207/773-2422. Web site: www.cedar-audio.com/cedar-audio. ■

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SINCE ITS INTRODUCTION, the AD-8000 has rapidly become an industry standard for high-quality A/D and D/A conversion. Owners and reviewers alike agree: the Apogee AD-8000 delivers a uniquely flexible, versatile conversion solution for any facility. And it's an Apogee — it sounds great! Quite simply, it's the heart of digital audio.

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PURPLE AUDIO MC76

MONO PEAK LIMITING AMPLIFIER

The popularity of vintage audio gear has driven up prices and made desirable models hard to find. Some manufacturers are already emulating older equipment designs or duplicating the vintage products of now-defunct companies, and we can expect to see more retro packages in the future. Based on—but not identical to—the popular UREI 1176, the MC76 by Purple Audio Inc. is a monaural FET peak-limiting amplifier. Priced at $1,800, the MC76 features an improved circuit design that has eliminated the need to duplicate some original components.

THE BASICS

The MC76 front panel is simple and features the familiar illuminated VU meter flanked by eight push-button switches, four on each side. Four buttons are for compression ratio (4:1, 8:1, 12:1 and 20:1), three buttons are for meter functions, and one is for power. Two large knobs control input and output levels, and two small knobs modify attack and release times. Attack times range from 20 µsec to 800 µsec, while release times range from 1.1 seconds to 50 msec. Turning the attack knob fully counterclockwise turns the limiting action off. The knobs are all continuously adjustable, but the attack time knob has a different, almost "micro-stepped" feel.

Between the input and output controls a small hole allows for screwdriver calibration of the gain reduction "0." There are two XLR connectors—one for input, one for output—all pin 2 hot. Two ¼-inch jacks provide for linking of two or more units. An IEC power inlet also contains a fuse holder and a line filter.

A look within reveals many of the favored components of a familiar vintage compressor, with a rearranged circuit board. The Roman numerals "MC" denote the number 1,100, but, according to John Klett of Purple Audio, the letters actually stand for "Mono Compressor." Klett points out that the input attenuator in the MC76 is the same Allen & Bradley component used by UREI in the original 1176. The UTC input transformer is also the same as the original, as are many other parts. Purple Audio has "improved upon the original circuit design by cleaning up the amplifier circuit, biasing things a little bit differently," according to Klett, and by choosing alternate parts based on greater availability and better consistency. At the output is a Class A amplifier and a custom-made transformer. The specifications claim a frequency response of 15 to 80k Hz, ±1 dB. The manual is readily understandable and respects all levels of users, from its definition of compression to its detailed instructions for calibration and maintenance.

BY DAVID OGILVY

LISTENING TESTS

Before taking the MC76s into the studio, I tried them out on some jazz CDs. Of course, these CDs had already had their dynamic range set at a comfortable level during mixing and mastering, so it follows that any additional limiting might sound unnatural. With that in mind, I put on an alternate take of Charles Mingus' "New Now Know How" and listened to one channel without the units in link mode. With the limiting function turned off, the gain alone added a beautiful warmth. It beefed up the track in a thickening, yet clean, sort of way, and what little addition of harmonic content it imparted seemed to be the perfect selection of harmonics. As with most good compressors, it's very hard to hear the compression with gain reduction under 3 dB. This was the case when I set the ratio at 8:1, the attack fast, and the release medium/fast. For most of the song, the gain reduction stayed around 3 dB, but when the trombone solo came in, the GR went up to 9 or 10 dB, and it didn't sound bad—slightly squashed, yes, but not stepped-on; strangely, the rest of the band didn't sound stepped-on either. At 4:1, the effect was very pleasing and smoothing, with the threshold set so limiting only occurred at loud kick drum hits, solos and the head. The trombone solo was reduced only by about 6 dB and sounded more even in the mix, with less effect on the other instruments.

I also tried that old 1176 trick of pushing several buttons at once, combining 8:1 with 12:1 on the Mingus tune. The meter behaved very erratically, sticking mostly to the far right (approximately +3 dB), whipping down 2 to 15 dB at some unpredictable moments and some very pre-

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dictable moments, such as a -15dB jump at the trombone solo. The funny thing is, it didn't sound bad, just interesting. It may not have been the way Teo Macero wanted it to sound, but it gave a new bounce to the recording in a very interesting way.

Again, with this mastered CD higher ratios aren't appropriate, and the lead instrument often triggers the limiter to clamp down on the rest of the band. A more equitable test for the higher ratios is achieved with a single instrument.

The gain alone of the MC76 added a welcome warmth to an Aria Pro II bass, which was played direct into the console. Turning on the compression at an 8:1 ratio provided a lovely sustain with up to 4 dB of gain reduction. I also used the pair of MC76s on the room mics, going to tape. The drummer, who kept referring to the Purple Audio pair as "Barney," was about 15 to 20 feet from the room mics. I used two AKG C12s in omnidirectional mode, spaced about 15 feet apart and raised eight feet above the floor. These went through a Neve console with 1081 modules. The MC76s were inserted in the signal path pre-EQ, but I didn't end up adding EQ, as the limiting action was so transparent. Although the attack time is doubled (i.e., slower) when the units are linked, the Purple pair performed exceedingly well, with little or no color added to the signal by a 4:1 ratio.

Overall, the Purple MC76 is a very useful tool, both for subtle signal control and for wild production techniques. Most compressor/limiters tend to dull the high frequencies of the processed signal. Although the MC76 does this at very high levels of gain reduction, in general it is more efficient in this respect than its predecessors and most of its contemporary competition. In fact, the only modern mono limiter I like more costs twice as much and requires a year-long wait on delivery. The MC76 also seems to be a much more logical choice than searching for a similar vintage unit and paying to upgrade it.

Wave Distribution, 1170 Greenwood Lake Turnpike, Ringwood, NJ 07456; 973/728-2425; fax 973/728-2931; Web site www.wavedistribution.com; e-mail mc76@wavedistribution.com. ■

David Ogilvy is a freelance producer/engineer based in San Francisco. His recent projects include mixing the Broun Fellinis' latest album.

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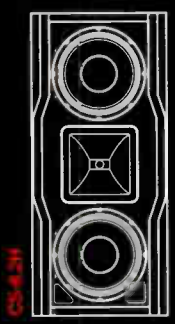

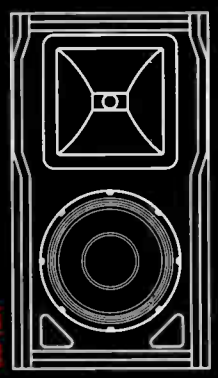

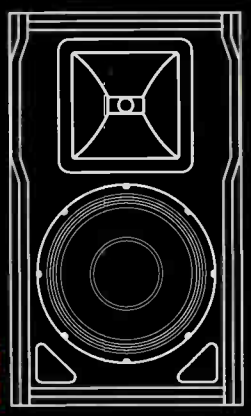

	CS-8.2H	CS-12HI	CS-15HE
Freq. range (Hz) ±3 dB	60 Hz - 18 kHz	55 Hz - 18 kHz	50 Hz - 18 kHz
Freq. range (Hz) -10 dB	55 Hz - 18 kHz	45 Hz - 18 kHz	40 Hz - 18 kHz
Power capacity	300W RMS - 600W program	300W RMS - 750W program	300W RMS - 750W program
Maximum output	118 dB (SPL @ 1M)	129 dB (SPL @ 1M)	133 dB (SPL @ 1M)
Nominal impedance	Full range 4 ohm	Full range 8 ohm	Full range 8 ohm
Horn	#CD-101	#CD-9045	#CD-9045
	1.0" exit compression driver	1.4" exit compression driver	1.4" exit compression driver
	nominal coverage angle/-6dB:	nominal coverage angle/-6dB:	nominal coverage angle/-6dB:
	Horz. = 90° Vert. = 45°	Horz. = 90° rotatable	Horz. = 90° rotatable
		Vert. = 45° rotatable	Vert. = 45° rotatable
Optional horn	n/a	#CD-6045	#CD-6045
		1.4" exit compression driver	1.4" exit compression driver
		nominal coverage angle/-6dB:	nominal coverage angle/-6dB:
		Horz. = 60° rotatable	Horz. = 60° rotatable
		Vert. = 45° rotatable	Vert. = 45° rotatable

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PREVIEW

HAFLER TRM6 ACTIVE MONITOR

Hafler (Tempe, AZ) has introduced the TRM6 Active Monitor Speaker System, a self-powered two-way design featuring a 6.5-inch polypropylene cone woofer and a 1-inch soft dome tweeter in a magnetically shielded cabinet. The bi-amped system, which is driven by Hafler's Trans•ana amplifier technology, boasts a frequency response of 55-21k Hz ±2 dB and a peak acoustic output of 120 dB SPL @ 1 m. A front panel LED indicates power on/clip/thermal conditions. Rear panel I/Os include XLR/TRS combo and RCA input connectors. DIP switches provide for bass and treble shelving, tweeter/woofer mute and balanced/unbalanced input selection. Price is $1,399 per pair.

Circle 327 on Product Info Card

TASCAM MINIDISC RECORDER/PLAYER

Tascam (Montebello, CA) intros the MD801R MkII MiniDisc recorder/player. Features include a new rapid access drive, 20-bit A/D and D/A converters, separate monitor/online outputs, an input sample rate converter, Sound Sync recording and an Incremental Play function. Price: $2,699.

Circle 328 on Product Info Card

MILLENNIA TWIN TOPOLOGY COMP/LIMITER

The TCL-2 Twincom compressor/limiter from Millennia Media (Placerville, CA) is a 2-channel rackmount unit providing both tube and solid-state electronics; the user simply selects the desired circuit topology via a front panel switch. Each channel is provided with front panel controls for threshold, ratio (2:1 to 30:1), attack and release times, and output level. Individual VU meters indicate signal level or gain reduction. Boasting a minimalist design (the TCL-2 has only one active stage in the audio signal path), the unit is transformerless. The solid-state circuitry includes Class A discrete J-FET amplifiers; the tube circuitry includes 300-volt Class A triode vacuum tubes. Price: $2,795.

Circle 329 on Product Info Card

CURTIS STEREO TUBE MIC SYSTEM

Curtis Technology (Rockford, IL) offers the AL-1 stereo microphone system, a matched pair of tube mics with associated rackmount preamp. Designed to be used as a pair, the mics feature an elongated cardioid pattern. They are flat from 20-30k Hz and accept maximum input levels of 125 dB SPL. Additional features include 22mm diaphragms, hand-picked, audiophile-grade matched 12AU7 tubes, close-tolerance, metal film matched resistors and special capacitors. Price of the AL-1 Stereo System, with two matched mics, cables and preamp/stereo controller, is $2,995.

Circle 330 on Product Info Card

KRK LARGE CONTROL ROOM MONITOR

The 15K-A5 large control room monitor from KRK Systems (Huntington Beach, CA) features two 15-inch double-layer Kevlar cone woofers, one 7-inch dual layer Kevlar midrange driver and two 1-inch Kevlar inverted dome tweeters. To minimize interference caused by the transmission

PREVIEW

of bass energy to the mid/high drivers through the cabinet structure, midrange and tweeter drivers are shock-mounted in their own separate enclosure in a "speaker within a speaker" design. A 24-bit DSP speaker management system controls crossover and the time alignment of the various components. Frequency response is 23-24k Hz. Price is $24,000 per pair.

Circle 331 on Product Info Card

JBL SPEAKER STANDS

JBL (Northridge, CA) offers the SS2-BK Series loudspeaker stands to support speakers up to 110 lbs in weight. Featuring glass-reinforced polycarbonate fittings and a two-step anodized finish, the lightweight (6 lbs. 4 oz) tripod stands are adjustable to any height between 44 and 79 inches. Price is $175.

Circle 332 on Product Info Card

HHB CIRCLE 5 STUDIO MONITOR

HHB's (Santa Monica, CA) Circle 5 studio monitor is offered in both active (self-powered) and passive versions. The active Circle 5 includes a 2-channel amp delivering 120 watts to the 8-inch synthetic polymer cone woofer and 60 watts to the soft dome, fluid-cooled tweeter. The woofer features an aluminum voice coil operating in a field-canceling magnet, which allows the Circle 5 to be used in proximity to computer and video monitors. A solid-state polyswitch protects the tweeter from excessive input levels and, rather than merely limiting the input level, will cut

all power to the tweeter and illuminate a red LED when necessary. Prices are $1,399 (active) and $749 (passive).

Circle 333 on Product Info Card

FOSTEX 16-TRACK HARD DISK RECORDER

Fostex (Norwalk, CA) announces the D-160 V2, a 16-track hard disk recorder (with an additional eight "virtual" tracks) that expands the company's line of removable media and hard disk recording and editing systems. Features include .WAV file compatibility for data exchange between the D-160 V2 and external DOS-formatted recording media via the unit's SCSI port (it also includes an ADAT interface). A Level Envelope Display shows the sounds being edited for accurate selection of edit points, and the unit offers six user-assignable edit memory points, 99 memory locations and an edit preview function. Additional features include 44.1/48kHz sampling rate selection, varipitch, MMC record track selection and MTC-only chase functions. The D-160 V2 is priced at $2,195, and options include balanced I/Os and/or a built-in timecode reader.

Circle 334 on Product Info Card

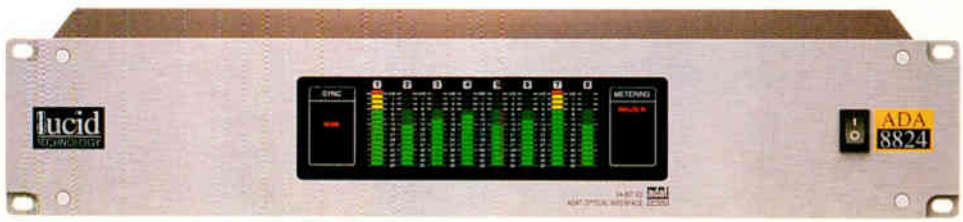
LUCID 8-CHANNEL ADC

Lucid Technology (Lynnwood, WA) has introduced the ADA8824 (ADAT), an 8-channel 24-bit A/D and D/A audio interface for use with ADAT-optical systems. The 2U rackmount unit features 24-bit oversampling, delta-sigma A/D converters, which provide a dynamic range of 113 dB, and both 44.1kHz and 48kHz sampling rates are available (sampling rate may also be set to an external AES reference signal or word clock sync). Digitally controlled analog attenuators on both inputs and outputs ensure optimum recording levels, and 15-segment LED ladders provide high resolution metering. MIDI connectors allow for external control of analog I/O attenuators. I/Os include eight XLR and eight digital AES/EBU connections, plus one digital S/PDIF pair and one ADAT lightpipe pair. Price is $3,295.

Circle 335 on Product Info Card

TERRA SONDE AUDIO TOOLBOX

Terra Sonde (Boulder, CO) is now shipping the Audio Toolbox™, a handheld multifunction test, calibration and utility device providing sophisticated acoustic analysis and a wide range of useful test functions, including a MIDI analyzer, a tempo computer and a cable tester. This software-driven device includes a graphical LCD screen, and it will calculate SPL and function as an RTA. Acoustic analysis functions include RT60 and ETC calculations, and the unit can measure S/N ratio. An internal signal generator enables phase and frequency response sweep measurements, and the unit will also test for polarity, phantom power and battery status. The timecode computer



PREVIEW

function generates timecode with optional offsets, reshapes and gen-locks. Utilities include a frequency counter and guitar tuner, and the unit can function as a headphone or practice amp. I/Os are balanced XLR and TRS and unbalanced MIDI. Price: $899.

Circle 336 on Product Info Card

QUIK-LOK MONITOR STANDS

Quik-Lok (Floral Park, NY) offers a range of studio monitor speaker stands in 36- and 42-inch-height versions. The BS-336 ($149.95/pair) and BS-342 ($159.95/pair) have an 11x11-inch monitor platform atop three vertical steel support bars attached to a 17.7-inch (per side) triangular base. The Optimum® OS Series OS-136 and OS-142 are similar but include a large internal compartment for "sand deadening" to reduce stand resonance. All four models feature self-adhesive, nonslip rubber padding for the monitor platform, retractable carpet spikes and rubber feet. All Quik-Lok stands are UPS-shippable, easily assembled, and they come with a five-year warranty.

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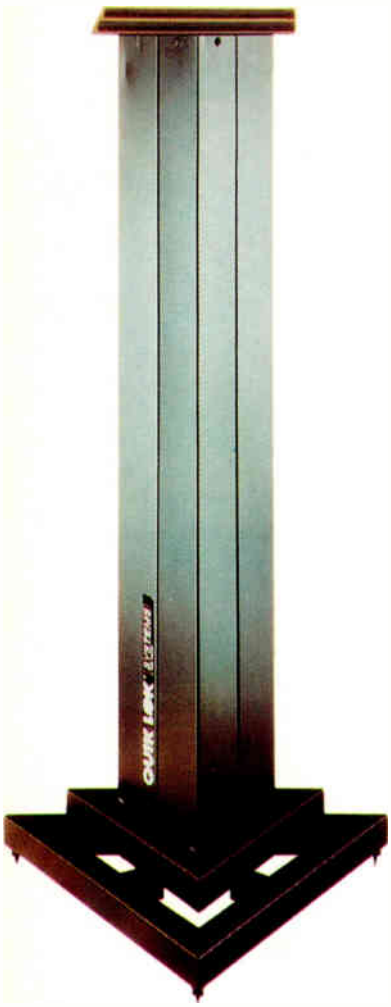

KURZWEIL ENHANCEMENTS

New from Kurzweil (Lakewood, WA) is the KDFX add-on effects board for the popular K2500 Series sampling/synthesizers. This $795 option adds 200 new effects (including reverbs, chorus, flanging, dynamics processing, distortion, EQ and more), with real-time control over all parameters and digital mixing. A Live mode allows the entire architecture to be used for real-time processing of external signals. All V.A.S.T. algorithms as well as all modulators and effects can now be used on external signals. The Live mode option is also available separately (without the expanded KDFX effects) for use on standard K2500 rack or keyboard units for $299, or existing K2500 owners can download it for free from www.youngchang.com/kurzweil.

Circle 338 on Product Info Card

BALDWIN MASTERPOT 7.1

Baldwin Products (Marina Del Rey, CA) offers the Masterpot 7.1™, a monitor level controller for 5.1 and 7.1 surround applications. Featuring an all-analog signal path and digital logic control, the unit provides variable and fixed level controls and Mute/Dim, Solo and 2-track inject switches. A wired remote control unit duplicates these functions for console-top operation. Front panel trim controls on the main unit ease room calibration. Channel tracking is better than 0.1 dB over a 70dB range, and the system handles output levels up to +26dB without distortion. Price of the Masterpot 7.1 is $1,795; the optional remote controller is $795.

Circle 339 on Product Info Card

HOT OFF THE SHELF

Dolby Laboratories and Lake DSP of Sydney, Australia, will jointly develop a new multichannel surround sound technology for headphones. Named Dolby Headphone, the new DSP-based system will allow headphone listeners to hear the full 5.1-channel surround capabilities of modern film sound mixes. Call Dolby at 415/558-0200 or visit www.dolby.com or www.lakedsp.com...Koss intros a 40th anniversary edition of the famed PRO4/AA Stereophone, in a limited run of 1,000, featuring a dynamic element and closed cushion design. Price is $99.99. Call 414/964-5000...ATM Fly-Ware offers a rigging system for the EAW KF700 series of loudspeakers. Each truss module in the AMFS-KF700-T system weighs 74.5 lbs, complies with ASME B30.20, CE and VBG 70, VBG 9a standards and has a weight load limit of 2,100 lbs. Call 310/834-5914...Electro-Voice redesigned its venerable Eliminator two-way loudspeaker system. It's now loaded with an EV DL15BFH 15-inch woofer and an EV DH2010A compression driver in a High-Q 60°x40° constant directivity horn, for a frequency response of 50-20k Hz. Constructed of EV's RoadWood, the system features the easy-lift handles designed for the X-Array system and weighs 66 lbs. Call 616/695-6831 or 616/695-1304...Neutrik's new 48-page product guide catalog lists approximately 550 model numbers and includes product features, dimensional drawings, part numbers, special versions, specifications and technical data. Call 732/901-9488 or visit www.neutrikusa.com...Music Interface Technologies (MIT) has reduced prices on the company's RIPCORD and GAS instrument cables by an average of 20% to 40%. Call 530/823-2600...ADK Inc. has added the A-51sd (switchable dual-pattern) omni/cardioid large-diaphragm studio condenser to the company's A-51 microphone family. ADK also announced that it will expand its line of products later this year, adding a multipattern version of the A-51 and an all new ADK large capsule tube microphone. Call 503/772-3007. ■

Testing...

. . . 1, 2, 3, 4,. . . it takes more than one kind of tester to get the job done on the road or in the studio, and we have a lot of them ready to ship your way. On the right is our new SC-48EP speaker cable checker. It tests EP cables with 4-pin and 8-pin connectors for shorts, opens, and cross-wiring. For systems with 6-conductor systems, we have the SC-46EP. Both models also check standard 3-pin XLR's. Down at the lower left of the page is our SC48NL, the companion 4-pin and 8-pin NL connector cable checker.

To your left is the Qbox audio line tester, featuring a complete set of tools for the person who has to find out what went wrong and fix it. For sending signal up a line it has a built in tone generator and a built-in microphone. For monitoring signals it has a built-in speaker and amp (along with a headphone jack for private listening).

The Tester checks cables with virtually every possible combination of XLR, 1/4", or RCA Phono connectors for shorts, opens, and cross-wiring.

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New Hardware/Software for Audio Production

CD CYCLONE 8-DRIVE DUPLICATOR

CD Cyclone's (Lake Forest, CA) T-8 is an 8-drive, stand-alone CD duplication system, with an internal hard drive and eight 4x CD recorders, expandable up to 16 drives. Features include full CD premastering capabilities, CD audio capture and playback, optional DAT import support and 50-CD autoloader color printer connectivity. Also available are the CD Cyclone T-30, which uses 30 CD recorders to duplicate up to 120 CDs per hour; and the CD One-2-One, a cost-effective, portable compact CD duplicator that can be used either as a CD disc-to-disc duplicator or as an external PC drive.

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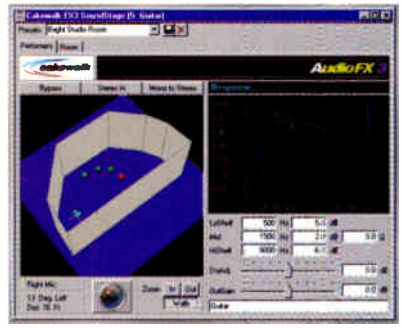
CAKEWALK AUDIO FX 3



Cakewalk (Waltham, MA) debuts the newest in a series of acoustical simulation applications, Audio FX 3 Soundstage. Audio FX 3 adds ambience to a recording by simulating the complex acoustic response of a live room with various surfaces and dimensions. Audio FX 3 is completely configurable: Users can model rooms, halls and concert shells by determining room dimensions and defining reflection parameters such as damping, trapping and absorption. Microphone placement (of up to two omni, bidirectional or cardioid mics) can be simulated for imaging, and up to 20 performers can be placed in the virtual room. Audio FX 3 is compatible with any DirectX application and retails for $249 list.

Circle 341 on Product Info Card

FOSTEX CR300 CD RECORDER

Fostex (Norwalk, CA) introduces the CR300 CD recorder, an optical disc recorder offering compatibility with CD, CD-R and CD-RW media. It also provides a comprehensive feature set, including a variety of recording modes and I/O choices. The CR300 is compatibile with any input source: Inputs and outputs include S/PDIF coaxial and optical digital I/O, AES/EBU in, XLR +4 dBu and 10dBV inputs. A Synchro Recording mode allows the CR300 to be armed and synchronously started from an S/PDIF-equipped DAT deck. Also included is a built-in sample rate converter, auto track incremental level setting, four erase modes (Last Track, All Track, Disc and TOC-Only), margin indicator, digital fader and Copy Bit Selection for copy protection.

Circle 342 on Product Info Card

SONIC FOUNDRY DOLBY ENCODER

Sonic Foundry (Madison, WI) introduces Soft Encode, a stand-alone application for providing cost-effective Dolby Digital (AC-3) encoding for multichannel audio delivery. Two versions are available, a Dolby Digital 5.1 Channel version ($995) and a Dolby Digital 2 Channel version ($495). The encoder fully supports multiple encoding modes, offers sample rates of 32, 44.1 and 48 kHz, is compatible with PCM, .WAV and Raw PCM files (16 and 24-bit) and can play back simultaneous audio output to multiple cards. Other features include playback of encoded preview channels; solo, mute and fader controls on each channel; batch conversion functionality; and a variety of graphical editing features.

Circle 343 on Product Info Card

ARBORETUM FREQUENCY MORPHING IONIZER

The new Frequency Morph function for Arboretum's (Pacifica, CA) Ionizer takes the spectral characteristics of a segment of audio and maps that frequency curve to another sound; the function analyzes content, then creates filter curves to give other recordings the same sonic characteristics. Ionizer is a PowerMac-native multiband dynamic processor offering spectral analysis and 512 bands of gated EQ per channel. The application can operate as stand-alone, or as a plug-in with any MacOS Premiere-compatible audio application. Version 1.3 is now shipping; retail is $499.

Circle 344 on Product Info Card

FRONTIER'S NEW CARDS

New from Frontier Design Group (Lebanon, NH) is the Dakota card, with two ADAT optical ports for 16 channels of I/O. Included are Windows 95/98 drivers and a breakout cable with S/PDIF RCA jacks, ADAT 9-pin sync, two MIDI I/Os and an internal connection for direct audio transfers from your computer's CD-ROM drive. Dakota supports 44.1 and 48kHz sample rates, and dynamically resamples other audio. The Montana expansion card doubles the Dakota's optical I/O, with two pairs of ADAT optical ports, providing 16 inputs and outputs (switchable to S/PDIF via a breakout cable). Montana also has an RCA input for sync to external video or external audio word clock. A dual-slot layout permits installa-

tion in either a PCI or ISA slot next to the Dakota card. Both Dakota and Montana support Frontier's SoDA (SMPTE on Digital Audio), a unique feature that allows any digital I/O to be defined as SMPTE I/O. The Dakota is $649; the Montana is $249.

Circle 345on Product Info Card

SMARTPAN PRO SURROUND PANNING FOR TDM

The SmartPan Pro TDM plug-in from Kind of Loud Technologies (Santa Cruz, CA) offers discrete 5.1 mixing by allocating three stereo Pro Tools channels as a virtual output bus. Multiple tracks can be linked/panned as a group, and channels can be individually muted. Features include a visual joystick representation showing audio positioning/relative gain, a SmartPan Soundfield Controller "smart knob" that lets users dynamically adjust the sound width/spatial extent, and a divergence control for adjusting width in the L/R and L/C/R speakers. All SmartPan Pro functions are automatable; and Dolby Surround Tools automation data can be imported to create 5.1, 7.1 or LCRS surround mixes automatically. The system is compatible with Pro Tools|24 and Pro Tools|24 MIX systems.

Circle 346 on Product Info Card

HHB CDR850 CD RECORDER

HHB (Los Angeles) announces the CDR850 professional CD recorder, priced at $1,249. The two-rackspace unit records on write-once CD-R media and CD-RW discs. It features track-by-track recording, all-track recording or DAT ID Synchro, in which direct DAT-to-CD copies can be made, with DAT IDs automatically converted to CD tracks. An internal SRC accepts any input from 32 to 48 kHz, and I/Os include balanced XLR and unbalanced phono analog I/Os, coaxial and optical digital I/Os, and an AES/EBU digital input.

Circle 347 on Product Info Card

TASCAM CD-D4000 CD DUPLICATOR

Tascam's (Montebello, CA) CD-D4000 is a cost-effective CD duplicator designed for either the professional or personal recording studio. Priced at $1,299, the CD-D4000 offers 1x, 2x and 4x writing speeds, and ease of use: A Mode Selection function selects write speed, disc comparison, disc check and duplication.

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UPGRADES AND UPDATES

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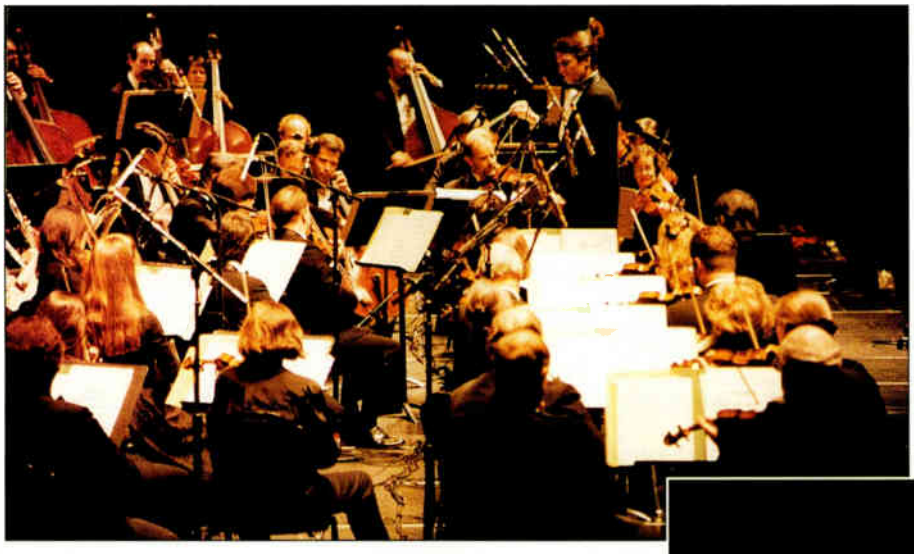
SOUND REINFORCEMENT FOR THE BOSTON POPS

MIKING THE ORCHESTRA



PHOTOS: MARK FRINK

Live mix engineer Steve Colby

As American as motherhood, apple pie and the Office of the Independent Counsel, the Boston Pops made its first appearance in July 1885, when a large and fashionable crowd filled the Boston Music Hall for the first Music Hall Promenade Concert. Conceived by Boston Symphony Orchestra (BSO) founder Henry Lee Higginson, the new series aimed to re-create the ambience of summer evening concerts in Vienna, where Higginson had been a music student. Another goal was to provide summer employment for the members of the Boston Symphony.

Nearly 114 years later, the history of the Boston Pops contains dozens of "firsts." For example, under conductor Arthur Fiedler, the Pops recorded the first orchestral record to sell more than a million copies, and the Pops' special bicentennial program on July 4, 1976, drew an audience of 400,000, the biggest in the history of orchestral concerts. The commercial and popular success of the Boston Pops has not gone unnoticed—today symphony orchestras all over the country offer "Pops" programs, often as part of a marketing campaign to sell season tickets. And for many orchestras, a 4th of July pops program that incorporates a popular guest artist, the "1812 Overture" and a fireworks display helps to underwrite less well-attended performances. Since few (if any) orchestras maintain a full-time sound crew, they generally rely on regional sound companies and independent engineers. To gain insight into the problems of amplifying a symphony orchestra, *Mix* spoke with BSO live mix engineer Steve Colby.

Colby started out as a New England Conservatory clarinet student. While working in the school's recording studio, he was introduced to the WCRB group that recorded the BSO for radio syndication. This led to stints as a live radio mix engineer for the BSO's Tanglewood broadcasts, and for the New York Philharmonic radio series. Colby has also mixed for TV and radio for artists as diverse as Aerosmith and the Atlanta Symphony. After eight years with Boston's PBS station, WGBH, Colby founded Evening Audio Consultants, which specializes in remote production and orchestral sound reinforcement. When the BSO began performing in arenas and on outdoor stages, he was a natural choice to step into the role of mixing them live. Colby has now been FOH engineer for the Pops for nearly two decades. A veteran of literally hundreds of shows, Colby has developed an approach driven by practical necessity; he must often work with local sound companies whose inventory is geared toward more typical live concert productions.

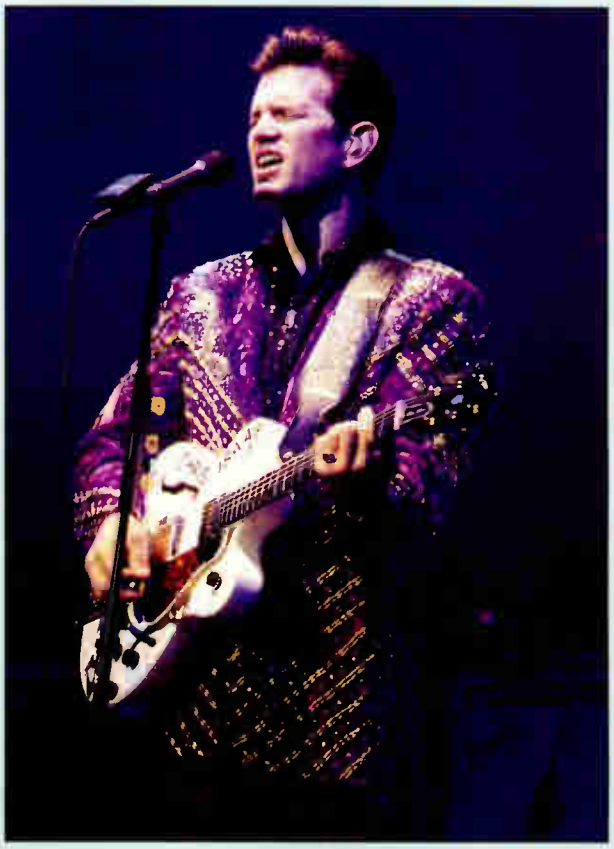
Perhaps the primary challenge Colby faces is miking the orchestra. Approaches for miking symphony orchestras run the gamut from a

—CONTINUED ON PAGE 148

BY MARK FRINK

CROONING WITH CHRIS ISAAK

"Speak of the Devil" Tour



PHOTOS: STEVE JENNINGS

L to R: Ryan Trefethen, A-1 system tech; Kevin Harvey, FOH engineer; Connie Fernstrom, monitor engineer

Capping a whirlwind tour of North America in support of his sixth album, *Speak of the Devil*, Chris Isaak recently sold out two nights at San Francisco's Warfield Theatre. Stepping onstage like a casino cowboy in a lavender velvet suit adorned with sequins, Isaak earned the devotion of his fans before crooning a single song. Later in the show, he changed to a mirror-covered outfit that transformed him into a brilliant bundle of beams. In light of Isaak's numerous film and TV appearances, it's somehow appropriate that the sound system is provided by Hollywood's A-1 Audio and that both engineers hail from Las Vegas.

Kevin Harvey, whose recent engineering credits include Collective Soul and Foreigner, mixes Isaak and perennial backup band Silvertone on a Yamaha PM4000. FOH effects include a Roland SDE-330 delay, TC Electronic M5000, Yamaha SPX900 and SPX1000, plus a Lexicon PCM 70 that's used on acoustic guitar and keyboard solos. The M5000 is Harvey's main vocal reverb, and he uses both machines, mixing two different scenes on adjacent stereo faders. Harvey also uses both SPXs on drums, with the 900 generally on short plates and the 1000 on long halls, "balancing and blending the two effects on snare and toms," he explains. "It's something I've done for a long time, and I'll use more of the long reverb depending on the sound of the room." Harvey controls his effects with a Yamaha MPC-1 MIDI controller.

Inserts include a BSS DPR-402 on the acoustic guitars and Drawmer gates on the drum inputs. Kick, bass, keys, backing vocals and the Leslie high rotor get dbx 160x compressors, while a dbx 165 is used on the Leslie low rotor. Isaak's vocal and spare mics run through a Summit DCL-200, along with a BSS DPR-901 dynamic equalizer and a KT DN410 parametric equalizer. The effects rack also includes a Wendel Jr. sampler, which Harvey uses to add

BY MARK FRINK

—CONTINUED ON PAGE 146

ROB ZOMBIE

Mix caught up with Rob Zombie's Hellbilly Deluxe tour on its first leg, which comprised U.S. dates from October through December '98, plus a few shows in the UK. The tour is now into its second leg, playing in venues from large theaters to small arenas.

"I specified the Midas XL4 board for this tour," says FOH engineer Ted Kendick, who's worked with Rob Zombie since 1992. "I've always been a fan since I was first introduced to one back when I started in '78. My rack has a Brooke-Siren Vari-Curve for the main system EQ, along with the Omni-Drive crossover systems. For effects I'm using the Eventide H3000 Harmonizer, TC 2290 delay and multiple SPX-900s and a Lexicon 300 reverb unit, designated specifically for the drums."

"For Rob's vocals, I mix some harmonizing and chorusing effects with delays and certain types of reverbs," Keedick says. "I actually use four units just for his voice alone. All the guys use Audix vocal mics; Rob uses a Samson UHF wireless, with an Audix OM-6 capsule."

The P.A. is Delicate Productions' F-2 system. "We generally fly six boxes a side," Keedick says, "two long-throw mids, two long-throw highs and two bass bins (two wide/three deep in configuration). All the subs and the remainder of the bass are on the floor with Martin F-2 combos—four of those for the floor fill. It's a pretty compact P.A. I'm running 39 inputs from the stage, 21 of which are for the drums alone."

TEXT AND PHOTOS BY STEVE JENNINGS

"I have a Midas XL250 with Klark-Teknik EQs and Drawmer mid dbx processing," says monitor engineer Jebi Kritz. "I'm also using three SPX-900s and a Brooke-Siren 901 dynamic EQ for the vocals. We use conventional wedges, mostly. The band doesn't like it too much in their face; they like it clean and toned down. Rob has six different wedges because he is all over the stage during the show. The backmembers hear themselves, the samples and Rob in their wedges. Since I have so many cues during the show, I can't always go to the cue fader—I have to do the volume with my feet. I use a vintage Morley volume pedal."

"We use 21 channels for the drums," says Kritz. "That includes six overheads and hi-hat, and six channels of kick drum, two mics and a trigger per drum. The snare drum has three channels alone—two 57s, an Audix D-3 and a trigger. Each tom tom has a Shure SM98 and a trigger, and there are additional electronic pads as well as the traditional toms. On kick is a Beyer M-88 and Shure Beta 52; hi-hat and overheads are SM81s. The drummer uses a Mackie to drive his in-ear monitors, and we use one of the auxiliary sends that is set up back to my monitor console, or he can send it into his drum fills as well. We have sound shakers under his drum stool; the kick drum is the only thing in there, and he gets a really tight gate, so he gets a nice punch out of it."

—FROM PAGE 143, CHRIS ISAAK

texture on slower songs. The unit is triggered by a pre-fade feed from the kick-drum channel via another dbx 160x.

The main speaker system consists of EAW KF850s, which are flown in typical double-column theater arrays and powered by Crest 8001 amps. The SB850 subwoofers are deck-stacked along with a single KF850, plus a pair of JF260s on each side as front-fills. Harvey equalizes the system with three Klark-Teknik 3600 programmable graphics and uses a pair of BSS 804s to delay the front-fills and flown speakers by a few feet so that Isaak gets a good feel in the center of the stage. Like all good audio teams, Harvey and monitor engineer Connie Fernstrom work together on the combined response of the lead vocal mic in the mains and monitors, along with its interaction with the hall. A-1's Ryan Trefethen, who was out with Jane's Addiction last year, rounds out the three-person audio crew.

Monitor chores are performed by Fernstrom on a Yamaha PM4000M and a rack of Klark-Teknik graphics. Isaak relies on a pair of personal single-15 tri-amped Compact Monitor Systems wedges, powered by a BGW amplifier. The other proprietary JBL-loaded floor monitors are powered with Crest 7001 amps. A Tasco XT double-15 sits on the drum riser, and the remaining bandmembers listen to A-1's DFM single-12 slants, with a stereo pair at the keyboards. KF850 sidefills sit on the floor at the downstage corners and are angled up with audio logs.

Fernstrom also provides in-ear mixes via a rack of Radio Station transmitters. Isaak listens to UE-5 two-way custom molds, while bandmembers use a single Sony ear-bud for turbo-charged monitoring that combines with their wedges. "Initially, we went to just the in-ears, and it was too sterile," Fernstrom explains. "Chris is really happy with the Ultimate Ears." Isaak's in-ear mix is mainly his voice and guitar, kick and snare, plus a few vocal or keyboard cues, with ambience mics between songs. Reaching over each sidefill cabinet is a Shure Beta 87 on a boom-stand, aimed toward the audience but also positioned to catch some of the stage.

"I split the snare to two inputs, with one for the wedges and the other for Chris' ears," Fernstrom continues. The wedges get a big, fat sound, while Isaak is also listening for the subtleties from brush work and side-stick. Inserts include KT 514 gates on drums and 160x on bass and vocals. "I'm compressing the vocals to smooth them out because of the ear mixes," Fernstrom says. "Chris' range goes from singing softly to a full-voice howl." Fernstrom uses a Yamaha SPX 1000 on vocals and a Lexicon LXP-15 for drums to sweeten up the ear mixes. He has inserted a 160x compressor on the SPX 1000's input so he doesn't have to ride it so much.

Silvertone has backed up Isaak his entire career with only minor personnel changes. Veteran Kenny Dale Johnson's five-piece maple DW kit is miked with an SM57 on snare, SM98s on toms and AKG 414s for overheads. A Sennheiser KM40 is the under-snare mic, and Neumann KM84 condensers are used on the two sets of high-hats. A second "cocktail kit" that Johnson plays downstage for a couple of rambunctious rockabilly songs that close the set is miked with a Beyer M-88 on kick and another 57 on snare.

Roland Sally's double Bassman rig is miked with an EV RE-20. Guitarist Hershel Yatovitz uses an X-Wire digital wireless for his various Strats and a Guild 12-string acoustic, and his twin Fender Twins are miked with a pair of Sennheiser 409s. Joining Isaak for road shows this year is Brett Tuggle, who plays a Korg Trinity keyboard and a Hammond B-3. The Leslie's high rotor is miked with a 57; a 421 is used on the lows.

While SM58s are used on backing vocals, Isaak sings into Audio-Technica's new 4055 vocal condenser mic, the version without the low-frequency rolloff. "It's flat and full-sounding," Fernstrom comments. "Chris likes it a lot, and he says it's almost too clean." A D-3 Mic Mute proximity gate turns the vocal mic off when Isaak steps away from it, removing the drum bleed from his ear-mix as well as from the mains. Harvey points out that Isaak is a pleasure to work for: "He's very cooperative to work with as an artist and is always happy to turn down the stage volume to accommodate me."

Following the obligatory appearance of material from the new album and Isaak's signature hit, "Wicked Games," members of the audience eagerly accepted Isaak's invitation to the front of the stage for a dance party of up-beat tunes spanning his career, and some eventually joined him onstage. By the time he played "San Francisco Days" in the second encore, it was obvious that Chris Isaak was back in the saddle. ■

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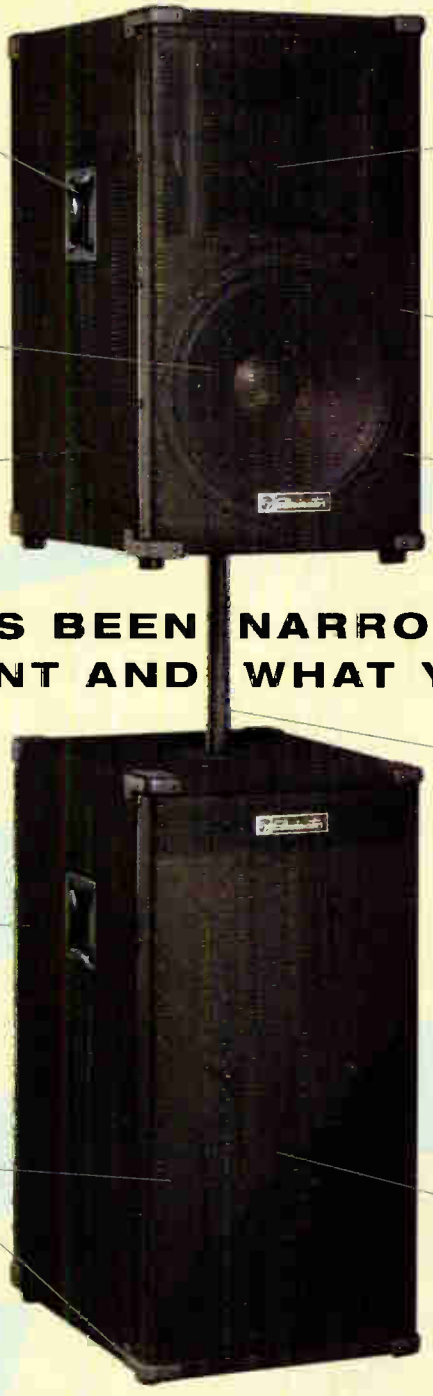

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—FROM PAGE 142, BOSTON POPS

well-placed stereo pickup to placing a mic on every instrument. Colby's method incorporates a multimiking scheme with a planned measure of controlled bleed between sections. This approach, says Colby, helps create a sense of depth and stage perspective, while also allowing for rebalancing. It also provides superior gain before feedback.

"I've fielded a lot of questions from people who don't understand why a stereo pair isn't the best way to go," says Colby. He doesn't dispute the argument that the fewer microphones used, the truer the phase relationship. "However, given the challenging acoustics of large arenas and outdoor venues, we've found that the orchestra needs a fair measure of rebalancing over the course of a program," he explains. "A lot of dynamic adjustments are made by the players as they get used to their stage environment. Some of it also boils down to a brute gain issue—if you need to get loud enough to overcome a noisy air handling system or a ball park with chatty patrons, you need more microphones placed closer to the sound source."

Since so many of the Boston Pops events are "one-offs," Colby has developed a mic list that conforms to what most good regional P.A. companies have in their standard inventory, or can easily rent locally. "While I would always prefer using a stage full of Schoeps condensers, the quantities needed of those excellent microphones are frequently not available, or are beyond the resources of the event," Colby explains.

MIC CHOICE AND PLACEMENT

Colby's microphone setup generally relies on one microphone model per section. "Within the violins, violas and cellos, my favorite has emerged as the Shure SM81 because of its consistency and directional characteristics," says Colby. "It almost acts like a short-throw shotgun, letting me place the mic a little farther away from the instruments without giving up a lot of isolation. Most classical instruments sound better with the mic at a distance of several feet, not several inches. It gives the sound a little room to breathe." Other acceptable mics for these sections include AKG 535 and 451 models.

Colby mikes the first violins from behind, with the microphone extending over the shoulders of the players and aimed at a spot equidistant from the two instruments occupying that "stand" (two players share a single music stand). The mic is typically placed two feet above the heads of the musicians and carefully positioned to avoid being struck by a bow during performance. "This position produces a warm sound that's somewhat direct without a lot of upper-midrange screech that needs to be EQ'd out," offers Colby.

Second violins are miked at a similar distance and angle, but from the front of the instruments. "This works out well for a couple of reasons," Colby explains. "It allows me to have a diversity of string tonality within that section, which makes the overall violin sound a little more three-dimensional. It also helps balance when the seconds play a musical line that is lower in range." Having the mics pointing more directly at the seconds helps to bring out the details of the orchestration. "It's kind of a self-mixing technique," adds Colby.

Violas are also miked from behind and slightly upstage. Since the viola sec-

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tion sits stage-right of the conductor, the top of the instruments face more directly toward the microphones, which helps to increase their presence. "Violas are problematic because they have a lower, darker tone, and it's hard to bring them out in the mix, but they're very important," Colby continues. "They often act as a sonic glue for the string section. They're sort of like the high-mids in a four-way system."

Cellos are generally miked with a short boom reaching under the music stand in front of two players, with the mic about two feet from a point between the pair. "I actually prefer a cello miked from above, but it doesn't turn out to be practical," comments Colby. "The extra gain and presence win out over sonic superiority in this case."

Colby's favorite mic on basses is the AKG 414 set on a cardioid pattern, one per stand, again reaching under the music stand and positioned at the height of the instrument's F-hole. Colby notes that placing the microphone at this height yields a good blend of bass "thump" and detail, reducing the need for radical EQ.

WOODWINDS AND BRASS

Typically, the woodwinds sit in two rows at the center of the stage, just upstage of the conductor's podium. Colby places a Sennheiser 421 between the first two players of each woodwind type—flutes, clarinets, oboes, bassoons—with a fifth mic to accent the low-pitched English horn. Piccolo flute, bass clarinet and contra bassoon are generally left unmiked and are picked up as bleed into other nearby microphones, a technique that helps give the sonic impression of depth.

French horns sit just behind the woodwinds, while the remainder of the brass section—trumpets, trombones and tuba—occupy two rows in the upstage left corner of the stage. Here, Colby's favorite setup is 414s all around, but more frequently he'll use two Sennheiser MD-409s to cover four trumpets, plus a pair of 421s on trombones and a Shure SM57 above the tuba, less than a foot from the bell. "I've really gone 'around the barn' on mic selection for French horns," says Colby. "For now I've settled on a pair of EV RE-20s set on the drum riser behind the section. These mics are only used occasionally in the mix to add presence to a particular musical passage. Most of the rich horn sound comes from bleed into the woodwind mics."

For the harp, Colby eschews the use of a contact mic and usually points an 81 or a 451 at the middle of the sound board, orienting the mic away from the timpani, which is a loud neighbor. "I haven't really had the harp problems I've heard others talk about," Colby comments, though he notes that the harp is one of the few instruments on which he uses a compressor, limiting its dynamic range to allow more control in the mix. "The harp is a wily instrument dynamically," Colby explains. "Without gentle compression, certain notes pop out more than you want, while the rich low notes can almost disappear." Colby uses no more than a 3:1 ratio and likes to see 2 to 4 dB of reduction on a good passage. Similar compression is used on the "Mr. Rogers" bell tones of the celeste, as well as on the pitched percussion mics; percussionists often play "toys" (triangle, whistles, sleigh bells, etc.) close to these mics, which are set up for the more distant mallet instruments.

The percussion section is spread out in the upstage right corner. Colby

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uses condensers on percussion, and it's one of the few places where he prefers AKG 451s, with one per pitched (mallet) instrument. "I mike from above, at about seven feet, over the low end of the instrument and aimed toward the high end," he explains. Another 451 is set up for the "toys." Colby covers the four timpani with two SM57s on short booms, each mic pointing down between a pair of drums from about 18 inches. "They lend a nice, warm presence and are not in the player's way," Colby notes. What is called the battery (the concert snare and bass drum), doesn't need a mic, since these instruments bleed into many other inputs. "The string mics are great for providing a sense of distance for the battery," says Colby.

Typically, Colby leaves roll-off switches on the microphones flat and makes adjustments at the board. "A real rookie mistake that I used to make was setting the highpass filters too high out of concern for feedback," Colby comments. "There's a wonderful wash of energy onstage that is useful to thicken out the orchestra. You're going to get some bleed anyway, so you want it to make a fidelity contribution to the mix."

At the board, Colby sets highpass cuts at 60 Hz on violin mics, with 40 and 50Hz cuts for celli and double bass mics, depending on the choice of mic and the P.A.'s response in the room. He sets highpass filters on harp at 100 Hz, woodwinds and trumpets at 80 Hz, and trombones at 50 Hz. Tuba and timpani are cut down at 25 Hz, pitched percussion at 80 Hz.

One of the ways in which the Pops differs from a traditional orchestra is the presence of a rhythm section located upstage center, including a drum kit, bass and keyboards, often augmented with a guitar and synthesizer. For piano, Colby uses a single SM81 in the middle of the piano pointing back at the hammers, plus a Barcus Berry Planar Wave piano pickup. "Where the piano is so close to the drum kit, [the pickup] helps with isolation," he explains. The kit is miked simply, with a single overhead condenser pointed at the drummer's right knee and a 57 on the kick placed on the pedal side. The electric bass and synth are run through DIs, and the guitar is miked with a 57 on the amp.

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THE BOSTON POPS LIVE ON TOUR

For their 1998 Christmas tour, the Pops carried their own production for the first time in the group's touring history, squeezing sound and lights into a single truck. *Mix* caught the show at Portland's Rose Garden Arena. It was one of a dozen arena shows featuring the Pops in their run up the West Coast. "While it is always a pleasure to work with regional sound companies, there's obviously no substitute for the advantages of flying the same rig every night," says the Pops' FOH engineer Steve Colby. New England-based Scorpio Sound supplied a Crest-powered EAW sound system. Crew chief Carl Gagnon handled system tech duties with Mark MacArthur taking care of the forest of microphones onstage.

Left and right main arrays comprise KF/BH 853 and KF850 cabinets and are custom-configured for each venue by Scorpio's Gagnon. In Portland, four SB 1000 subs were stacked on the floor at each down-stage corner, JF 200s served as under-hung downfills, and JF 80s placed along the lip of the stage reproduced vocals and announcements.

Gagnon tunes the P.A. each day before handing the reins over to Colby. "Carl has an incredible ear and a real knack for getting the very best out of the system every day. I rarely make more than small, very subjective changes to system EQ after he's finished," says Colby, whose favorite system equalizer is the BSS VariCurve. "There's nothing better than being able to take the remote controller, walk around to representative seats and tweak.

Gagnon notes that using a vocal mic and the mantra of "check-one-two" is the wrong way to adjust system EQ for symphony reinforcement, which requires a smooth and even system response. "A lot of times for rock you're EQ'ing the system so you can run your vocal input fairly flat, but with the symphony it's more about making it sound natural," explains Gagnon. He recommends starting with an analyzer to get the system as flat as possible, but then using listening material to hear what frequencies are sticking out. "We're trying to give the impression that the music is coming from the stage, rather than the speakers," says Gagnon. "The orchestra is heavy in the 300 to 400Hz area, so we try to take a little more of that out of the EQ to compensate."

Gagnon stresses that the P.A. must be exceptionally quiet and free of hums and buzzes. "You have to pay more attention to detail if you want the show to come off well," he notes. "Crowds that come to symphony shows want the P.A. to sound natural and transparent, and not get in the way of the music."

Five monitor mixes from the FOH console feed HotSpot speakers placed in various sections of the orchestra. Colby prefers the HotSpots because of their compact size and their restricted ability to reproduce low frequencies that could adversely affect the sound onstage. Each monitor is fitted with a volume control, enabling the musicians to adjust the level within a preset window. Without daily soundchecks, Colby notes, this is essential for the comfort of the players.

The show has modest effects requirements—Colby uses only two digital reverbs. For Colby, reverb is the glue in the mix, and he favors the hall sounds that Lexicon offers. "If it's not noticeable, it's working," he comments. Colby puts many of the instruments in the primary reverb, but at different levels—strings to provide some sheen, a little more on woodwinds to give them dimension. A second reverb is reserved for a vocal soloist and for the chorus that joins the Pops for the Christmas presentations.

Practical matters of time, cost and a tight travel schedule prevent a daily soundcheck, so Colby often starts with a rough setup of default console settings. "Nine times out of ten, however, our only soundcheck is when the concert master stands to tune the orchestra," Colby laments. "Typically, the show peaks around 93 dB. Our target for the performance is to achieve the same dynamic range you would have at our home at Symphony Hall in Boston." However, due to the lack of intimacy in an arena, Colby often attempts to compensate by making the sound a little punchier or brighter.

—Mark Frink

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large number of microphones, Colby limits the number of cable paths to a minimum and lays down a lot of gaffer's tape after the line check. All the string section mic cables, as well as the majority of the mic stand bases, are placed in a stage-wide alley that exists within the body of the string section. Even so, Colby notes, he would be lost without the cooperation of the musicians. "Our players are quite gracious about looking after mic placement, because the stage setup often gets shuffled during the last five minutes before show time," Colby comments. "They're aware of the technical difficulty our show presents and will tug a mic back into position if they have to shift their chair. It's not a bad idea to briefly introduce the musicians to their mics and indicate the correct position as you're checking the stage."

On a Pops tour, the nearest thing to a soundcheck is often a short rehearsal before the first show of the run. Colby starts by listening to the orchestra with the P.A. turned off to see how the venue acoustics treat the natural sound of the orchestra. "We are in the 'reinforcement' business here," he comments. "Our strategy is to augment and complement the basic sound of the orchestra whenever possible." Next, he starts creeping up one section at a time, beginning with the strings. "I want to put up the microphones that will present the most severe 'washout' first, and then I can fill in the detail of everything else around that," Colby explains. "It's the same philosophy as getting a rock drum sound together with the lead vocal mic open—using the onstage bleed to create the overall sound."

Input gain settings are critical. "I'm one for driving a console at its sweet spot and then making adjustments after the desk," Colby remarks. He hears the same warmth in the woodwinds and strings when the desk is correctly trimmed that other engineers can hear in their lead singer when the vocal channel is opened up optimally.

Colby's most frequent equalization adjustment is to the high-mids on the violin mics. "Temperature and humidity play a role with any wooden instrument, plus the players tend to dig in a little more if they can't hear well, and this can contribute to a harshness of string sound," he says. For this important adjustment, Colby usually dips out 3 to 6 dB between 800 Hz and 2 kHz. He uses wide filters because he finds they sound more musical and natural.

On the low strings (celli and basses), Colby often finds that there is an unwanted 400Hz sweet spot. "I think it may have to do with the fact that the orchestra is sitting on a 40 by 60 hollow platform," he explains. "This is another place where a little high end can add some detail." On the woodwinds, he often ends up taking a little 300 Hz out and putting in a little articulation bump between 5 and 6 kHz, especially when using 421s. This lets him run the section a little softer, but still reveals detail in subtle woodwind lines.

The ability to mix in a way that highlights the subtle nuances of specific instruments is one of the benefits of amplifying orchestral music. The other, main advantage, of course, is the power to bring symphonic music to a new audience. Though there's obviously some crossover, the folks who go to Pops concerts in a park or shed are not always the same people who frequent concert halls. The BSO's Pops programs blazed the trail for symphonies all over the country, giving them a way to reach new fans by playing old favorites. ■

Mark Frink is Mix*'s Sound Reinforcement editor.*

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New Sound Reinforcement Products

TELEX PLUG-ON UHF TRANSMITTER

Telex Communications Inc. (Minneapolis, MN) offers the ProStar UHF UT-12 Universal Plug-On Transmitter. Equipped with mute and power switches, battery status LED and screw-type gain adjustment, the UT-12 connects to any dynamic or electret condenser mic via the integral XLR connector. The UT-12 operates in the 690-725MHz UHF band on one of eight factory preset crystal-controlled frequencies, and runs up to ten hours on alkaline batteries. Frequency response is 50-50k Hz, S/N ratio is 91 dB, and THD is 0.5%. Other components in the ProStar line include the UH-12 handheld, the UB-12 beltpack and the UG-12 guitar transmitters. The UT-12 is $250.

Circle 314 on Product Info Card

RADIAN CO-AX SPEAKER SYSTEMS

Radian Audio Engineering (Orange, CA) debuts a line of compact, full-range speaker systems based around its new 8-inch coaxial compression/cone driver. The RPX-108P, designed for monitoring applications, measures 10x17.5x9.75 inches (HxWxD) and features a 45° wedge angle. Capable of handling 400 watts program/200 watts RMS, the Radian 5208B 8-inch full-range coaxial speaker has a 1-inch compression driver and a 90 conical dispersion pattern. Other Radian speakers featuring the 5208B include the trapezoidal RCX-108P-V for fixed installations and the RPX-108P-V with stand mount and handle for portable use. All three cabinets are constructed from 13-ply, exterior grade Baltic birch, and feature a metal grille, parallel Neutrik Speakon™ connectors and a three-year warranty. The RPX-108P is $795.

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ARX ZR350 POWER AMP

ARX Systems (Victoria, Australia) debuts the dual-channel ZR350 power amp. Featuring new-generation lateral MOSFET output devices and a toroidal-transformer-based, non-switching power supply, the ZR350 is rated at 100 W/ch into 8 ohms and 150 W/ch into 4 ohms. Headroom Enhance circuitry provides maximum power levels under all conditions and eliminates clipping, and modular architecture allows for the addition of integrated signal processing modules. Inputs are XLR and ¼-inch; outputs are Neutrik Speakon™.

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EV SX80 TWO-WAY SPEAKER

Electro-Voice (Buchanan, MI) intros the rugged, portable Sx80 two-way loudspeaker system as part of the expanding System 2000™ product line. The lightweight (16 lbs.), compact high-impact polystyrene enclosure measures 15.75x11.5x8.75 inches (HxWxD) and contains an 8-inch woofer and a DH2005 high-frequency compression driver on a 60°x90° constant directivity horn. Frequency response is 70-20k Hz; power handling capacity is 175 watts. Available in various models for portable P.A. and installation applications, the Sx80 is compatible with the Omni-Mount™ System 75, and an optional stand mount kit is available. Price: $265.

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CELESTION ADDS MID/HIGH SYSTEM

Celestion (distributed by Group One, Farmingdale, NY) adds a new mid/high enclosure to the company's CX Series of installation systems. Featuring two 10-inch Celestion bass/mid drivers and a 2-inch exit compression driver with a 60 x40 rotatable horn, the CX1022HP is designed for two-way active use and has a frequency response of 120-20k Hz. The 39x14x14-inch (HxWxD) cabinet can be used horizontally or vertically and may also be flown using 12 M10 flypoints. Weight is 84 lbs., and price is $2,000. Celestion also intros the SubStation, a compact subwoofer with a frequency response of 38-250 Hz.

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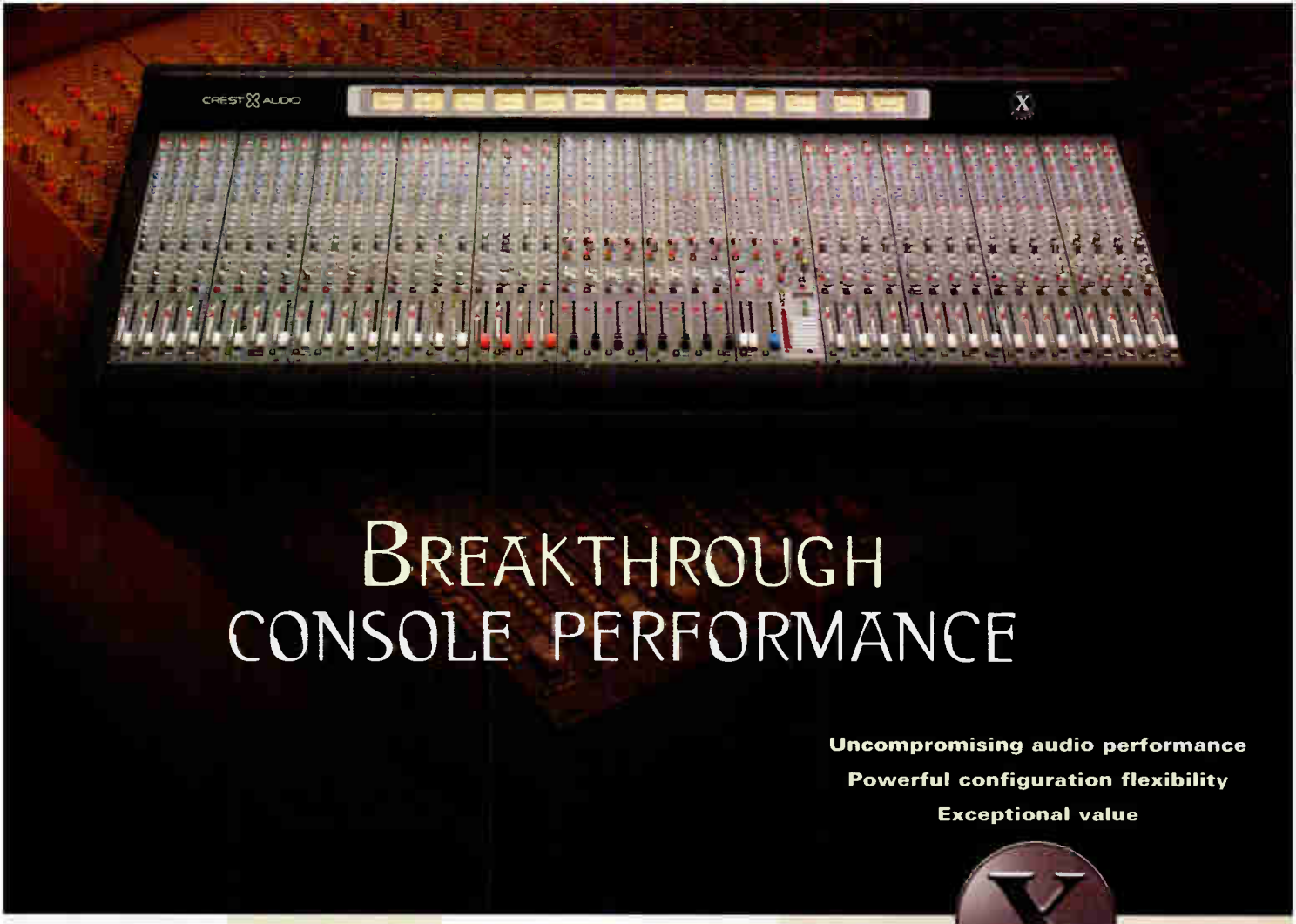

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BY BLAIR JACKSON

RECORDING NOTES

PHOTO VALERIE PHILLIPS

Colin Moulding (L) and Andy Partridge

XTC'S LONG ROAD TO "APPLE VENUS"

by Blair Jackson

"Quirky." The word invariably pops up in every story written about the venerable British art-pop group XTC, so it's best to get it out of the way right off the top. And they are a quirky band, though as co-founder, de facto leader and self-proclaimed "benign dictator" Andy Partridge notes, "At the moment, we're not so much a band as a brand. I mean, now it's just the two writers—myself and Colin [Moulding]—left. But we carry on, and I think to most people it's still XTC."

Though XTC has occasionally flirted with the pop music mainstream and has had a few marginal radio hits, they have mostly survived thanks to a dedicated and still-growing cult following that has embraced Partridge's and Moulding's constant musical shape-shifting. XTC's musical eclecticism has taken them from edgy, new-wavish rock to brilliantly arranged Beatlesesque confections, folk-inspired musings, sly "garden party psychedelia" (as Partridge calls it) and, on their new CD, *Apple Venus Volume One*, sweeping orchestral-based tunes. Over the course of a dozen or so albums, they have crafted songs about the sacred and the hopelessly mundane, with lots of insight and nonsense in between, and they've done it with humor and passion. Partridge, in particular, is capable of being both cynical and wide-eyed almost in the same breath, just as his music moves easily and unpredictably from the most tuneful melodies imaginable to surprisingly dark dissonance. Yes, quirky—but lovably so.

The '90s have been a strange time for XTC. Besides *Apple Venus*, which was released last month, the group's only other effort this decade was 1992's typically eclectic *Nonsuch*, produced by Gus Dudgeon, who was reportedly fired from the

—CONTINUED ON PAGE 167

WENDY CARLOS

A SYNTH MASTER RETURNS

by Bryan Reesman

In the ever-growing world of electronic music, veteran synthesist and composer Wendy Carlos has achieved greater glory than most. Although newer techno-buffs may not know her name, many are indebted to her. In the '60s and into the '70s, Carlos gave the notion of music performed on a synthesizer popular appeal through her Baroque albums, *Switched-On Bach*, *The Well-Tempered Synthesizer* and *Switched-On Brandenburgs*. She created one of the first ambient records (the double-LP *Sonic Seasonings*) years before the genre was supposedly christened by Brian Eno. She also composed one of the first major electronic film scores, for Stanley Kubrick's *A Clockwork Orange*.

PHOTO: ANNEMARIE FRANKLIN

Excluding the *Switched-On Bach* 25th anniversary tribute in 1992 and her *Peter & The Wolf* album with Weird Al Yankovic, Carlos' last release of all new material was *Beauty in the Beast* in 1986. Now she has broken that long silence with the dramatic new *Tales of Heaven and Hell*. It's an epic record that nicely blurs the distinctions between ambient, orchestral and gothic sensibilities and that, as the title implies, balances light and dark musical motifs. It even contains an ominous-sounding "sequel" to the *Clockwork Orange* score. She says that "Clockwork Black" is a further examination of how our society has gradually become more like the violent and

—CONTINUED ON PAGE 174

THE TRACTORS

A FRESH BREEZE FROM TULSA

by Robyn Flans

In 1994, The Tractors seemed to defy the laws of Nashville. Bands were not traditionally big sellers, these guys weren't hunkish in the least, they didn't live in town, they produced their record themselves and didn't hire session cats to play on it. But they still managed to take the country music world by storm. Their self-titled first album, powered by the hit "Baby Likes to Rock It," became the fastest-selling debut by a group to go Platinum. Ultimately, it sold over 2 million copies and became the top-selling debut country album of the year. After riding that album for two years—much longer than the average country act—The Tractors began their new project in 1996. Two years later, they emerged with *Farmers in a Changing World*, an appropriate title for a band that is using the technology of the '90s to craft an aesthetic rooted in the early '30s.

PHOTO: SEÑOR MCGUIRE

L to R: Jamie Oldaker, Casey VanBeek, Ron Getman, Walt Richmond and Steve Ripley

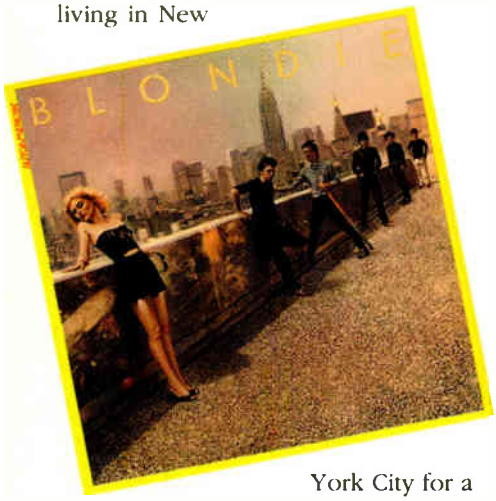
"I'm not just fascinated, but *obsessed*, with the idea of first takes, and I use everything I can find that allows me to get closer to first takes and the energy and life that I think was in Chuck Berry records," explains The Tractors' leader, guitarist and engineer, Steve Ripley. "In Hank Williams' and Chuck Berry's days, they didn't have any time or very many microphones, and it was

—CONTINUED ON PAGE 175

BLONDIE'S "THE TIDE IS HIGH"

by Barbara Schultz

In 1984, in the liner notes on the band's first album, the members of Camper Van Beethoven wrote about their small-town roots, complaining about growing up in provincial Redlands, Calif., where people "thought Blondie was punk." By that time, Blondie had long been part of mainstream music, and their "punk" sound had been successfully meshed with new wave, disco, reggae, rap, etc. to create some of the most popular songs of the late '70s and early '80s. But Blondie was pretty punk when they first started performing and recording in New York's fertile underground scene in the mid-'70s. Their early songs were raw edged, urban and fairly daring because of the tough sensuality Debbie Harry brought to each performance. And, no matter what other sounds they incorporated, the band never abandoned that attitude; it became Blondie's combination of pop and punk that brought them the greatest chart success of any of those CBGB bands.



Debbie Harry had been living in New York City for a while by the time Blondie formed in the mid-'70s. She'd been a singer in other groups and, yes, she'd been a Playboy Bunny. When she met guitarist/songwriter Chris Stein, she was a member of an all-female group called The Stilettos. Harry and Stein became fast friends and decided to form their own group, recruiting bassist Fred "Sonic" Smith, drummer Billy O'Connor, guitarist Ivan Kral and, later, keyboardist Jimmy Destri. The band's first year-and-a-half saw numerous personnel changes, as did many bands on the scene at that time. Kral left to join the Patti Smith Group. O'Connor, who went off to law school, was replaced by ex-Sweet Revenge drummer Clem Burke. Gary Valentine joined Blondie when Smith went over to Television. In '77, after the group's eponymous first album was released on the indie label Private Stock, Valentine left and was replaced by Frank Infante, formerly of World War II. Not long after that, the band struck its major-label deal. Chrysalis bought out Blondie's contract and all of their previously recorded material. Before long, Infante was moved to rhythm guitar, and Nigel Harrison became the new bass player. But this all came before producer Mike Chapman helped turn the group into rock stars.

PHOTO: ©CHARLYN ZLOTNIK/MICHAEL OCHS ARCHIVES/VENICE, CA

Blondie's Chris Stein and Debbie Harry, circa 1980

In the Blondie episode of VH1's series *Behind the Music*, Destri said that when the band met Chapman, he told the group in so many words that with him they would make a hit record, and they did. Blondie's first collaboration with Chapman, *Parallel Lines*, is a new-wave classic (oxymoronic as that may sound). Well-crafted songs like "Dreaming," "Hanging on the Telephone" and, of course, "One Way or Another" showed the more polished and layered guitar and vocal sounds that Chapman helped forge. This record also included the hit "Heart of Glass," which Chapman has said actually was conceived as a slower, reggae-style song; on the VH1 show, Chapman said that it was his suggestion they switch to that faster, percolating disco beat.

Chapman also produced the band's next effort, *Eat to the Beat*, which was less commercially successful than *Parallel Lines* but contained very strong songs, including "The Hardest Part" and "Atomic." Which brings the band up to 1980, when they traveled with Chapman to United Western Studios in L.A. to record their fifth album, *Autoamerican*, the record that includes Blondie's version of The Paragons' song "The Tide Is High."

Though the band had been to L.A. before, their prolonged stay for these sessions apparently made at least one band member feel like a stranger in a strange land. Chris Stein wrote about it in an article that was published in the Blondie Fan Club newsletter after the album was released: "Los Angeles, the city of lost angels, and angles. Dreamland. And, of course, Hollywood. L.A.'s not really a tough town. It has a strange feeling of fragility. Earthquakes on the brain may be part of the reason why the surface always seems about to crack with delicate tension. The fires burn the hills. The Strip still throbs dull reds and pinks, and the lights of the Valley still look beautiful in the hot, dusty nights... Every day we get up, stagger into the blinding sun, drive past a huge Moonmobile from some ancient sci-fi movie that lies rotting by the side of the road and into L.A. proper. The Strip. The sessions get under way..."

The engineer on the sessions was a young woman named Lenise Bent. Previously, Bent had attended Soundmasters Recording School and then had been an assistant engineer at The Village Recorder. There she had contributed to

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Platinum albums by Steely Dan (*Aja*, assisting Roger Nichols) and Supertramp (*Breakfast in America*, assisting Pete Henderson). She'd heard through the grapevine that Chapman was looking for an engineer and that he had a sort of Svengali-like idea that he'd like to school the industry's first female Platinum producer. She got the position.

After rehearsals were finished, Bent began by bringing drummer Clem Burke in to start getting sounds in the large, live room at United Western, which was equipped with a Harrison 4032 console and UREI 815 monitors. That studio, now part of Ocean Way Hollywood, was well-known as the room where the Beach Boys had recorded "Good Vibrations," among other hits. (Side note: Bent is a second cousin of the Wilsons and says she felt a warm sort of family connection working in that studio.) The rest of the tracking process was run by Chapman, a supremely organized producer.

"Mike had these charts for every song," Bent recalls, "breaking them down into different instrumentation and the different parts that had to be done: drums, bass, rhythm guitar, lead vocal, backing vocals, overdubs. Each song had its own section, and as they were completed, he checked them off. They'd done a lot of pre-production, too, and everybody was pretty prepared by the

Cool Spins

The Mix Staff Pick Their Current Favorites

Rolling Stones: *No Security* (Virgin)

Why give ink to a megaband like the Stones when there are a zillion lesser-known groups worth writing about? Be-

cause no one takes Stones live albums seriously, and this one really is worth picking up. On the surface, it seems like this CD shouldn't work—where are the big hits, the knock-'em-dead show stoppers? Been there, done that. What we have here is a selection of wonderfully performed, mostly second-tier Stones songs that we haven't heard them play a million times: "The Last Time," "Gimme Shelter," "Live With Me," the haunting "Sister Morphine," the little-heard "Memory Motel" (how many of you still own *Black & Blue*?), "Respectable" (from *Some Girls*), "Waiting on a Friend" (with Josh Redman on sax), and a handful of '90s tunes, all of which are surprisingly good. Taj Mahal and Dave Matthews appear on one track each, but it's Mick, Keith, Woody and the still incredible Charlie Watts who rule this roost. Every time I get cynical about the Stones Machine, listening to them play is all it takes to remind me how great they still are.

Producers: Mick Jagger and Keith Richards. Engineer: Ed Cherney. Live Recordings: Remote Recording Services; Eurosound; Hilton Sound/Dreamhire; Effanel Music. Additional Engineers: Dave Hewitt, Ulli Poesselt, Peter Brandt, John Harris. Mastering: Tony Cousins/Metropolis Mastering (London). —*Blair Jackson*

Hugh Cornwell: *Black Hair, Black Eyes, Black Suit* (Velvel)

It was more than 20 years ago that Cornwell's former band, The Stranglers, first burst onto the British music scene with their darkly compelling rock that was at once reminiscent of The Doors and clearly part of what would become known as

the New Wave. The band managed to stay together up until 1990. Along the way they built a sizable following and had a whopping 30 chart hits in England. This is Cornwell's second solo outing. Although it doesn't exactly break new musical ground, it's a powerful work through and through.

—CONTINUED ON PAGE 180

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time they got into the studio. Magical things did happen; there was room for those spontaneous-combustion kinds of things, but the preparation helped because you didn't have to think about the basics."

Part of the pre-production for "The Tide Is High" included listening to a cassette of the original version, for reference and for inspiration. The Paragons' song, written by John Holt, is a straight reggae tune, with its syncopated, persistent groove and soulful harmonies. To make it their own, Blondie added a horn section, strings and more percussion, not to mention Harry's lively singing. Basic band tracks and a working vocal were laid down before the horn, string and percussion players were brought in.

Bent says that she recorded most of the tracks on *Autoamerican* fairly dry, using mic placement and/or changing microphones to get different sounds. On this song, Harry's vocals were recorded with a Neumann U87, but Bent recalls using a U67 for a different effect on some of the other songs. Guitars and bass were taken direct and with AKG C-414s. On drums, Sennheiser MD-451s were used to close-mike the snare, more 451s for overheads, plus two Neumann KM84s right above the snare. "There was one overhead for that and one really high overhead," Bent recalls, "and underneath I think we used another KM84, but we used a lot of spill, too. We didn't use a lot of tight miking techniques. For the cymbals, I think we used 414s, because we wanted a brighter sound. It was a pretty bright kit, pretty new wave."

The horn and string sections were handled by veteran arranger Jimmy Haskell. Bent says she recorded each of these parts as sections, using more of the 414s, rather than miking individual instruments. "The horn section was like the A team of L.A., the guys from the Johnny Carson band," says Bent. "If I remember right, there were six of them and we doubled it. On strings, I think there were at least two violins, two violas and possibly a cello. The percussion was pretty much the last thing we did, because that was more like sweetening—fine-tuning and making it something uncommon or a little more interesting."

In his article, Stein wrote that the percussion for "The Tide Is High" also includes "eight tracks of drum sticks tapping on a piano bench." He also recalls, "Chapman hunches over the console into the wee hours. People are pressed flat against the back wall by his playback volume. Gallons of Jose Cuervo Gold are consumed...Finally, the basic tracks wind down, and we move a block down the Strip to Studio B [*sic*, the studio is really Studio 3]. The move marks the Home Stretch; the vocals, overdubs and finally the orchestral horns and what have you. Here is Mike Chapman's little Magic Room. In days gone by, these burlap walls saw the likes of the Righteous Brothers, Jan & Dean, the Beach Boys...Now the control room is filled with a gigantic blue console that's hooked up to computers, satellites and atomic submarines off the coast of Maine. Here the songs get the 'chrome' put on."

Bent concurs about Chapman's playback levels: "The [UREI] Time Align speakers had these little red and green fuses and we blew boxes of them. I used to wear headphones, not plugged into anything." She also supports Stein's sci-fi view of some of the studio equipment: "Chapman had two of these EMT 250s [the first-ever digital reverb] that we used to call R2D2s. They belonged to Mike, so we had our special settings, Mike's signature settings that he liked to use. You could set the length of the decay and the size of the decay and the sound quality, and they had these knobs

that you could slide back and forth or up and down. They were these red, shiny things that were a foot-and-a-half tall in little carts." Bent also used the Aural Exciter on this record, as well as the preamps and EQ on the room's new Neve 8108 console with Necam automation. The tracks were mixed to Studer A80 2-track at 30 ips, with no Dolby, and she says that for most of the album, they were able to mix one song per day. "The Tide Is High," however, took double that time because of the layers that had to be dealt with. "We didn't use all 48 tracks on that Neve console," Bent says, "but I'm sure we came close."

The album *Autoamerican* went Platinum, rising to Number 7 in the United States and Number 3 on the UK charts. The song "The Tide Is High" became one of two Number One hits off the album; the other was the 11-minute "Rapture."

Bent remembers the sessions for *Autoamerican* as a time of great professional rewards but also of severe physical stress, because midway through the process she became very ill. She remembers that during this period, Debbie Harry was so kind as to cook her macrobiotic meals because she was having trouble digesting some foods. On the day the project was completed and handed off to Bernie Grundman to be mastered, she checked herself into a hospital to be treated for cancer.

For Bent, a period of recovery followed. She moved to the Caribbean, where she could focus on her own well-being. She didn't return to pro audio until 1986, a time, she discovered, of shrinking budgets and diminished returns in the music business. So she shifted gears and moved into post-production for TV and film. Today Bent does a lot of Foley recording for animation—mainly working out of L.A.'s Advantage Audio—and at press time, she was completing work on a Miramax film on its way to Sundance. She says she remains extremely proud of her work with Blondie and has great memories of "those really magic moments in the studio when you'd be covered with goose bumps because the music is so great."

A couple of albums and a good deal of touring later, Chris Stein was also diagnosed with a traumatic, long illness, during which his then-partner, Deborah Harry, set aside her career to be with him. Today, Stein is also healthy again, and 15 years after Blondie last worked together, a core lineup of Stein, Destri, Burke and Harry have just released another album called *No Exit*. ■

—FROM PAGE 160, XTC

project after he refused to let Partridge have significant input at the mixing stage. Then, long-festering disagreements between XTC and Virgin, the band's record label in England (they were on Geffen in the United States), exploded into open hostility, and they effectively went on strike for the next four years. They eventually extricated themselves from their deal and signed in America with the upstart indie TVT Records. In the meantime, Partridge and Moulding kept writing songs. Between them they penned 42 new tunes, 22 of which were intended for a double-CD release. Instead, Partridge and Moulding decided to put out two CDs: The just-released *Apple Venus Volume One* "is sort of acoustic-orchestral," Partridge says, "and Volume Two will be simpler electric, head-against-the-wall sort of stuff. You could see my head going in an orchestral way from some of the tracks on *Nonsuch*, like 'Rook,' 'Wrapped in Grey,' Colin's 'Bungalow' to some extent, even songs like 'Omnibus' or 'Humble Daisy.' They're not your standard rock 'n' roll instrumentations.

"When we finished *Nonsuch* I wanted to get more into the orchestral area, so I bought myself a [E-mu] Proteus and really fell in love with a lot of the sounds. I don't play keyboards, but I

love the inspiration of keyboards. They intimidate me terribly, and if I find a chord, it takes me half an hour to find out where I want to go next. I'm not the fastest kind of busker to sit up in a bar and play the piano! I have a tiny studio—12 by 8—and I couldn't cram anything like an orchestra in there, so this was the nearest I could get to it. And I started sketching out links and parts and pieces, anything that was inspirational, and eventually some songs came out of this, such as 'River Orchid' [opening track on *Apple Venus*]. That started as a wonderful little loop I came up with. I was literally dancing around the studio after I came up with that loop, making myself really sweaty, and I didn't want to turn the thing off; it was just lovely going around and around and around. There could be a million songs in that loop, and I wrote three to 'River of Orchids'—very simple nursery rhythm-type melodies, and wrestled them to the ground, made them fit each other. Then we got a 40-piece orchestra at Abbey Road to play it through."

That's the simple version of the story. In fact, recording *Apple Venus* was a long, drawn-out and occasionally traumatic affair. After a couple of weeks of programming sessions in the fall of 1997 at the Kent home studio of producer Haydn Bendall (BeBop Deluxe, Kate Bush, Elton John, Tina Turner, XTC's 1977 EP *3D*), work on the songs began in earnest at another home studio, this one in Sussex and belonging to Squeeze's Chris Difford. But Difford's studio wasn't ready to accommodate the group (which at this point still included guitarist Dave Gregory, a 19-year vet of XTC and the strongest player of the trio), and after a couple of weeks the sessions collapsed. The action began all over again at Chipping Camden Studios, in the rural Cotswolds region of southern England, in early 1998. This time things went considerably better, with engineer Barry Hammond working with Bendall and the group to put down basic tracks over the course of about six weeks.

"We did months and months of sketching and planning and cutting tracks and replacing them, but because there's so much orchestral material, most of the album was actually recorded in one day at Abbey Road with the orchestra," Partridge says. "Then we spent a couple of months editing and tweaking and nipping and tucking. Anything that you record with orchestras and you have a limited time, you just have to make it all with edits. We didn't used to edit. In fact, I was appalled when I heard other bands doing editing between takes. I thought, 'Jesus, they're cheating!' But you buy any classical album and you can bet your life that every few bars there's an edit. So we did a lot of work [in Pro Tools] back at Hayden's place, until he had to quit to work on other projects.

"The latter part of the album, which was the vocals mostly, along with some bass and acoustic guitar, was recorded in Colin's house," he continues. "We did it on a Mackie desk. We bought a really nice AKG valve mic, and we bought some really lovely valve [tube] compression and limiting made by Linncraft—the blue boxes—and we bought a Linncraft EQ, as well. So basically we got a lot of nuts-and-bolts, get-it-down stuff. And as part of making the album we also bought a secondhand 24-track Sony digital." Nick Davis was the principal engineer for the sessions at Moulding's house, and Davis mixed the CD at Rockfield Studios in Wales.

Somewhere in the swirl of making the record, Dave Gregory decided to

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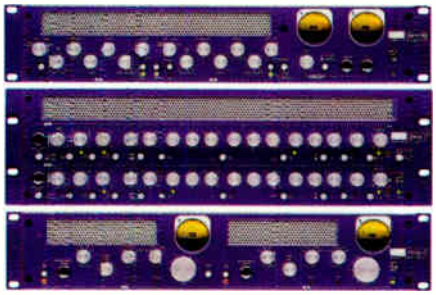

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quit the group, leaving Partridge and Moulding to complete the disc. Partridge, who wrote nine of the 11 tunes, thinks it's one of XTC's best and fully believes that with the strength of a new label behind them, *Apple Venus* could challenge *Skylarking* and *Oranges and Lemons* to become one of their best sellers. Over the years, XTC fans have given the group plenty of latitude musically, so what might seem like a bold stylistic departure to some bands is regarded as par for the course with Partridge and Moulding.

"We've never really fit in anywhere," Partridge says good-naturedly. "We were extremely lucky in the early days [mid-'70s]. The good thing about the punk thing is that the record companies panicked—afraid they were going to miss something—so they signed everything that moved and we got swept up in that. We were doing the same thing a couple of years before and no one would even look at us; they thought we were insane, playing our little three-minute songs—short, sharp, quirky pop songs. People just said, 'It's them!' and the dance halls would clear! Then, late in '76, record companies started to go crazy and sign up everything. Make no mistake, they didn't really care who we were. They were looking for tuna and we were a porpoise that got stuck in their net."

Through the years XTC has worked with a number of top producers and engineers, so I asked Partridge for some brief reflections on those relationships.

On John Leckie, who produced the first two XTC records, *White Music* (1978) and *Go 2* (1978): "We knew nothing about producers, and Virgin Records suggested John Leckie. He'd done BeBop Deluxe, whom we really liked. They were a classy, modern-sounding band. So we went in the studio and John was extremely amiable to work with, and he liked working with young bands—he liked the energy and naiveté of young groups. He was young, too. In fact, about halfway through the album he got drunk one night and confessed that this was the first album he'd ever produced; he'd only done individual tracks on records up till then. But he was good. Working with John Leckie was always immensely pleasant, just because of his personality."

On Hugh Padgham/Steve Lillywhite, the recording team on *Drums & Wires* (1979): "I felt what was lacking from what we recorded with John Leckie was this feeling that I liked from really

old rock 'n' roll records—primarily the sound of the slapback echo and the drums, which really exploded. I kept asking people, 'How did they get the sound of the drums on 'Jailhouse Rock?' or whatever, and they'd explain that the drums were recorded in a big room, lots of ambience and loads of compression to pump it all up. And I said, 'Who records drums like this? Let's do it!' Around this time I heard a Siouxsie & The Banshees record, and it had really noisy drums on it, a real '50s kind of sound. And it turns out it was done by Steve Lillywhite, and he came with Hugh Padgham as a team in those days. Hugh was interested in engineering and Steve was mostly interested in mixing, and between us we seemed to get it recorded, with Steve vibing everyone up: 'C'mon! That's great! One more take! One more take!' and Hugh getting these very polished but aggressive sounds. We worked in The Townhouse, which was a relatively new place then, and they had these very live rooms with stone walls and ceilings and the drums sounded really explosive in there. Hugh sort of perfected that sound, and then everyone wanted it—Peter Gabriel wanted it, Phil Collins. It became the sound of the early '80s. And a lot of it was Hugh working it out on us."

On Steve Nye, who produced *Mummer* (1982): "That's probably the least liked of all our albums. Steve Nye had done a few things we liked, such as Tin Drum, from Japan. He was an excellent engineer, but a little too exacting for me. And he had an incredibly grumpy manner which seemed to depress everyone in the studio. He should really learn to cheer up."

On Todd Rundgren, who produced and engineered *Skylarking* (1985): "I wish that Todd Rundgren were a less sarcastic and more amiable person, because some of his other skills are fantastic. I can't say highly enough what a brilliant job he did. Although, he should certainly work with an engineer, because I don't think his engineering skills are all that good. But his arranging skills are fantastic and very intuitive. He can come up with arrangements instantaneously and you think, 'Where the hell did that come from?' You can suggest something to him and then overnight he'll go and do it, whereas it might take you months to work something through. He can't deal with people, but he can deal with music and machines and computers. The two of us were butting horns constantly, but I think that's part

of his nature as a producer. Maybe he feels he has to break people to mold them to his decisions."

On Paul Fox and Ed Thacker, producer and engineer of *Oranges and Lemons* (1988): "They were different than all the rest. That album is like having your ears and eyes blitzed by fluorescent chromium or something. There's a lot going on in there. Paul never wanted to upset us. If we had any ideas, he'd say, 'Well, let's record it!' or 'Hmm. That might be a good idea, as well. Let's record that, too. You have another idea for a high-hat part? Let's give it a try!' So you might end up with three or four high-hat patterns, two basses. And though we always said we'd choose one, a lot of times we kept several! So there might be a bit much on there. But they both did a great job, and they were very conscientious and very easy to work with; very nice guys. Paul was possibly the most conscientious producer we ever had. He really *lived* every note. I'd like to work with them in the future; in fact, I've expressed that.

"Producers' personalities invariably color the music immensely. Todd's sense of order, his sense of arrangement and his rather shabby engineering attractively colored *Skylarking*. Paul Fox's extreme devotion to the project, his indecision about what we were recording and Ed's million-dollar engineering colored that project. So you get the input from the engineer. But input also comes from other sources, as well: You might have bought a new guitar the week before that you want to play. Anything can affect it. New boots. Tight trousers..."

With the first part of *Apple Venus* finally in stores, Partridge and Moulding are now turning their attention to *Volume Two*, which Partridge expects will be recorded at Moulding's house. "This time we're building a studio," he says. "We're sick of throwing vast amounts of money at studios, so we've decided to throw it at ourselves and we've taken over Colin's double-garage, which he doesn't use, and the adjoining building, and we're bashing it all into somewhere that we can record *Volume Two*."

XTC retired from the road many years ago, so don't hold your breath waiting for a grand promotional tour supporting *Apple Venus Volume One*. Instead, Partridge and Moulding will skip around the States, chatting up the disc to journalists and on radio. The new CD also coincides with the release of an XTC boxed set called *Transistor Blast* and an authorized book about the group by Neville Farmer called *XTC: Song Stories*. Partridge says that in preparation for the book, he listened to the band's entire catalog.

"It was very strange because it's nearly all stuff I haven't heard for ten or 15 years or more," he says. "Otherwise, the only time I hear my music is if I get so stupidly drunk I get through the embarrassment barrier—the vanity barrier, rather—and I put headphones on and lay on the floor and then I usually pass out after a quarter of an hour, so I don't get to hear much of it!

"To be honest, I'm not really interested in our old songs. I'm much more interested in the songs I'm working on at the moment and the ones I haven't written yet. Anything that's been done in the past—and this is me talking about my 'art,' with a capital 'F'—is dead and gone the minute it's been recorded. Then it's for other people to stumble upon and say, 'Hmm, I like that,' or 'No, don't like that one.' I'm always much more interested in finding new things."

Which has kept XTC a vital band for more than 20 years. ■

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making records. Then, everybody was playing together. Now, if you have everybody playing together, you have to go through getting the levels on 20 different microphones.

"On an old Elvis record, they might have had four or five mics," he continues, "but most of the sound and level came from Elvis' mic, and then Scotty Moore's amp for the guitar was five, ten feet away from that, so really, the sound of that record is that guitar coming through Elvis' big vocal mic. So the question is, how do you make a record that can be played alongside other modern records, and still have some of that stuff? For us, the method is to do things one at a time for the first take and the sound. Sometimes we're playing the whole thing together, too, but if we do that, it's for that sound and it still might be recorded with one or two microphones so you have that bleed in the room. On 'Tulsa Shuffle Revisited' on the first album, there were something like 14 people playing together at once—including four drummers, three guitar players, a harmonica player and a couple of B3 players—but I still recorded it with two microphones for the equivalent of one, but a stereo kind of recording of the whole room.

"The computerized hard disk recording has a cut-and-paste ability that appeals to me," Ripley continues. "What I love most about Pro Tools is cutting one guy at a time—the J.J. Cale school of recording, where things are put on one noise at a time, almost a sculpting process. Somebody's always got to start the tune, and in The Tractors' case, it's almost always me because I'm writing the song. So I'll sketch out the shape of the song with an acoustic guitar to a Roger Linn drum machine. It's a SMPTE-based thing, so there's a structure which you can move things around to, including Jamie [Oldaker] when he plays the real drums, because it's fixed with the right tempo and time structure. Almost always, we record to the Studer through the Neve [8078], and when we want to do some moving around, we put it into Pro Tools so it's still captured as analog.

"On a couple of these songs, I put up a fresh roll of tape striped with SMPTE, so I'm listening to the drum machine for tempo. I just had a basic idea of the song and didn't really know how the song was going to go, so I played a Martin guitar part and yelled and sang and counted through a Neumann mic. I played all the elements that might be a part of this song sever-

al times in no particular order until the tape ran off, so I ended up with a 14-minute guitar part. I got to go free-form and experience it like it was the first time I heard it, too, and I dumped that into Pro Tools and went back and cut them together, sort of finishing the writing of the song after I had played. You end up with energy and spirit and life, which is the opposite from the mathematical approach of when you know how the song goes and you're trying not to make a mistake."

PHOTO: WALT RICHMOND

Steve Ripley in his Tulsa studio.

Obviously this is not the typical Nashville recording method. But then again, they're not in Nashville. The Tractors all live in Oklahoma and record at Church Studio in Tulsa, a facility with a long history that links it to Ripley. It began with Ripley's discovery of Leon Russell:

"I was in college at Oklahoma State University, which was about an hour and a half away from Tulsa, when I saw a poster for a Leon Russell/Joe Cocker and Mad Dogs & Englishmen concert," Ripley recalls. "Anyone lucky enough to have been at that concert at the Brady Theater must remember it. It was right then that I discovered that Leon Russell was from Tulsa. Imagine the impact of finding out a hero is one of your own, so to speak. It was a big night."

He had no way of knowing how intertwined his life would become with Russell's. In the early '70s, Russell opened Shelter Records along with a fine old studio built in a converted church in Tulsa. Just as the tapes Ripley had made on his 8-track Ampex one-inch machine in Stillwater attracted attention at the label, Shelter closed its doors. But it wasn't the end of contact with Russell. After a brief attempt at songwriting with his wife in Nashville, Ripley moved back to Oklahoma in 1976 and took a job as Russell's monitor mixer.

"That's the most thankless job in the universe," Ripley says. "The monitors were never right. It was a huge band. Gary Busey was playing drums with two other drummers, there were background singers and a stage full of people, which is really great, but we had a cheesy P.A. system that I had to make work. Leon actually threw an SM57 at me one night from across the stage during a show because he was angry at me for something that wasn't my fault. I can see him now, waving the

background singers, who were between me and him, out of the way, so he could throw that SM57. It was just like a cartoon. I was shocked as it came right at my head, but the cord ran out like the dog on the chain, and it fell down on my monitor mixer about two feet from my face. Then I remember one night as we were packing up, he was walking down below the stage to the bus. We still hadn't really met yet, and he looked up and said, 'You'll get it right someday, Mickey Monitor.'"

Eventually Russell came to appreciate Ripley's talents, and when Shelter moved to L.A., Ripley was brought out to work as Russell's recording engineer. The experience was invaluable. "The greatest moments were while I was placing mics with my head up under the lid of the Steinway that Leon was playing," Ripley says. "Going back to the control room to try to get that on tape was always my goal. I loved that natural left to right, low to high stereo spread where the piano was centered and the drums spread out left to right—mostly from just direct overheads so you also hear just the way the drummer is sitting at his drum throne—and a Leslie on a B3, miked from different sides."

As a sideline during his tenure working with Russell, Ripley invented a unique 6-channel guitar. When the momentum of Russell's career stopped due to the pianist's financially complicated divorce, Ripley switched gears and became a full-time luthier. He made guitars for such virtuosos as J.J. Cale, Steve Lukather and Eddie Van Halen. "I don't regret the time I spent doing that because it was the best excuse to meet my guitar heroes," Ripley says with a laugh.

Then one day, out of nowhere, Ripley's friend (now a successful country video director) Sherman Halsey was listening to one of the tapes Ripley had made and said, "I don't know, it sounds like The Tractors to me."

"I don't know where that came from, but it then became my goal to get back to Oklahoma to do this band called The Tractors," Ripley says. Over time he put together a group consisting of Walt Richmond, who had played keyboards for Bonnie Raitt and Rick Danko; guitarist Ron Getman, who had toured with Janis Ian and Leonard Cohen; bassist Casey VanBeek, who had worked with Linda Ronstadt; and Jamie Oldaker, who had provided the backbeat for Eric Clapton for many years. Then, lo and behold, Church Studio went up for sale. Ripley and the boys found themselves in the building that Ripley had once used to ride by just to see whose car was parked there.

They began the first Tractors record on an MCI 24-track and MCI J-600 console. As soon as they signed a record deal, though, they bought a Neve 8068 and a Studer multitrack that was refurbished by Fred Hill.

"The people we bought the studio from had put in a modern control room with angled walls and all that stuff," Ripley says. "We ripped that out and we found Leon's control room box sandwiched in between their two walls and we put the control room back to the way it used to be in the old church days, which is hardwood floors and brick walls with enough sound absorption stuff to suck out some of the noise. It's not a very proper control room. It's got lots of windows, and you can open them up if you want to let the air blow through. The control room is fairly good size, but Leon also added a tape room, which must have been a classroom in the old days. That's all one big room now, so it's pretty big and we have one of the Steinways in there, and the tape machines. It's big enough to put a drum kit up in it if you want, because it's all brick walls and windows and hardwood floors, so it's real live.

"The big room is the sanctuary, which is pretty much as Leon left it, although he deadened it up probably a little too much. We left the hardwood floors in the big room, and the vibe of it is astonishing."

Ripley spends an inordinate amount of time in the studio playing music, engineering and doing his own maintenance work. "When we need more mic cords, I tend to be the guy to solder them, so I might spend the day making mic cords or guitar cords, or hooking up the speaker wire or building a headphone system," he says. "We don't have a factory up the street, and we're poor boys, too. So we're not about to fly everything in that we need. Besides, it helps us to be more Tractor-ish and homegrown."

It's not surprising that Ripley is a fan of vintage gear, from Neumann mics to Pultecs. Ripley calls himself a Neumann 47 and 48 fanatic and notes, "Every time I see a great old picture of one of my favorite artists, they're singing through one of those two microphones. It's the Beatles mic, it's the Johnny Cash mic, it's the Frank Sinatra mic—it never got better than that. With three of those mics, we're able to put the background vocals on all at once, which is what we do together with Casey, Ron and Walt. So that all the jiving, laughing, joking, snorting and spittin' happens at one time. Then I have a selection of other tube Neumanns—54s, 64s and 86s. I do a lot of the acoustic guitar and dobros through those 54s and 56s.

"We use the Neve console, and those Neve preamps and EQs are really great," he continues. "I like three different preamps—a solid-state one made by GML, the Manley tube preamp, which I use quite a bit, and a D.W. Fearn, which is a great big tube preamp that's based on the old RCA design. I don't want to be such a tube fanatic that I go for tube even if it doesn't sound as good as solid state, just because it's tube. That's a silly position to be in. In terms of preamps, the Neves certainly sound great, and, of course, they're transistor and the GML is also. I have a few channels of API preamps and EQs, and I have about 30 or 40 channels of Telefunken tube preamps that are being refurbished.

"The creative process isn't just the three-minute song," Ripley says of his passion for the entire recording process. "It's literally making the cords you're going to use on the microphones and deciding what microphone and amp you're going to use. It's all part of the process down to that final moment where I have to turn it loose and send it off to the manufacturing process. Everything is part of the deal—how it's going to sound and what zone you're in when you're singing it. There's stuff in the air any given day. Ron played an old Gretsch lap steel—the precursor to steel guitars—which he had never played before. We plugged it into a random amp, turned it up real loud and he played the solo. We were thinking, 'That can't be it,' but he played great solo after great solo all day long and the next day, and eventually we went back to the first one, which happens over and over again. That's the screaming slide sort of solo on the first song on the album, 'I Wouldn't Tell You No Lie.'"

The album ends with "Foot Stomp Stompin'" and a full-circle moment: Leon Russell recording at Church Studio with Ripley and the group. Ripley says he just let the tape roll, a practice he learned from working with Russell and nearly being fired for forgetting a few times. "The only reason he was there playing that Steinway is because of the buddy thing," Ripley states. "He doesn't nor-

mally overdub or play old-fashioned acoustic piano anymore, but I set up the tape and got it ready, and he knew at some point he'd have to play or go home," Ripley laughs. "He had never heard the song before and he got it in the first take, and at the end, I didn't shut the tape off, and sure enough, he came through for me—he noodled around and sang, 'There's a Tractor tugging at my heart.' Then he says, 'What now, Steve?'" The perfect ending to a perfectly imperfect record. ■

—FROM PAGE 164, COOL SPINS

The tunes are mostly straight-ahead rock, with strong, tuneful hooks offsetting Comwell's typically dry, sung-spoken delivery. Of course, Comwell actually *can* sing, but often he prefers a sort of Lou Reed-like narrative voice, which he uses very effectively. The band sound is attractively retro, but producer Laurie Latham has done an excellent job of making a record that sounds modern, too. A nice find.

Producer/Engineer: Laurie Latham. Studios: Soundlab UK, Helicon, The Workhouse (all in England). Mastering: Tim Young and Crispin Murray/Metropolis Mastering (London).

—Blair Jackson

Miles Davis: *The Complete Bitches Brew Sessions (August 1969-February 1970)* (Columbia Legacy)

One of the most influential records of its day, *Bitches Brew* was Miles' great fusion of rock, funk and jazz ideas, blending electric and acoustic instruments on a series of mostly long, unpredictable open-ended tunes/jams. The jazz purists cried "sell-out," but rock fans bought it in huge numbers—it became Miles' best-selling effort. And in ts wake came the impressive fusion careers of some of the record's amazing lineup of players, including Joe Zawinul and Wayne Shorter (Weather Report), John McLaughlin and Billy Cobham (Mahavishnu Orchestra), Chick Corea and Lenny White (Return to Forever) and Bennie Maupin (Headhunters). Listening to it with late-'90s ears, it doesn't sound remotely commercial to me, but then the early '70s was a more adventurous time. This four-CD set presents the remastered original album, two of the standout cuts from *Big Fun*— the Indian-flavored "Lonely Fire" and David Crosby's haunting "Guinnevere"—and nine previously unreleased tracks, my favorites of which are Shorter's "Feio," Zawinul's epic ballad "Recollections," and Miles' "Yaphet." Certainly not for every taste, but the patient and adventurous listener will be rewarded.

Producer of original recordings: Teo Macero. Engineers: Frank Laico; Stan Tonkel. Studios: Columbia Studios B and E. Reissue produced by Bob Belden. Remix and Mastering engineer: Mark Wilder. *—Blair Jackson*

The Lapse: *Betrayal* (Gern Blandsten)

This smart, mercurial New York-based trio—Chris Leo, guitar and vocals; Toko Yasuda, bass and vocals; Dave Leto, visiting drummer—play an energetic "emo-core" dominated by Leo's and Yasuda's wordy, philosophical ravings, which are both personal and icily academic. The Lapse offers tight, angry grooves, then switches to damaged spoken-word set to music, then moves to purist-rock rave-ups, introspective slow-burners and even techno-pop. A nice balance is set up on the

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disc—Yasuda's pieces bring a warm and mysterious counterpoint to the fist-shaking/hand-wringing blasts from Leo. It's as if they took some of the best aspects of '80s' underground originators (Minutemen, Big Black, Sonic Youth, et al.), threw it all into a punk blender and shot it into the next century. Plus, how can you not love song titles like "This is Not the Pure Aesthetic" and "We Must Move Backwards to Progess"? It's righteous and ambitious enough that I didn't even mind being lectured.

Producers: The Lapse. Engineer: Nicholas Vemhes. Additional engineering: Alap Momim. Studio: The Rare Book Room. Mastering: Alan Douches/West WestSide.

—*Anne Eickelberg*

Badi Assad: *Chameleon* (i.e. Music)

Assad is talented Brazilian singer and nylon-string guitarist whose lovely album offers a panoply of airy styles and textures that range from jazzy, spare balladry in the tradition of fel-

low Brazilian Milton Nascimento, to what she terms a "Brazilian tango version" of George Harrison's "While My Guitar Gently Weeps" (which she dedicates to the late Michael Hedges). There are moody pieces that float along like a canoe on the Amazon and others that sound like deep soul explorations. Assad's often hypnotic vocals and fluid guitar work dominate the proceedings, but she also has help from a few well-known players, including guitarist Lee Ritenour, bassist Abe Laboriel,

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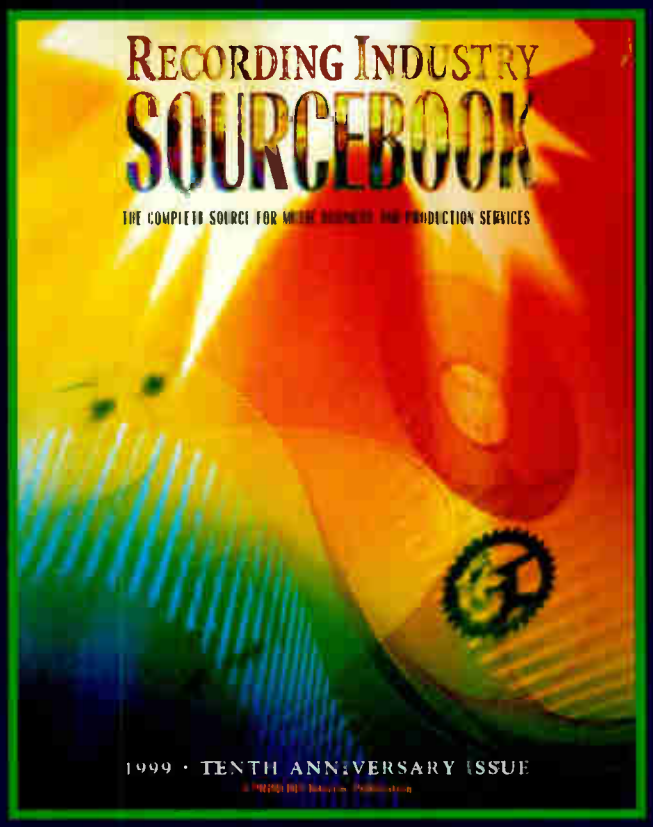

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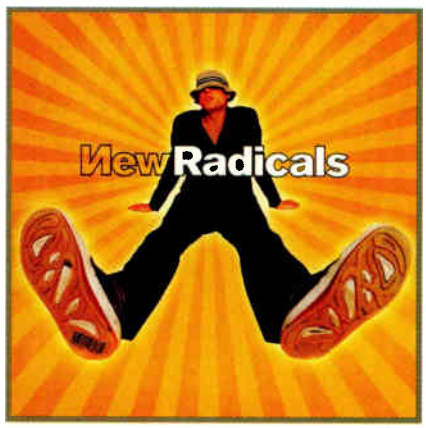
percussionist Alex Acuna and didgeridoo master Steven Kent. Jeff Scott Young is the other force here: He co-produced, co-arranged and co-wrote most of the record. Assad sounds more comfortable singing in Portugese than in English, but in either tongue she communicates a dreamy tranquility that is positively intoxicating.

Producers: Jeff Scott Young, Don Murray, Badi Assad. Engineer: Don Murray. Mixers: Don Murray, Jeff Scott Young, Michael Wagener (one cut). Tracking Studio: Starlight (L.A.). Mixing Studios: Sound Image (L.A.); O'Henry (L.A., one song); Wire World (Nashville, one song). Mastering: Bob Ludwig/Gateway Mastering (Portland, ME).

—Blair Jackson

New Radicals: *Maybe You've Been Brainwashed Too* (MCA)

The New Radicals' first CD on a major label is the effusive creation of writer/guitarist/singer Gregg Alexander. It offers a tight program of Alexander's catchy songs and clever lyrics, supported by equally slick producing and arranging skills. Backed by a small pool of steadily competent musicians (no two songs feature the same lineup), Alexander consistently draws sumptuous sounds from stock ingredients, eschewing instrumental virtuosity in favor of dense and detailed backgrounds. Alexander's voice is light and flexible, reminiscent of Prince, Todd Rundgren and Mick Jagger, and fans of powerpop artists Toy Matinee, Jellyfish and World Party will appreciate the frequent references to the post-Beatles production canon. Whether or not this release is a commercial success, Alexander is a talent to watch.



Produced and arranged by Gregg Alexander. Recording engineers: Bob Wartinbee, Bill Cooper, Andre Berryman, Michael James, Curt Kroeger, Michael Blum and Mike Bradford. Mixing engineers: Michael James, Bob Wartinbee, Michael Brauer, Andre Berryman, Curt Kroeger, Bill Cooper and Chris Lord-Alge. Recorded "All over the place." Mastering: Stephen Marcussen and Don Tyler/Precision Mastering (L.A.). *—Chris Michie*

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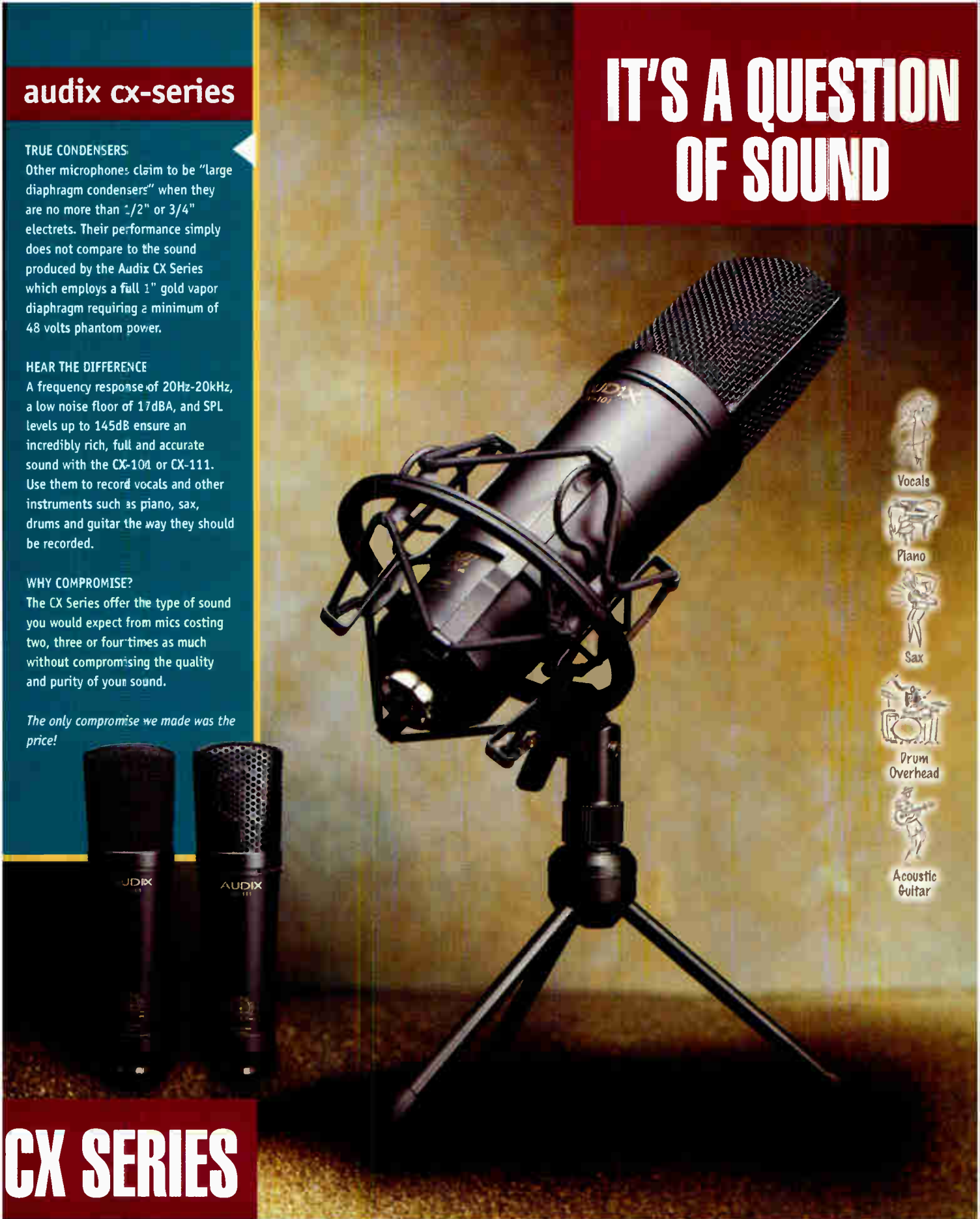

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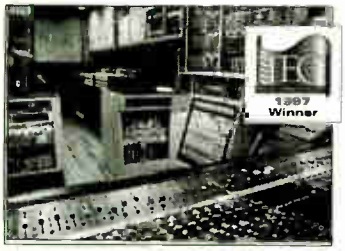

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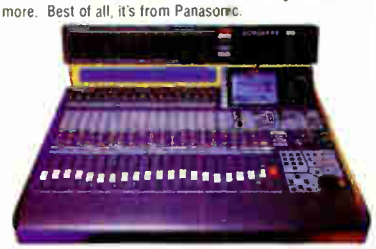

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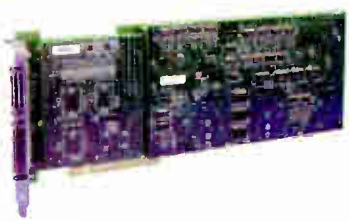

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  AES-8. 8 channels of AES/EBU digital I/O
  ADT-8. 8 channels of ADAT digital I/O and sync
  STC-1, Post option including read and write of LTC read and generate of VITC, Window-burn, House Sync and a General Purpose Interface for triggering external devices from the system.

EFFECTS PROCESSING

t.c. electronic
ULTIMATE SOUND MACHINES

New

Finalizer Express

The Finalizer Express is a fast and efficient way to turn your mix into a Professional Master! Based upon TC's Multi-Award winning Finalizer Mastering Technology, it delivers the finishing touches of clarity, warmth and punch to your mixes, putting the world of professional mastering within your reach.

FEATURES–

- 24-bit resolution A/D & D/A converters
- 16 & 20 bit dithering
- TC's unique Multiband Comp & Limiter Algorithms
- Boost and cut over three bands with the Spectral Balance Controls
- Soft Clipping and Look Ahead Delay.
- Finalize Matrix for 25 variations in style and rate
- Optimize overall level with the Automatic Make-Up Gain
- Extra compression in each band using Emphasis keys.
- Record fades from the built-in Digital Fader or the optional TC Master Fader via MIDI.
- Connections include AES/EBU, S/PDIF, Optical Toslink & MIDI I/O's.
- High Res LED Metering of I/O & multi-band gain reduction

M3000 Professional Reverb

New

Incorporating TC Electronic's new VSS-3 technology, the M3000 is a great sounding, versatile reverb that is easy to use. Combining ultimate control of early reflections with a transparent reverb tail, the art of reverberation is brought to a new level. Whether it's a phone booth, cave or concert hall, the M3000 delivers high-quality ambience.

FEATURES–

- VSS-3, VSS-3 Gate, C.O.R.E. & REV-3 reverbs as well as Delay, Pitch, EQ, Chorus, Flanger, Tremolo, Phaser, Expander/Gate, Compressor and De-Esser
- 300 high-grade factory presets including Halls, Rooms, Plates, Ambience, Gated Reverbs, and more
- Up to 300 user presets in internal RAM and 300 more using an optional PCMCIA card
- Dual engine configuration featuring 24-bit A/D/A's.
- Connections include AES/EBU, Coaxial S/PDIF, Optical Tos-Link/ADAT & analog XLR I/Os, MIDI IN/OUT/THRU, Clock Sync and External Control.

Lexicon 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–

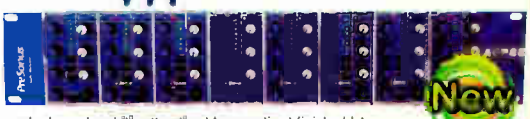
- Intuitive user interface for easy editing, built-in help.
- Balanced Analog I/O (1/4" & XLR)
- 56 effect algorithms
- Digital Inputs & Outputs (S/PDIF @ 44.1KHz)
- 18 Bit A/D; 20 Bit D/A Conversion, 32-bit processing
- >90dB of Dynamic Range
- Intelligent Sorting by Name, Number, Application, etc.
- 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 ROM.
- 2x MIDI In/Out/Thru ports for 32 MIDI channels
- Stereo digital I/O and up to 16 analog outputs.
- 2x SCSI ports standard
- Wordclock connection
- Optional ADAT interface provides 16 digital outs
- .WAV files as native sample format

S6000 ONLY FEATURES–
- Removable front panel display
- User Keys
- Audio inputs on both the front and rear panel allow you to wire the S6000 directly into a patchbay from the back and override this connection simply by plugging into the front.

E-MU

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
- Magnetic shielding for close use to video monitors
- Hard-wired, low-loss crossover
- Wide, flat frequency response
- Gold plated 5-way binding post connectors

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—FROM PAGE 24, MOSTLY DATA

ogy to play all those '50s and '60 tunes that I like on long plane trips.

I bought an original Sony cassette Walkman when it came out. It was obscene. More metal, more machining, more leading-edge micro-technology than any single piece of gear should ever have. It was the ultimate. It still works today, though it has not been out of the drawer in ten years. (I tested it specifically so I could tell you it worked.)

This is exactly like that was. Almost the same size. Way, way too much expensive metalwork. Way, way too much fun.

The compression that I found to be profoundly unbearable has been redone—and redone again. It is now, though still lossy, pretty impressive. It doesn't really sound worse than Dolby Digital—acceptable while we wait for further evolution, especially when you consider the fun factor.

I used to burn CDs for traveling, and to send home as dailies for artists who worked in my studio. While it's unrealistic (and probably basically wrong) to force all my clients to switch over to MD from CD, as a cassette-type personal toy, these things are amazing. You can name discs, name songs (up to about 1,700 characters total per disc), add and erase instant access markers at will, and *re-sequence on-the-fly*!

As I played with it, I began to realize that there were some things going on, good and bad.

THE GOOD, THE BAD AND THE UGLY

Bad first: Sony has a full-blown campaign to prevent owners from actually being able to see the wonderful displays they give you. They simply refuse to put back lights on this (and most other) gear. The competition has LED, electro-luminescent, incandescent, Indiglo, or even nuclear decay emitters, but not Sony.

Here's a strange one—or not, depending on who you are. To me, magneto-optical discs, like MiniDisc, are random-access computer media for storing digital data. So, when I went back to add a few tunes to a disc with 15 songs already on it and 13 minutes left, I expected it to append the new material, just like a hard drive or a floppy would...but, noooooo. It plopped the new material right in the middle of the disc, happily overwriting music and markers alike. So it is digital random-access media, with editable TOC and markers, but a *totally analog linear tape recording paradigm*! Damn. Overwrite without warning. To me, this is wrong, but to someone who is replacing a cassette deck, maybe it's right to write without a fight. Who knows what Sony had in mind when they made this decision.

Another strange thing: I enjoyed the little pocket recorder so much that I went out and got a big component one as well. Everything about it is different. The way it records, edits, cues and generally operates is totally different from its little portable brother. Why? Who knows, but it makes it pretty frustrating to own both. My favorite feature, on-the-fly marker moving, adding and erasing, is *totally missing* from the big unit! I called Sony and asked if the big unit was much older (as this seemed the most likely reason for these missing functions), but they told me it was in fact considerably newer, and that these functions were not deemed applicable to the component version (?).

One more: Entering text is, um, not fast. On the pocket unit, you spin a little wheel until you see the letter you want, and push to enter it. On the component unit, you must deal with an ABC layout IR remote. But Sony makes a great IR keyboard for Web TV for $49. Cool. Does it talk to the component MD? No.

Okay, now the good stuff: everything else. Optical digital in; auto start, pause and resume while digitally recording; 40 full seconds of skip buffer memory; random-access song selection about four times faster than CD; and on and on.

Why did I spend an entire column on the new gen of MD? Because it fascinates me that something once so ugly could come back so cool. This is a fun toy that costs very little (I bought one at Best Buy for $285) and works very well. I thought some of you might not have gotten any little tech toys for Christmas or the holiday of your choice, and you might just enjoy picking up something fun, useful and inexpensive enough to be guilt free.

Please note that the 50 will be replaced by the 55 by the time you read this. Sony had no clue at all what the changes might be. If the 55 has a light, I'll be pissed. ■

SSC wanted to use his bio space for this cosmic truth: Nothing ever happens if you don't show up.

COAST TO

Tony Merrill (L) and Stephen Paul

PHOTO MAUREEN DRONEY

L.A. GRAPEVINE

by Maureen Droney

With so many new mics on the market, it was time to drop in for a visit with that mythical, mystical and charismatic microphone maven Stephen Paul. I met with Paul and his longtime associate Tony Merrill in their Sherman Oaks atelier, where, on speaking with them, one is likely to imagine oneself in a turn-of-the-century Left Bank artist's loft. Paul, of course, is responsible for the modifications to Neumann and AKG microphones that discerning engineers and studio owners are willing to shell out big bucks for—the U87 modification in particular has become legendary, although mods are also available for the M49, M50, U47, U67 and KM series, and for the AKG C-12, M-251, C-12a, C-414 and C-452. Stephen Paul Audio, as its brochure tells us, was the creator of the world's first and only 0.4-micron capsule (that's the thickness of the wavelength of a single cycle of near ultraviolet light, the smallest wavelength in the visible spectrum) and was the first design firm in the world to engineer ultra-thin film, large diaphragm microphone capsules and the electronics to go with them. Paul's client list—it's a roster of the golden-eared—includes George Massenburg, Garth Brooks, Shawn Murphy, Babyface, Jon Gass, John Mellencamp, Barbra Streisand, Celine Dion, Amy Grant and Linda Ronstadt, among many, many others.

Upon my arrival Paul immediately checked out the mic on my Radio Shack recorder (the man can't help himself) before I got down to business and got myself into trouble by asking the question I've wondered about for some 15 years: "So, Stephen, what is it that you actually do here?"

The easy answer is that the company provides authorized service, sales and support for Neumann, AKG, Sanken and Milab mics, along with custom, high-performance engineering for AKG and Neumann microphone capsules. Beyond that,

—CONTINUED ON PAGE 196

NY METRO REPORT

by Gary Eskow

Ham Brosious is adding to his resume, although some would say that extending its formidable length is a tad superfluous. Brosious broke into the audio biz way-back-when as both a radio station manager and on-air talent. In 1961 he was recruited by the Scully Corporation and ended up as a vice president before leaving to start his own company, Audio Techniques, in the early 1970s. He sold Audio Techniques to Manny's Music in 1988, but by then he had already established Hamilton Brosius Associates, an equipment and facility brokerage company. In 1992 Brosius opened an office in Monroe, Conn.

For the last several years, Ham has been working with his son Matt on DigiBid, an online equipment auctioning Web site (www.digibid.com). I spoke with Ham and Matt about their site recently and was struck by their enthusiasm for the project and their obvious commitment to ethical business practices. (The latter can be scarce in the often depersonalized world of online commerce.) "Customer service is very, very important to us," says Ham. "We call each and every buyer after a sale to see how things are going. It's important to put the personal touch into Internet

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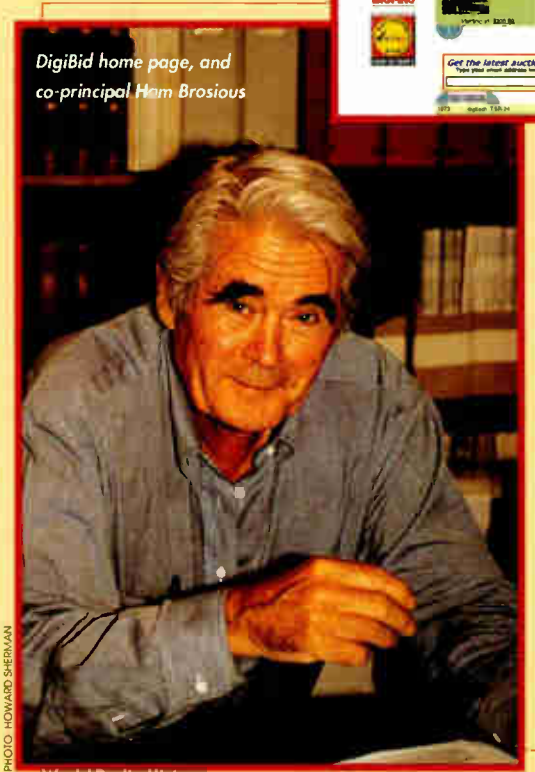

DigiBid home page, and co-principal Ham Brosious

PHOTO HOWARD SHERMAN

COAST

NASHVILLE SKYLINE

by Dan Daley

The consolidation that has been sweeping the recording studio industry has affected Nashville deeply, and a lot of space has been dedicated to such stories as the Emerald/Masterfonics and Seventeen Grand/Love Shack acquisitions. However, Nashville remains the most densely populated studio environment on the planet, and the stories aren't all occurring in the rarefied atmospheres of the upper-echelon facilities. A look in the trenches reveals Nashville to be a complex studio town, with many smaller facilities dealing with the same problems that the larger ones face. The scales are different, and the solutions are remarkably varied.

A good example is **Cumberland Recording, which owner Billy Anderson started 15 years ago** as a means to get away from touring as a musician. His single-room studio uses 16 tracks of ADAT, a 48-input Behringer Eurodesk console and rents for $25 per hour, mainly to songwriters doing demos—who remain the staple client of most of these kinds of owner operator studios. However, Anderson acknowledges that the personal studio phenomenon has affected that client base in Nashville, driving more people to record in their homes. His response has been to advertise his demo services in national songwriter magazines, soliciting guitar/vocal demos on cassette in the mail and returning fully produced versions for $150 per song, or $2,650 for a full album. "It's a niche market," Anderson says, "but there are so many small studios [in Nashville], and the technology is so affordable and available, if you just go for local business, it's too competitive." It's so competitive, actually, that despite Anderson's clever niche marketing, the studio remains his secondary source of income; he's also employed as a mastering engineer at Nashville's

—CONTINUED ON PAGE 199

California band Neve recorded their new Columbia release at NRG Recording Services (North Hollywood, Calif.) with producer Don Gilmore, engineer Daniel Mendez and assistants Michael Baskette and Evan Hollander. At the Neve 8068 in Studio A (L to R): bandmembers Brian Burnwell, Tommy Gruber, John Stephens, Mike Raphael and producer Gilmore.

SESSIONS & STUDIO NEWS

NORTHEAST

Dreamworks recording artists Ours recorded in Studio A and the Turtle Creek Barn at Bearsville Studios (Bearsville, NY) with producer Steve Lillywhite and engineer John Siket. The band overdubbed and edited using the Otari Radar II hard disk recorder...At Sony Music Studios (NYC), Atlantic artist Malik Pendleton mixed for his debut with engineer Angela Piva...Guitarist Ben Monder tracked for his new Arabesque Records release at New York City's East Side Sound

—CONTINUED ON PAGE 200

At The Village Recorder (West Los Angeles), Tom Petty recorded songs for a new album with The Heartbreakers in Studio A, while Sheryl Crow produced sessions for Stevie Nicks' next LP in Studio D. Joining the two during a break was Heartbreaker keyboardist Benmont Tench (L).

—FROM PAGE 194, L.A. GRAPEVINE

Paul, a musician for over 25 years (with a new CD titled *The Awakening* available this spring), probably knows as much about the history and manufacture of microphones as anyone in the world, and he obviously delights in sharing his knowledge.

"Microphones fall into two categories," he explains, "mics that are modifiable, and truly, truly sound better for the modification work, and mics that so far have defied modification because they require so much work to get them to do anything great, and this includes a lot of modern mics.

PHOTO: MAUREEN DRONEY

Chris Vrenna (L) and Mark Blasquez

"We've talked about building a microphone, and it's just a question of time at this point," he continues. "I watch the new plethora of microphones appearing out there, and I'm happy to say that I find when I talk to the owners of some of those companies that they do have copies of the three-part series I wrote for *Mix* handy in their drawers ["Vintage Microphones," October through December, 1989]. A lot of people have asked, since those articles appeared, 'Why did you give so much away?' but I think that I accomplished what I set out to do. I gave away a lot of the store, but it was a backlash against the secrecy of the past. I truly also wanted to share the knowledge to improve the general awareness of designers all over the world.

"I admit I've sometimes had mixed feelings, seeing all these 3-micron microphones come out, following on my work, but at the same time I realized that if you blaze a trail and nobody follows it you're not a pioneer, you're an eccentric! And most of the people who have been around long enough understand what really came out of here, out of those articles and out of the early work I did. Because, before that, they [meaning Neumann and AKG] had the music world in this grip of utter control that made people honestly think it was better to shove their mics in a closet somewhere and forget about them than to keep them functioning.

"Now those guys had something special, of course. Neumann, especially, was a real pioneering spirit. That's why today we see this enormous number of microphones coming out that are basically clones of a Neumann or an AKG—in Sony's case, they're cloning an 87 capsule, and they're also cloning one of their own capsules, the C37. They still don't understand, by the way, that, in my opinion anyway, a pentode is a questionable tube to use in a microphone. The only successful mic that had a pentode—wired as a triode, mind you—was a U47, but that's a very strange mic, made in a very strange time: 1949 in Berlin.

"These U47s have a resistor in them that is made of toaster wire wound on packing cardboard with German printing on it. There's newspaper over the packing cardboard, and that's the resistor that drops the voltage for the filament in the microphone. That's why it stays warm—they made the body of aluminum in order to act as a heat sink; actually, the whole bell of the mic is set up as a heat sink. They put a couple of pieces of mica in there to prevent shorting out and basically wired up a mic that would have given Underwriters Laboratory nightmares. U47s were known for the fact that if you're not careful when you take them off the stand, there's quite a whack left in those capacitors.

"Anyway, people had incredible microphones sitting in drawers because they refused to send them to the only place in the country that they were allowed to. Old-timers know the story—for years, if you wanted a Neumann fixed it went to only one place, and its serial number was checked to see if it had been brought in through the importer. If it hadn't come in through the importer, it cost you quite a bit of money to get the microphone "licensed" before they would even work on it.

"So I gave away the store, and what we did has now gone into the mainstream, in some ways, but still I believe our 3-micron modification will sound better than most of the 3-micron capsules out there. We have a little more edge because of our true understanding of how to design the capsule, and there are still a few things that we do that make it sound just a little bit better.

"And what we do is proven. You can't go to the AES show with a suit and tie, put a rep on the floor with a product, immediately sell your product and have it accepted. It must go through a trial by fire. There's going to be a time period where you have to prove that you are absolutely Everest for something to be a classic. And you either do it through the quality of the work or through the quality of the idea behind the work—or, ideally, you do it through both. In the old days alchemy was considered the perfect marriage of art and science, and in that sense I'd like to be able to say that that's what we do here—alchemy. It's truly not all about business here; in fact, it's not really about business at all! There are artists who have told me that singing into a mic of mine made them sound the way they always dreamed that they would—that's something that's priceless. We're lucky to have done something properly, and to have a lot of people who appreciate that fact."

Over at his Los Feliz home studio, artist/producer/drummer/programmer Chris Vrenna and his compadre, guitarist/producer Mark Blasquez, were working on Vrenna's solo project, titled

Tweaker, for Almo Sounds. The multiple-threat Vrenna, a longtime drummer and programmer for Nine Inch Nails who has also collaborated with Smashing Pumpkins, Marilyn Manson and Green Day, is a relative newcomer to Los Angeles. But being new in town hasn't kept him from working—this past year he produced Rasputina for Columbia, Underwater for Risk, programmed six songs for Hole's *Celebrity Skin*, and did additional production, performance and remixing for the upcoming release of the band Flood's album on Glen Ballard's Java/Capitol imprint. He also played drums for Seal, and, along with various other ongoing projects, is currently contributing programming, production and composition to Peter Himmelman's *Eyeball*.

Whew! Makes you wonder how he keeps all these roles and projects straight. A visit to Vrenna's domain indicates that he's a master of organizing chaos—his home and studio are both exceptionally neat and uncluttered (CDs alphabetized *and* chronological by band), and the studio is an example of logical, ergonomic design.

"I work on my project for a while, then take on other things," Vrenna explains. "Production and remixing are as important to me as my artist side. So, this was a *Tweaker* week, the last three weeks were Ebony Tay—that's a singer/songwriter on Chris Blackwell's new label, Palm Pictures, who I'm working with. We did most of that here, then went to a real studio to cut drums and mike guitars onto 24-track, which we then dumped to [Tascam] DA-88 that has timecode reference, brought back here and laid to Pro Tools through the [Yamaha] 02R, eight tracks at a time."

Asked to describe *Tweaker*, Vrenna laughs and says, "It's constantly changing and evolving, but it's primarily electronic noise. Instrumental audio is what I like—ambient electronic stuff, like the group Autchere. The sludgier and weirder the better, like one loop of something that goes on for nine minutes."

"The kind of stuff that truly enslaves your brain," Blasquez elaborates, "with subtle differences that only people who program and create loops and design sounds for a living would find fascinating. Meanwhile, anyone else who's unfortunate enough to be in the car listening with us will be saying, 'What is that? Just the same thing over and over,' and we're going, 'Listen to that little thing that comes in, check out that filter.'"

"For *Tweaker* I am doing a more structured, song-oriented format," continues Vrenna, "and getting the whole ball of wax over in four minutes. There are words, with guest vocalists, on about half the record—people I really respect who come from different genres, like King Buzzo of the Melvins, Craig Wedren from Shudder to Think and a rap track I can't talk about yet that's really cool. There's a producer named Tom Grimley who did That Dog, Beck and The Rentals that I brought in, and some of my other producer friends have also helped out."

Vrenna designed his studio himself, with help from Blasquez, whose background includes a long stint at the sorely missed Nadine's Music, as well as work for DigiTech. "Since it's usually just me and I don't ever want to move much," Vrenna notes, "I've arranged it so that I never leave the monitoring field. I can patch and go to outboard world, or synth world, and I just have to rock in the chair.

"I also tried to make just about any point in the room patchable—in and out of all the gear, all the inserts on the board, even the Pro Tools goes digital in and out of the 02R, and all the analog gear comes up on patches as well. So if you want something to just go to a stomp box, you don't have to go through setting up an aux send; you can patch it directly from the analog source. Having analog outs and mults were two of the smartest things we did. I use the mults for guitar a lot. I'm a big fan of direct guitar, and I like highly processed sounds, so we track through a mult—one side wet with whatever weird tone we're using, then one side goes bone dry into Pro Tools so I can repedal it or Amp Farm it. Sometimes I'll use an amp head with the line out, but I always have one side of dry signal that I can change or blend in later."

Vrenna's speakers of choice are Genelec 1029s, used with a subwoofer. "I work a lot with an engineer named Critter," he says, "who uses Genelec 1031s. They're my benchmark now, but far out of my budget and also too big for this room. To decide on speakers I rented a different set of active monitors every day for a week. I knew I wanted active—it's much cleaner and better without some big, gnarly amp being one more variable. Out of all the speakers I tested, the 1029s with the subwoofer were the closest to the 1031s."

Both Vrenna and Blasquez are big fans of the 02R console. "Functionally it's fantastic," Vrenna says, "and it doesn't add any sound of its own to whatever's going through it, which I like. A lot of times people choose a board because they want a certain color, but then a digital, clean board isn't what you'd want. The EQs, though, are a little soft—you've really got to crank them; you've got to go plus six before you hear anything."

"Plus when you do as many different things as Chris does," Blasquez adds, "with so many projects coming in and out, it really helps to have recall. Then, when the label calls you up two or three weeks after you've done the 'final' mix and says, 'That's almost it, but there's a new guy here now, and he wishes he could hear...'"

"Yeah, recalls," agrees Vrenna. "I have my little sheets of everything I'm working on, and I have my little scenes for every mix so I don't accidentally overwrite one, and I keep them forever. There's a hundred memories in the 02R, so I can have a hundred separate mixes. Another great thing, it chases timecode or beat clock. When it's in slave mode, going into the MIDI rig, you just hit the space bar to start the sequencer, which then spews MIDI timecode; so it's like the transport control for the whole room is the space bar."

Although he has Pro Tools 24, Vrenna operates mostly in the world of 16-bit, going digital out of the 02R straight to the DAT recorder. "For now I don't want to worry about dithering. We can fight about bits all day, but once I cram a signal through one of my filter boxes, the extra bits really don't matter to me."

A quick rundown of some of Vrenna's favorite gear: "a filter box made in Belgium called the Sherman—I read about it in a magazine. It's this crazy filter bank that you can run in parallel or in series. The input knob is hypersensitive, and all it wants to do is distort and make noise." The Mooger Fooger—Bob Moog is back in business with a stomp box containing a four-pole Minimoog filter: "Basically it's a lowpass filter. He's also got a box coming out this month that's a ring modulator, and I hear he's going to re-release the Minimoog, with the exact analog circuitry, only it will have MIDI." E-mu samplers: "I love E-mu. I have an E64, and one of my favorite things is the E-mu Audity—all strange sounds and cool drum banks and 300 arpeggio styles. It locks to MIDI, locks to anything, and it has all these knobs on front, so you can mutate sounds really fast. I'm a big fan of knobs, as opposed to 'shift, page, page, page, now, where is the function 2 soft key?' I hate that. I don't want to open a manual too much. I don't have time.

"The Quasi MIDI is really good; it's a weird German thing, and it has my favorite button, Random Sound—you hit it, and it scrambles everything in the unit and puts up whatever it scrambles. So when it's, 'Oh, I'm bored, I don't know, I want a new sound,' you just hit the Random button ten times, and six of the times you'll get the coolest sound you ever heard. I also like the TC FireworX—it's distortion, reverbs, delays, dynamics. You can dial in the tempo you want, and it runs like a Mac—super-easy to use. And let's see, the DigiTech valve guitar system is good; it's got solid-state distortion and a tube section also.

"I don't have mic preamps and compression, you'll notice," Vrenna continues. "I don't do a lot of open mic tracking, and when I do vocals, I just rent the really good stuff—like 20 grand worth of equipment for the day! You've got to do a lot of sessions before you can justify spending that kind of money. Everyone who has project studios can totally relate: 'Okay, I have $3,000 to spend; I could buy one Neve 1073 module, or I can buy three of the new synthesizers, an Eventide and a FireworX.' You've got to prioritize. Already, I think everything I've earned in the last 18 months is represented by a blinking light in this room!"

Although Vrenna generally uses a combination of his studio and commercial ones for a project, he's also been known to go for the "total immersion" approach. "I did Underwater's whole record in this house—they're a goth, trip-hop group from Atlanta. I produced and Critter mixed. I tore my bedroom apart to make a vocal booth and slept on the couch for a week. Mattresses and box springs make great baffling, by the way, I highly recommend it. Packing blankets over the windows, baffled with mattresses—it worked great. I didn't tell the two mastering engineers that I work with, Tom Baker and Steve Marcussen, that I did it here, and when I asked them how it sounded, they both said, 'Great, fine.' So, it's working out pretty good, I guess." ■

Fax your L.A. news to Los Angeles editor Maureen Droney at 818/346-3062 or e-mail msmdk@aol.com.

—FROM PAGE 194, NY METRO REPORT

commerce. We also work closely with sellers. We know what the market for used equipment is, and we tell them what we anticipate their selling price will be. We don't have reserves—that's a situation where there's a secret price that an auctioneer won't disclose. If a reserve is set high, a bidder can end up wasting a lot of time researching an item and putting forth a good faith effort, all for nothing."

It's very easy to navigate around DigiBid and purchase or sell gear. You sign on as a member at no cost, scroll through the offerings and log your bid. DigiBid notifies you whether or not your bid has been accepted. It's just as easy to sell gear. Sign on, offer your equipment, and see how it fares. All sales go through DigiBid, and the company retains 15% of the sale as its commission. The Brosiouses are making a concerted effort to see that all equipment is accurately represented by sellers. Matt Brosious says that at this time they're requesting that all equipment—especially the high-ticket items—be sent to them for evaluation before it's passed on to a buyer. "We have a shop in-house," Matt says, "and we put gear up on the bench and test it wherever possible. We counsel our sellers to be as accurate as possible with respect to wear and tear and so on, especially on those sales where items do not pass through us."

Both Ham and Matt insist that the buyer be happy. According to Ham, "We're a young business, a new type of business. We need to have satisfied customers, and it's very easy to lose customers on the Internet. If a buyer has a problem—if he or she believes that a seller has misrepresented the condition of an item—we'll make an adjustment for them cheerfully. Our position is that we need not be right! The customer is right!"

Matt comes to DigiBid with extensive Internet experience. "I had a career in the computer business for 20 years," he says, "and had an Internet consulting business outside the audio industry. I started one of the first professional audio Web sites, Soundwave.com, in 1994. It's since been renamed Proaudio.net, and I still operate it. Proaudio.net is probably the largest single membership Web site in the audio business, with over 30,000 members."

The DigiBid concept is simple. "Probably 100 to 150 people attend a live auction, on average," Ham says. "These are usually held in major markets, and the people there are pretty well up on the going prices for equipment. But outside these markets, thanks to DigiBid, people are suddenly having opportunities they've never had before to buy quality used equipment at fair prices. We've got over 2,500 DigiBid members at the present time, and we've only been online since June '98. We're now adding members at a rate of 500 per month. So far, we've sold over 1,650 items through DigiBid and have had only a handful of returns on our money-back guarantee plan. We interrogate the sellers to make sure there are no surprises with their equipment. We want to know serial numbers, how old it is, condition, and so on."

"DigiBid heads into this new year with a rapidly expanding vision," Matt adds. "Our growth plans include increasing our warehousing, distribution and testing facility in Maryland, which will triple in size in 1999. We're going to increase DigiBid's pro audio presence and will be adding post-production video and television equipment. We also will be entering the high-end musical instrument business, with items such as keyboards, synthesizers, etc. In fact, we're negotiating relationships right now with several major manufacturers to handle their B-stock—reconditioned gear, overstocked and discontinued models. Twenty-bit processors might soon be yesterday's standard in the U.S., but there will continue to be a huge market for this equipment in other parts of the world for a long time to come."

"Right now about 20 percent of our membership lives overseas," Matt continues. "We expect that percentage to increase and expect that by the end of 1999 we will have 10,000 members worldwide. To handle that explosive growth we will be adding technical, administrative and customer service personnel." ■

E-mail your New York news to New York editor Gary Eskow at scribeny@aol.com.

—FROM PAGE 195, NASHVILLE SKYLINE

NTD duplication/replication facility. "But there's lots of songwriters out there," he says, "and they do like to move around and try different studios to get different sounds, so while it's competitive, there's also lots of business to go after."

In suburban Mt. Juliet, The Blue Room owner Danny Jennings concurs that songwriter demo work remains the basis for smaller Nashville studios, and he concedes it's getting harder to make a living off it—driven, as it is, so much more by price than is artist demo work, for instance. The emphasis on speed in

songwriting demos has moved many studios, including ADAT/Soundcraft Ghost-equipped The Blue Room, to price themselves on a per-song basis, calling and paying the musicians themselves, with owners sometimes playing on demos as well as engineering and/or producing them. "Demo work is certainly harder to find than just a few years ago," Jennings says. "I have to focus more on people doing their first project—people who are just starting out and who aren't using their own equipment yet."

And though Jennings agrees that studios such as his are facing many of the same rate issues, he feels that since many small-studio owners went into studio ownership partly as a means to pursue their own musical ventures, he has perhaps more in common with upscale personal studios. Such studios have to constantly debate and fine-tune the balance between selling studio time and using it themselves. "This is a one-man operation, and I can probably continue to work as a studio, but I think I'll have to focus more on custom projects in the future, which is another way of saying, 'I want to become a producer,'" he says candidly. "You can book a 24-track studio out here for $15 per hour, so you can't compete on a dollar-per-track ratio. You have to come up with something else that blows people away, whether it's the sound or your production abilities."

Jennings and others also feel the same "arms race" effect—the need to lure clients with the latest gear—that has driven a few Nashville studios to and over the brink, and he shares their resentment. In the process, he points out that the magazines that serve the recording industry, including this one, often emphasize, as he puts it, "the latest and the greatest," over more affordable and traditional technologies. "The magazines seem to be driving the business in terms of technology," he says. "They can make it appear that if you don't have the latest and the greatest, you can't compete. That's a message that clients can get, too."

Many of Nashville's small and mid-tier facilities have been using local media to stimulate business, and ads in small music papers have been bringing indie gospel, CC and rock productions to **Fatback Recording and Music Productions**, but co-owner Chris Hugan says the studio is still getting more than half of its business from unsigned songwriters doing one-off demos. In a town like Nashville, the volume is there, particularly since major publishers have been paring rosters recently. But Hugan is aware that that type of demo is increasingly going into homes instead of studios. To counter that trend, he tries to work with songwriters to the point of advising them when it might make more sense for them to simply do piano/vocal demos to save money, but to do them on the 32-channel Soundtracs console in the studio to give them a quality edge.

In addition, the studio owns its building and leases half of it to an independent record company that has its own recording facility using Yamaha 02R consoles, allowing Fatback to offer its clients access to digital mixing and analog recording. He will also handle negotiations with musicians for sessions. But Hugan notes that every studio has to look for as many unique aspects as it can and then market them aggressively. "We have a great Hammond B-3, so sometimes people are just coming in to do organ overdubs," he says. "That's a kind of niche specialty, too."

While the mergers and acquisitions are getting much of the attention, Nashville's base remains rooted in the smaller studios that make up its mass. At a time when country music in particular and the music industry in general is consolidating, it's the resiliency of the troops in the trenches that will largely help determine what the future holds.

Send Nashville news to Dan Daley at danwriter@aol.com or fax 615/646-0102.

At engineer Bobby Brooks' Sherman Oaks, Calif., studio, Brooks (L) and producer Greg Ladanyi worked on the debut release for artist Jody Davidson. The studio is equipped with a custom SSL F Series console and Westlake Audio BBSM-10 monitors. For the sessions, Ladanyi also brought in his preferred monitors, BBSM-4s.

—FROM PAGE 195, SESSIONS & STUDIO NEWS

with engineer Leonardo Bella and assistant Gary Townsley...

SOUTHERN CALIFORNIA

In Studio B at **The Complex** (West L.A.), **Joni Mitchell** and **David Sanborn** taped an interview and performance for "Good Morning America"...At **Larrabee West** (West Hollywood), producers **Trackmasters** and engineer **Rob Chiarelli** mixed the song "Why Oh Why" for Red Ant Entertainment artist **Bobby C**...**Time Bomb** recording artists **Chlorine** tracked on the custom Neve 8028 in Studio A at **Sound City** (Van Nuys) with producer/engineer **Matt Hyde** and assistant **Mike Terry**...At **Tom Weir Recording** (North Hollywood), Geffen artists **Phantom Planet** recorded with producer/engineer Tom Weir...

NORTHWEST

Ryan Hadlock has been producing a CD with **Black Heart Procession** at **Bear Creek** in Seattle...At **Avast Studios**, also in Seattle, **Maktub** and **Easy Big** recorded with engineer **Kevin Suggs**, and **90 lb Wuss** worked with producer **Steve Kravac**. The studio recently added automation to its API Legacy console... Power popsters **100 Percent** worked on a new release at **Found Sound Studios** in San Francisco...Seattle's **Hanzsek Audio** hosted sessions for **Marygold**, then handled a massive amount of Muzak recording with engineer **Scott Ross**...In Studio D at **Music Annex** (Menlo Park, CA), **Natalie Mer-**

chant and her band performed a show that was broadcast the following day on San Francisco radio station KLLC ("Alice"). Tickets were sold by auction to a small in-studio audience, with all proceeds benefiting a local health organization. **Tom Carr** engineered the session, with **Christopher Scott** assisting...Producer/engineer **Scott Crane** of **Soundhouse** (Seattle) was solidly booked with **Bicycle**, who recorded direct to hard disk using the Pro Tools 24-bit system...**Tom Waits** tracked for his next Epitaph release in Studio A at San Francisco studio **Toast** with engineer **Jacquire King**. Also in was **Mary Chapin Carpenter**, tracking and mixing a new song with engineer **Nathaniel Kunkel** and assistant **Alex Osbourne**... At **Gravelvoice** (Seattle), **Solar Federation**, **First Hand** and **Climax Golden Twins** were all in, working on their respective CDs with producer **Scott Colburn**...**Crow Recordings** in Seattle recently purchased a ½-inch mixdown recorder for work on a jazz accordion CD by **Merle Sanders**, recorded by owner **John Nelson**...

NORTH CENTRAL

Big Fish Records artist **Silver** worked on his second sample and loop disc, *Titanium Rhythms II*, at **Immortal Productions** (Canal Fulton, OH). In tracking for their new album were **Nancy Boy Records** artists **MoJo Honey**. **Cal Moore** engineered on both projects...

SOUTHEAST

New LaFace recording artists **Pink** tracked vocals for their debut at **Doppler Studios** in Atlanta with producers **Raphael** and **Ralph Stacy**, engineer **John Frye** and assistant **Ralph Cacciurri**...At **Emerald Sound** (Nashville), **Matt King** tracked for Atlantic with producer **Billy Joe Walker** and engineer **Dave Thoener**, and **Susan Ashton** tracked for Capitol with producer **Emory Gordy** and engineers **Russ Martin** and **Rob MacMillan**. After recently acquiring Masterfonics, Emerald announced some personnel changes: **Graham Lewis** was hired as director of studio operations, **Milan Bogdan** was promoted to sales manager for Emerald Entertainment Group, and **Bob Guerra** was promoted to VP of marketing...**The Jungle Brothers** recorded for **Gee Street Records** with producer **Alex Gifford** and engineer **Andi Carr** at **Criteria Studios** (Miami). **Christine Tramontano** assisted...**Dolly's** sister **Stella Parton** mixed a forthcoming album of new songs at **Henderson Entertainment** (Spartanburg, SC) with engineer/owner **Barry B. Henderson**...Recently in at **Catalyst Recording** (Charlotte, NC): **Pavlov's Dog**, **Tucker's Fault** and **The Vox Pops**...

STUDIO NEWS

Bates Brothers Recording (Birmingham, AL) installed an SSL 6048 E/G (with G Plus center-section upgrade and Total Recall) in Studio A...Composer/producer **Stephen Bray** added an Otari Radar II hard disk multitrack to his **Saturn Sound Studios** (Studio City, CA)...**Wateree Studio** in Atlanta recently added an Ensoniq PARIS 24-bit digital workstation...**The Sound Kitchen** (Franklin, TN) recently opened its sixth and largest studio, the Big Boy. The 5,000-square-foot space (acoustically designed by **Chris Huston**) has 22-foot ceilings, seven iso booths and, in the control room, a 60-input Neve V3. The first master tracking session in the room was for Warner Bros. artist **Michael Peterson**, in with producer **Josh Leo** and engineers **Ben Fowler** and **Allen Ditto**. ■

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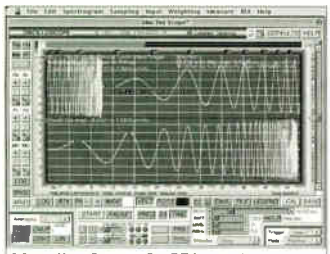

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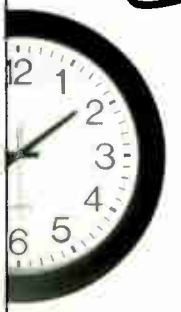

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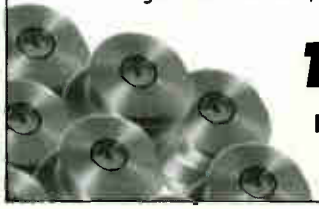

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—FROM PAGE 32, A LEGENDARY PLAYPEN

programmed things that I wanted to do. But because I wasn't very good, I had to simplify the programming. But then things came out that I never would have dreamed of by myself. So there's something to be said for not being a master of the technology."

Laurie Spiegel was another artist whose personal life was disrupted by Bell Labs. "I was going there all the time, and pretty soon a long-term relationship that I was in ended—he couldn't believe I was spending all those nights with a computer!" she said. A composer and instrument designer, Spiegel later developed the deceptively simple algorithmic program for personal computers—Music Mouse. Bell Labs gave her her first exposure to computers. "I had always loved art and science and was working a lot with Buchla synths when I met Manny [Ghent] and Max at a concert at The Kitchen," she said, referring to a well-known downtown New York spot for experimental music. The scientists invited her to come down to the labs and play at night. "I had no computer background at all, so I read a book on FORTRAN," she remembered. "I kept my sleeping bag in the lab's anechoic chamber—boy, was that a quiet place to sleep!"

Spiegel was intrigued by the real-time interactive aspects of the work. "You could hear interactively what you were doing for the first time, and get feedback," she said. "Max coined a term for it in 1973: 'intelligent instrument.' It meant that the response you got was not in one-on-one correspondence with the physical gesture you made." She also saw the Labs as an opportunity to experiment with "automating my own decision-making processes as an artist."

The process of composing with computers, she emphasized, although it was interactive, was not fast. "The computers allowed storage, editing and overdubbing of your performances, but all of these tasks were done in different rooms. The digital lab had a computer the size of four refrigerators, which had 32K of memory. The analog lab, where the synthesizer was, was 300 feet down the hall. There were 14 control lines, each for pitch, amplitude, etc., and you constantly had to retune and calibrate the equipment. So we did a lot of running around—we were all in good shape. Meanwhile, in between the labs, you had to pass by this incredible window that was showing evolving visual images. Finally, I got up the guts to talk to the programmer, Ken Knowlton, who was doing them. We ended up collaborating on some projects." She was also inspired to write control programs for video synthesizers.

And speaking of refrigerators, "We often worked in parkas," Spiegel recalled with a laugh. "The computers had trouble if the room temperature was above 50 degrees. Someone would come every hour and take the temperature."

Bell Labs was the site of some of the most important technological developments of the century.

Spiegel referred to the work going on at Bell Labs at that time as "a Rosetta Stone for connecting between different sensory modalities"—in other words, multimedia. And there was a communal aspect to the work that one sees infrequently today: "We were proud of each other's accomplishments, not threatened by them."

As Spivack said, "Algorithmic technology is dangerous to the idea of a sole artist working in solitude. Works that come out are not necessarily products of ego. It allows a collaboration, which is rare in our culture but common in many others."

Although AT&T supported all of the strange goings-on, their attitude was somewhat ambivalent. Spiegel said, "What we were doing wasn't really a 'proper' business for a monopoly, so we had to keep a lot of it hush-hush." Ken Knowlton, among whose contributions was a graphic language to describe motion on a computer screen, and the visualization of molecules and other sub-microscopic objects, recalled that "I did a computer-generated nude with artist Leon Harmon. The administration said that we shouldn't tell anyone where we did it—except when the *New York Times* published it, they told the *Times* to make sure the Lab got credit!"

After the breakup of AT&T in the early '80s, Bell Labs had to redefine itself more narrowly, and much of the "pure" research, and the open-ended collaborations with artists, ended. Bell Labs still exists (and, in fact, is probably larger than ever, comprising other research facilities all over the world), as part of Lucent Technologies, which before the breakup was essentially the Western Electric division of AT&T. It is still making contributions to the world of audio, most notably by developing codecs for squeezing high-quality audio into ever-smaller bandwidths. It's still a high-powered place: Recently, it announced that its scientists had achieved the first data transmission of 1 trillion bits per second.

And there are other research centers that still follow the Bell Labs model of putting artists and engineers in close quarters: IRCAM in Paris, MIT's Media Lab, CNMAT in Berkeley, and CCRMA in Stanford, to name a few. But, as Max Mathews said, "They no longer lead the technology. It's the companies that make the products that we use that are leading. I think that's good." But it follows a different model.

Lucent is very aware of its extraordinary heritage—the company was one of the sponsors of the meeting—and Dorée Seligmann, currently a researcher at the facility in multimedia communications, said she is doing what she can to recapture the spirit of those years by organizing collaborations between the Labs' researchers and artistic groups. "They told me when I came on board," she said wryly, "that I had missed the Golden Years. But I think there's a very important role for artists to play in development of technologies. They have to participate in the technical discussions. We have to always ask ourselves what technology is for, not just how to get the best bit or frame rate."

The answers, the methods and the players are different from what they used to be, but the need for people who can ask those questions doesn't change.

Paul D. Lehrman is editorial director of Mix Online (www.mixonline.com) and is slowly putting his whole life onto the World Wide Web. Take a look at his latest project at http://s2n.org/ballet.

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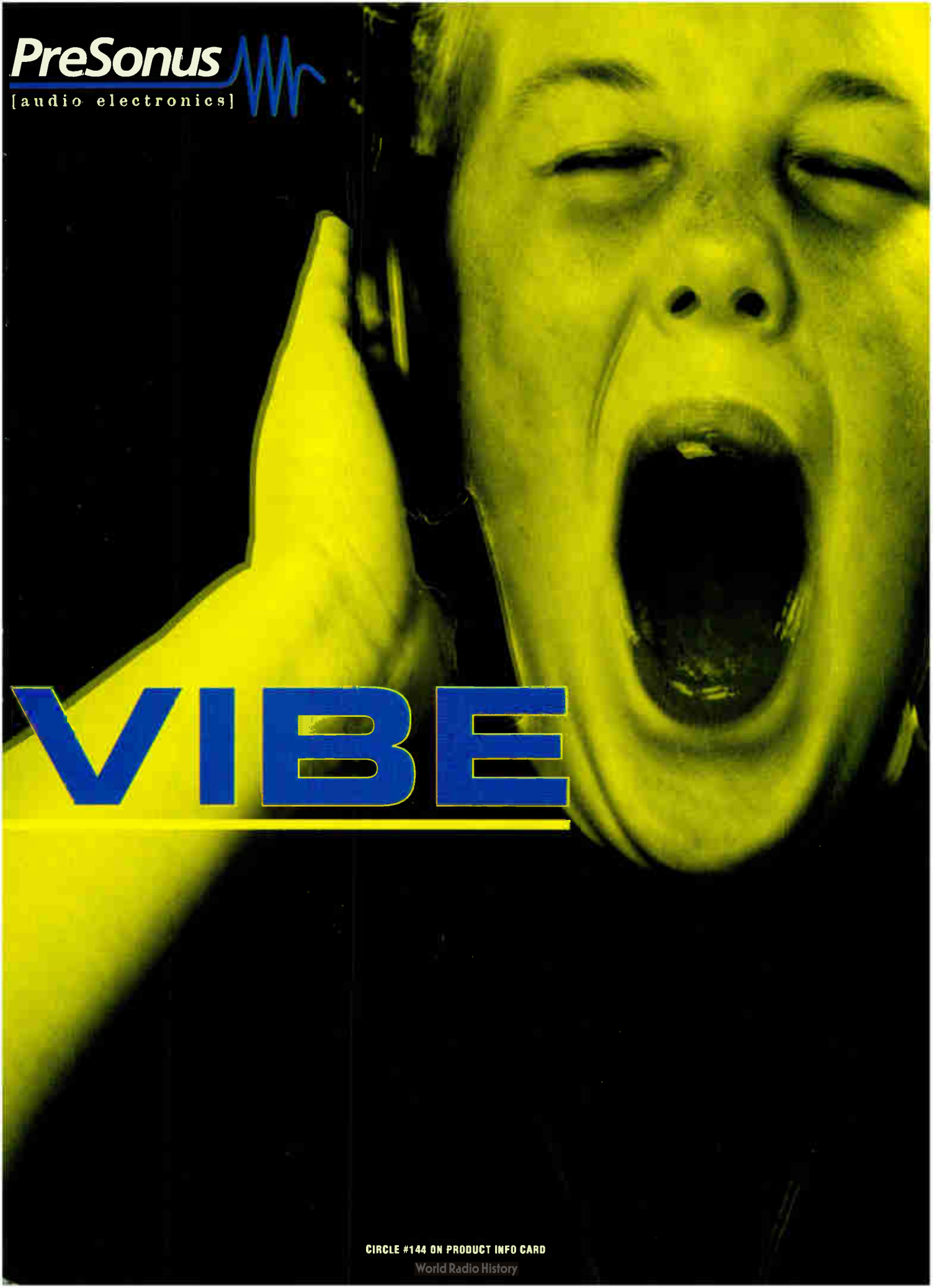

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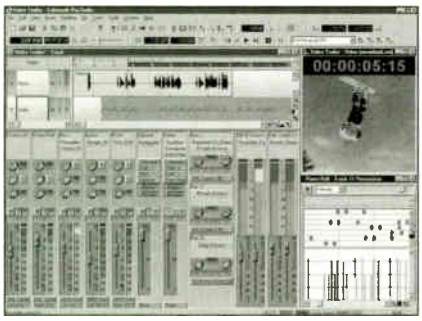
This season, I've found myself on the post-production stage for television shows, much more than previous seasons. I have worked on *Mad About You*, *Just Shoot Me*, *Party of Five*, *The Nanny*, *LA Doctors*, *Rude Awakenings* and *Oh Baby*. In a number of situations, I'm mixing and editing shows for foreign release; this typically involves re-creating Foley, ambience, sound effects, music and laughter, but removing dialog.

Because the time allotted to post



for the foreign dubs of these shows is a few hours instead of a few weeks, I need to work efficiently. I need audio processing power beyond my Pentium CPU, so I use Soundscape hardware right from within Pro Audio 8, as if it were a sound card, but with all the DSP power of the Soundscape unit. I use this configuration to perform the tasks of spotting, and cutting effects, Foley, backgrounds and music. (This configuration gives me versatility, stability and speed: In six years of heavy duty, my setup has never crashed.) The following tips will show some of the advantages to using Pro Audio 8 in the same capacity.

SYNC EASE

In one pass, you can load all of the video, dialog, Foley and miscellaneous audio straight into Cakewalk on your PC. Once that's finished, you have sample-accurate audio (in 44.1k, 48k or 96k) and subframe-accurate video loaded in Cakewalk, all controlled from one location, with solid, instantaneous sync.

Any sound effects or music cues you want to drop in can be done immediately and synchronized to video in one step through Pro Audio's Insert | Wave File command, without scrubbing. However, if you do want to scrub, in the Video view, you can use the +/- and left/right arrow keys to advance the video by frames (or use the [and] keys to advance by ten frames). This lets you quickly find a location where you want to insert an audio file.

The video will even seamlessly loop along with the audio if you have set up loop points—invaluable if you are trying to get a scene right. To set loop points, simply drag in the time bar above your tracks, or select a section of music and then hit the Loop button on the Cakewalk tool bar.

If you are going to be working with numerous sound effects or cues, Cakewalk's Virtual Jukebox utility lets you load and preview up to 999 .WAV, MIDI or Cakewalk files and then simply drag the file you want onto Cakewalk's track pane, exactly where you'd like to place it. You can also drag files directly from the Windows Explorer.

TIME-SAVING TIPS

Here's a real time-saver when working with sound effects. Pro Audio 8 features anchor points for each audio event. This lets you define which part of the audio is important. For example, when creating a cue list while playing back the video, you may want to insert a sound effect of a door that is slammed at a specific location, say 01:10:21:17. Your slamming door .WAV file might contain some creaking door sounds before the actual door is slammed. In Pro Audio's Audio view, you can easily locate the actual slam by looking at the peaks in the waveform. Then you can drag the anchor point to the peaks in the waveform. Next, right-click the audio event, and type 01:10:21:17 in the Now box. The sound effect sample will align perfectly with the video.

Using markers, you can jump quickly from scene to scene. To drop markers, press F11, even during recording and playback. Markers are listed as a drop-down list in the Markers tool bar. Jumping from scene to scene is as simple as selecting a marker from the list. Markers can be locked to SMPTE, so they never move if you change the tempo of the project.

If you change the tempo, you can specify whether or not audio tracks should be stretched to fit the new tempo. For example, you probably do not want to stretch audio in tracks that only contain sound effects. Pro Audio lets you define a track as unstretchable by double-clicking the Patch column of an audio track, and selecting <Unstretchable> as the patch.

By having all of these tools in one integrated environment, you can work fast and finish early. With my setup, I have true nonlinear, high-resolution playback of NTSC or PAL video; recording, editing and playback of high-quality audio and MIDI; and automation of the entire project, including mix and outboard effects. Project management is simple. Sound effects are easy to locate and use. Best of all, one file will store everything: audio references, edits, synchronization settings, signal routing, lyrics or dialog laid out right in the timeline, clock settings, notes and more. This makes backup and retrieval a breeze. I've even e-mailed my Cakewalk Pro Audio 8 file for an entire show to another stage. This is truly a great way to work. I finished the shows in a quarter the time it took on the conventional gear. ■

BY AARON STIPKOVICH

*Aaron "Stipko" Stipkovich is a mixer, composer and coffee drinker. Visit www.stipko.com/cakewalk/ for a feedback forum, sample *.wrk files, screen shots, etc. related to this article.*

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We know you're as serious about your creative product as these folks are. So why compromise with less than the best near field monitors? Visit your nearest Mackie dealer for a demo or call us toll-free for more info.

"Mackie asserts that the HR824s are 'smooth from 39 to 20kHz (±1.5dB)' and our tests corroborated the claim. This is no mean feat for monitors this size. The HR824s performed admirably, allowing us to distinguish very fine shades of tonal color and to establish subtle timbral and harmonic relationships between sounds. If you are in the market for a pair of compact active monitors and you are not afraid of the truth, do yourself a favor and give the Mackie Designs HR824s a critical listen."

HR824

"[HR824s] sound incredible — I was extremely surprised by the low end response. Clarity, detail and reproduction in reverb tails is real good." Pat McMacon, Facility Director, Sony/Tree Studios

"HR824s give systems costing twice as much a run for their money in terms of sound quality... they deliver a solid low end that's surprising for their size and a flat transparent response across the spectrum."

"Very tight bass... clean mids... crystal pristine highs. There's a truth to them. Once you hear you can't go back."
Frank Serafine, Hollywood motion picture & TV sound designer

"Performance, features and a cost-not-barred design at a retail price of $1500 a pair* make this product a very good value. In the words of one person involved in these listening tests, 'I have a feeling that [the HR824s] will become the NS-10 of the late '90s and beyond' ...ubiquitous."

"Very musical. Very accurate. We actually move them between our five rooms."
Glenn Meadows, TEC-nominated mastering engineer, Masterfonics

MACKIE

* U.S. suggested retail price.

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WOODINVILLE, USA
800/898-3211
www.mackie.com

"When A $2,000 System Sounds As Good As A $50,000 System, I'd Say They Got It Right."

William Wittman, Engineer/Producer

The First Integrated Professional 5.1 Monitoring System With THX® Approval

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.

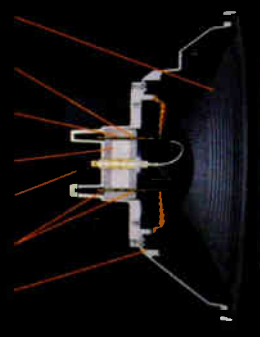
Not Just A Better Spec... A Better Monitoring System

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

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