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- The Spec
- The Rollout
- The Discs

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Eminem And Dr. Dre Go UP IN SMOKE

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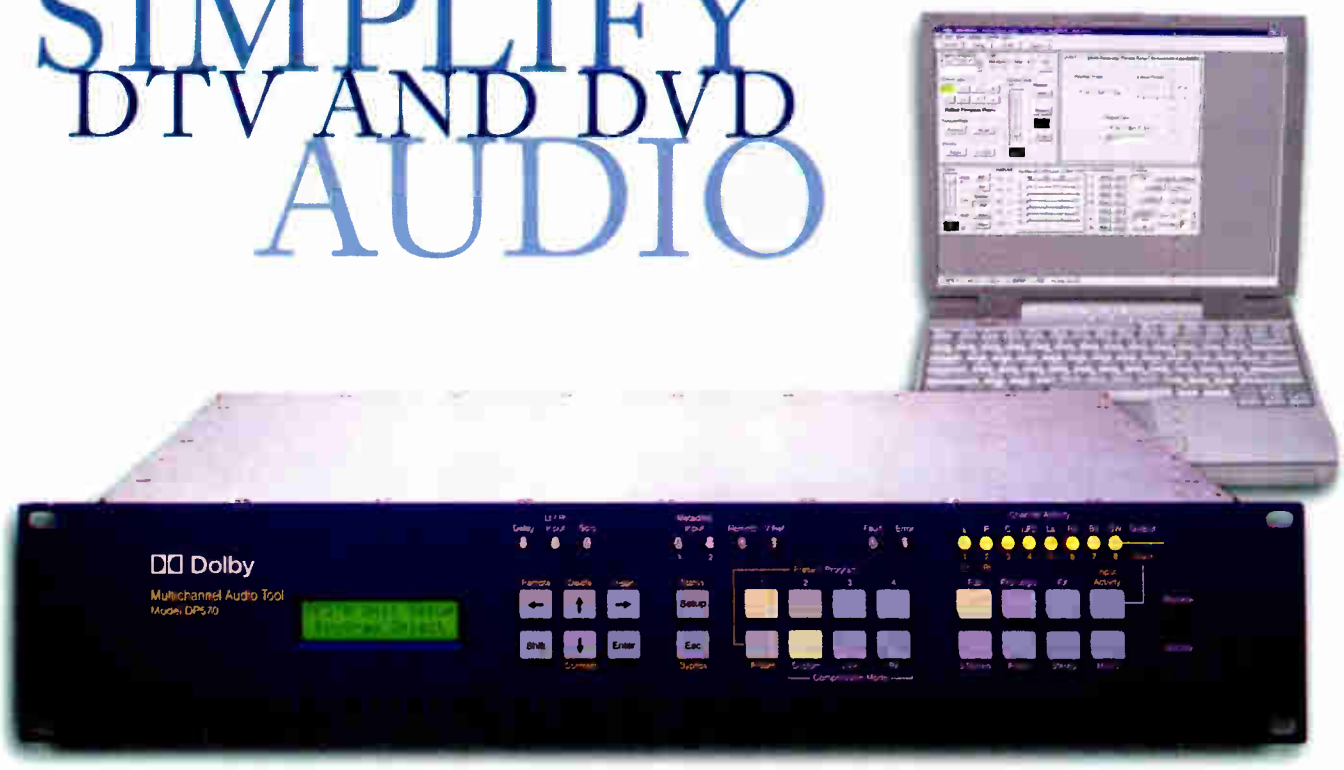

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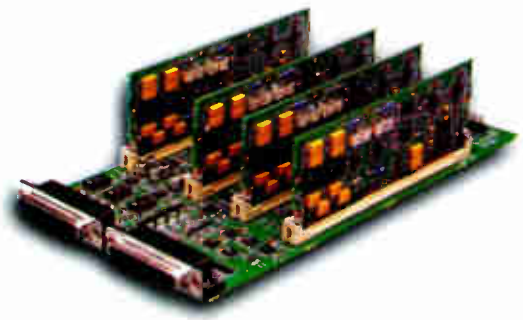

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Pictured at the SL 9000 J Series console in Studio A of Henson Recording Studios (formerly A & M Studios) is V.P. Studio Operations / Studio Manager Ron Rutledge (standing) and Grammy Award-winning Engineer Ray Bardani.

Engineer Ray Bardani, winner of four Grammys whose credits include Whitney Houston, Miles Davis, Luther Vandross, Prince and David Sanborn, recently worked on the facility's newly installed Solid State Logic SL 9000 J Series console. "The SL 9000 is my first choice for recording and mixing, and Henson Recording is one of my favourite studios," says Bardani. "The combination of these two leaders results in an incredible mix of versatility, flexibility, technical excellence and creativity."

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SL 9000 J SERIES

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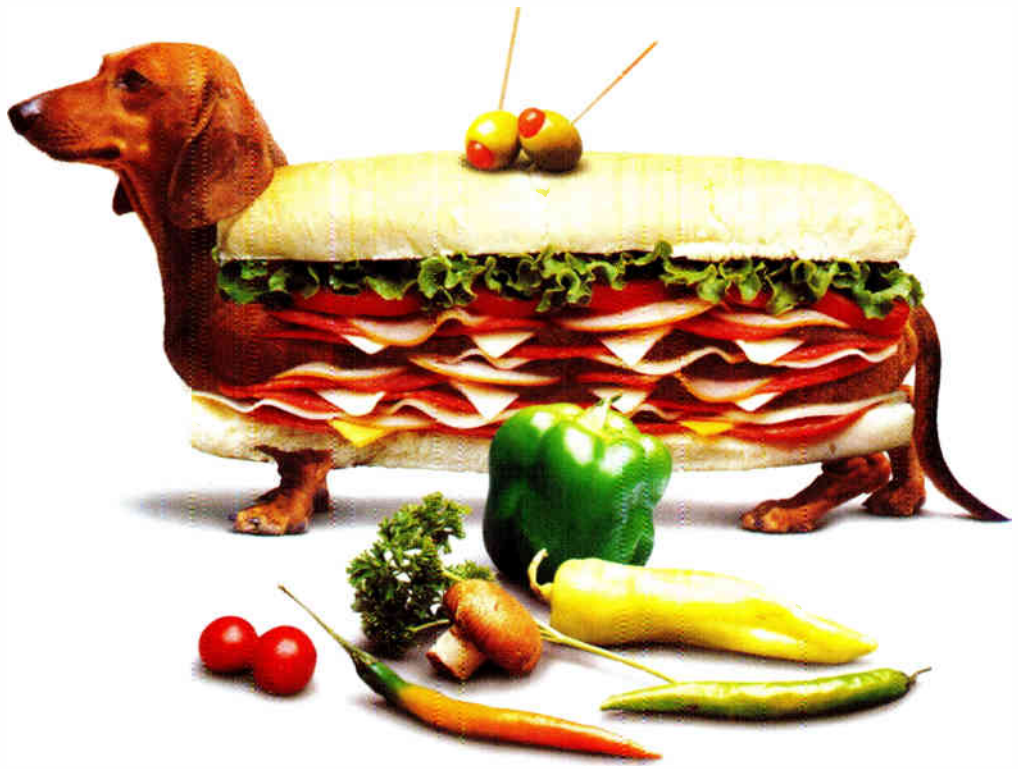
Extra Toppings

(or how to get real bass management)



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Our new PS350B subwoofer with Real Bass Management uses just the right ingredients to get your juices going. Much more than the flavor of the month, the PS350B adds unprecedented power, accuracy and functionality to the studio environment.

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We could (and should) go on about the other extra's in our new gourmet offering, but the proof of the pudding is in the eating, and the PS350B is most definitely- Hmmm...Yum.

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DECEMBER 2000, VOLUME 24, NUMBER 12

AUDIO

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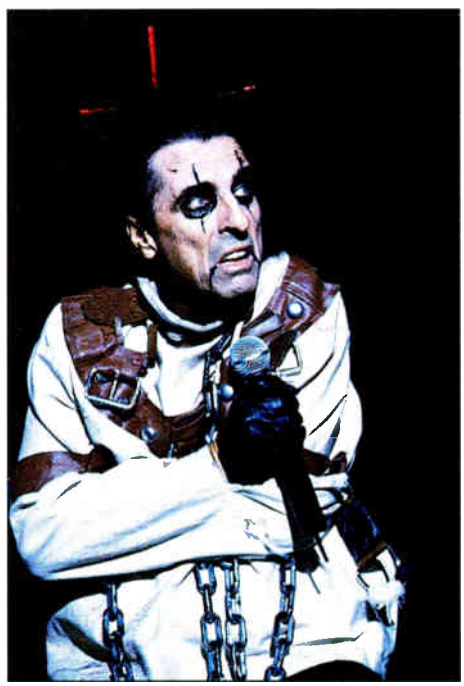

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DVD-AUDIO SPECIAL

SOUND FOR PICTURE

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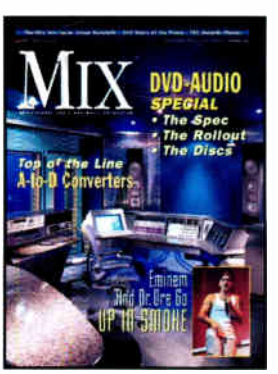
PRODUCTS

LIVE SOUND

PAGE 90

DEPARTMENTS

On the Cover: Opened in June 2000, Master House, Miami, is the home of South Florida stalwart Jose Blanco. Designed by Pilchner Schoustal, the main room is based around a Sonic Solutions system and custom Crookwood console, with Dunlavy SC-4 monitoring. For more, see story on page 28. **Photo:** Rick Diaz Photography. **Inset Photo:** Steve Jennings.



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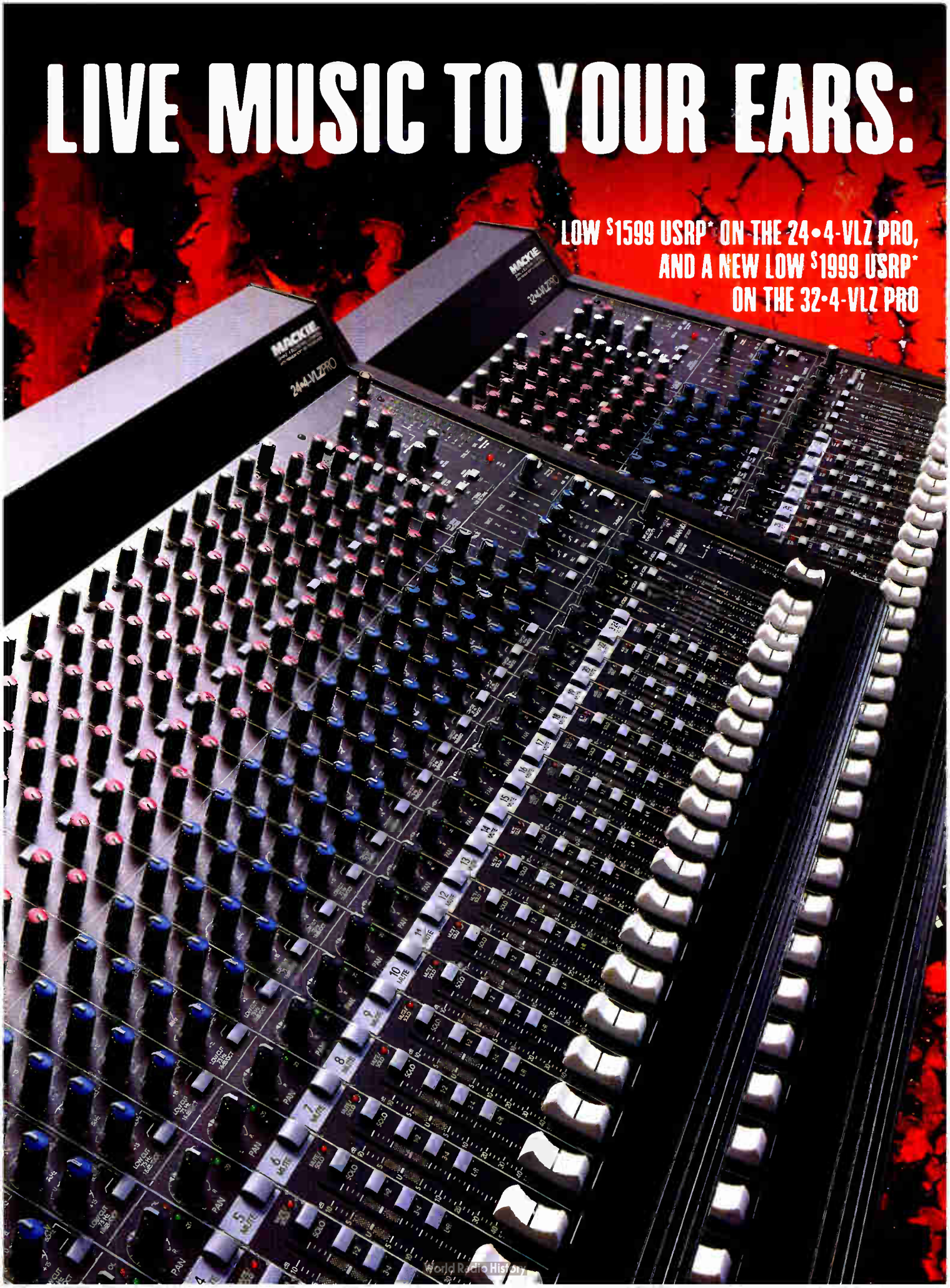
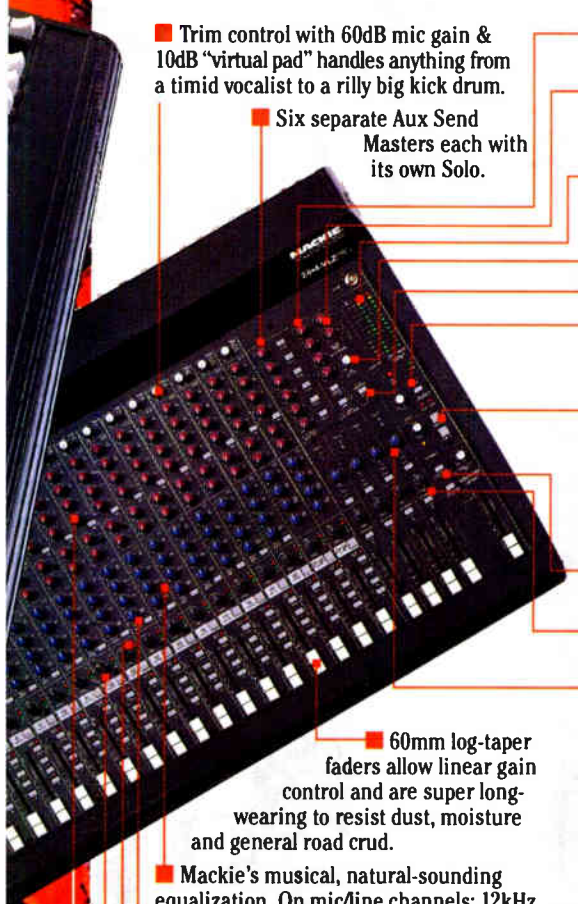
ON THE 32•4-VLZ PRO



NEW 24•4 & 32•4-VLZ PRO™ SR MIXERS WITH PREMIUM XDR™ MIC PREAMPS.

Why put ultra-precise, tweakazoid audiophile XDR™ mic preamps on sound reinforcement consoles? Because live performers deserve good sound, too. Especially when our new design also has the best **RFI protection of any mixer on the market.** It took several years of hard work to design a mixer preamp that could beat $2000-a-channel, esoteric outboard mic preamps in independent listening tests. But we did it. You'll enjoy more warmth, detail and headroom than has ever been possible with even the most prestigious mega-consoles. Plus less noise, and total freedom from potential hot-patching and short circuit damage, and flat frequency response regardless of mic/cable impedance.



- Trim control with 60dB mic gain & 10dB "virtual pad" handles anything from a timid vocalist to a rilly big kick drum.
- Six separate Aux Send Masters each with its own Solo.
- Stereo Aux Return 4 Master can be assigned to Buses 1-2 or 3-4.
- EFX to Monitor lets you send different effects or effects levels to stage monitors without screwing up your main PA mix.
- Easy level setting with In-Place Stereo Solo. Just solo a channel & adjust the Trim 'til the meter flickers at the Level Set arrow.
- Separate Tape Return level control.
- Global Aux Return Solo switch.
- Separate Solo section with level control, global AFL (post fader) or PFL (pre-fader) mode switch & Aux/Sub Solo LEDs.
- Separate Talkback section with level control, LED and switches for assigning talkback to Main Mix or Auxes 1 and 2. There's also a separate mic preamp input on the back of the mixer so you don't have to tie up a channel.
- Tape to Main Mix routes tape inputs to main outputs for music during breaks.
- Each Submaster bus has Solo switch, Pan control and Left/Right assign switch.
- Air EQ adds crispness and definition to high-end without boosting ear-fatiguing 8kHz-10kHz range.
- 60mm log-taper faders allow linear gain control and are super long-wearing to resist dust, moisture and general road crud.
- Mackie's musical, natural-sounding equalization. On mic/line channels: 12kHz Hi shelving, peak midrange sweepable from 100Hz to 8kHz (so it can also be used as a 2nd HF or LF control) and 80Hz Lo shelving. On stereo line channels: 12kHz Hi shelving, 3kHz Hi Mid peaking, 800Hz Lo Mid peaking and 80Hz Lo shelving.
- Sharp 75Hz 18dB/octave infrasonic filter on all mic channels cuts wind noise, stage rumble, mic clunks and P-pops.
- Super-twitchy –20dB signal present and overload LEDs on each channel.
- Constant loudness pan control.
- Six aux sends per channel. 2 pre-fader, 2 post-fader and 2 pre/post switchable.

NEW 24•4 & 32•4-VLZ PRO MIXERS

- 4-bus design with 20 or 28 mono mic/line channels with XDR™ mic preamps and 2 stereo line channels
- New high-performance 2068 op-amps
- Muted channels can be soloed!
- 6 individual aux sends per channel
- 4 master stereo aux returns
- Inserts on all mono mic/line channels
- 3-band EQ w/swept mid on mic/line chs.
- 4-band fixed EQ on stereo line channels
- 60mm long-life logarithmic-taper faders
- 6 aux send masters with individual solos
- 4 stereo aux returns w/EFX to Monitor
- 16kHz Air EQ, pan and solo sub buses
- Double-bussed subs for easy multi-tracking with 8-track recorders

LOADED WITH LIVE SOUND FEATURES.

The new 32•4-VLZ PRO and 24•4-VLZ PRO are designed to make live sound mixing easier: You can solo a muted channel. Effects to Monitor lets you "fold" effects back into a stage monitor mix without affecting the main PA sound. There's a separate talkback section with its own mic preamp. Separate tape inputs with level control and routing to main mix make playing music during breaks easy. And typical Mackie touches like 18dB/oct. Low Cut filters, Rude Solo Light and fast level setting via in-place stereo solo make these mixers awesome values.

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We'll send you our jumbo product brochure complete with hook-up diagrams — and a serious, graph-and-equation-loaded White Paper on why XDR technology beats the cables off anybody else's mic preamps.

Better yet, visit a Mackie dealer, check out the 24•4-VLZ PRO and 32•4-VLZ PRO. You'll hear just how good a "live" mixer can sound.

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The 24•4 & 32•4 are made by Mackie's [illegible] these folks in scenic Woodinville, WA USA

CIRCLE #004 ON PRODUCT INFO CARD

FROM THE EDITOR

HERE'S DVD-AUDIO! NOW WHAT?

It's been a long time coming, but DVD-Audio is finally here. DVD-A players have been dribbling into U.S. stores for months, and (reportedly) the first commercial DVD-A release—Gordon Goodwin's Big Phat Band's *Swingin' for the Fences* on Silverline Records—debuted a couple months ago, followed by a number of other projects. Meanwhile, as the latest rev of the DVD-A spec (Version 1.2) includes CPPM (Copy Protection for Prerecorded Media) and Verance watermarking technology, everybody should be happy. Well, almost...

Normally, the release of a new audio format would be a big deal. Major record labels have typically welcomed new formats as a means to remarket the same back catalog that Chris Q. Consumer had previously purchased on other formats. Catalog releases are low-risk/high-profit ventures, and record labels would love to re-create the CD gold rush days of the '80s and '90s.

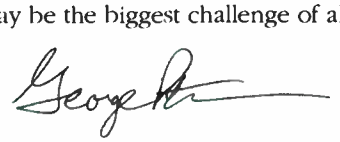
But, today's consumer is extremely wary of new formats, and with little excitement about DVD-A on the part of the electronics industry and record labels, DVD-A may be in for some tough times. Major labels have been slow to implement DVD-A product rollouts; and with few titles available, hardware manufacturers have adopted a conservative, wait-and-see attitude.

Of course, the major advantage of DVD-A is the pristine audio quality it can deliver, but will this advantage be lost on consumers with "average" home playback systems? Most home surround playback systems are not $40,000 custom-engineered installations—rather, users supplement their existing home stereo speakers via an add-on pack with small center and rear speakers and an underpowered sub. Admittedly, we're early in the DVD-A game, but consumers have been less than enthusiastic about super-high-performance audio lately. It's a sad commentary, but these days, what consumers are really excited about is downloading MP3s over the Internet. Given a choice of paying for hi-fi or getting free lo-fi material, most music listeners opt for the latter. Surprise, surprise!

On the other hand, consumers have taken the DVD-Video format to heart, making it, depending on whom you talk to, the fastest-selling consumer format in history. Accustomed to years of watching stereo films at their local Bijou, moviegoers are upgrading and investing in 5.1 systems for home DVD playback. But are these same consumers ready to plunk down $19.95 (or more) for an audio-only DVD release and buy a new player for the privilege? Yes, onscreen lyrics, liner notes, a bonus video clip and still graphics are all incentives to buy a DVD-A disc. But is it enough? Or is it more than people want when they can get that information elsewhere?

In this issue's special focus on DVD-A technology, we look at various aspects of the format from several viewpoints—technical, marketing and creative production. Certainly, DVD-A offers a convenient means to store high-res stereo and surround recordings. But for the format to prosper, audio producers need to take the next step and design products that use DVD-A's interactive capabilities in creative, innovative ways that stimulate and inspire the consumer.

That may be the biggest challenge of all.



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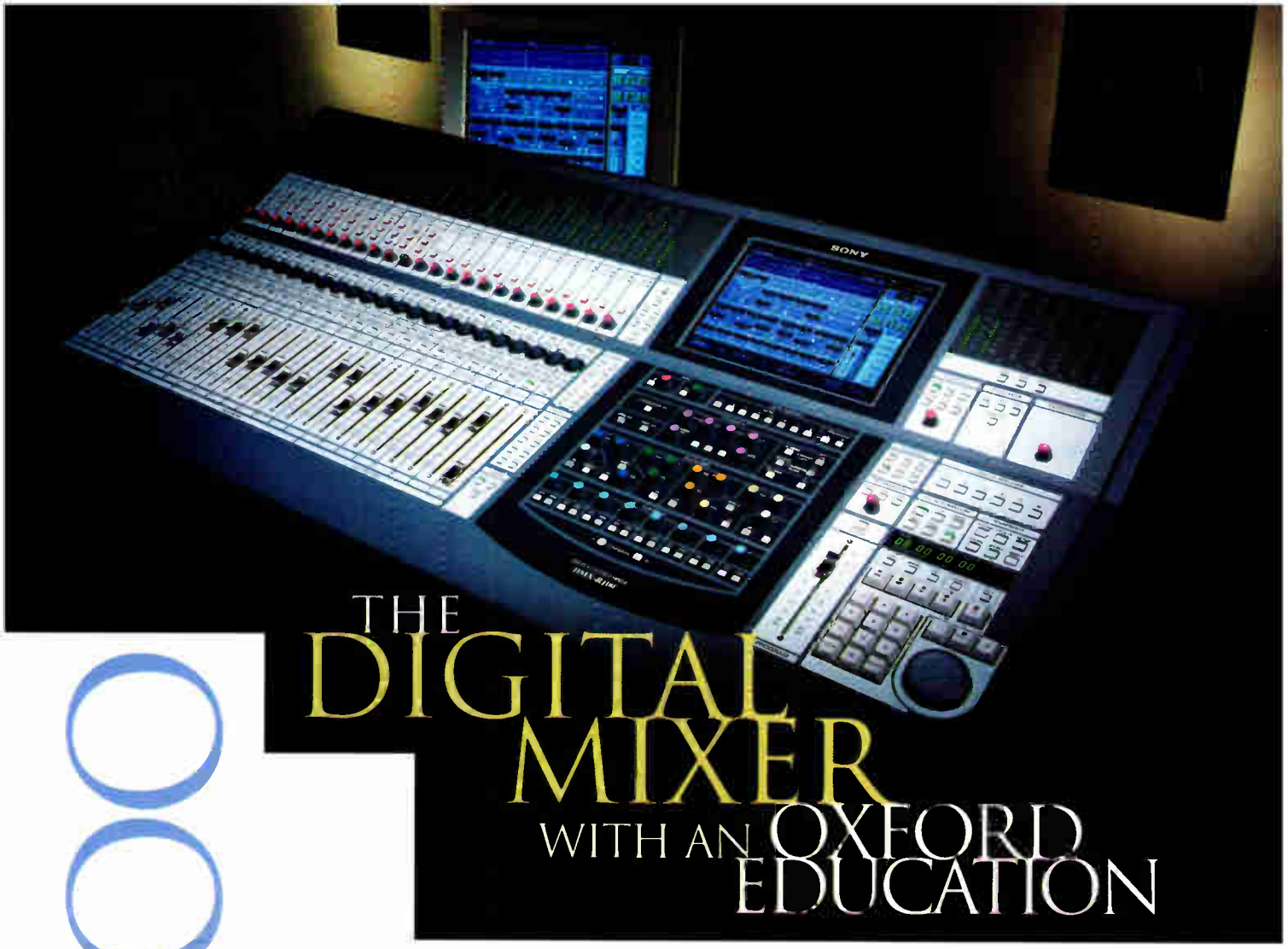
Founded in 1977 by David Schwartz and Penny Riker Jacob



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Full input module with a knob for every function

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5.1 surround mixing and monitoring

Introducing the Sony DMX-R100: a small-format digital mixer inspired by our Oxford console, considered by many industry leaders as the most advanced digital mixing system ever developed.

How does the DMX-R100 work? The way you want it to. You have a full input module with a knob for every function. Equalization and dynamics can be adjusted simultaneously. Your hand goes intuitively to the right knob. Your mixing session goes faster. You can concentrate on the mix, not on the technology.

The R100 can memorize your automation moves the moment you touch the high-resolution touch-screen fader. Don't tell the mixer to change modes. Don't think about it at all. Just touch it.

A color touch-screen is built into the control surface. Use the built-in router to assign inputs to faders. Select buses, sends, and directs to analog and digital outputs. View a complete input module or zoom in on the EQ and Dynamics sections.

Machine control with 9-pin and MMC interface is standard.

Right out of the box, the R100 is smart enough to make you more productive. And open up opportunities for working in new high-resolution formats, without expensive upgrades or difficult learning curves. Which makes it an educated choice for audio professionals everywhere.

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CURRENT

WORK-FOR-HIRE BILL SIGNED

President Clinton signed the much-debated Work for Hire and Copyright Corrections Act of 2000 on October 27, allowing recording artists to reclaim ownership of their works and master recordings from their respective labels.

The controversial work-for-hire clause was added into last year's copyright law, essentially demoting artists by redefining sound recordings as works made for hire and tilting the balance of power toward the record companies. This clause created an outburst from many recording artists, such as Don Henley, Jimmy Buffett, Billy Joel and Sheryl Crow.

Other industry-related organizations also pitched in this past year to reverse the added clause. In a letter to Chairman Coble of the U.S. House Subcommittee on Courts and Intellectual Property, Marilyn Bergman, ASCAP president and chairman, said, "One of the equities to consider in crafting copyright law...is the disparity that exists between the bargaining power of the performing artist and that of the recording companies."

The bill passed unanimously through the U.S. House and Senate this fall, allowing recording artists to reclaim their master tapes from labels after 35 years, with the start date in 1978, reverting the bill to its former state. The bill also establishes the National Recording Registry within the U.S. Library of Congress and a seal to identify sound recordings within the registry.

According to Michael Greene, president and CEO of the National Academy of Recording Arts & Sciences, "The President's signature signals the end of a long process...to reinstate the rights of artists and producers."

MP3.COM ORDERED TO PAY UNIVERSAL, LICENSES WITH NMPA

A Federal District Court judge awarded Universal Music Group $53.4 million in statutory damages and attorney fees in its copyright infringement suit against the online music service provider, MP3.com. MP3.com does not intend to appeal the decision.

According to president and CEO of UMG, Zach Horowitz, the decision furthers the legal precedents to protect copyrighted works distributed over the Internet by sending "a strong message that copyright owners and artists need to be properly compensated."

Concurrently, MP3.com was granted a nonexclusive, North American license to use UMG-controlled recordings on the My.MP3.com system.

Meanwhile, My.MP3.com announced that it has reached another licensing agreement with the National Music Publishers' Association and its licensing subsidiary, the Harry Fox Agency, that effectively gives MP3.com users access to more than a million musical compositions.

According to Michael Robertson, CEO of MP3.com, this agreement represents one of the "key partnerships with companies to improve the distribution of music."

The proposed three-year agreement states that MP3.com will pay up to $30 million to HFA for up to 25,000 music publishers and their songwriter partners as part of two equal funds. One fund will pay HFA for past uses of music on the Internet service. The other fund will provide advance payments toward royalties.

For more information, visit www.nmpa.org.

RIAA BEGINS NEW ID SYSTEM

The Recording Industry Association of America announced that it has launched a project to develop a standardized system to identify digital audio on the Internet. This identification system will build on and integrate systems already in use, such as the International Standard Recording Code.

Because the new system is intended for worldwide use, the RIAA has chosen Rightscom Ltd., a UK-based consulting firm for design and development of identification systems, to manage the project. Additionally, the RIAA plans to involve other music industry segments, such as distributors and retailers, to help determine the requirements needed for the new identification system.

The RIAA also plans on working with the International Federation of the Phonographic Industry (IFPI), the Recording Industry of Japan (RIAJ) and member companies of those organizations.

In other RIAA news, the association has come to an agreement with the National Music Publishers' Association of America concerning new procedures to facilitate the licensing of songs distributed over the Internet.

The five major record labels represented by the RIAA have entered into an agreement with Harry Fox Agency, a subsidiary of NMPA, to allow music to be licensed through HFA.

For more information, visit www.riaa.com.

STUDY EXAMINES EFFECTS OF INTERNET AUDIO

The National Association of Recording Merchandisers hired Emerald Solutions Inc. to conduct a survey to examine the effects of Internet-based digital audio on the music industry.

Emerald Solutions investigated the impact of digital music on distribution, examined available options to increase consumer demand and recommended plans of attack for various industry segments. The results were based on interviews with industry participants, previously published research material and information gathered from former clients.

To find out more about the survey's results, visit www.narm.com.

PROPELLERHEAD MANAGES OWN DISTRIBUTION

Propellerhead Software, maker of synthesizer software ReBirth, Reason and Loop Editor ReCycle, announced plans to distribute its own products effective March 1, 2001. The company's products were previously distributed exclusively by Steinberg. Propellerhead will manage customer service, technical support and updates.

For more information on the company's distribution plans, visit www.propellerheads.se.

STANTON MAGNETICS ACQUIRES KRK

Hollywood, Fla.-based Stanton Magnet-

—CONTINUED ON PAGE 16

TEC NOMINEE

sensory reality check:

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INDUSTRY NOTES

A couple of familiar faces, new places: Oxford, England-based SSL announced that **Colin Pringle** is the new group marketing director ...**Klotz** (Atlanta) welcomed **John Carey** as VP of business development...**Steinberg North America** (L.A.) named numerous distribution appointments: **Devins & Associates** (Frederick, MD) will cover Virginia, Maryland, Delaware and Washington, D.C.; **TechRep Marketing** (Antioch, TN) will target Tennessee, North and South Carolinas, Georgia, Alabama and Mississippi; and **Audio Research** (Longwood, FL) will manage its Florida territory...The managing director position at **Beyerdynamic** (Heilbronn, Germany) was filled by **Dr. Karl G. Arnold**...**Charles M. Salter Associates** (San Francisco) promoted **Thomas A. Schindler**, VP, and hired **Pamela Marie Vold**, marketing coordinator. In other company news, a branch office was opened at 2880 Zanker Road, Suite 367, San Jose, CA 95134; 408/432-7270...**Larry Lipman** will take over for **Shirley P. Kaye** as executive director of SPARS (Memphis). The company office also moved to 364 Clove Drive, Memphis, TN 38117; 901/821-9111; fax 901/682-9177...**Mark Martin** was promoted to director of operations at the **SAE Institute's** Nashville campus (Nashville)...**Harman Music Group** (Sandy, UT) welcomed many new faces: **Allan Nichols**, manager of Eastern regional sales for **Allen & Heath** (Cornwall, UK) and **dbx** (Sandy, UT); **Robert Benson**, VP of marketing and sales; **Janice Palamides**, human resource manager; and **Lori Rhoades-Aucutt** and **Kenton Smith**, graphic designers...**BGW** (Hawthorne, CA) named **Lonnie Pastor** as Southwest region factory salesperson...**Alesis** (Santa Monica, CA) chose **Plus Flour Marketing** (Concord, CA) as the new independent sales firm for Northern California and Northern Nevada...**Megatrax Production Music** (North Hollywood, CA) promoted **Andrew D. Robbins** to the newly created position of director of licensing for film and TV...**Lucid** (Lynwood, WA) announced **Jim Latimer** as new director of pro audio sales. He will be headquartered in Charlestown, RI. The company also named **Ana Lopez** as inside sales associate and distributor **Quebec Leisure International Pte Ltd** (Singapore) to its Southeastern Asia market...**Fred Farrar** is the new president and CEO at **Klipsch Audio Technologies** (Indianapolis). In other company news, **Michael F. Klipsch** and **T. Paul Jacobs** were promoted to executive VP and CEO of the worldwide manufacturing and supply management group and executive VP and CEO of worldwide products group, respectively...Tustin, CA-based **BEI Duncan Electronics** announced **JIT Supply** (Brea, CA) as its exclusive U.S. distributor...**Jim Peacher** was appointed to the director of worldwide sales for **Clear Com Intercom Systems** (Emeryville, CA)...**Sonic Foundry** (Madison, WI) welcomes **Dan McLellan**, senior VP and general manager in the media services division, and **Ted Lingard**, VP of operations...**Pacifica Sound Group** (Burbank, CA) announced many new appointments: CEO **Joseph Melody**; president **G. Michael Graham**; VP of Pacifica/Echo **Sue Jesse**; senior VP of studio facilities **Wayne Gordon**; president of Pacifica/Digital **Timothy J. Borquez**; VPs of sales and marketing **Richard Ellis** and **Matt Preble**; and mixer **Rick Alexander**...**Steven Young** is the new director of marketing and technical sales for **Atlas Sound** (Phoenix)...Mastering engineer **Dawn Frank** joined **Airshow Mastering** (Boulder, CO)...**Garwood** (Philadelphia) announced **Sevans Pro Audio** (Bordentown, NJ) as its U.S. distributor...After spending seven-and-a-half years as **Rockford's** (Tempe, AZ) art director, **Celise Harris** announced her retirement. ■

—FROM PAGE 12, CURRENT

ics, LLC, announced its acquisition of KRK, a manufacturer of high-end passive and active studio monitors.

A new management team will be appointed, while KRK's Huntington Beach, Calif., facility will be used as a West Coast distribution center for Stanton products.

HANOVER PARTNERS OBTAINS AUDIO PRECISION

Hanover Partners announced that the acquisition of Audio Precision is complete. The sale will not change the management or other aspects of Audio Precision but the ownership will change.

For more information, visit www.audioprecision.com or www.hanoverpartners.com.

DIGITAL HARMONY ADDS TO LICENSING PORTFOLIO

Digital Harmony Studios announced that it has licensed its portfolio of technologies to TC Electronic and QSC. Both licensing agreements provide TC Electronic and QSC access to Digital Harmony's IEEE-1394-based technology to develop pro audio products.

Under the agreement, all TC Group companies will have access to the licensed rights.

Costa Mesa, Calif.-based QSC licensed Digital Harmony's Interface for Video and Audio (DHIVA) embedded 1394 interface, software drivers and professional production assistant (PPA) software modules.

Other companies currently using Digital Harmony's technology include Cirrus Logic, JBL, Lexicon, Nippon Columbia and Peavey Electronics.

For more information, visit www.tcelectronic.com, www.qscaudio.com or www.digitalharmony.com.

CORRECTIONS

In "All Access" in the October 2000 issue, The B-52's guitarist was incorrectly identified as Ricky Wilson. Ricky Wilson died in 1985. The guitarist in the picture is Keith Strickland, who originally played drums but switched to guitar after Wilson's death. *Mix* regrets the error.

There was an error in "Industry Notes" in the November 2000 issue. iZ Technology is not the sole distributor for RADAR. Otari corporation is also a distributor for this line. ■


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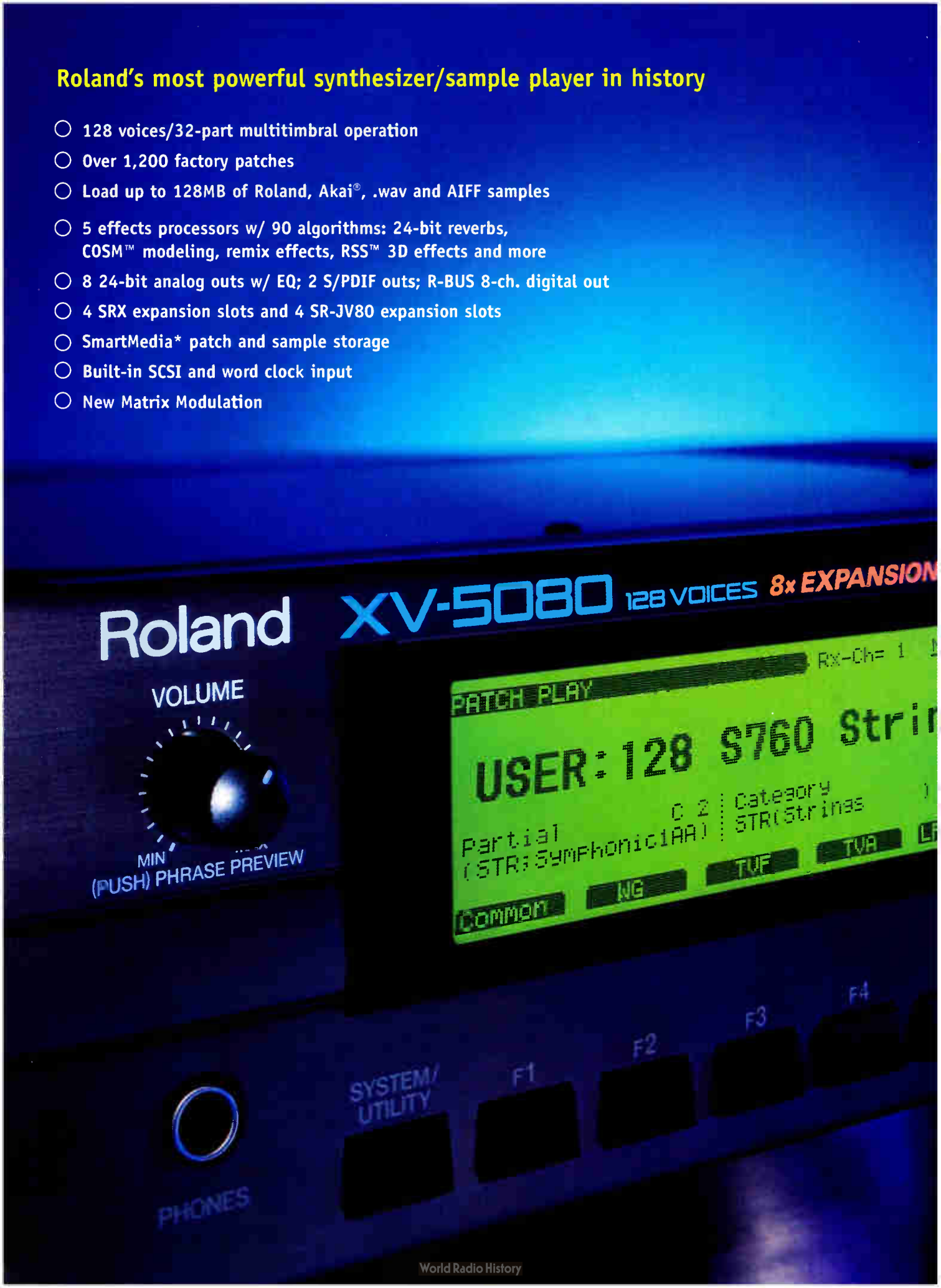
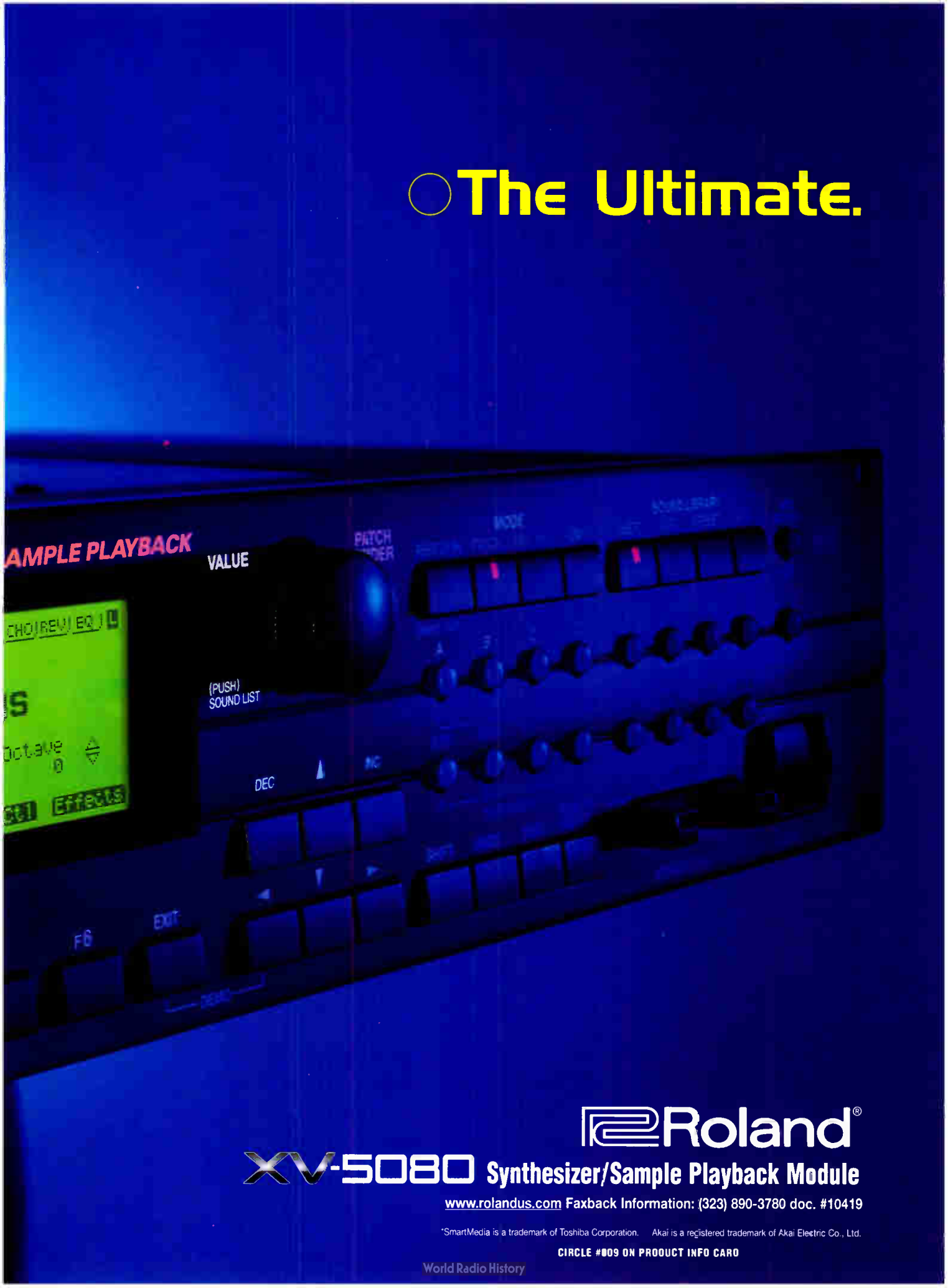




A Different Kind of Roots

REVISITING THE DAWN OF ELECTRONIC MUSIC

ILLUSTRATION: KAY MARSHALL

Once upon a time, there was "music," and there was "electronic music." Music was what everybody listened to on the radio and on their "hi-fis," at the movies and in concert halls and clubs. It was played by people in tuxedos, uniforms, dungarees and black suits with shades. Electronic music, on the other hand, was the stuff created by (mostly) guys in white coats and thick glasses behind the sealed basement doors of university studios, or by longhaired, unkempt bohemians in lofts in old warehouse districts, and listened to by...well, not too many people.

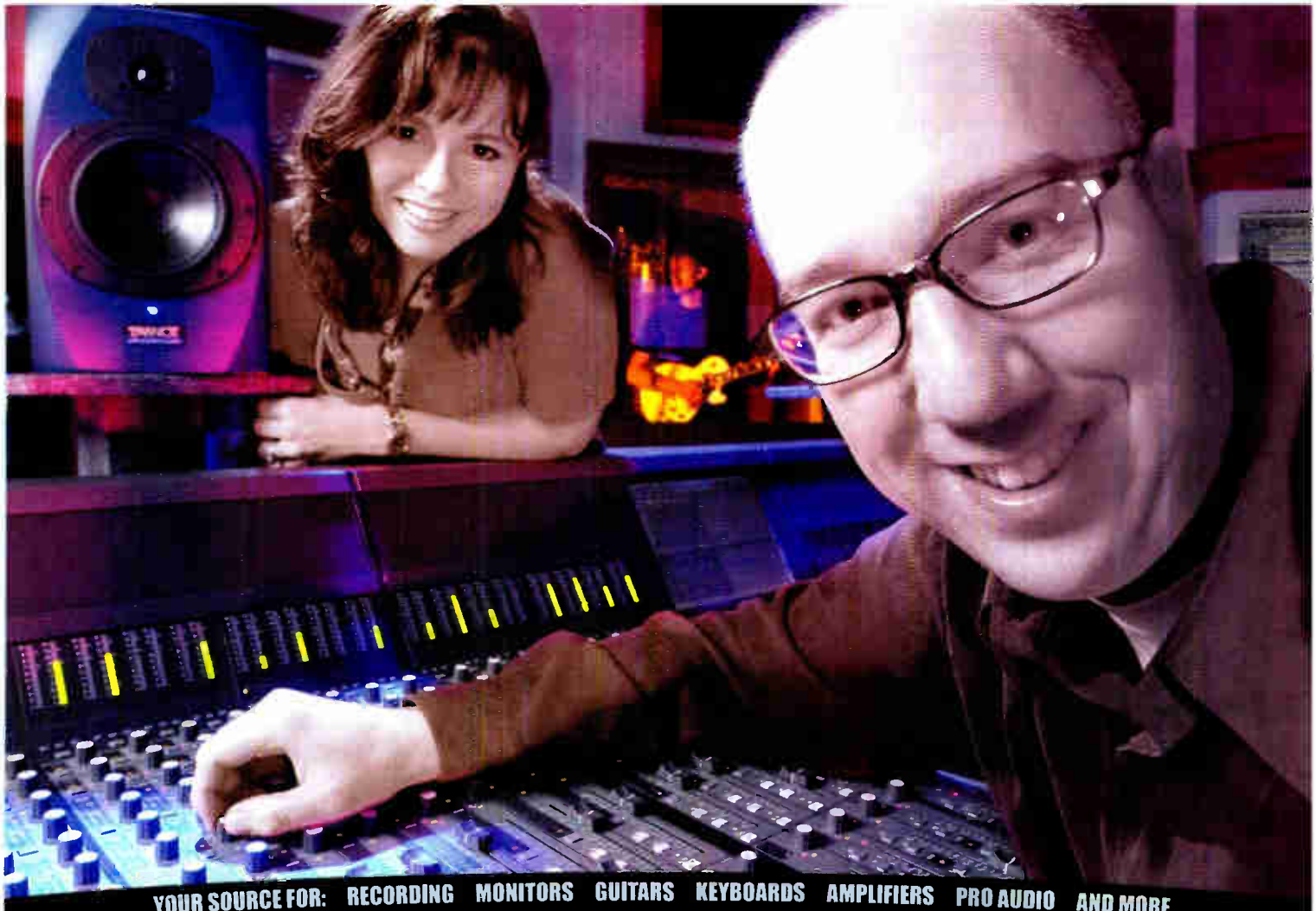
But I was one of them. I got into electronic music at a very impressionable age, thanks to my older brother, who would bring home these weird records from his college radio station and New York's free-form Pacifica radio station, WBAI. I created my first electronic piece—involving a Sony 3-head tape recorder, an electric guitar, a kit-built Theremin that didn't work too well and a $6.95 microphone—when I was 15. Studying electronic music was my goal when I left for college, and I was thrilled to learn the techniques from the people who had been my personal heroes, to get a chance to play with some of the coolest equipment on the planet.

But when I realized that at just about every sparsely attended electronic music concert I went to, the people in the audience were limited pretty much to those who had been onstage at the *last* concert, and vice versa, and I decided that a career in this rarefied field might not be for me. A dozen years later, however, the audiences had caught up, and I dived back into electronic composing with a vengeance, using the new commercial tools of the '80s.

Thanks to those tools, which of

Stephen St.Croix is vacationing from "The Fast Lane" and will reappear in the January 2001 issue of *Mix*.

BY PAUL D. LEHRMAN



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the New York downtown scene of the '60s and '70s whose work has recently only been available on bootlegs made by a small but rabid group of fans, is featured in an excerpt from one of his *Drift Studies*. Two sine waves, tuned to a ratio of 32:31, are allowed to drift very slightly over time—on this disc, seven minutes are excerpted from a piece originally 32 minutes long. The description would make it seem excruciatingly boring, but, in fact, the piece really draws your attention, and it makes most "trance" music made since then seem unnecessarily cluttered.

And arguably the greatest of all early electronic pieces, Edgard Varèse's *Poème Electronique*, commissioned for the 1958 Brussels World Fair and designed to be played over 425 (!) loudspeakers in a building by famed architect Le Corbusier that was shaped like the inside of a cow's stomach (!!), is here in a (stereo) version so clean and crisp it sounds like it was recorded yesterday. Stark, spare and incredibly emotive, I guarantee that if you listen to it loud, with the lights off, you won't need to listen to any more music for a while.

During these early days, many composers were forced to create for themselves the devices to make the sounds they heard in their imaginations—and thus was born the "musician as technician," a combination of disciplines that once seemed very foreign, but in today's musical world is not only common, it's expected. Unlike today, there was no commercial light at the end of the tunnel for most of these inventors, and their devices and techniques were created entirely for art's sake. Few received much fortune or fame for their efforts, despite the fact that the technologies they created have become part of the mainstream.

For example, here is one of the first uses of what we now call "sampling": *Dripsody*, a 1955 piece by the Canadian composer and inventor Hugh LeCaine, who used the sound of a single drop of water, recorded onto what he called a "Multitrack Tape Recorder." This was not the multitrack tape deck we know and love today; instead, it was a device that could play 16 tape loops, each going at a different speed, under the control of a keyboard. (If you're thinking this was the direct precursor of the Mellotron, you're paying attention.) The loops in Pierre Schaeffer's *Etude aux Chemins de Fer* weren't done with tape: He recorded railroad sounds onto vinyl records with "locked grooves" so that the same sound would play over and over, "suspending it in time and isolating it from its context," as the liner notes read. And then he discovered what happened when he played it backward!

The inventor of FM synthesis was not a Japanese engineer. He was a Stanford composer, John Chowning, whose goal was to broaden the sonic vocabulary of computer-generated sound and achieve greater precision and control over his music. He didn't set out to create a technology that would end up bringing in more revenue to the university, by licensing it to Yamaha, than any other patent in its institutional history. One of Chowning's early experiments with the concept, *Stria*, from 1977, points the way to the digital synthesis that would define the music of the next two decades. Charles Dodge, then at Columbia University, was a pioneer in computer speech synthesis and manipulation, and we get to hear a selection from his wonderful 1972 group of "Speech Songs" based on poems by Mark Strand, *He Destroyed Her Image*, in which the bardic voice is literally destroyed by the computer. And if you think real-time interactive control over synthesizers only began with MIDI, listen to the 1974 *Appalachian Grove*, a delightful bluegrass-inspired piece realized late at night on the computers at Bell Labs in New Jersey by "resident hippie" Laurie Spiegel.

OHM contains three-and-a-half hours of the roots of electronic music, much of which has not been available on record for years.

OHM also demonstrates how aesthetically diverse the world of electronic music has always been. In the hands of its many practitioners, it has been tonal, anti-tonal, dynamic, static, accessible, obscure, funny, spooky, breathtakingly beautiful and (especially in the case of one piece here, Steve Reich's *Pendulum Music*, in a new recording by Sonic Youth), downright ugly. Perhaps, fortunately, all the pieces on *OHM* are relatively short. While many composers (like John Cage) could create pieces that went on literally for days, nothing in this collection lasts more than eight minutes—where the producers wanted a longer piece to be included, they took an excerpt of the piece, sometimes suggested by the composer, and sometimes using their own judgment.

The sonic quality of the recordings is remarkably good, especially considering the age of some pieces. The only audible noise is on the Clara Rockmore recording, which is actually a little surprising considering it was made in the late '70s. I have heard one of the original 2-track masters of the Varèse, and this CD sounds better than that—I really don't know how or why. Todd Simko, owner of Chateau Shag, a project studio in Vancouver, did most of the mastering for the project, and he says that all of the works came in already digitized, either on CD or DAT, from transfers that were often supervised by the composers (which speaks well for their ability to keep up with technology), their students or associates. Simko's job, he says, was relatively simple, mostly consisting of matching levels. His tool of choice, interestingly, was Mark of the Unicorn's Digital Performer, occasionally employing the Ray-gun plug-in to remove some hiss and rumble, but using no other processing besides an occasional bit of EQ. There's plenty of tape distortion in many of the pieces (and in the LaMonte Young piece, some bias noise, something you don't hear much any more), but that's part of the character, and indeed the charm, of the music.

In keeping with previous releases from Ellipsis Arts, the packaging is gorgeous, and a 96-page booklet accompanies the three discs. Each piece has a short essay from the composer or someone close to him or her, and there are plenty of pictures, as well as a thoughtful introduction by Eno, who maintains that we've actually all been listening to electronic music for 80 years, not just 30. If there is one criticism about the booklet, it is that it doesn't go into the technical aspects of the pieces nearly enough to satisfy the more gear-minded among us. But an excellent source of information about the music on *OHM* can be found in Joel Chadabe's book *Electric Sound* (Prentice Hall), which I also wrote about when I reviewed Ellipsis Arts' previous efforts. Listen to the music, have the book handy as a reference and you will learn much.

Even on three CDs (and with the music packed so tightly together, to fit as much as possible on each disc, it's

—CONTINUED ON PAGE 212

media production system

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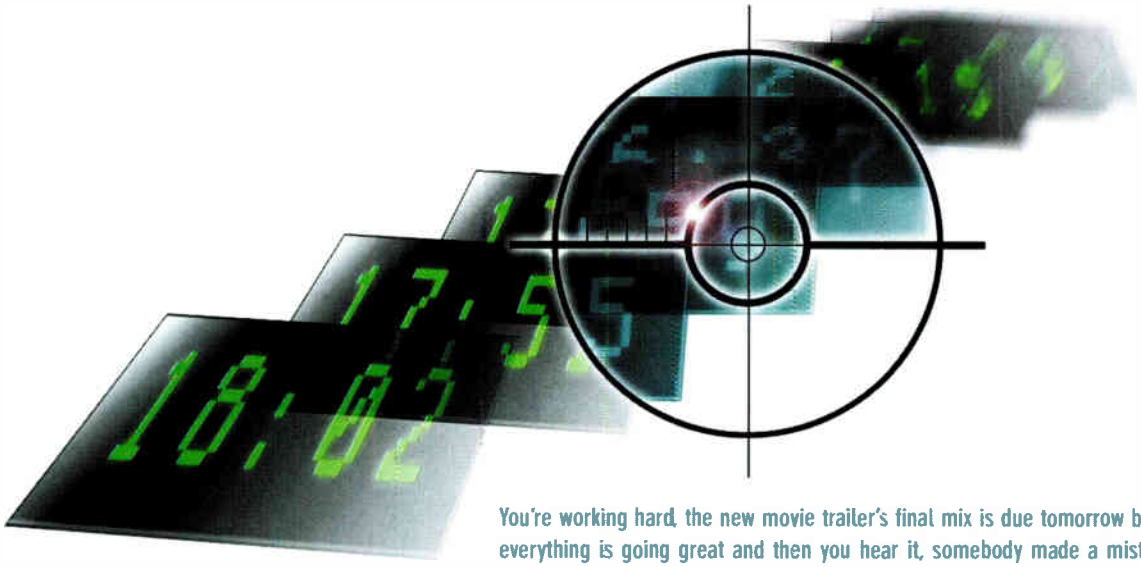

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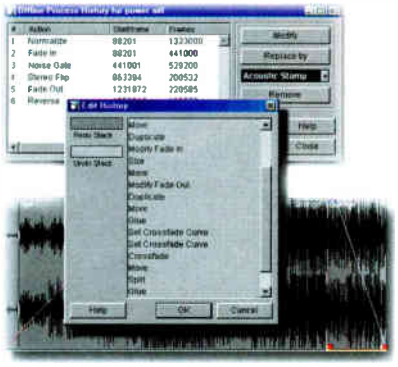
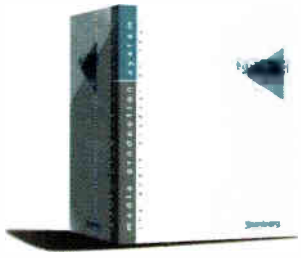


"The top grayed section of the Edit History window indicates events you can Undo or Redo, while the Offline History window behind it shows the various processes that can be modified, replaced, or removed for each audio segment."



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MASTER HOUSE

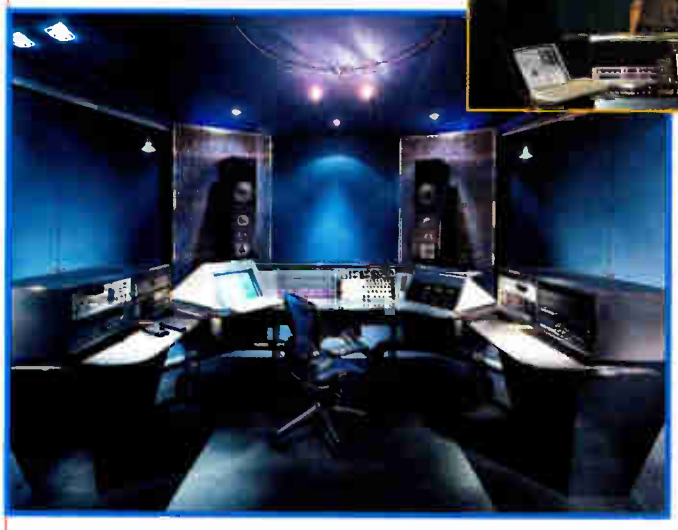
BY BLAIR JACKSON

Over the past few years, Miami has emerged as one of the top second-tier recording scenes in the country—a nexus for homegrown talent that's risen from its multiethnic neighborhoods, as well as for artists from Central and South America who flock to South Florida for its excellent studios and electric atmosphere. Venezuela-born Jose Blanco, owner of this month's cover studio, Master House, is emblematic of the new Miami. He came to the city 20 years ago and, through hard work and persistence, has become an integral part of the city's recording community.

ON THE COVER

He got his start in Miami recording by earning an internship at Studio Center. The internship evolved into a position as an assistant and then, in time, as an engineer. He left that gig to work as a freelance engineer for a period, but then came back to manage Studio Center for two years. The next stop on his career path was managing the ultrahot South Beach Studios for two years. But while he was immersed in the complex and detail-oriented, studio-management jobs, Blanco also found the time to use his ever-growing connections to work as a part-time rep for Sony Mastering Studios in New York, bringing them clients from Central and South America.

Jose Blanco



"That turned out to be a great thing for both of us," Blanco says, "and that put the idea in my head to do something on my own. I had wanted to get into mastering for a while. I like that it's a finesse thing, a refining thing. And from a business point of view, there was a lack of mastering rooms down here. Coming from an engineering background, and the fact that I've managed two studios, gave me the whole package to be able to start up my own studio and hopefully do it the right way."

Initially, Blanco tried to interest other partners in his venture, but when none of those unions panned out, he went at it alone, hiring the renowned Canadian studio design firm Pilchner Schoustal International to draw up plans for his studio, dubbed Master House, designing some of the furniture and work surfaces himself, and calling on Danny Diaz of Acoustical Components to build the room. "We started building in December of 1999, and we had it finished by June 2000—pretty fast work," Blanco says. "Martin [Pilchner] and Rick [Schoustal] did a helluva job! You know, I chose them after seeing some of their work in *Mix* magazine. I had some ideas of how I wanted the room to look, and when I saw what they had done, I contacted them and it worked out great."

When it came to choosing equipment for the new room, "A lot of the credit has to go to Vlado Miller, who's a mastering engineer at Sony, who's been like my coach through the whole thing," Blanco says. "He's helped me a lot in part because I used to feed him work. We've developed a great relationship through the years. He gave me a lot of advice on what to try out for the gear."

At the heart of the room are a full-blown Sonic Solutions System and a Crookwood custom mastering console. Other equipment includes Apogee converters, Weiss digital EQ and digital compressor, Waves L2 Maximizer, the Alesis Master Link, Bryston 4B-ST amplifier, Sony and Tascam CD recorders, and Panasonic, Sony and Tascam DATs. Recently, Blanco has been auditioning some high-end analog EQs and compressors, as well.

As for the all-important monitors, Blanco chose Dunlavy SC-4s. "They are awesome," he comments. "The imaging on the speakers is really great. People sit down and listen to them and they say, 'Wow, man, those are amazing.' I first heard them at Sony, and Vlado highly recommended them for the budget I was in. He came down once to do a Celine Dion album at South Beach where we rigged up our studio as a mastering studio and we rented some Dunlavys, and I was blown away by them."

So far, Blanco has managed to parlay his industry contacts into a brisk business, primarily with acts from Mexico and South America. He also has found time to do mastering work for the great Miami world music band Inner Circle and various smaller South Florida groups. Though Master House was built to accommodate 5.1 work, "I'm still waiting to see where that's going in the next couple of years," Blanco says. For now, Blanco's priority is getting the word out about the studio and doing the best mastering work he's capable of.

For more info and photos, check out www.masterhouse studios.com. ■

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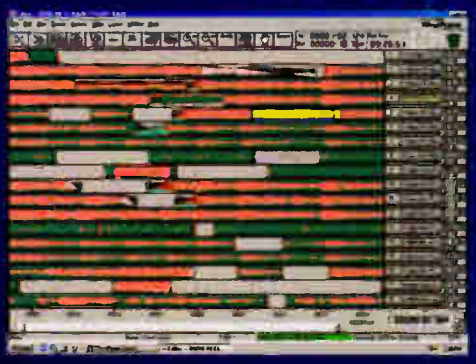

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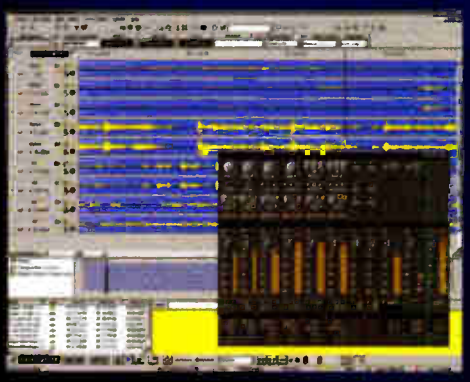

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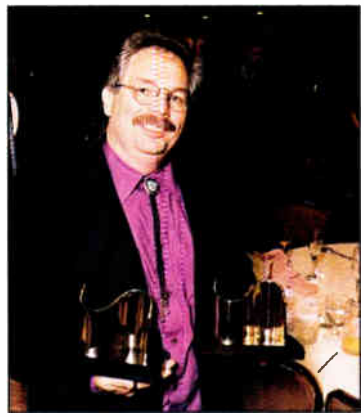
The 16th Annual TEC AWARDS

Photos: Ryan Miller

(L-R) Hall of Fame inductee Sam Phillips with Stevie Wonder and Ike Turner.

Producers Tony Brown (L) and Paul Fox team up to present awards for Outstanding Creative Achievement.

For the second consecutive year, Kooster McAllister was a double winner, with TEC Awards in the categories of Remote Recording Engineer and Remote Recording Facility (Record Plant Remote).



Mike Pappas (L) and Chris Martirano of Kurzweil accept the TEC Award for Musical Instrument Technology for the K2600.

Master of Ceremonies Godfrey keeps the crowd laughing with his energetic brand of humor.

More than 800 people filled the Biltmore Bowl to capacity at the 16th Annual Technical Excellence & Creativity Awards, held September 23 at the Biltmore Hotel in Los Angeles. The evening's highlight proved to be the induction of Sun Records founder Sam Phillips into the Hall of Fame. Introduced by original Sun bandleader Ike Turner, Phillips combined his Southern charm and preacher's humor for a poignant, heartfelt acceptance speech.

Another high point was Stevie Wonder's acceptance of the Les Paul Award on behalf of Sir Paul McCartney, who sent in a video thanking Les. Stevie, for his part, told a story from the early '70s when Sir Paul sent him a copy of the latest Wings album inscribed throughout in Braille.

TEC Awards were presented in 28 categories, covering Institutional, Creative and Technical categories. Hosted by comedian Godfrey, presenters included producers Glen Ballard, T-Bone Burnett, Tony Brown, Paul Fox and Don Was; recording artists Meredith Brooks, Herbie Hancock and Alan Parsons; engineers Ed Cherney, Jack Joseph Puig and Skywalker Sound's Leslie Ann Jones; Record Plant president Rose Mann; *Mix* editor George Petersen; Ocean Way's Allen Sides; and Soundelux's Wylie Stateman.

The House Ear Institute's Sound Partners campaign and Hearing Education and Awareness for Rockers (H.E.A.R.) will once again receive 50% of the evening's proceeds to continue their efforts in hearing conservation. The remaining funds will be divided between the AES Educational Foundation, the SPARS student assistance program and various audio scholarship programs throughout North America.

Soundelux's Wylie Statemon and Skywalker Sound's Leslie Ann Jones presented awards for Outstanding Technical Achievement.

Euphonix takes home a TEC Award for Large Format Console for its System 5 digital board.

(L-R) Mix Foundation president Hillel Resner, Lexicon's Wayne Morris and presenter Alan Parsons.

Jim Cooper of MOTU accepts the award for Ancillary Equipment for the MIDI Timepiece AV-USB.

Tascam's Jeff Klopmeyer (L) and Phil Sanchez happily accept the TEC Award for Recording Devices/Storage Technology for the DA-78HR.

Herbie Hancock (L) and Don Was provide a lively start to the 16th Annual TEC Awards.

Jeffrey Bork (left) and Paul Wolff (R) of API show off the award in the Small Format Console category.

Glen Ballard, winner of the 1999 TEC Award for Producer of the Year, and singer/songwriter Meredith Brooks wrap up the presentations in the creative categories.

TC Electronic's Ed Simeone (L) and Morton Lave accept a TEC Award for Signal Processing Technology/Hardware for the System 6000.

Producer Don Was and producer/engineer Ed Cherney mug for the camera during the reception.

The 16th Annual TEC Awards were partially funded by the generous sponsorships of:

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Record Plant Remote, Ringwood, NJ

Recording Studio
Record Plant, Los Angeles

OUTSTANDING CREATIVE ACHIEVEMENT

Audio Post-Production Engineer for Film
Ben Burtt

Audio Post-Production Engineer for Television
Sue Pelino

Remote Recording Engineer
Kooster McAllister

Sound Reinforcement Engineer
Robert Scovill

Mastering Engineer
Bob Ludwig

Record Producer
John "Mutt" Lange

Recording/Mixing Engineer
Mike Shipley

OUTSTANDING TECHNICAL ACHIEVEMENT

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Sound Reinforcement Loudspeaker Technology
Meyer Sound UPM-1P

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Genelec 1036A

Musical Instrument Technology
Kurzweil K2600

Signal Processing Technology/Hardware
TC Electronic System 6000

Signal Processing Technology/Software
Antares Microphone Modeler

Recording Devices/Storage Technology
Tascam DA-78HR

Workstation Technology
Digidesign Pro Tools 5.0

Sound Reinforcement Console Technology
Midas Heritage 3000

Small Format Console Technology
API 7600/7800

Large Format Console Technology
Euphonix System 5

LES PAUL AWARD
Paul McCartney

HALL OF FAME
Sam Phillips

Stevie Wonder accepts the Les Paul Award on behalf of Sir Paul McCartney from Hillel Resner.

Ike Turner helps induct Sam Phillips into the Hall of Fame.

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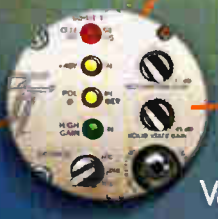

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DVD-Audio

Finally!

The Wait is Over!

Despite the rapid pace of technological change, the introduction of a new consumer format doesn't happen overnight. And from the first announcements of DVD-Audio more than four years ago to the eventual consumer rollout in time for Christmas 2000, it's been a long time coming. But DVD-Audio is finally here and, just like you, we here at *Mix* are still trying to figure it out.

To kick off this special section on DVD-Audio, New York editor Paul Verna writes about the many challenges facing the new format's introduction, from record label marketing strategies to the practical questions facing equipment manufacturers. New Technologies editor Philip De Lancie examines the DVD-A specification itself and explains the choices available to content producers. Contributing editor Rick Clark details the behind-the-scenes activities surrounding the 5.1 remix of *Frampton Comes Alive*, one of the best-selling live albums of the '70s. And East Coast editor Dan Daley expands on the forensic and legal hurdles that can hinder the repurposing of existing audio material.

Arrives!

A Special Mix Section

by Paul Verna

DVD-Audio is finally ready for prime time; the Warner Music Group released its initial batch of DVD-A discs on November 7, 2000. Those releases—on the Warner Bros., Atlantic, Elektra, Teldec and Erato labels—carry a suggested list price of $24.95, packaged in jewel boxes and clearly labeled as DVD-Audio titles. More Warner releases, including titles on the Nonesuch, Giant and Rhino catalog imprint, are set for a December 2000 and January 2001 release. With regard to hardware, DVD-A players are already in the marketplace or soon due from such brands as Panasonic, Technics, Denon, Onkyo, JVC, Toshiba, Kenwood and Pioneer. The players range from home units to car players to shelf systems to portables, and the prices range accordingly, from the low hundreds of dollars to $1,200 and up. Most of the DVD-Audio players in the U.S. incorporate the encryption technology mandated by the recording industry, and some include a watermarking chip that is designed to protect music copyrights.

Warner Bros. is the first major music label to embrace the new format, and, having spearheaded the promotional effort to launch DVD-A in the marketplace, is predictably bullish on the format.

"DVD-Audio represents a dramatic leap in quality," says Warner Music Group senior VP Jordan Rost. "[The DVD-A format] can take advantage of technological advances [that have occurred] in the 17 years since the CD was launched. That's many lifetimes in the digital world. We also can take advantage of the momentum and the acceptance in the marektplace of DVD [Video]. This is very different from any other music industry format launch. We have replication capabilities in our plants already in place, and millions of players are already out there. In fact, [the Consumer Electronics Manufacturers Association] says there are almost 10 million DVD Video players out there, and 20 percent of homes in the U.S. have surround systems."

DVD-WHICH? CROSS-PLATFORM COMPATIBILITY

Despite Rost's enthusiasm, the viability of DVD-Audio is still an open question. Skeptics point out that the improvement in sound quality *vis-a-vis* CD is not significant enough to entice consumers to buy DVD-Audio players. Furthermore, say critics of DVD-Audio, the installed base of DVD-Video players may act as a deterrent to the new format, because first-generation DVD-Video players are unable to access the full-bandwidth, multichannel audio layers on DVD-A discs.

Taking these potential hurdles into consideration, Warner and the other majors—BMG, Universal, Sony and EMI—are making sure that they cater to the installed base of DVD-Video users, while also trying to create a new market for high-resolution, uncompressed multichannel sound. The labels are also mindful of the hundreds of millions of consumers who appear to be content with their CD players and vast collections of discs.

In order to reconcile these distinct but overlapping market segments, Warner is equipping each of its releases with a DVD-Audio layer, which will play only on dedicated DVD-A players or combination DVD-Audio/Video decks; a high-resolution stereo stream (typically 24-bit/96kHz for the DVD-A player) and a Dolby AC3 layer so that owners of DVD-Video players

FIRST DVD-A RELEASES SPAN POP, ROCK, JAZZ AND CLASSICAL REPERTOIRE

In order to make the DVD-Audio launch as comprehensive and effective as possible, Warner Bros. has covered all stylistic and demographic bases. Other labels are expected to follow suit with product launches in late 2000 and early 2001. However, as this article went to press, no label group other than Warner had announced a specific release schedule.

The first DVD-A releases from the Warner Music Group cover a wide range of pop, rock, jazz and classical repertoire:

- Beethoven's Symphonies Nos. 4 & 5, conducted by Daniel Barenboim with the Staatskapelle Berlin.
- *Johann Strauss in Berlin*, conducted by Nikolaus Harnoncourt with the Berlin Philharmonic.
- *Core* by the Stone Temple Pilots.
- *Tigerlily* by Natalie Merchant.
- *Brain Salad Surgery* by Emerson, Lake & Palmer.
- *Hommage a l'Orchestre Lamoureux*, consisting of Chabrier's *España* and Ravel's *Bolero*, by the Orchestre Lamoureux conducted by Yutaka Sado.
- *The Bedroom Mixes* by the Jazz at the Movies Band.

Releases scheduled for December, January and beyond on Warner-owned labels will include DVD-Audio discs from such pop and rock artists as Barenaked Ladies, Tracy Chapman, Alice Cooper, The Corrs, Deep Purple, The Doors, Fleetwood Mac, Foreigner, Fourplay, Metallica, Steely Dan, Rod Stewart and Take 6. Other popular artists appearing on DVD-A for the first time will include the Buena Vista Social Club, Olu Dara, Miles Davis, the Firesign Theatre, Bela Fleck, k.d. lang, Pat Metheny, Luis Miguel and Joni Mitchell. The classical and new music repertoires will be expanded with works from Philip Glass, the Kronos Quartet, Daniel Barenboim (conducting Beethoven's complete symphonies) and Zubin Mehta (conducting Orff's *Carmina Burana* and Mahler's Symphony No. 2). DVD-A product launches expected from labels other than Warner include the Lonestar project on BMG's BNA label, the Blue Man Group's "Audio" project (EMI), Sting's *Brand New Day* (Universal) and Hanson's "Direct TV" special (also Universal). ■

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can still listen to multichannel versions of the audio titles—albeit in a compressed form—through their DVD-Video surround sound systems.

With regard to backward compatibility with the CD, Warner chose not to include a Red Book layer on its DVD-Audio discs; however, Red Book CDs will play in both DVD-V and DVD-A machines, ensuring that consumers' CD collections remain viable as they upgrade their hardware. (For an in-depth look at the DVD-Audio specification and what it offers to content producers and listeners, see "Music Meets Multimedia" on page 48.)

THE GREAT DEBATE

In fact, the DVD-A format has been debated fiercely in the recording industry for at least three years. First there were the technical hurdles of the format itself—deciding on the bit resolution and sampling rate, as well as the inherent structure of the discs. That debate was further complicated by the development of Super Audio CD by Sony and Phillips. SACD is a competing sound carrier based on Direct Stream Digital (DSD) encoding, which is incompatible with the Pulse Code Modulation (PCM) technology that underlies the CD and DVD-Audio. That issue was resolved; Sony and Phillips will market their product separately, targeting it as an audiophile format rather than a mass-market sound carrier.

Then came the entanglements over compression technology, which was needed to deliver six channels of full-bandwidth, high-resolution audio on a 12cm disc. Dolby was already using its AC3 compression algorithm on DVD-Video discs, and Digital Theater Systems (DTS) had developed a compression system that allowed for the use of multichannel audio on conventional CDs. However, neither system was acceptable to the recording industry, which insisted on a "lossless" compression technology that would be transparent to the listener.

Industry executives got their wish when Meridian Lossless

A letter to Mix

Greetings,
I and my studio manager attended the *Mix* magazine Studio Pro 2000 conference this past June in New York. There was lots of excitement about 5.1 as it relates to music. I was quite frustrated when I encountered presenters—some of whom design studios for a living—who seemed to think that 5.1 music is a separate issue from 5.1 film sound. At one point in a seminar, I challenged a studio designer's contentions about optimum listening position for the engineer and [asked] why was he recommending such different speaker/mix positions from the Dolby 5.1 spec? His response: "Why would you listen to Dolby about how to mix in surround?"

What worried me most about the conference was the implied supposition that people listening to 5.1 music mixes would want to have a different listening environment from the one they listen to their 5.1 movies in. By insisting that 5.1 music should be optimized for 5-point source speakers with the listener at dead center, as opposed to the Dolby spec of prime listening position two thirds of the way back in the room with more diffuse surrounds, are we imagining people have two living rooms? Or that they're going to slide their couches around and reposition their speakers depending on whether they're watching a movie or listening to a DVD-Audio disc?

Mixing *anything* in 5.1 is so much more fun than mixing in stereo. But with well-established standards already in place from the film industry for dynamic range, speaker placement and subwoofer channel response, I was really surprised to see that the music industry is barreling ahead on the 5.1 bandwagon assuming that those film standards are not particularly relevant.

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DVD-Audio Arrives!

Packing (MLP) emerged as a truly lossless compression system that, according to such golden-ears listeners as Bob Ludwig of Gateway Mastering & DVD, is not audible. ("The MLP encoding can take several hours to do," says Ludwig, "but it seems to sound transparent.")

Having cleared the compression hurdle, the industry seemed poised to launch DVD-Audio in late 1999, but just then a hacker in Scandinavia cracked the DVD-Audio copyright encryption code, sending developers back to the drawing board. Now, with that obstacle out of the way, the industry faces only creative and marketing challenges.

NEW FORMAT, NEW CHALLENGES

While some of the creative challenges of DVD-Audio production have been explored by the producers of multichannel audio mixes for DVD-Video releases, several new issues confront studio professionals just now getting their feet wet in DVD-A.

For starters, the ability to deliver full-resolution audio signals (24-bit at 96 or 192 kHz) direct to the final product is enormously exciting to producers and engineers. Ken Caillat, a partner in Los Angeles-based 5.1 Entertainment Systems, recently remixed rock classics like Fleetwood Mac's *Rumours* and Alice Cooper's *Welcome to My Nightmare* for DVD-Audio. The Fleetwood Mac project was especially close to Caillat's heart—he was the original engineer and co-producer of the album. Caillat not only knew the source tracks inside out, but he also kept meticulous notes. On one cut, "Songbird," the DVD-Audio format gave him the luxury of bringing out ambient mics that had previously been buried in the stereo mix.

"When we tracked 'Songbird' at the Zellerbach Auditorium at U.C. Berkeley, we put tube mics out in the hall," recalls Caillat. "Originally, those mic signals got blended in under the piano and the vocal, but this time I was able to place them discretely in the soundfield. In some cases, in the stereo mix, the delay in the rear mics was too much, so you'd have to pull them way back, but in multichannel you want that space."

For the Alice Cooper title, Caillat and the album's original producer, Bob Ezrin, were faced with the challenge of re-creating a bus flange that was a hallmark of the original recording, which appeared in 1975. "Flanging went out in the '70s, but we had to re-create the effect on 'Welcome to My Nightmare,'" explains Caillat. "First, we tried doing it digitally, but we ended up renting a couple of analog multitracks and flanged all five channels the old fashioned way. When Bob Ezrin heard it, he said, 'How much more can you give me?' He overemphasized what it was doing in the stereo mix, and it sounded great. Even better than the original."

Although Caillat, like many engineers working in the multichannel medium, is not afraid to use the surround sound field to its full potential, he respects the sound design of the original recordings. "We try to be faithful to the original CDs, so fairly soon into the mixing process we start doing comparisons," he observes. "We don't want to come up with Ken Caillat's cool echo things when Joni Mitchell or Fleetwood Mac had a sound that the consumer wants to hear. Our yardstick is that if someone down the hall from the studio where we're mixing these albums in 5.1 hears them, they should sound like the original album." [For an in-depth look at a 5.1 remix of an iconic album, see "Frampton Comes Alive in 5.1" on page 60.]

AUTOMATIC FOLDDOWN SPEEDS REMIXES

While the DVD-Audio format allows for a discrete stereo mix, many producers who are remixing classic albums are opting for the automatic folddown feature, which extrapolates a 2-channel master from the 5.1-channel tracks, according to the producer's instructions. Most of the Warner titles, at least in the initial batch, employ the company's proprietary SmartContent folddown technique. Similarly, the Lonestar DVD-Audio was also "folded down" automatically from the multichannel surround mix, according to the project's engineer, Jeff Balding.

"The Euphonix console at Emerald in Nashville, where we mixed Lonestar, allowed us to do several different things at the same time," says Balding, noting

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"I found myself pulling it out for all sorts of material — not just vocals but strings, drums, sampled Wurly, you name it. Mic Modeler never ceased to amaze me."
> JOHN KROGH, *Keyboard Magazine*

"[My engineer Alan Meyerson] had experimented with the plug-in on the new Ridley Scott film *Gladiator* for composer Hans Zimmer, running the entire orchestra through Mic Modeler. For me, he was using the Mic Modeler for enhancing string samples.

All I can say is that the difference was profound and wonderful. Mic Modeler is becoming one of my favorite plug-ins to make everything sound more vibrant and interesting."
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> ERIK HAWKINS, *Electronic Musician Magazine*

"Mic Modeler can be a great way to bring in a new color to work with... The cool thing about this plug-in is that the tonality changes with the strength of the signal, so it's like a dynamic EQ of sorts, which is definitely a bonus for hard disk recording, where things can tend to sound flat and one-dimensional."
> BILL GOULD, Producer/Engineer

"I turned an acoustic guitar recorded with a Fishman pick-up into a AKG C12 miked thing of beauty. Wow! ...Are you sure there's no little guys with mics inside there? Pretty amazing. Pretty amazing."
> TED PERLMAN, Producer/Arranger for MTV, Chicago, Kaci, The Manhattans

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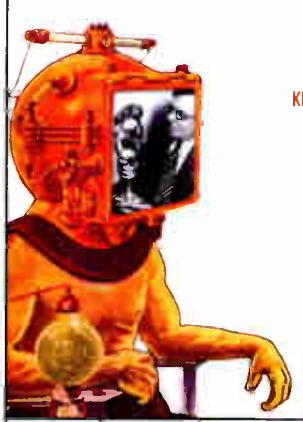

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DVD-Audio Arrives!

that he created a discrete, 6-channel mix and a folddown in stereo at the same time. "In the monitoring section, we could go between 5.1, stereo and mono. We had a formula that folded in the sub and rear speakers into that, and it really kept everything intact. We also had it set up so we could check bass management, as well as discrete audio."

Balding, like many engineers, was initially of the mindset that DVD-A would necessitate two separate mix passes. However, his positive experiences with folddown have persuaded him otherwise. "I thought I would want to do two mixes, but I don't think it's going to be necessary," he says. "Folddown is going to work well enough so that it's going to be a matter of simply checking to hear how well everything relates."

Noting that mixing for DVD-Audio is still in its infancy, Warner's Rost says, "The studio infrastructure is still developing. We'll see more and more work on the surround mix as people are mixing for stereo at the same time, and that will facilitate the whole process. A lot of people who are mixing for surround tell us that it's actually easier than they anticipated, because they're not shoehorning everything into two channels."

RECORDING FOR 5.1

As the craft develops, more and more producers and engineers are taking multichannel into account at the recording stage. For instance, Balding has been laying extra tracks down on most of his projects for the past few years, with the hopes of being able to put more ambience into multichannel mixes down the road.

At 5.1 Entertainment, Caillat and his partner, engineer Gary Lux, made a surround recording from the ground up with the Big Phat Band, which 5.1 has signed to its Silverline label. The DVD-Audio, "Swingin' for the Fences," featured the band set up in a semicircle in the studio and the final product reflecting the "in-the-round" style.

"It was amazing," says Caillat. "The whole band decided to place the instruments around the room, so there was a lot of point-counterpoint between the front and back speakers. At first, the concept was new to the musicians, but once they got it, it was great. It was the first thing we did from the ground up in multichannel."

Balding is enthusiastic about the new creative possibilities that the medium affords him. "I think it's got a lot of potential," he says. "If you look at it from the creative standpoint, from an engineering or producing perspective, you've got a whole new palette. From the consumer's standpoint, music is about entertainment, and this is going to provide more entertainment for the listener. Even when you've got a tune that isn't very creative, production-wise, like a ballad, you can still pull the mix around you so you really get that live, sitting in the room with the band feel."

For those who really want to feel surrounded, the car is one of the best venues for multichannel sound. In fact, there's a school of thought in the industry that believes, in Ludwig's words, that "the car's going to be what sells 5.1. It's amazing in the car." ■

Paul Verna is a freelance writer based out of New York.

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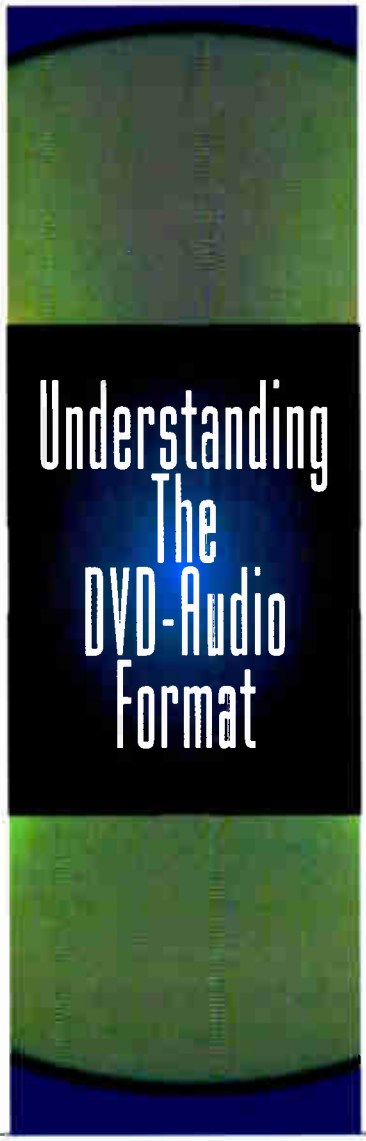


by Philip De Lancie

With the world's attention riveted on the Internet, the DVD-Audio format is facing a tough fight—will DVD-Audio establish itself as the successor to the Compact Disc, or will it face the same indifference as the ill-fated Enhanced CD format? Now that the first DVD-Audio players and titles are trickling out, it's hard to remember why the format was proposed in the first place, and what it actually brings to the party. This article will attempt to clear up some of that confusion.

It must be said that the DVD-Audio format is a compromise and not everyone will be happy with it. But DVD-Audio significantly extends the technical and creative options of prerecorded audio, while simultaneously offering a consumer-friendly platform for music-related multimedia. Although it will take awhile to make consumers aware of its presence, music industry professionals who begin exploring DVD-Audio's capabilities should immediately find much to like.

Like CDs, DVD-Audio uses Pulse Code Modulation (PCM). But DVD-Audio takes significant technical strides beyond CD by supporting higher-resolution (word length and sample rate), multichannel sound and lossless compression. Depending on how these factors come into play on a given disc, the format also offers greatly extended playing times.

One of DVD's most important characteristics is versatility. Beyond a simple audio format, DVD-Audio offers built-in support for the same kinds of "value-added" multimedia features that the record labels tried to support with the Enhanced CD format, which was undermined by technical incompatibilities and consumer apathy. DVD-Audio will support still pictures, text and video and, like DVD-Video, may use graphical menus.

How much (or little) a DVD-Audio release takes advantage of these multimedia features is entirely up to the producer. Unlike CDs, which are all conceptually the same, DVD-Audio albums can, and probably will, be all over the map in terms of audio and multimedia content. That means there will likely be no such thing as a "typical" DVD-Audio disc. And, because the audio market depends on a broad spectrum of player types—from in-

DVD-Audio Playback Time Examples

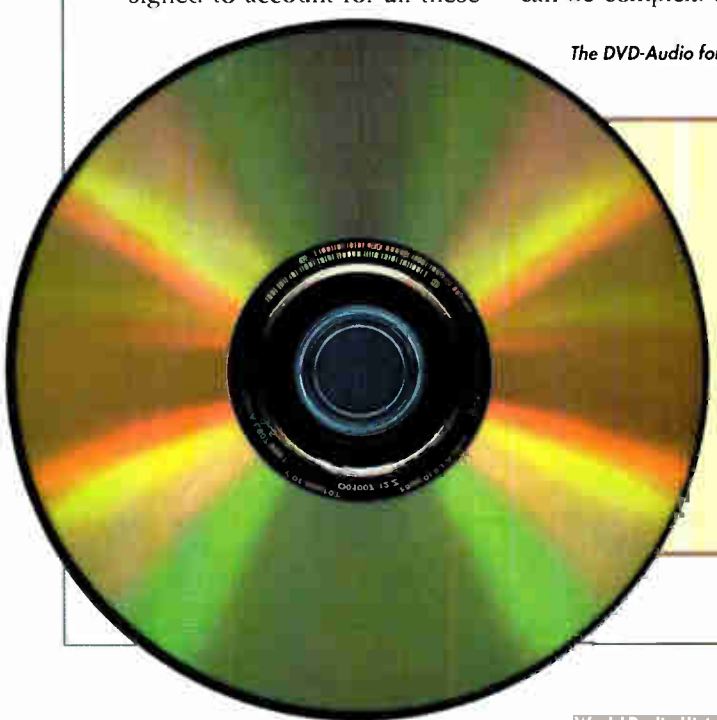
Audio Contents Combination	Channel Combination	Playback Time per Disc Side			
		12cm Disc		8cm Disc	
		Single-Layer	Dual-Layer	Single-Layer	Dual-Layer
2-ch only	48k/24-bit/2ch	258 min	469 min	80 min	146 min
2-ch only	192k/24-bit/2ch	64 min	117 min	20 min	36 min
2-ch only	192k/24-bit/2ch	125 min	227 min	39 min	70 min
multich. only	96k/24-bit/6ch	86 min	156 min	27 min	48 min
2-ch and multich.	96k/24-bit/2ch + 96k/24-bit/3ch & 48k/24-bit/2ch	76 min each	135 min each	23 min each	41 min each

The capacity of a DVD-Audio disc ranges widely depending on variables, including number of channels, resolution, use of MLP and disc size and type. (DVD-5, a single-layer, 12cm disc, will likely be the most common.)

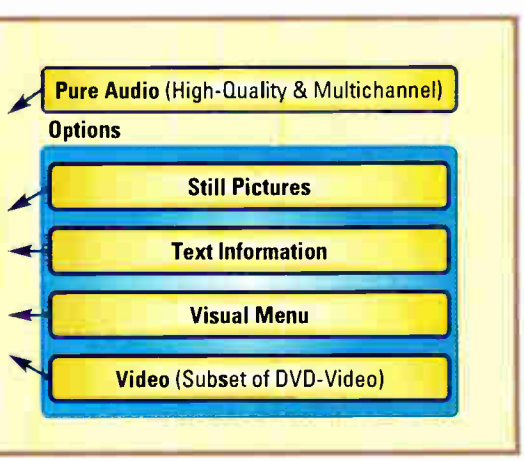
DVD-Audio is a compromise, but it significantly extends the technical and creative options of prerecorded audio.

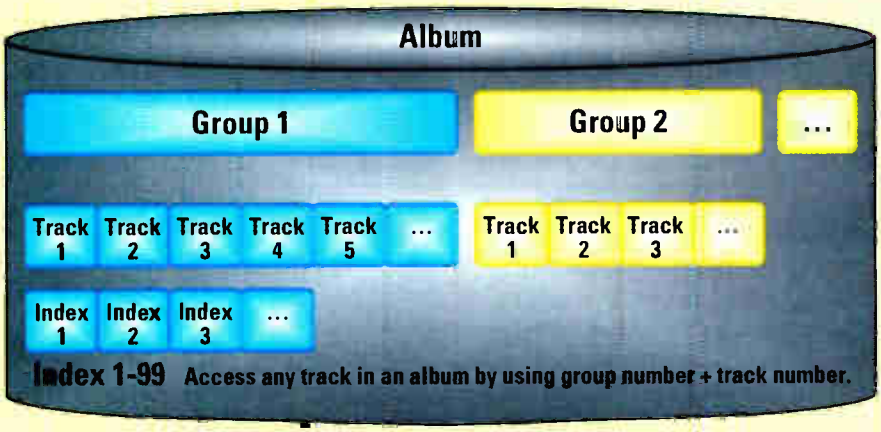
expensive personal portables to boom boxes, automotive decks and home hi-fi players—there will be many types of DVD-Audio players.

DVD-Audio has been designed to account for all these variables and still maintain compatibility. All in all, the format allows a fair amount of creative flexibility, but demands strict adherence to the technical details of the specification, which can be complex. Before we dig into the specifics of the audio and other media types that make up DVD-Audio content, let's examine the underlying structure of the format, as well as the various types of supported discs and players.



The DVD-Audio format is built around digital audio but also supports optional added-value content, including still pictures, text, visual menus and video.





DVD-Audio albums may contain up to nine groups, each of which is a playlist of up to 99 tracks.

A COMMON PLATFORM

In defining the DVD family of formats, the consumer electronics, entertainment and computing industries created the specifications for a single platform with multiple uses, which would allow for both interoperability in use and economies of scale in manufacturing. So all prerecorded DVDs are actually DVD-ROMs formatted in the UDF file system.

A DVD-Video, for instance, is a DVD-ROM disc that includes a VIDEO_TS directory (folder) containing all the presentation data (video, audio, etc.) and navigational data required by the DVD-Video specification. A DVD-Video player is designed to look for this DVD-Video "zone" and uses the data to play back DVD-Video content. For DVD-Audio, the equivalent zone is called AUDIO_TS.

Anything on a DVD that is not in these DVD-Video or DVD-Audio zones is referred to as being in the "DVD-Others" zone. This could be any kind of computer data, such as a huge database, an interactive game or a clip-art collection. A single-sided, single-layer DVD, known as a DVD-5, has a total storage capacity of 4.7 GB for the combined contents of all the disc's zones; a DVD-9 (single-sided, dual-layer) has space for 8.54 GB. The DVD format also includes DVD-10 (double-sided, single-layer) and DVD-18 (double-sided, dual-layer).

A common underlying platform for all DVDs makes it easy to allow a DVD-Video or DVD-Audio disc to be played from a DVD-ROM drive (assuming the host computer is properly equipped) and includes extra features—HTML pages that link to the Web, for instance—that may be accessed on a computer. When the same disc is played in a set-top player, however, the DVD-Others material is ignored, and only the contents of the DVD-Video or DVD-Audio zone are played.

MANAGERS AND GROUPS

Many artists and/or labels may choose to use only DVD-Audio's audio capabilities and will create what have been referred to as "Pure Audio" DVDs. In its simplest form, a Pure Audio disc will function much the same way as a CD; the player uses linear, track-based navigation to access the disc's contents.

When a CD is inserted into a CD player, the player reads the TOC (table of contents) file to find the addresses of all the tracks. With DVD-Audio, a player looks in the AUDIO_TS folder for a similar directory of the disc's contents, referred to in DVD lingo as a "manager." The manager that is equivalent to the CD's TOC is the SAMG (Simple Audio Manager), essentially a list of up to 314 tracks. Every DVD-Audio disc is required to include a SAMG to enable track-based navigation.

A more sophisticated form of Pure Audio DVD will offer more flexible navigation by taking advantage of the DVD-Audio specification's organizational hierarchy. Of this hierarchy's five levels—album, group, title, track, index—users are generally only conscious of tracks and groups.

As with CD, a DVD-Audio track is a single selection, such as a song. The function of a group is to allow an album's producer to specify multiple playlists of tracks. Up to nine groups are allowed per album (each side of a DVD-Audio disc is one album). Because a group is simply a playlist, a given track may be referenced by more than one group. For example, on an album with 20 audio tracks, one group might be a sequence of all the songs, another could be a "mellow" playlist of just acoustic numbers, and a third might be a "party" playlist of just dance tracks.

Using groups, producers may create up to nine different listening experiences from one set of material. To access a given track using the player's remote, the user first enters a group number and then the number of the track within that group. Once any track within a given group has begun playing, the player will continue playing the rest of that group's tracks on through the end of the group.

MULTIPLE PLAYERS

As noted earlier, a successful audio format needs to be compatible with a range of players covering a wide variety of prices and playback environments, from the jogging trail to the living room. The mandated inclusion of SAMG allows manufacturers to design inexpensive machines that utilize only track-based navigation, and thus keeps DVD-Audio from being limited to the high end. Players that support the use of groups, however, ignore SAMG and instead read a different manager called AMG (Audio Manager). By requiring two different directories, the specification ensures that every disc can be read by different types of players that are designed for quite

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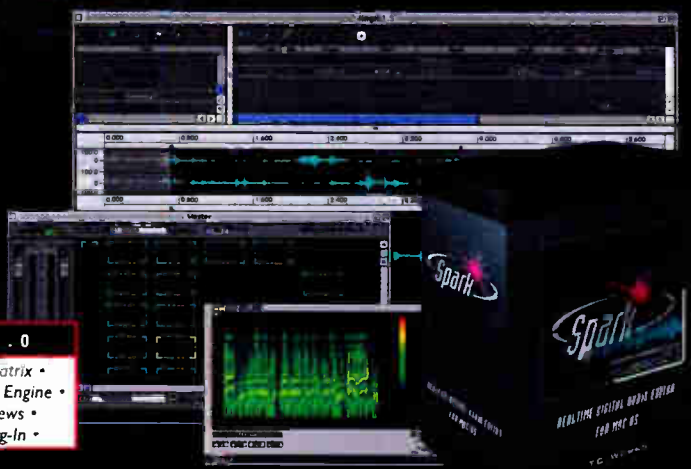

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different segments of the consumer market.

To give hardware manufacturers even more flexibility in targeting their players to specific markets, the more sophisticated players—those that use AMG rather than SAMG—may or may not include video outputs to hook to a television for DVD-Audio's multimedia features (SAMG players never have video outs). Even without video, AMG players may support text by means of a front-panel LED display that shows information, such as song titles (with a choice of languages).

To figure out how to play back a given disc, players with video outputs look at a section of AMG known as AMG/AVTT (the "AV" refers to audio-with-video). AMG players without video outputs, on the other hand, refer to AMG/AOTT (audio-only). If there is no graphical content on the disc, then AVTT and AOTT are essentially the same. By defining these two distinct sections of AMG, the specification allows a single type of disc to cover two quite different types of players.

AUDIO AND VIDEO TRACKS

In addition to DVD-Audio players, some of the content on a DVD-Audio disc may also be playable on a DVD-Video player, because there are two basic types of tracks allowed in DVD-Audio: audio and video.

The basic unit of presentation data for an audio track is an AOB (Audio Object) file. Each AOB contains a PCM audio stream, plus an optional Dolby Digital (AC-3) audio stream. Optionally, an audio track can also be accompanied by still images (photos, graphics) and/or text. The still images are stored in presentation data files called ASVs (Audio Still Video), made up of an MPEG-2 encoded frame with optional highlightable subpicture overlays for information, such as lyrics or bios.

Up to 99 ASVs (not more than 2 Megabytes total) may be grouped together into an ASV Unit that plays over an "ASVU range" of one or more audio tracks. The producer decides the Display mode, which may be Slideshow (predefined image duration) or Browseable, and the order, which may be sequential, random or shuffle. The player preloads each ASVU into memory before starting to play the tracks in that range. There is no audio output for at least two seconds during this preloading, so the boundaries of ASVU ranges must be placed in such a way to avoid muting during continuous audio program.

The presentation data for a video track, meanwhile, comes from VOB (Video Object) files. As in DVD-Video, a VOB contains interleaved streams of MPEG-2 video, plus audio and optional subtitles. However, video is not handled identically under the two specifications. Except for during menus with motion-video backgrounds, DVD-Audio does not support DVD-Video features, such as seamless branching, parental control, and some of the author-defined commands that make DVD-Video capable of complex interactivity.

The producer of a DVD-Audio decides whether or not the audio from a given video track should play back on audio-only players. If yes, then the video's audio must include a linear PCM stream. (An optional Dolby Dital stream may also be present.) If no—if the audio would be pointless without the accompanying picture—then a linear PCM stream is not required. (Using Dolby Digital only would be allowed.) However, a video track that is not set up to allow audio playback on audio-only players may not be included in a group with any material that is. That means that such video tracks must be segregated into their own groups.

When a DVD-Audio player looks for the files (audio, stills and text) that it may need to play back audio tracks, it finds them in the AUDIO_TS folder. The data for video tracks, however, is stored in a VIDEO_TS folder like that used on a DVD-Video. The inclusion of a VMG

Group 1	#1	#2	Time
Track 1 aaa	48k/20b/5ch	48k/20b/2ch	4:00
Mute → Track 2 bbb	48k/20b/5ch	48k/20b/5ch	4:30
Track 3 ccc	96k/20b/3ch & 48k/20b/3ch		5:10
Track 4 ddd	96k/20b/3ch & 48k/20b/3ch		4:00
	Group 1 total time		12:40

Group 2	#1	#2	Time
Track 1 ccc	96k/20b/3ch &		5:10
Mute → Track 2 aaa	48k/20b/5ch		4:00
Mute → Track 3 eee	96k/20b/3ch & 48k/20b/3ch		4:00
	Group 2 total time		13:10

A given song may be referenced by more than one group. (See songs aaa and ccc in the example above.) Groups may also include audio tracks of different resolutions and channel configurations.

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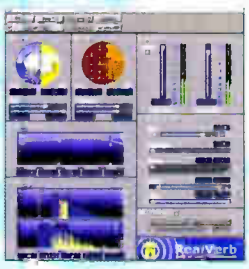

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(Video Manager) in this folder is what allows the disc's video tracks to also be played in a DVD-Video player, which cannot recognize AMG (or SAMG). This setup allows creation of discs that will play back something on a DVD-Video player, even though the rest of the DVD-Audio material is only accessible on a DVD-Audio player.

While the implementation of all these playback variations may seem dauntingly complicated, it's all intended to allow producers to use as many DVD-Audio features as they like—without creating discs that won't play at all on certain types of players. In practice, the types of players producers will likely need to target their efforts come down to three: track-based, audio-only players; audio-only players that support groups; and "Universal" players that have video outputs and also include the ability to play DVD-Video titles, such as consumer video releases.

AUDIO FORMATS

With a general understanding of how DVD-Audio works, we can focus on the format's audio capabilities. As explained above, there are actually two types of tracks, audio and video, and each has its own audio requirements.

The audio requirements for video tracks, based on the DVD-Video spec, are the simpler of the two. Linear PCM streams are supported at 16, 20 and 24-bit word lengths. Two sample rates are supported: streams at 48 kHz may use up to eight channels; streams at 96 kHz may use two channels only. The maximum audio bit rate is limited to 6.1444 Megabits per second. For Dolby Digital streams, up to 5.1 channels may be used, with a maximum bit rate of 448 kilobits per second.

The audio for audio tracks, which is really the heart of the specification, is quite a bit more complex. While players may optionally include support for formats such as Dolby Digital or DTS, support for PCM is required. Players are actually required to support two types of PCM: linear (the same type as on CDs, aka LPCM) and "packed" using Meridian Lossless Packing. MLP is a data-reduction technique that allows PCM to be expressed more compactly than LPCM—yielding storage and bandwidth efficiencies of 40% to 50%, depending on the program—and then reconstructed with bit-for-bit correspondence to the original signal (hence the term "lossless").

MLP was included in the DVD-Audio specification to facilitate the use of high-resolution and multichannel sound. The supported resolutions use 16, 20 or 24-bit word lengths and are divided into two sample-rate families. One is based on the CD's 44.1kHz rate, and also includes 88.2kHz and 176.4kHz rates. The other is based on the standard audio-for-video rate of 48 kHz, and also includes the multiples 96 kHz and 192 kHz. Within each family, the highest rate is supported for mono or 2-channel playback, while the other rates allow up to six channels.

High-resolution audio eats up a lot of bandwidth. Using LPCM, for example, six channels of 24-bit/96kHz audio requires a bit rate of 13.824 Mbps, far in excess of DVD-Audio's audio bandwidth of 9.6 Mbps (the maximum rate at which audio data is read by the player's drive). This problem is addressed in part by MLP, but the specification also allows producers to allocate bandwidth by using higher resolution for some channels than for others.

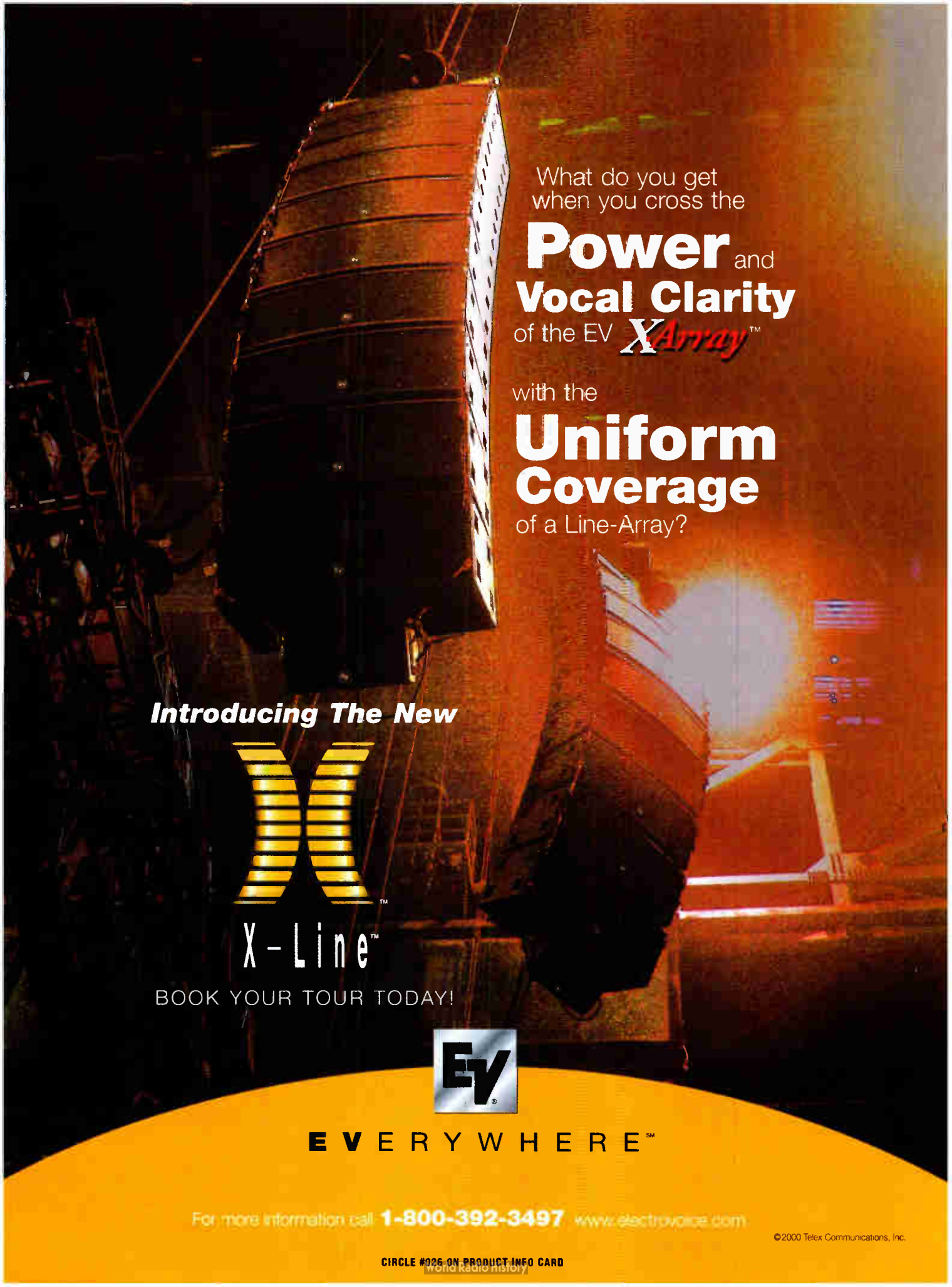
Each channel used in a given track is assigned to one of two Channel Groups, with the resolution of Group 2 lower than that of Group 1. Left, center and right across the front, for instance, might be in Group 1 at 24-bit/96 kHz, while left and right surrounds and a low-frequency (subwoofer) channel are assigned to Group 2 at 16-bit/48 kHz. Twenty-one different Channel Group configurations are defined in the specification. The number of channels, their assignment to the two Channel Groups and the resolution of each Channel Group may be changed on a track-by-track basis, though players may briefly mute during such changes.

While the use of MLP and Channel Groups makes high-resolution multichannel sound feasible within the available bandwidth, it still takes up a lot of disc space. This problem

The audio channels of a given track belong to either one or two Channel Groups, with the resolution (sample rate and word length) of Group 1 always equal to or higher than that of Group 2.

	Channel Group 1	Channel Group 2
Sample Rate	48 kHz	48 kHz
	96 kHz	96 kHz or 48 kHz
	192 kHz*	—
	44.1 kHz	44.1 kHz
	88.2 kHz	88.2 kHz or 44.1 kHz
	126.4 kHz*	—
Word Length	16-bit	16-bit
	20-bit	20-bit or 16-bit
	24-bit	24-, 20- or 16-bit

***Note: When Sample Rate equals 192 kHz or 176.4 kHz, the number of channels must be two or fewer (2-channel stereo or monaural).**



is compounded by the fact that the specification requires that every track on a DVD-Audio is playable on a 2-channel playback system—once again, the idea that all discs are playable on all players.

To avoid forcing producers to include additional 2-channel mixes of songs that are already present as multichannel mixes, the format requires that players support SMART, a system for downmixing to stereo on-the-fly using level, panning and phase "coefficients" that are predefined by the producer during the mix. A SMART "downmix" will only be played if a discrete 2-channel mix of a given program has not been included on the disc. Thus, producers can use separate stereo mixes or use SMART downmixes and have longer available playing time.

THE BEST HOPE?

It's evident from the foregoing that the DVD-Audio specification allows tremendous flexibility. A full-featured album might include several different playlists (groups) drawn from the underlying audio tracks and accompanied by browsable "still-shows," with lyrics you can click on to take you to different parts of the songs. And the disc could also include a set of music videos, as well as an interview with the band. A Pure Audio disc, on the other hand, would simply present the music using the producer's preferred resolution and channel configuration (stereo up through 6-channel).

What's nice about the format is that the basic elements—high-resolution, multichannel sound, still pictures, text and video—can all be used (or not used) without making the disc incompatible with some types of players. This means that producers' choices can be driven by creativity (and, admittedly, budget) rather than constrained by technology.

In a world where MP3s at 11:1 compression seem to be acceptable to listen to music, the record industry needs more than simply ultra-high fidelity to rekindle consumer enthusiasm for buying prerecorded music. To the extent that the format's creative possibilities can stimulate a fresh wave of imaginative entertainment, DVD-Audio may well be the industry's best hope. ■

Mix New Technologies editor Philip De Lancie is co-author of the book DVD Production, *published by Focal Press.*

Channel Assignment With Two Groups

	ch 0	ch 1	ch 2	ch 3	ch 4	ch 5
When the priority of sound quality is given to front L/R channels						
1	C					
2	L	R				
3	L	R	S			
4	L	R	Ls	Rs		
5	L	R	LFE			
6	L	R	LFE	S		
7	L	R	LFE	Ls	Rs	
8	L	R	C			
9	L	R	C	S		
10	L	R	C	Ls	Rs	
11	L	R	C	LFE		
12	L	R	C	LFE	S	
13	L	R	C	LFE	Ls	Rs
When the priority of sound quality is given to front L/C/R channels						
14	L	R	C	S		
15	L	R	C	Ls	Rs	
16	L	R	C	LFE		
17	L	R	C	LFE	S	
18	L	R	C	LFE	Ls	Rs
When the priority of sound quality is given to c... L/R/Ls/Rs channels						
19	L	R	Ls	Rs	LFE	
20	L	R	Ls	Rs	C	
21	L	R	Ls	Rs	C	LFE
	Channel Group 1					Channel Group 2

A given audio track may use any of 21 different channel configurations, which use either one or two Channel Groups. Note: The resolution of Channel Group 1 should equal or exceed Channel Group 2.

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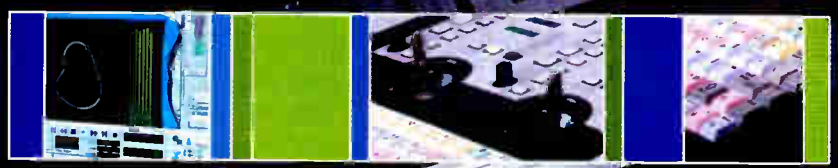

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FRAMPTON COMES ALIVE IN 5.1

BY RICK CLARK

Recent history shows that however saleable a new entertainment delivery format may appear to manufacturers and industry pundits, the factor that usually determines success or failure is a rush of consumer enthusiasm. The average consumer generally buys into a new format not for the technology itself, but rather because there is some "must have" blockbuster title on hand to spur the upgrade. Just as in the early '80s, such sonically seductive music titles as *Brothers in Arms*, *Graceland* and *Avalon* boosted sales of CD players, the current growth of DVD player sales is accelerated by the DVD releases of such recent films as *The Matrix* and *Fight Club*.

Eager to find and market the first DVD-Audio blockbuster, the record companies have scoured their vaults for proven titles that can be re-issued in surround sound. Coincidentally, as music industry giant Universal began to look for a title to spearhead its DVD-A marketing efforts, Peter Frampton began pressuring the label to remaster his entire catalog. Not surprisingly, discussion soon centered on a surround sound re-release of Frampton's landmark concert album, *Frampton Comes Alive*.

As it happened, Frampton was already a fan of the new format and recently completed work on a surround sound DVD, *Live in Detroit*, with Chuck Ainlay, one of the new format's foremost remixing engineers. Universal quickly agreed that a 5.1 DVD-A re-release of *Frampton Comes Alive* would not only celebrate the 25th anniversary of the biggest selling live album in music history, but might also fuel consumer acceptance of the new medium.

"Peter and I have been talking about doing this for some time," says Chuck Ainlay. "A year ago we did the *Live In Detroit* DVD. We began talking then about how it would be great to get the old multitracks out and remix the *Frampton Comes Alive*. We kind of just pursued it, and it happened. Since we got into it, the Emerging Technologies Department of Universal got wind that we were actually doing a 5.1 remix and that I was doing it, and they've become really excited to make this a DVD-A release."

FINDING THE TAPES

As with any re-release project, the first task was to assemble the tapes. Bill Levenson, senior VP of A&R, Catalog Development for Universal Music Enterprises, located the original multitracks and had them sent to Ainlay. "Four shows were recorded and used on the original album, but there had to be another five or six shows recorded," says Levenson. "I sent them everything, which was over 40 reels of tape. It was a mammoth job just getting them all in one place."

Locating the scattered multitracks was only the beginning. Not only were the 25-year-old tapes spread out geographically, but many had been stored in a less-than-perfect environment; a number of the tapes needed work just to get them in playable condition. The original recordings had been made on Ampex 406 and 407 and Scotch 206, all recorded at 15 ips with Dolby A, and, while the Scotch tape was no problem, the Ampex reels required some serious work. "I think there was only one reel that we didn't have to bake, but all the other 40-some-odd reels of 2-inch tape had to be baked two or three times before we could get them to play," recalls Ainlay. "These are treasured items to us, so we were very conservative on our baking temperature and times. We didn't want to over-bake it so that the oxide would just fall off."

IN THE STUDIO

Working at Backstage Studios, Ainlay's private studio within Nashville's Sound Stage facility, Ainlay routed the original tracks from a Studer multitrack to the SSL

Peter Frampton (front) and Chuck Ainlay at Backstage Studios, Ainlay's private studio within Nashville's Sound Stage facility

Axiom-MT's A-to-D converters and then into the 24-bit RADAR system. This setup allowed Ainlay the flexibility to add new material if necessary and eased the job of repairing analog dropouts and matching material from different shows. (Though most of *Frampton Comes Alive* was recorded 24-track at San Francisco's Winterland, some tracks were recorded on 16-track at other venues.)

For example, on one of the Winterland multitracks, the edge track on which an audience mic had been recorded was full of dropouts. Fortunately, a total of four audience tracks had been recorded, so Ainlay was able to use the remaining three tracks to create a surround environment. "The problem track was one of two stage mics pointing out to the audience," says Ainlay. "What I had to do was use the one good stage microphone and create a phantom center and sort of spread that out with effects across the front so that it sort of had the same sort of surround effect that the two [distant audience] mics were giving me."

For songs that had been recorded on 16-track, Ainlay had to re-create a surround audience from only two audience tracks. "That was one of the reasons why we used 'canned' audience to fill in gaps from song to song and make it sound like you didn't leave one venue and go to another," explains Ainlay. Similarly, Ainlay found that on the 16-track tapes drums had been grouped onto a stereo pair plus a separate kick drum track. "Toms are more out front in recordings today, and on these recordings, they were basically nonexistent on those stereo tracks of drums," he recalls. "In fact, I don't even know if they used separate tom mics—it may have just been overheads. So in order to get the tom fill levels up, I had to do major rides on those stereo tracks, just to make those toms sound like they were up at a proper level. You can imagine trying to make the drums fill out a surround mix with a pair of tracks. It is pretty difficult."

Even on the 24-track Winterland recordings, some drum tracks were compromised, because in the excitement of performance, Frampton inadvertently knocked the kick drum mic out of position. "We had the old big dance band bass drum with mufflers on the head and the back," recalls Frampton. "I think I tripped over the bass drum mic, and it ended up facing offstage."

"I could've gone in and replaced all of the drums with samples and everything, but then it wouldn't have sounded like the original album at all," says Ainlay. "I used what was there and just tried to EQ it and compress it and rely on all of the tricks that I used to have to do 20 years ago."

STRUCTURING THE MIX

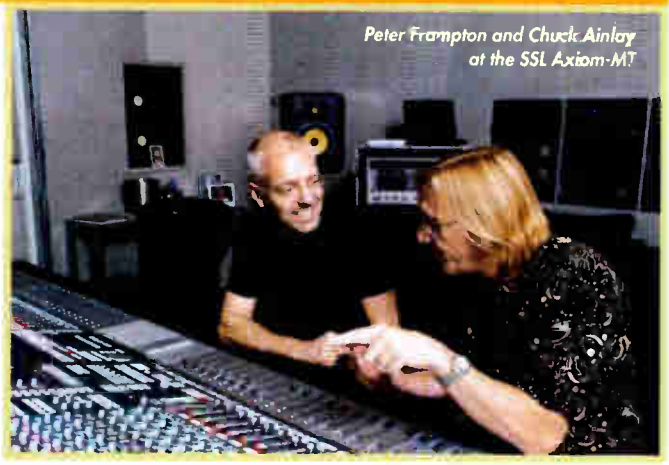
The original tapes may have been something of a mess, but mixing the project was relatively straightforward. Thanks to the SSL console's facility for making stereo and 5.1 mixes simultaneously, Frampton and Ainlay were able to create both stereo and 5.1 remixes of *Frampton Comes Alive* at the same time, an economy that pleased Universal's Levenson and eased the workload for Ainlay and Frampton. To monitor in both formats, Ainlay used Backstage's self-powered KRK E-8s with an M&K subwoofer and bass management crossover.

"My intention for this project was to provide the listener with a good seat in the house and not surround the listener with all the instruments. Rather, it was my intention not to redesign the idea of the original live record, but to try and enhance it and bring it up to today's technology and then offer a 5.1 mix of it," Ainlay explains.

One area where Ainlay diverged from the original

mix was in the level of the audience tracks. "That audience must've been huge—you turn up the audience mics and it is like white noise. It must've been deafening there at the time," Ainlay laughs. Though the audience interaction with the music helps create much of the magic on *Frampton Comes Alive*, Ainlay, Frampton and Levenson decided to lower the audience tracks slightly for the 5.1 mix. "The original album was a little over the top with the audience," says Ainlay. "If you listen to the [original album], there is so much coloration from the audience mics being so cranked up that to make the remix sound good, we backed off a little bit. I wanted to keep that energy and vibe, but I wanted to also make it sound warmer and richer, with a little more contact with the source. We tried to not redefine what the record is, but we tried to bring it more up-to-date and have more power, and so there was slightly less use of the audience."

On the original *Frampton Comes Alive*, audience reaction and sounds were added to the smaller venue recordings to match the feel of the Winterland recordings. Because "Show Me the Way" had not yet been released in any form, the audience response was less than more familiar numbers. On the original album, Frampton added more audience response to make it appear that it was as recognizable to the audience as more familiar material.


Peter Frampton and Chuck Ainlay at the SSL Axiom-MT

"The remix makes you feel like you are really sitting at the mixing console, and that is the best seat in the house," enthuses Frampton. "I've engineered a lot of my own stuff, and I mixed 'Show Me the Way' and 'Shine On' from the live record, because Chris Kimsey had to go off to another project. So it was quite interesting to hear someone else mix 'Show Me the Way,' and—what a bastard—he made it sound better."

Frampton is particularly pleased with the way Ainlay used the 5.1 surround sound field to enhance an already historical

—CONTINUED ON PAGE 66

5.1 FORENSICS

SURROUND AUDIO MIGHT REQUIRE SOME DETECTIVE WORK—AND HAVING A GOOD LAWYER'S NOT A BAD IDEA, EITHER

BY DAN DALEY

As the major labels gear up to feed the consumer pipeline with DVD-A product, most will discover that there are often major hidden pitfalls when it comes to reformatting archival material. After sitting in a vault for two decades, many so-called master tapes are in poor physical condition, and if the tapes have been improperly stored or cataloged, then anything from a guitar solo to an entire reel of tape can go missing.

MANAGING THE MUSIC

"The problem in the music business is that 25 years ago, no one had any concept about the future uses of the recordings," observes Blaine Graboyes, founder and creative director of Zuma Digital. The multimedia authoring and audio facility in New York City has been doing 5.1 remixes for a range of media, including film, television, advertising and music videos. "Now you pull a tape out—if you can find it—and you find five takes of the same song. They all sound the same to you; only one is the approved version, and the engineer's been dead for 20 years," Graboyes explains.

Graboyes applies terms picked up from Zuma's corporate clients to describe the problems that the music industry faces as DVD-Audio attempts the transition from a novelty to a mass-market product. "The biggest issue in doing any kind of repurposing of previously used creative elements is 'knowledge management'—the ability to know where all the assets of a project are and how to retrieve them," he says. "And the absolute biggest problem that surround music faces on a day-to-day basis is missing assets, from pieces of recordings to the media itself. The second biggest problem is missing records of the asset. That is, the documentation that tells you things like how to use the asset, which pieces the artists intended to be used and which were not, and where to find the right pieces on the media. Without either of those things, you're not going to be completely successful in repurposing them for new media."


Jake Nicely

The stories of tapes moldering away forgotten in broom closets, dumped in the trash or auctioned off for a few dollars when studios and record labels close down are legion in the entertainment business. Proper archiving and record-keeping of the music media has been almost nonexistent. And that's compounded, Graboyes adds, by the fact that the entertainment industry, in general, is a transient one. "The turnover rate in the music and film businesses is incredibly high," he says. "One of our clients has had four different assistants, all of whom get up to speed on

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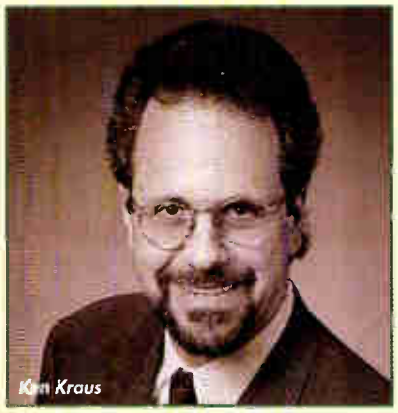
where things are and then leave, and the next person has to start all over again."

It's not just the golden oldies that are missing the most in music. Even relatively recent recordings show up with missing pieces, slowing down or completely halting the remixing process. Jake Nicely, co-owner of Seventeen Grand Recording in Nashville and one of the leading multichannel remixers in the music industry, was contracted this year to do a DVD-Video multichannel remix of a live album by the country group Alabama. Though the record was originally released in stereo in 1998 on RCA Records, pieces of the master recording quickly went missing, and Nicely had to turn to gumshoe detective techniques to get the project moving.

"When they recorded the concert, they didn't have enough tracks on the 48-track tape for the audience tracks and the MC's announcements, so they slaved those off onto a DA-88 tape," Nicely recounts. "But when it came time to do the [multichannel] remix, no one could find the DA-88 tape. This is a live record, so the audience tracks are incredibly important to making it work, especially in surround. We started calling around, trying to track the tape down, and everyone kept saying, 'Yeah we had it, but we turned it over to so-and-so,' and so-and-so told us they turned it over to someone else, and so on and so on down the line.

"Finally, I found out the tape had been over at TNN [country cable channel The Nashville Network] from when Gaylord [Entertainment] used it in post-production for a broadcast," continues Nicely. "So I drove over there and asked their tape log person for it, and she had no record of it. It had never been logged into their vault, so she said it couldn't be there. But I asked her if I could look around in the vault anyway, and in there I happened to glance at a pile of tapes in a little bin marked 'To Be Erased,' and there it was. The tape girl said she was supposed to erase the tapes for reuse but just hadn't gotten around to it. Had I gotten there a day later..."

Chuck Ainlay has also run into the kinds of problems that result when documentation is missing. Ainlay has recently been working on a 25th anniversary 5.1 re-release of Peter Frampton's huge '70s hit *Frampton Comes Alive* (see related article on page 60) and describes the kind of problems that crop up even after all the media assets are collected. "It was a live recording, but there were parts that were fixed with overdubbing in


Ken Kraus

the studio afterward," Ainlay explains. "We had very little documentation on the tapes, and we had to rely on Peter's fantastic memory when it came to which parts were the ones used on the final version. In doing surround remixes, you want to stay true to the original vision of the recording, so every little piece counts."

Most of the Frampton record's tracks were taken from shows at San Francisco's Winterland venue, but audience effects from other concerts were also added to the original album. "If you listen closely [to the original], you can hear where you go from one crowd sound to another in different songs," notes Ainlay. "There's three different crowds on the record; they didn't have the digital editing and the ability to do crossfades like we have now. So to get the same crowd noises in the same places, you listen for cues, like a guitar note or a firecracker, and then you sample it and put it in."

Many of the issues raised in surround music have been seen before in surround for film and are now showing up in the production process while creating surround audio for DVD-Video. Cynthia Banach, VP of operations and a mixer at Zuma Digital, notes that she increasingly encounters poorly stored tape elements and M&E tracks with missing sound effects. In the latter case, she has more than once had to go out and redo a film's Foley effects, using the original video release as a guide track. This slows down the work considerably, with additional levels of approvals required when new sound elements are added to a project.

THE LEGAL ANGLE

Banach has had her work slowed down at times, and sometimes stopped altogether, when music tracks for films arrive with songs completely different from those on the original release. It often happens that the company that now has the rights to the film may not have been able to get approvals renewed for the DVD soundtrack. "People acquire the rights to distribute films, sometimes from estates or from other means, but that doesn't necessarily mean that all the elements are automatically also licensed," says Banach.

And the need to fill up to four more channels of information is already leading to the addition of elements that were not part of the original artistic entity. In one instance, Jake Nicely was working on a DVD music video of a George Strait concert. "The acoustic/electric guitar player had been having technical problems onstage, so the instrument wasn't recorded on a couple of songs," Nicely explains. "It was something that was important to the song and the mix, so I picked up a guitar and played the part myself and recorded it and put it into the mix. We could have called the original guitar player, but he was out on the road and that would have slowed the whole project down, plus added an additional cost to the mix. So I just figured to do it myself."

That seemed like an obvious solution, and in this instance carried little liability, either artistic or legal, because the part being replaced was not done by any component of the artistic entity that would be compelling to consumers. In other words, people buy the DVD because they are interested in George Strait, not his

—CONTINUED ON PAGE 66

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—FROM PAGE 62, FRAMPTON IN 5.1

musical document. "I think it helped to have a different perspective, someone who wasn't involved in the original project," says Frampton. "Chuck's got such a great pair of ears, and he knows exactly what he is doing. It was great to hear the extra warmth that he gave to the instruments, warmth that wasn't originally there on the tapes. When you really sit down in front of the speakers and you concentrate and do an A/B, you go 'Wow!'" Frampton continues. "It feels like you are there at the show."

In addition to the surround mix, the new DVD-A version features other value-added elements: There

are four new tracks, three of which were from other concert recordings made that same year, and one live-for-radio session. The new tracks are "Just the Time of Year," "Nowhere's Too Far for My Baby," "White Sugar" and "Day's Dawning."

And, encouraged by this first foray into mining its vaults, Universal is already looking at other candidates for future DVD-A releases, including *The Allman Brothers Live at the Fillmore East*, *Layla* by Derek & The Dominoes and Joe Cocker's *Mad Dogs & Englishmen*. ■

Rick Clark is a producer and freelance writer raised in Memphis, now living in Nashville.

—FROM PAGE 64, 5.1 FORENSICS

hired band.

But the surround post-production process offers the potential for much more wide-ranging enhancements to music projects. What happens if musical parts played by a band member are irretrievable for a surround remix or can't be resampled? Does the project stop? Is the band member contacted to play the part again? Suppose that person refuses or asks for too much money? Can the rights holder of the sound recording—which is very often not the artist—pay for a less-expensive replacement part to be played and recorded? If that is the case, must the rights holder advertise that the re-released surround version of the recording does not contain solely original elements? A similar scenario has played out hundreds of times in recent years as oldies and classic rock bands headed out on tours years after their last hits, often with few or in some cases, none, of the band's original members onstage. Often, none of the original band members have any legal rights to the names of their own bands. Court cases have been filed in the past seeking to put the musical equivalent of truth-in-labeling into such shows.

What are the legal implications when elements are irretrievably lost? Ken Kraus, a music business attorney at Loeb & Loeb in Nashville and who was involved in the negotiations to bring Steely Dan records into the DVD domain, says the answers are unclear at this point, but that DVD-Audio appears to be a new minefield in the music business. "A sideman added to a record or deleted from one is fairly simple—the employer owns his services," Kraus says. "But in the case of a band member, it's more difficult. What's the artist's claim to the artistic entity, and what documentation does the artist have? Also, it becomes important as to how a record is represented to the buying public, as either containing all the original elements from the first version or with new elements that might change the recording. All of that has to be clear before a label should authorize a remix.

"Then there's the issues regarding the record labels' responsibilities for the safekeeping of the masters," Kraus continues. "What if the label loses the tape? That happened for a period with Steely Dan. There's an awful lot of tape out there, and no one knows where it is. What losses can the artist allege if they're not able to re-release a recording and make more money from it, because the label can't find the tapes?"

Could studios be held liable for being party to artistic liberties in the pursuit of surround mixes? There is nothing specific in the legal literature yet on the matter, but precedent seems to indicate that they could. Over the last three years, the Recording Industry Association of America (RIAA) has sued several large CD replicators on the grounds that they were manufacturing discs containing material that was not properly licensed. And the suits have been successful—RIAA has won over $25 million in judgments against some replicators, including a record $10 million from Americ Disc alone.

It's unlikely that anyone will try to fill in missing guitar parts of a Jimi Hendrix record with a ringer. But what happens when someone hires Jimmy Vivino to re-create the rhythm guitar part of a Foghat record from 1976 because the tape was damaged? "It's a matter of how significant the part is, and how it's represented," says Kraus.

As Zuma Digital's Graboyes points out, regardless of who owns the rights to musical material, there needs to be some acknowledgment of the implicit right of the original artist to maintain the integrity of the original artistic vision. "On the other hand, though, we also have to realize that musicians are at the extreme end of the artistic temperament," he says, "and we have to find ways to balance those needs with the need to get work done. All the while, we have to keep in mind that the financial records are part of the documentation of the assets, too. There's a lot to watch out for." ■

Dan Daley is Mix's East Coast editor.

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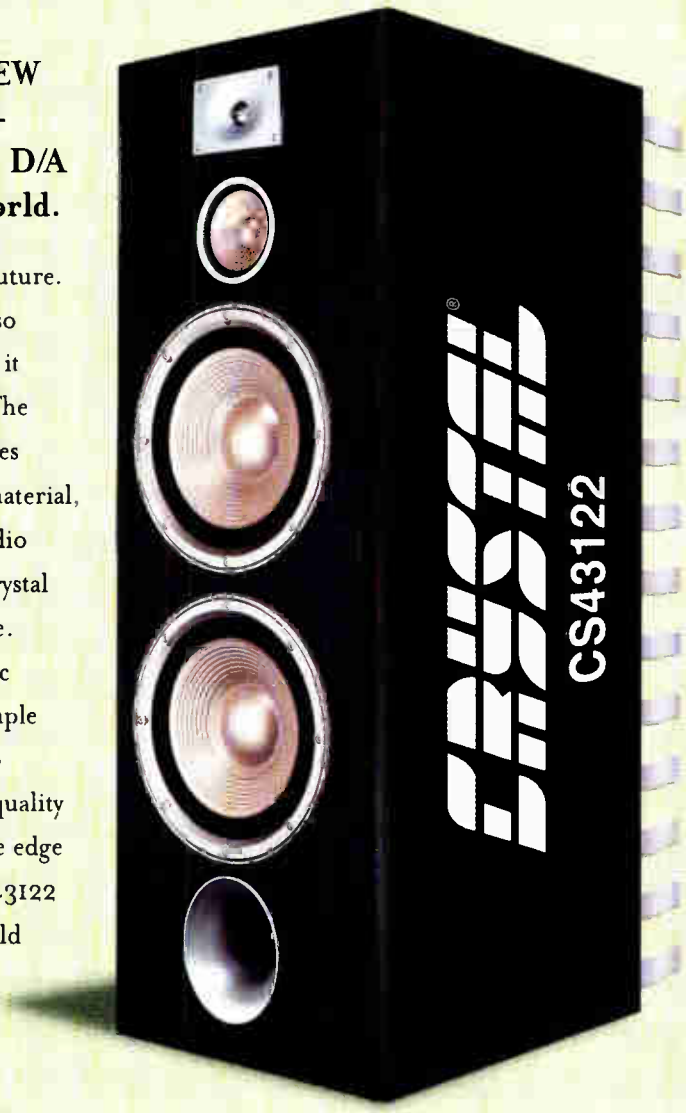

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BORN TO CRAWL

ROADBLOCKS TO DVD-AUDIO

It wasn't so long ago, just a few years really, that I got excited about the prospect of a really hi-fi replacement for CDs. Well, it's two years on and what a fine mess we're in. Let's face it: No public awareness that I've been able to discern, and no perceived need on the part of Jenny Q. Public, who's quite happy with her Barbara CDs, thank you very much. No consensus, good or ill, on intellectual property protection since the current crop seems to have been created either in a vacuum or a law office. Players that harken back to first-generation DVD-V, not in a nostalgic sense anyway. And let's not forget laughable content creation tools...

When was the last time you heard someone say, "Umm–um, gotta get one of them DVD-Audio players..." Ha! Few, if any, consumers are even aware of a replacement format for CD–DA, never mind forking over the dough for a playback device. Those yupsters, DINKs, YUCAs and early adopters who *must* have the latest e–toys already have DVD-V players and have run out of rackspace in their home entertainment centers. Of course, DVD-V players won't recognize Audio Zone content. That means that DVD-A discs won't play in legacy players unless explicitly authored to be backward-compatible. (Score one for SACD, with its backward and forward compatibility.) In turn, that choice means less capacity for the groovy, new DVD-A content, even though an AC3 stream is quite compact compared to PCM data.

This mess isn't helped by the dearth of players on the market. Seen any lately? Sony will make DVD-V/SACD players but isn't yet publicly supporting DVD-A, though Sony Music is sweating through the process of creating titles. If you stopped by the Sonic Solutions booth at AES, you got to see third-generation players with one from Pioneer being the first example of the long awaited omniplayer—one that offers CD, DVD-A/V and SACD support. But Pioneer is a welcome aberration in the CE world, so don't expect too many other examples anytime soon.

So, why *should* Jenny Q. Public drink the DVD-A Kool-Aid? Got me. There's little compelling value in the format, and creating market demand seems to be something beyond the ken of the DVD Consortium. How about the high-fidelity angle? Yeah, right. Most pop music is created on MI-class systems that give fidelity a bad name. Besides, it's the performance, stupid. The public doesn't care about the data-sampling rate. Yes, trained listeners and audiophiles *can* hear the difference, but we're a minuscule segment of the population and aren't likely to sway the consumer electronics and media giants that control the Consortium. But wait, what about surround? To that I say: What's wrong with AC3? Because the performance is conveyed just fine via 56k MP3, multichannel AC3 must be high fidelity by comparison!

I was at the AFIM conference earlier this year, speaking to indie music producers about the new

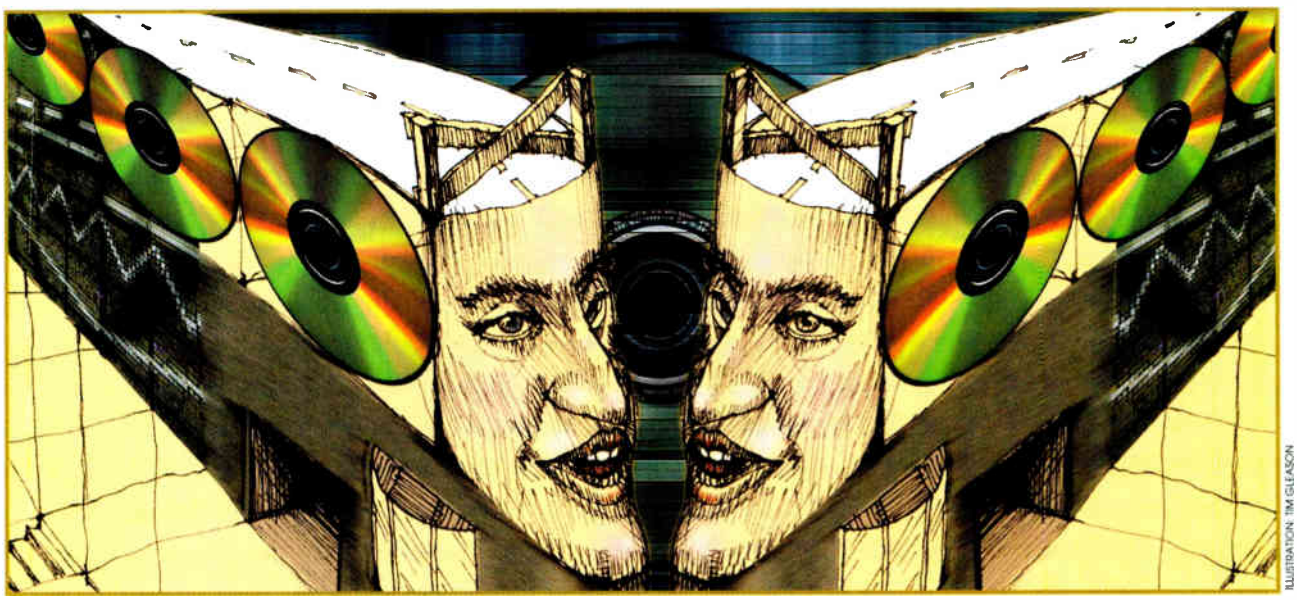
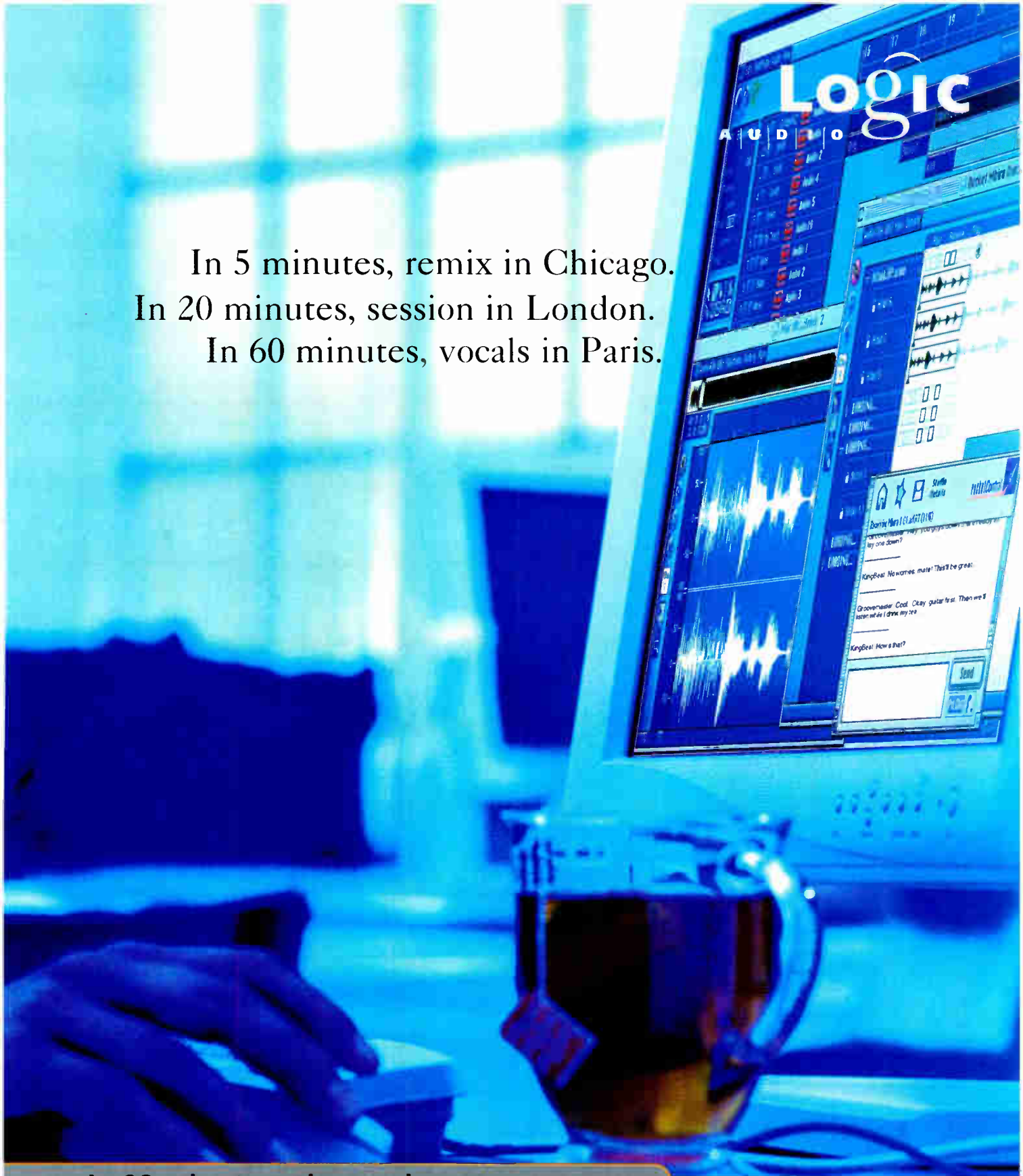


ILLUSTRATION: TIM GLEASON

BY OLIVER MASCIAROTTE



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optical distribution formats. The folks at Panasonic CE's Technics division were kind enough to haul an entire DVD-Audio rig down to the venue so folks could experience the format. I had brought along a newly minted DVD-A title, a Japanese domestic release that should have provided a welcome change from the repurposed DTS stuff that we were stuck with from the U.S. labels. In it went and boom! It froze the player up real good! Can you imagine having to reboot an appliance? Not a good thing. And I thought the Blue Screen of Death was only a Windoze phenomenon. This incident was a replay of bad times of yore, when DVD-V first appeared on the scene. Lack of compatibility plagued players into the third generation, making our jobs hell trying to produce titles that worked everywhere. What would you do if you were a label?

Speaking of labels, let's talk about that watermarking. The folks at Verance seem to be schizophrenic, offering to work hand-in-hand with the engineering community, while making it very difficult for manufacturers to offer production tools. Verance provides the data hiding technology that makes watermarking for DVD-A possible. And who thought up the audibility tests and licensing costs? Mammon only knows. At least watermarking is an option, not a requirement, so some labels have simply opted out on the whole watermarking issue.

What about the production tools? Try creating a DVD-A title with what we now have at hand. Yikes! Sonic and Matsushita are the only vendors out there. Sonic thinks the new audio formats are weak, in terms of consumer acceptance, so there's little political will to move the tools forward. Gotta agree with the weak demand. Of course it's weak. To make matters worse, the Matsushita offering is a geekfest and not available in stores, and the Sonic alternative requires hand-crafted coding with no debugging or validation tools. That means that only the hardiest/craziest souls or those shackled to the corporate treadmill would dare to create anything but a brain-dead, simple title. Hmm, wonder why there are so few DVD-A titles for the public to buy? Scary thing is, Sonic is a pioneer and champion of the format! Now, I love my Sonic, but give us something that creatives can work with.

You may ask if there *is* anything I like about DVD-A? Actually, I do. Whether you're talking about DVD-A or SACD, the higher cost of production infrastructure means that it temporarily puts engineering back in the hands of engineers. With fewer punters competing for the client's dollar, we'll be able to bill out rates that are more appropriate to our investment and expertise.

I'm no different from my colleagues in many other technical professions in that a significant portion of my annual income is plowed back into equipment. In fact, all this gloom and doom hasn't prevented me from diving head first into the maelstrom of DVD-A production. But, I urge all manufacturers involved, whether Pro Audio or CE, to fulfill your commitments to the production community and consumer. Stop the finger pointing and one-upsmanship and deliver on the promise of a unified DVD family. Let the consumer decide whether DVD-A is too weak to compete, but give us fully formed choices, not half-baked excuses. ■

Now that Omas has vented his spleen, he invites you to join in on the festivities. Send your mental machinations to bitstream@seneschal.net or visit http://seneschal.net for more digital detritus.

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LINDA RONSTADT

GOTTA SING!

It is the hottest day of the summer so far in Nashville—102 degrees—and Linda Ronstadt is in town working on her Christmas album (*A Merry Little Christmas*). But contrasts have characterized her entire career. Though she was a major influence in defining country-rock music, putting songs by Hank Williams and Holland/Dozier/Holland on the same recordings was the norm for her. This day, she is working with her longtime engineer/producer and Nashville resident George Massenburg and John Boylan, a producer who worked with Ronstadt at the very beginning of her solo career and again in its more recent and mature iterations.

Ronstadt's never been one to sit still for long, stylistically. From her first chart success with her L.A. bar band the Stone Poneys, through her Peter Asher-produced mega-hits of the '70s, which found her interpreting country, Motown, rock 'n' roll and the crème de la crème of SoCal (and other) singer/songwriters, to her fascinating explorations of classic pop vocal music (the albums with the Nelson Riddle Orchestra), light opera (*The Pirates of Penzance*), opera (*La Boheme*), Mexican folk music (*Canciones De Mi Padre* and *Mas Canciones*), trio singing with Dolly Parton and Emmylou Harris, children's music and more, Ronstadt has touched a lot of bases. What runs through it all is her passion for singing and intelligent arrangement and a certain integrity she brings to every project.

Ronstadt left her mark on more than the record business; her devotion to the craft of singing influenced many audio professionals. Massenburg, who first worked with her in 1974 recording "Keep Me From Blowing Away" at a studio in Silver Springs, Md., observes, "Working with Linda has been the most important artistic relationship of my life. This is the woman from whom I learned what singing is—the power and the charm and the importance of the story."

PHOTO © ROBERT BLAKEMAN/MICHAEL OCHS ARCHIVES/VENICE, CA

Up close, Ronstadt is intensely knowledgeable about the mechanics of singing and the cultural contexts of every genre she passes through and is *laissez-faire* about the success part. For her, judgments are not made by RIAA-awarded Platinum trophies but by an internal meter she alone reads. "I know when I've done something well. and when I've done something not so well," she states. Her knowledge of the motor effects of native language on vocalization and the history of Latin and classical music is extensive. A conversation with Ronstadt is like a journey planned by a mischievous travel agent—unscripted, landing in unexpected ports of call at unexpected moments. But it is invariably a fascinating itinerary.

What are your earliest studio memories? Was it with the Stone Poneys?
Earlier than that. There was Lee Furr, who was associated with George Massenburg in the early days in Baltimore. There was a studio called Copper State Recording Company in Tucson owned by Foster Cayce where Lee worked as an engineer. We recorded there with my brother Peter and my sister Suzy. We were a folk group called the New Union Ramblers. There was a lot of seminal stuff happening there, but I was very dedicated to traditional music—most of us in my family [were], because we did a lot of traditional Mexican music in the family. I never had a real fondness for mainstream music. Even when I was kid, I didn't like "How Much Is That Doggie in the Window." I knew there was something better. And I liked the Mexican music that I heard. It made you feel like you knew where you lived. That kind of regional music is almost gone now; radio has really destroyed it. But radio also gave me a taste for bluegrass music and a wish to emulate it. Because I heard it so early, I can sing around that kind of music, but I don't have that kind of authenticity that Emmylou or Dolly has. They were raised in the South; I was raised in the Southwest.

You certainly sound comfortable in the country and bluegrass idioms.
I really have a whole theory about languages and what they develop in the musculature of the larynx,

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and the language that you grow up speaking determines what will be all the colorations of your voice. There's something about Scottish Gaelic and Irish Gaelic and Welsh that puts you way up on the top of your voice that makes trills very accessible. Same way with the kind of singing that they do in New Orleans, which comes from French Baroque opera. Because the Creoles all sent their children to be educated in Europe, they came back speaking and singing French. In French Baroque opera, the men go right into the falsetto. The idea of belting the high notes was more from the Italian opera around the turn of the century. So the kind of music that Aaron Neville sings is not like the rest of R&B throughout the South; it is Catholic, it's French Baroque, and when he goes up high he goes into falsetto and does the trills. In opera in the 18th century, you were expected to bring your own embellishments. You read the text, but you were also expected to embellish freely. So in a sense, opera was like jazz; it was improvisational. So when you hear someone who comes from the Protestant side of R&B, like Wilson Pickett, they were belters. And someone like Aaron sings like a choirboy. That's the 18th-century singing technique. I sing from a Mexican point of view. Dolly sings from generations of people that spoke Scottish or Irish Gaelic. It was preserved there. The pronunciation of English is still affected by the history of that language.

Why did you and Emmy and Dolly work so well together vocally?

It was completely from sound. When Dolly and I and Emmy sang, it was a beautiful and different sound I've never heard before. I analyzed it years later. Dolly's voice has a real horn-like quality on the top. My voice is thicker and bigger—it's like lead on the bottom. That was the key to it—the three voices were so different.

On the* Trio *records, how did you record the vocals—ensemble or individually?

We did them as individual parts, because we didn't have the luxury of spending a lot of time together on a tour bus, and we never performed together. So knowing how each other's moves are going to go takes years. But we all sing totally differently with totally different instincts in terms of phrasing. With a woman's voice, it's whether you're on the edge of falsetto or on the edge of chest. So Emmy will sing from the chest, but the falsetto keeps mixing in all the time. That's what makes her have that crystalline quality in her voice—it sounds like cracked crystal sometimes. The crystal parts are incredibly clear. We'd work the parts out together. I did most of the harmony arranging, and Emmy helped a lot with the instrumental arranging. That way we could see exactly where each of us went into falsetto.

Were you involved in choosing microphones?

I know nothing about technical stuff. It mutates faster than a virus. That's why I have someone like George [Massenburg]. If you don't have the ability to think intuitively and musically, then you can get bogged down in that. There are people who are going to make music regardless of how technical they are. But there are a lot of people who get bogged down in it. I don't care two beans about it. I know what the machines can do, I know what the different echo units sound like, I know what they can give me. But I don't like to learn their names. It's like alphabet soup with a handful of numbers thrown in. I always rename them, like "Fluffy" or "Spot." I don't have a computer, a TV, I don't have a microwave, a dishwasher—anything that blinked in my house, I threw it out.

The worst thing that happened to us in the '70s was that everybody went into these little tiny rooms that were so ungratifying.

Where was* Different Drum *recorded?

At Capitol Studios [in L.A.]. I wanted to make a bluegrass record. I was attached to traditional music, and here's this orchestrated thing, and I didn't like it...

So you were dragged kicking and screaming into the music business?

How kicking and screaming can you be when you don't have any money, and you don't have a [record] deal? So you do what you're told. I was very surprised when it was a hit. I was staggered, because I didn't think it was very good. I

think we did maybe three takes of it, and maybe the record was take two. But at least we had ambient rooms. See, as much as I'm a Luddite, I'm a haranguer for room ambience. I love room ambience. And the worst thing that happened to us in the '70s was that everybody went into these little tiny rooms that were so ungratifying. The carpeting alone was enough to kill you if you were allergic to it. I left a studio in L.A., because they put in carpeting, Val Garay's Studio.

So how did you reconcile your musical instincts with the pop music business?

I remember The Byrds were happening and doing folk-rock, and I thought, there you go. So I went to the Troubador. I grew up singing Mexican music, and that's based on indigenous Mexican rhythms. Mexican music also has an overlay of West African music, based on huapango drums, and it's kind of like a 6/8 [time signature], but it really is a very syncopated 6/8. And that's how I attack vocals. Rock 'n' roll comes from black music, and I came from Mexican music.

But when you sang country, like "I Can't Help It if I'm Still in Love With You," it sounded like an homage. But when you sang R&B, like "Heat Wave," it didn't sound like Motown at all.

I didn't know how to phrase it. The only reason I sang "Heat Wave" was because we had a club act, and when you have a club band you have to have fast stuff. I was a ballad singer. I would have been happy for the rest of my life singing "Heart Like a Wheel." But in the clubs you needed stuff like "Heat Wave" and "When Will I Be Loved." Peter Asher did a great job with the track on "You're No Good," but the vocal's terrible. I just didn't know how to sing it. I think the track really helped to sell it.

Speaking of Peter Asher, what was it like to find producers that you could work with?

The reason I started to work with Peter Asher, when I showed him "Heart Like

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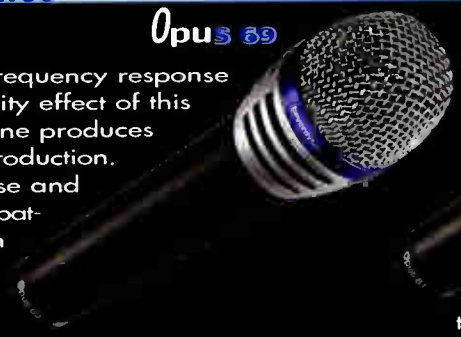

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a Wheel," which I'd taken to a couple of other producers who thought it was too corny, it won't be a hit, he thought it was charming, and he loved it. And he understood why I wanted to record it and understood why I wanted a cello on it. He understood the McGarrigle Sisters [writers of the song]—if people don't get the McGarrigle Sisters, I don't get them. I've had people say they sound like they've been eating goat meat, but they have an eccentric, beautiful sound.

As soon as I started working with John Boylan, I started co-producing myself. I was always a part of my productions. But I always needed a producer who would carry out my whims. Producers work in a lot of different ways. They either work autonomously or work as a collaborator. When I worked with John and Peter, they did that. They also brought some balance. I'm not very organized. Sometimes I asked for things that weren't realistic, or too expensive, or that were so flat-out, noncommercial that had we done a record with that we wouldn't have made another one. Left to my own devices, I would have just become an opera singer.

What was the studio environment in the '70s with Peter Asher?

A lot of camaraderie. We rehearsed with the same band that we recorded with and went on the road with. It was sort of a seamless unit. We were also one of the first artists to give points to the band. I think Jackson [Browne] and I were the only artists besides Elvis Presley that were giving points to the band. What that did is it made it more of a collaboration. One of the skills of a good producer or the savvy of an artist is figuring out how to cast the music with the players you hire. And once you get those players, you want to hang on to them. Our stage versions sounded exactly like the records.

You were recording much of the material live in the studio in those days, weren't you?

I didn't learn how to overdub vocals until I met George Massenburg. George Massenburg taught me and Peter Asher how to overdub vocals. He's a genius at it. And Peter has learned it seamlessly. One of the things that I like about Peter is that he's not afraid to learn something. He's not a know-it-all.

By the time* Heart Like a Wheel *came out, the studio band had really coalesced. How did the band evolve in the

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studio from making country-rock records to rock records?

All I did was try to do things I admired. Of course, they didn't come out sounding anything like that, but that was me. People don't realize how much George Jones copied Hank Williams, or how much Ray Charles copied Nat Cole when they were starting out. I tried to copy anything I heard—Judy Collins or Bill Monroe. I didn't care much for female country singers 'til Dolly Parton and Emmy, 'cause they just sound so twangy. So I always tried to sing like the men. And I wound up sounding twangy anyway. [Laughs.]

Those are real guitar-oriented records...

And I hate guitars! Took me years and years to deal with that.

But those records were characterized by the triple guitar harmony parts...

I didn't learn how to overdub vocals until I met George Massenburg. He's a genius at it.

Those were all my ideas. The arrangement for "That'll Be the Day" was all mine from beginning to end, including the rhythm guitar parts.

The only guitar I like is Ry Cooder.

And David Lindley, I would think.

I'd rather hear him play some other instrument. I just don't like guitars. [Laughs.]

You were working in the studio with some very brilliant and assertive talents, like Asher, Andrew Gold, J.D. Souther. Was there a hierarchy in the studio for those records?

We needed someone to keep order, and Peter was very good at that. The band would put ideas on the table, and we'd try them. I usually came in with the songs and the direction I wanted to go in. I also came up with the arrangement ideas. Like "When Will I Be Loved"—I had ideas for the rhythm parts and the solo. I took ideas from a lot of places, and we'd try things. If I brought in an R&B song, the more country I'd try to do it; put a pedal steel guitar and dobro and bluegrass harmonies. And if I brought in a country song, the more rock 'n' roll we'd try to do it.

How would you characterize your working relationship with Peter Asher?
Peter was very good, because he was very organized. He did what he could to try to help me fulfill what I was trying to do. At the same time, he had his eye on the charts. And that's a tight line to walk. I don't walk that line well. And often I think we fell more onto the commercial side of the line, and I didn't like them very much. It wasn't his fault. It was my fault. Maybe I should have been more...There's just so much pressure on you to succeed, and making a successful record means you get to do another record. So there were certain things that I protected that I had to have a certain way, and the other things I allowed them to be as they needed commercially. There's nothing wrong with being manipulated, as long as you know who you are and everyone's in agreement about it. And I think that's what Peter does well.

George Massenburg is a recurring character in your career.
Get Closer [1982] was the first record I made all the way through with George. I'd been trying to work with George for years. I had met him in the early '70s. He had cut one of the tracks, "Keep Me From Blowing Away," on *Heart Like a Wheel*. I got sick, and I stayed in Washington, and we decided to go into a studio there. John Starling introduced me to George, and he was wonderful in the studio. He moved out to L.A., and I told Peter about him and wanted to work with him, but when you've been with a person for a long time, like we were with [engineer] Val Garay, you don't want to change. So it took awhile.

Did you have a microphone that you especially liked to use for your vocals?
There was one that we loved that the capsule was damaged in some way. We used it on everything, but it broke while we were doing one of the Nelson Riddle records. It broke in the middle of the session. The capsule just screamed and melted.

[Massenburg knew the microphone immediately—a Neumann U67, which he had purchased years before from Deane Jensen. "It was in the middle of a Nelson Riddle session," he recalls. "It made a squeal, a pop and it was dead. The capsule was very beaten up, and it touched the backplate and shorted out. It was one of those 0.7-micron capsules that cost as much as a car." And both confirm that the microphone itself is

—CONTINUED ON PAGE 206

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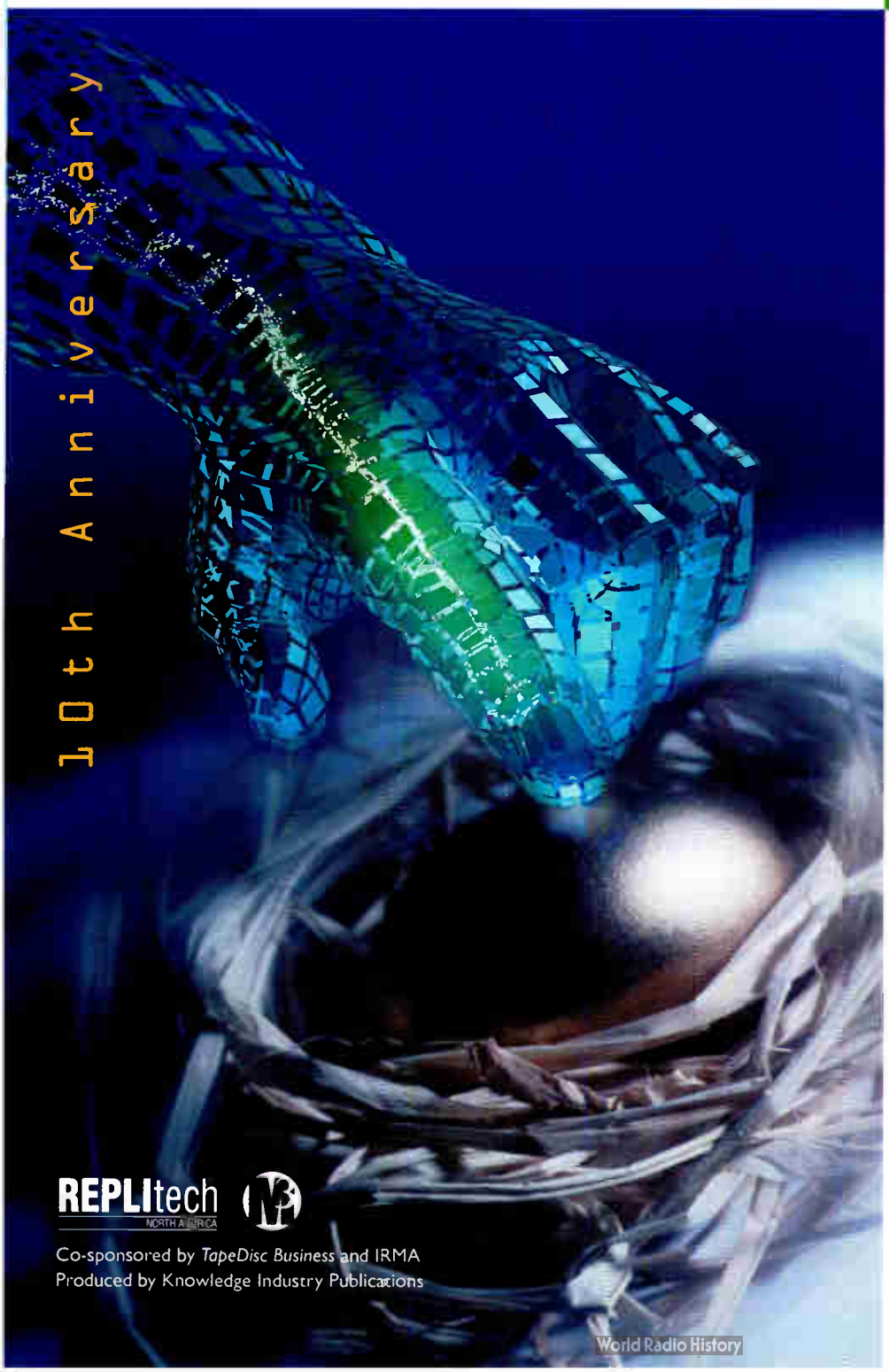

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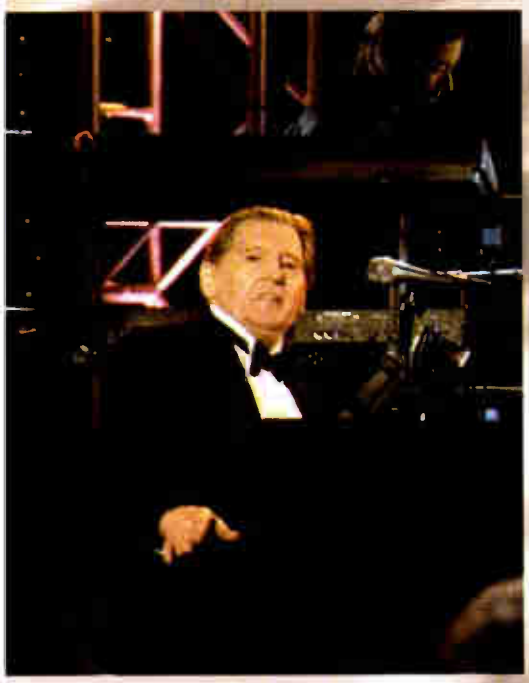

Jerry Lee Lewis

Piano Celebrates 300th Birthday

BY MICHAEL GOLDMAN

PBS AIRS HD/5.1 SURROUND TRIBUTE

When the Italian craftsman Bartolomeo Cristofori built three pianos in 1722 under the patronage of the Medici government, he couldn't have predicted that one of them would be featured 278 years later in full-blown, High Definition (HD) and 5.1 surround sound on PBS. But one of Cristofori's pianos—believed to be the oldest piano on Earth—survived long enough to participate in the instrument's birthday celebration. That piano, on loan from an Italian museum and currently on display at the Smithsonian Institute as part of an exhibit marking the invention of the piano in 1700, is briefly spotlighted in "Piano Grand! A Smithsonian Celebration," which aired on PBS in late November.

(At press time, it was uncertain if PBS' November telecast would include the HD/5.1 version, as the network was still working on its capacity to broadcast in HD, but that version will be broadcast eventually and is available on DVD. In addition, NTSC/stereo versions were created for home video and shorter, pledge-break PBS broadcasts.)

Katia and Marielle Labeque

Diana Krall

Produced by Smithsonian Productions, Maryland Public Television and Japan's NHK and hosted by Billy Joel, the two-hour show featured concert-style performances by a star-studded lineup of pianists in most major genres: Billy Joel, Jerry Lee Lewis, Cyrus Chestnut, Robert Levin, Katia & Marielle Labeque, Toshiko Akiyoshi, Dave Brubeck and Hyung-ki Joo, to name a few. The broadcast also highlighted documentary-style segments about the history of the piano, anecdotes and backstage interviews with the participating musicians.

Piano Celebrates 300th Birthday

While Cristofori's piano was obviously not playable, 18 other pianos did see action during the show, which was recorded before live audiences over the course of two days in March on a soundstage at the BET (Black Entertainment Television) studios in Washington, D.C.

To tape the piece, producers used an ambitious combination of 11 Sony HDC-700 and HDC-750 camcorders, which were rented from HD Vision of Dallas. Because PBS wanted to conform and eventually broadcast the show in HD and 5.1 surround sound, the producers faced a host of technical issues.

"The biggest creative challenge was the need to perform and record all the music in one location and do it in such a way that the paying audience would enjoy the performances," says the show's co-executive producer Wesley Horner of Smithsonian Productions. "We wanted to design an environment to take advantage of TV's power for intimacy and stage it to appear like a live concert event, even though it was an in-studio production. It was a large studio, about 200 to 300 feet long and 80 feet wide, with an audience of over 300 people. We wanted something similar to the feel of PBS' 'Sessions at West 54th Street' and let the television audience see the lighting instruments, cameras and mics. The real issue was that we had a Rubik's Cube of pianos, and we had to match them with artists and figure out how to stage each performance."

Horner brought in Steve Colby of N.H.'s Evening Audio Consultants to set up the P.A. system for the live audience, produce the audio recordings and perform initial mixes on the show's 30 musical numbers. In pre-production, Horner and Colby worked with director Matthew Diamond to chart every music score scheduled to be in the show, choreographing camera angles on four specially designed stages in order to permit Diamond to switch live from a video production truck while taping performances. That painstaking pre-production work was crucial, because it allowed producers on the video and audio sides to streamline the amount of material needed to collect for the looming post phase.

MIC ISSUES

To record the performances, the producers hired Dave Hewitt and his company, Remote Recording Services of Lahaska, Pa. Using a Studer D827 48-track recorder in conjunction with a pair of Sony PCM-800 recorders (the Sony version of the Tascam DA-88), Hewitt and crew recorded the performances on 64 tracks of digital audio. The recording method, according to Colby, was capturing pristine piano recordings in stereo, along with separate ambient sounds, and in the post phase building them into a 5.1 mix.

Dave Brubeck

In many ways, Colby says, that process was fairly straightforward, once a microphone plot was figured out for the 18 pianos and the BET facility. Eventually, a total of 96 microphones were used throughout the two-day shoot (counting voice-overs, interviews and orchestras), but Colby says the piano mic issue initially raised philosophical questions. He used fairly standard configurations for miking orchestras and interviews, but for the pianos and ambient surround elements, he needed a uniform approach to a diverse set of circumstances.

"There was a major philosophical question we had to answer in deciding how to mike everything," explains Colby. "On the one hand, we wanted a consistent sound, even though we were recording very different pieces of music and musical styles. On the other hand, we wanted to reveal the character of each piano, and at the same time not have the mics get in the way of the picture or interfere with the live audience's enjoyment. After much discussion, we decided to go with a single manufacturer for all piano mics—Schoeps."

For the most part, each piano was miked with a Schoeps CCM 4 (a miniature cardioid Collette mic) and a Schoeps MK 21 with a cardioid capsule mounted on a Collette system.

"With pianos being sort of long, curving rectangles, we could hide the small mics," he says. "On most of the pianos, we hid the first mic in the crotch, that swooping curve. The second one we positioned at the far end from the performer, at the tail piece, pointed back toward the keys. That gave us a warmer, easier sound for the second microphone position. With a couple exceptions, all the pianos were miked in the crotch and tail."

The big exception was the rock 'n' roll piano used by Jerry Lee Lewis. "In that case, the rock piano is meant to be more aggressive, more percussive, with a harder-edge sound," says Colby. "Putting the mic in the crooked tail area wouldn't give us that kind of detail and aggression. We wanted to get the mic close to the hammers, to isolate it and just get the piano and not the surrounding electric guitars and things. The other problem is that the rock stage was constructed like a 'T' with the audience sitting on the bottom of the 'T,' and a grand piano on one side of the 'T' and a rhythm section on the other. In order for the cameras to tape the musician clearly, we had to make sure the mic didn't block the view. So, we used Schoeps BLM (Boundary Layer Microphone) mics, which are specifically designed to pick up sound as it collects on hard surfaces. It used the piano lid as the integral boundary to collect the sound so we could let the artist play with the lid closed, with the mic on the edge of the piano."

For surround elements, the Remote Recording Services' team strung Audio-Technica 4041 mics throughout the room, collecting enough general material, according to Colby, to build a 5.1 mix later.

"Producers wanted 5.1 surround, but, of course, the show was designed with different performers playing in

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Piano Celebrates 300th Birthday

different parts of the facility, so we couldn't mike the entire place for complete surround sound," he says. "Instead, we filled up eight tracks with room mics placed throughout the area, and as we mixed later, we picked through those elements and chose sounds appropriate to the area we were working with at the time. There was a bit of trial-and-error in doing it that way, but it was the only practical way to do it, given our logistics."

MIX ISSUES

Colby says producers determined early on that, although the project would be conformed in 5.1 surround sound, "this wasn't going to be any sort of phonic surround spectacular. It was more a question of enhancing, tickling the rear surround speakers, to give viewers the perspective of sitting in the space and being part of the live audience, not necessarily being literally surrounded."

We wanted a specific style and uniformity to these recordings, so we didn't want the home user to be able to tamper with the center and subwoofer and alter the result of the mix.

—Steve Colby

Therefore, going into the mix, both philosophical and logistical considerations determined the approach. The producers brought the entire post-production job—both audio and video—to Henninger Digital Audio and Video, Arlington, Va. There, Colby personally handled the music mixes before laying off the stems to DA-88 tape. Henninger's David Hurley, the show's audio editor, assisted Colby and then took over the show to perform the final surround mix, combining the music stems with interviews, documentary elements and ambient sound.

Because Colby had never before used Henninger's AMS Neve Logic 2, 96-input, 24-fader board (connected to the digital recorders via MADI card), Hurley set up what he calls a "generic configuration" for him. This allowed Colby to mix 30 songs in three days without having to worry about learning the nuances of a new console.

In mixing surround stems, Colby purposely avoided the center channel, leaving it for Hurley to use for ambient sound, applause and interview/documentary audio. In that sense, he entered into the ongoing surround debate over the musical usefulness of the center channel.

"We wanted a specific style and uniformity to these recordings, so we didn't want the home user to be able to tamper with the center and subwoofer and alter the result of the mix," says Colby. "So we decided to live with the home frequency information in the two front channels. There was nothing earth-shaking going on in terms of surround, anyway, so our desire was to keep it simple. Some people would say that is not true surround. In the debate over whether music belongs in that channel, a lot of people feel it should be reserved for dead mono information and dialog, while others think lead vocals could go there. We decided to leave that channel for the announcer, documentary and ambient stuff. That also played to the creative style of the piece: The idea that this wasn't just a concert show, but also a show with a documentary flavor, cutting back-and-forth to musical moments. We felt that made the transitions more dramatic to blossom out of the stereo field into the surround field."

When the music stems were complete, Colby eventually had to leave the project to fulfill a previous commitment, so Hurley stepped in to perform the final mix. That step, he says, was performed by using the Logic 2 in conjunction with a 24-track AudioFile digital editor.

"We had hard disk recorders, but there was simply too much material and too little time to deliver to digitize all of it, so we mixed straight off the tapes,"

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says Hurley. "I played an assistant role to Steve while he took care of the songs, and then he would lay off 6-channel stems for me. From the EDL provided by the HD room, I auto-conformed portions and manually conformed other portions until the show came together, placing the performances in the right sections in conjunction with the nonmusical material, and then making music edits as needed, cutting it all together with the Billy Joel standups. Most of the edits were based on decisions made in advance by the offline video editor, so much of it was fairly standard. I did go back to original sources for some of the transitions—the end of one song and the beginning of a different one. I might steal applause from one end and put it onto the start of another song, and so on. With a show of this length, on this deadline, there were lots of transitions that were not pre-assembled in usable form, so I had to do a lot of that by ear, using a combination of Steve's mixes and other material from source tapes. For the final permutation of the show, I took Steve's sort of quad mixes, and by adding dialog and ambient sounds and such to the center channel, I made it into more of a true 5.1."

DOLBY E ISSUES

As the project progressed, the Henninger team found itself faced with a major engineering problem. PBS insisted the show be delivered in the Dolby E audio-coding format, designed specifically to ease future post-production as the network produced different versions of the show in different audio formats.

Brad Hughes, Henninger chief engineer and the man in charge of solving all technical issues between the show's video and audio worlds, says the PBS request made sense because Dolby E would allow the network to transfer, synchronize, encode and broadcast the show to HD-ready consumers in the Dolby AC3 surround format. Dolby E would also allow the producers to easily develop a letterboxed version in Pro-Logic or stereo formats, without having to re-encode for each version.

Unfortunately, at the time the project came to Henninger, Dolby E and Sony's HDW-500 playback recorder weren't exactly the best of friends.

"It was a major problem for a while," says Hughes. "PBS didn't have Dolby E encoders at that point, so we needed to find one ourselves. I had our local Dolby dealer get us a prototype box, but we quickly found out we couldn't do an encode to our HD-CAM machines [the HDW-500]. Before the project began, Sony told us we would need a model kit to modify the HDW-500 to talk to Dolby E, which they said would be no problem. But when we started the project, they said they had scrapped the plan to distribute the model kit, and instead, the new versions of the recorder would automatically convert to the format at the press of a button. Of course, that version wasn't available to us yet, so it was a huge concern."

Hughes solved the problem with tenacity—by "doinking around," he says—eventually finding an HDW-F500 recorder compatible with Dolby E. "Basically, with the new HD 24P format coming up, we'll need to replace all our earlier HD equipment anyway," adds Hughes. "So, we would have gotten the box sooner or later, but this project was so far ahead of the curve technically, we couldn't wait."

Overall, Hughes says these and other issues would have been more complicated to solve had producers not decided to bring the entire post phase—audio and video—under one roof at Henninger, a facility located close to Smithsonian producers in Washington, D.C., and PBS producers in Maryland.

"Having the mix under the same roof as the online edit (performed in linear fashion in a Henninger online room using Sony high-def switchers), was a huge blessing," he says. "There were so many versions of the show, for one thing, especially all those down-converted versions that did not have the surround mix, so there were lots of changes all the way through. Being the chief engineer, I could find the audio guys, ask questions about the mix and make sure everything matched with the video. That was real important during the Dolby E layback: We had everyone in one room who were required to make sure all the tracks ended up in the right places." ■

Michael Goldman is Millimeter*'s West Coast senior editor.*

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ANALOG/DIGITAL CONVERTERS

Most of us live in a world surrounded by digital converters. They're everywhere—in digital consoles, DAWs, MDMs, DASH decks, DATs and in digital outboard toys of every variety. To be sure, the role of the A/D converter has much to do with shaping the sound of the all-digital studio, especially when audio is converted once and stays in the digital domain until playback in a movie theater, broadcast chain or consumer's home as direct download, MiniDisc, CD or DVD. Fortunately for the pro audio industry, converter quality continues to improve, with high fidelity, wider bandwidth and better resolution, while prices for digital gear either remain stable or drop earthward.

In many cases, an investment in a set of new outboard converters can extend the life of older gear, and in the case of computer-based systems, new converters and a software upgrade may be all that's required to enter the era of high-performance, 24-bit/96kHz production. And, sometimes, an outboard device—e.g., a digital reverb, digital console or one of the popular workstation front ends, such as the SeaSound Solo or the Event EZbus—can perform analog/digital (and/or digital/analog) conversion chores in place of a dedicated outboard converter set. A recent trend is to build an A/D converter into mic preamps, vocal processors and the like, but for the purposes of this article, we'll examine what's new in top-of-the-line dedicated converters from various manufacturers, listed alphabetically. Should you require more information about these products, a Web address is included with each entry.

by George Petersen

Pacific Microsonics Model Two

Weiss ADC1-Mk2

Alesis AI-3

Benchmark AD2408-96

dCS 904

Genex GXA8

Apogee AD8000SE

Steinberg Nuendo 8 I/O

Panasonic AD96

ADC DA4030

NVision is now a part of ADC (www.nvision1.com) and is incorporating its technology within the ADC product line. Designed for use in the NVision 4000 Series frame, the DA4030 is a 24-bit, 4-channel AES A/D converter card that contains two independent converters, so 16 high-quality converters fit in two rackspaces. Features include 28kHz to 96kHz sampling rates (with support for off-speed sampling), redundant digital outputs in AES/EBU format, input level adjustment from +12 dBu to +24 dBu in 1dB increments, 128x oversampling, and user-configurable jumpers for selection of analog input termination and FSD operating level.

Alesis AI-3

Originally designed as a single-rackspace front end for the ADAT Edit card, the AI-3 from Alesis (www.alesis.com) is an 8-channel, A/D/A set using the ADAT Lightpipe optical protocol. Features include eight analog inputs and outputs (balanced ¼-inch TRS), 24-bit/128x oversampling digital converters, selectable +4dBu/-10dBV operation and a patching function for routing the signal though the AI-3 to any Lightpipe-equipped device or ADAT in the chain. Retail is $499.

Apogee AD-8000SE

Over the past few years, Apogee (www.apogeedigital.com) has continued to upgrade and enhance its TEC Award-winning AD-8000 8-channel A-D converter with a variety of accessory cards and options. The newest addition is the AD-8000SE, a Special Edition featuring an upgraded analog board using specially selected components for improved sound quality. Standard features of the AD-8000 line include: 24-bit converters; Apogee Soft Limit® on each channel; Apogee UV22® encoding on every channel for translating the 24-bit signal to 20 or 16 bits; multimode LED metering; switchable DC Offset removal; balanced or unbalanced inputs; AES/EBU and co-ax S/PDIF out; and optional ADAT/Pro Tools/Tascam TDIF interfacing. The AD-8000SE is $7,995, and existing AD-8000s can be upgraded. An optional DAC8-SE enhanced D/A card is $1,595.

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Audio Service D.A.I.S.

A versatile converter system, the Digital Audio Interconnection System (D.A.I.S.) from Audio Service (www.audio-service.com) is an external cardcage that accepts 14 single- or five double-height YGDAI (Yamaha 02R format) cards. This allows the user to configure any desired combination of A/D, D/A, format conversion, routing and I/O (AES/ADAT/TDIF/Yamaha Y2) possibilities using standard Yamaha-compatible cards, with master clocking and a 72x72 stereo router matrix controlled via a simple Windows program.

ART DI/O

New from Applied Research and Technology (www.artroch.com), Model 110 DI/O 24-bit A/D/A converter offers sampling rates up to 96 kHz. Its 12AX7 vacuum tube-based analog circuit has a variable "tube character" control for warming up existing tracks. Features include coaxial S/PDIF digital I/O, switchable 44.1, 48, 88.2 or 96kHz sampling rates and ¼-inch stereo analog ins/outs. Retail is $249.

Benchmark AD2408-96

The AD2408-96 8-channel, 24-bit, 96kHz A/D converter from Benchmark (www.benchmarkmedia.com) features 16, 20 or 24-bit recording; 44.1, 48, 88.2, 96kHz sampling (plus varispeed); 9-segment true digital metering and various settings for noise-shaped word length reduction. All analog connectors are balanced XLR, and several available motherboards offer a choice of digital interface connectors—AES3-1992 XLR (110 ohm), AES3id-SMPTE-276M BNC (75 ohm) and optical, with more coming soon. Retail ranges from $4,695 to $4,995.

dB Technologies dB-4496

Distributed by Audio Intervisual Design, the expandable dB-4496 system frame from dB Technologies (www.dbtechno.com) can be ordered with a variety of plug-in modules, the newest of which is the M-AD824, a 2-channel, 96kHz, 24-bit A/D converter. The multichannel system supports 44.1, 48, 88.2 or 96kHz sampling frequencies and a choice of 2, 4, 6 or 8 channels. Other modules for this self-contained single- or double-wire conversion system include the M-DA824 (2-channel D/A module) and the M-AD824, M-DD1-2 and M-DD2-1 (single/double and double/single-wire AES translator).

dCS 904

Distributed in the U.S. by Independent Audio (www.independentaudio.com), dCS offers three ADCs covering all standard PCM sample rates from 32 kHz to 192 kHz, with output word lengths of up to 24-bits; all are hardware/software upgradeable for new formats or rates. The top-of-the-line dCS 904 features 2.822MHz Sony DSD format capability (AES/EBU 4-wire), along with dual and quad AES/EBU outs, SDIF-2 and SDIF-3 outputs, four anti-aliasing filters for each sampling rate, three noise shaping choices, remote control via Windows software and the ability to output DSD reformatted in pseudo-AES3 format, using the unit's four AES digital outputs for storing DSD data on any PCM digital audio recorder that can store eight tracks of 16-bit/44.1kHz data, such as the Genex GX-8000, Alesis M20 or Tascam DA-88. Retail is $7,335.

Digidesign 888|24 I/O

Originally designed as a front end for Digidesign (www.digidesign.com) Pro Tools systems, the 888|24 I/O offers eight channels of 24-bit/48kHz A/D and D/A conversion and can also be used as a stand-alone converter set for non-Pro Tools applications. Multiple 888|24 I/Os can be combined for up to 72 channels (software dependent) of discrete analog or digital I/O. All analog interfacing is via balanced XLRs with recessed level matching trim pots; digital I/O is 2-channel AES or S/PDIF, or multichannel direct to Pro Tools cards; ADAT Lightpipe interfacing is optional. Retail is $3,695.

Euphonix AD-26+2

As part of the development of its TEC Award-winning System 5 digital console, Euphonix (www.euphonix.com) created a versatile series of outboard multichannel A/D and D/A converters, which can be used with nearly any type of digital gear. Each unit in the series has 26 channels (24 channels plus a stereo pair) of 24-bit/96kHz conversion in a two-rackspace chassis, and units include analog-to-AES/EBU (the AD-26+2), analog-to-MADI, AES/EBU-to-MADI and the reverse of each, along with an AES/EBU digital-to-digital converter. Standard on the AD-26+2 are XLR balanced inputs; input level trims; stereo AES/EBU and S/PDIF outputs; multichannel AES/EBU outs on 12 XLRs and three DB-25 (Yamaha 02R/Sony PCM-800 pinout) ports; 24-bit, oversampled, noise-shaped sigma-delta conversion; and dithered or noise-shaped conversion to 20 or 16-bits on each of the 24 AES/EBU outputs.

Genex GXA8

Unveiled at AES Los Angeles, the GXA8 A/D converter from Genex (distributed by HHB, www.hhbusa.com) is a stand-alone unit offering eight channels of 24-bit/192 kHz. (A companion D/A is also available.) Outputs are available in a variety of digital audio formats, with AES3 fitted as standard, supporting four channels of 24-bit/192 kHz in dual-wire mode, or eight channels of 24-bit/96 kHz in single-wire mode. An optional AES expansion card provides eight channels of 24-bit/192 kHz in dual-wire mode, with cards also available to support eight channels of SDIF-2, ADAT and TDIF outputs; IEEE 1394 is planned for the future. Another option offers operation in Direct Stream Digital (DSD) mode, converting eight channels of analog audio into the 2.8224MHz digital bit stream, which forms the basis of the Sony Super Audio CD format. Retail is $4,220.

Graham-Patten Avenue

Avenue from Graham-Patten Systems (www.graham-patten.com) is a versatile cardcage that houses a wide array of audio and video processing cards, including analog and video D/As, video A/D/As, AES/EBU word clock generator, and 4-channel audio A/D and D/A cards. The Model 6010 is a 4-channel, 20-bit audio A/D converter with four balanced line inputs (with gain trims on each) and two AES3id outputs (four copies of each). Parameters can be locally or remotely controlled.

Harrison Digital Converter

The Digital Converter from Harrison (www.harrisonconsoles.com) provides up to 448 channels of analog/digital signal conversion with MADI interfacing housed in a twelve-rackspace enclosure. Each unit houses eight dedicated converter cards that can be mixed within the system to create custom configurations with 28 AES pairs or 56 balanced analog signals per card with built-in sample rate conversion on the AES receiver card. Audio interfacing is via 25-pin D-type connectors.

Lucid AD 9624

Lucid (www.lucidaudio.com) offers

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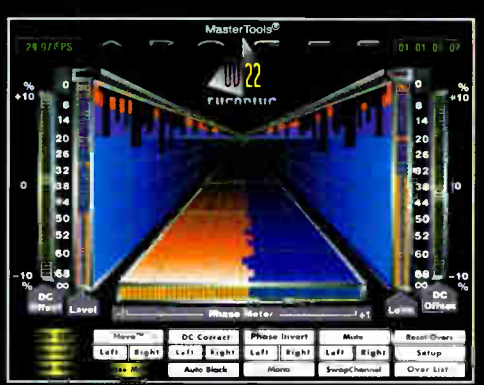

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dedicated A/D converter sets in stereo versions (with AES/EBU and S/PDIF outputs), as well as 8-channel A/D/A converters equipped with Sonic Solutions SonicSystem or ADAT Lightpipe interfacing. All offer up to 24-bit resolution with 32, 44.1, 48, 88.2 and 96kHz sampling rates. The half-rackspace stereo AD 9624 features balanced XLR analog inputs; outputs are simultaneously routed to AES/EBU and S/PDIF (coaxial and optical TosLink) ports, and a noise shaping function is available when creating 16-bit masters. The AD 9624 is $899; a rack-mounting tray and a companion DA 9624 D/A converter are optional.

M-Audio Delta 1010

The Delta 1010 from M-Audio—the digital audio arm of Midiman (www.midiman.com)—is intended as a workstation front end and even includes a PCI interface card, although the unit can be used as a stand-alone 8-in/8-out, A/D/A converter with Lightpipe interfacing with the addition of an optional 1010Ai adapter. Features include support for all bit widths and sampling rates up to 24-bit/96 kHz, and individually switchable +4/-10 operation. Retail is $999.95.

Mark of the Unicorn 1296

Intended as a 24-bit/96kHz front end to MOTU's (www.motu.com) 2408 workstation, the 1296 is a rackmount A/D/A set featuring 12 analog inputs and outputs on +4dB balanced XLRs. Digital I/O includes an AES/EBU pair with built-in sample rate conversion, while multichannel digital I/O is handled via MOTU's proprietary Audio Wire format. Price is $1,795.

Mytek 8X96 ADC

The 8X96 from Mytek (www.mytekdigital.com) is an 8-channel, 24-bit/96kHz A/D set priced at $2,795. The two-rackspace 8X96 ADC is equipped with AES/EBU digital outputs as standard, but is available with optional plug-in interfaces for direct connection to ADAT Lightpipe, Tascam TDIF, Digidesign Pro Tools, Sonic Solutions, SADiE and other popular digital audio formats. A matching 8-channel 8X96 DAC is also $2,795.

Mytek 8X96 ADC

Pacific Microsonics Model Two

The Model Two HDCD Processor from Pacific Microsonics (www.hdcd.com) offers multiple functions in one unit, including A/D and D/A conversion at 16, 20 or 24-bits and 44.1, 48, 88.2, 96, 176.4 and 192 kHz; along with upsampling/downsampling; bit rate reduction; and, of course, both HDCD-format and standard AES/EBU conversions. Multiple units can be locked for surround sound production, and user-operating configurations can be stored as presets, allowing instant setup. Software updates can be downloaded using a built-in RS232 serial data port.

Panasonic AD96

Incorporating recent generation 24-bit/96kHz delta-sigma converters with 128-times oversampling is the AD96 8-channel A/D converter from Panasonic (www.panasonic.com). The AD96 features single-wire (and optional dual-wire) AES mode connections and built-in ADAT Lightpipe port for connecting to MDMs and DAWs. An optional TDIF interface with a 24-bit/96kHz, 4-channel mode for use with 24-bit DTRS-compatible devices is available, as is the AD96M, a similar model that incorporates eight high-quality mic preamps based on Ramsa's patented "padless," low-noise/high-output circuitry. The AD96 is $2,195; the AD96M is $2,495.

Prism Sound ADA-8

Initially offered in 8-channel A/D/A configuration with AES I/O, the ADA-8 from Prism (www.prismsound.com) is a modular, multichannel digital processor. In addition to 24-bit/96kHz conversion, features include premium-quality, 8-channel synchronous sampling rate conversion and SNS noise shaping. Options include a direct Pro Tools interface, additional AES I/O card for 2-wire on all channels and a 24-bit TDIF interface. Retail is $8,250.

SEK'D ADDA 2496 DSP

The ADDA 2496 DSP from SEK'D (www.sekd.com) is a 2-channel, rackmount A/D/A converter set that features 24-bit/96kHz resolution, balanced analog I/O, with AES/EBU and S/PDIF (optical and co-ax) outputs. Retail is $5,200.

Sonic Sense Sonic AK2K+

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- M•DA824 D to A, featuring the exclusive CrystalLock™ feature which totally eliminates transmission jitter.
- M•DD1-2 and M•DD2-1 AES single/dual speed translators
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Top-of-the-Line

ANALOG/DIGITAL CONVERTERS

AK2K+ from Sonic Sense (www.sonicsense.com) is a compact (8x5x1.75-inch), 24-bit/96kHz analog-to-digital converter. Features include 44.1, 48, 88.2 and 96kHz sampling rates, balanced analog XLR inputs and multiple 16, 20 and 24-bit outputs on single- or dual-wire AES/EBU and S/PDIF. The unit can operate for nearly eight hours on a 12-volt/7.2 amp-hour battery, and a digital thru is provided for word-length reduction and format conversion. Retail is $1,795.

Sonifex Redbox RB-ADDA

The newest addition to the Redbox range from Sonifex, distributed in the U.S. by Independent Audio (www.independentaudio.com), the RB-ADDA is a stereo A/D/A pair housed in a one-rackspace chassis. Using 24-bit/96kHz capable devices, the RB-ADDA produces an AES/EBU or S/PDIF digital output from a stereo line-level, balanced XLR or unbalanced phono input. The unit also produces a stereo balanced XLR or unbalanced phono output from an incoming AES/EBU or S/PDIF source. The unit ships in January 2001 at a retail of $650.

Soundscape iBox 2

Soundscape (www.soundscape-digital.com) is now shipping its iBox 2, a 2-channel A/D/A converter set with balanced XLR line and mic inputs and TDIF digital ports for interfacing with any gear having 8-channel TDIF-compatible connections. All converters are 24-bit and can operate at any sampling rate from 22.05 kHz to 48 kHz. Other features include phantom power on the mic inputs and a monitor headphone jack. Up to four iBox 2 units can be cascaded via TDIF for 8-channel operations. Retail is $549.

Steinberg Nuendo 8 I/O

The Nuendo 8 I/O from Steinberg (www.steinberg.net) is a rackmount, 8-channel, 44.1/48kHz, 24-bit A/D/A converter. Features include Intelligent Clock Control, SyncCheck, SyncAlign, and independent or linked operation of the A/D/As. Digital I/Os are ADAT Lightpipe and Tascam TDIF. An 02R-compatible Bit/Split/Combine feature records 24-bit data onto 16-bit machines. Nuendo 8 I/O offers a Digital Patchbay operation, which allows duplication and distribution of digital input signals. Retail is $1,999.

Stellavox AD8

Following the success of its ST2 D/A converter, Swiss manufacturer Stellavox (www.stellavox.com) plans to offer the AD8, an 8-channel, 24-bit/96kHz A/D converter using four circuits of AD2 circuits with a common power supply and chassis. Both AES/EBU and Pro Tools-compatible outputs will be offered.

Swissonic AD 8

The AD 8 from Swissonic (www.swissonic.com) is an 8-channel, 24-bit/96kHz A/D converter with switchable mic/line inputs. Clocking can be internal or word clock. Several output formats are available via optional modules, including ADAT Lightpipe, AES/EBU and mLAN. Retail is $1,499.

Troisi Octal DC8-224ADC

The Octal DC8-224ADC from Troisi (www.troisi.com) is an 8-channel A/D converter in a single-rackspace package. The analog inputs are all balanced line XLRs, with front panel +4dB or -10dB input level trims. AES/EBU stereo digital outputs can be selected to operate at 16, 20 or 24-bit quantization at either standard resolution (44.1/48 kHz) or high resolution (88.2/96 kHz). Custom packages with S/PDIF (co-ax or optical) and DA-88 50-pin interfaces are also available. Retail is $3,920.

Weiss ADC1-MK2

Distributed in the U.S. by GPrime (www.gprime.com), the 2-channel ADC1-Mk2 is based on the ADC1 but offers true 24-bit/96kHz performance, built-in redithering/soft clip/crossfade functions and remote control of all parameters. Besides its AES/EBU digital outputs, the ADC1-Mk2 also includes AES/EBU digital input for routing through its DSP functions. The unit uses a modular design where the A/D converters, input stages and (optional) microphone preamps are on plug-in circuits. All parameters are stored in a nonvolatile memory, with 20 sets of parameters retained for user recall as needed. Retail is $5,000.

Yamaha AD824

Designed for use as a front end for the DME32 or 02R (but also useable with AES/EBU, ADAT or TDIF devices via optional output cards), the AD824 (www.yamaha.com) is an 8-channel A/D with remote-controllable mic/line amps and balanced analog insert points. This two-rackspace chassis features 44.1/48kHz, 24-bit precision. Retail is $1,899; a matching D/A unit is $1,299. ■

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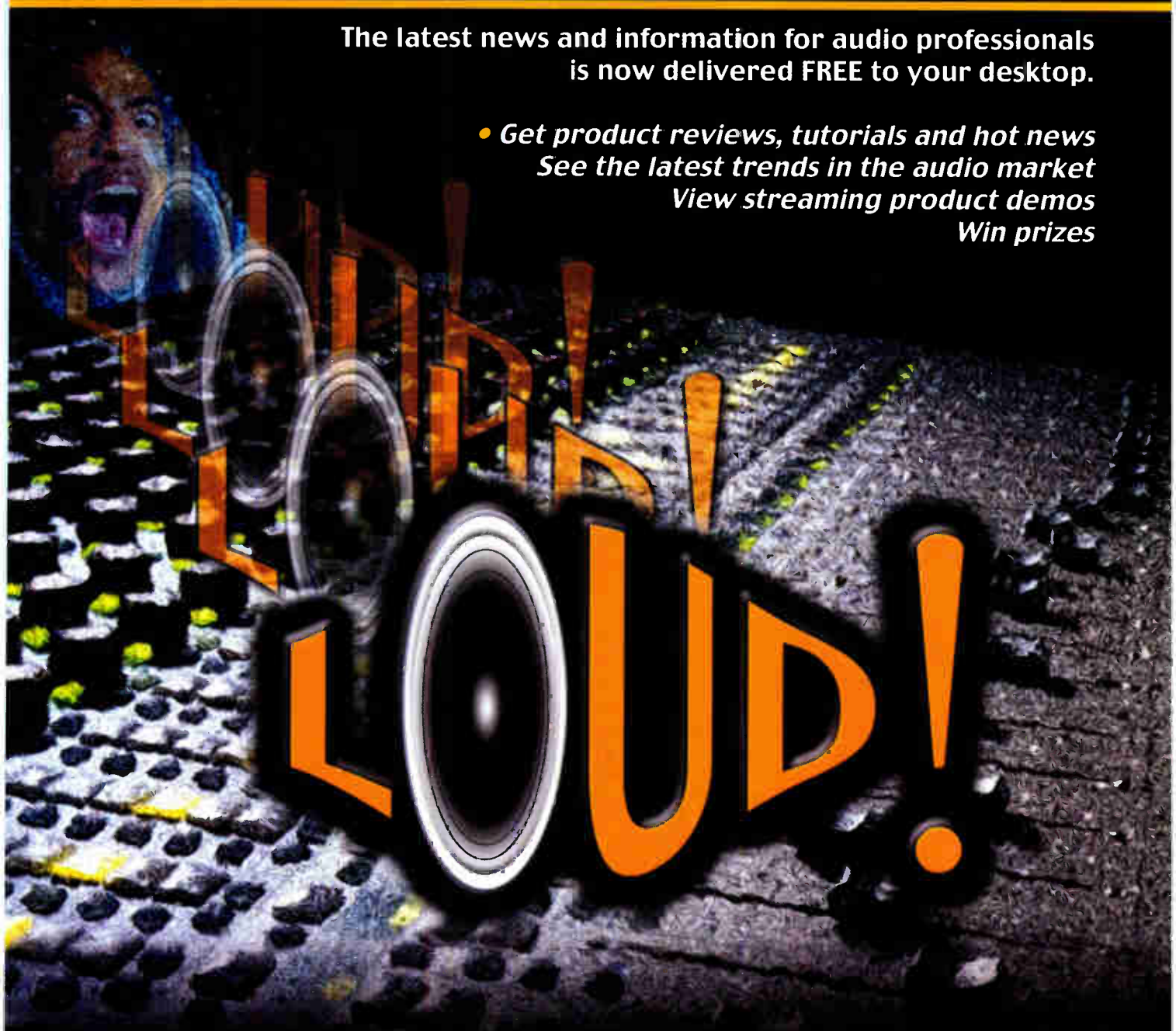

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BOB IRWIN

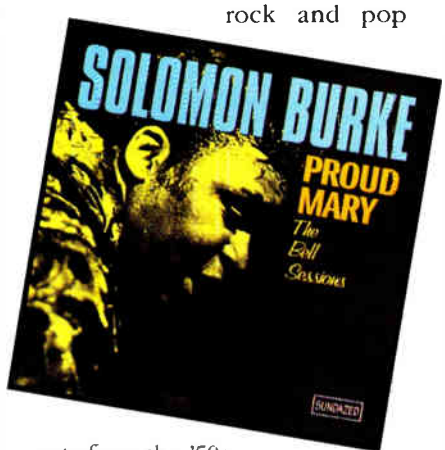
REMASTERING FOR FUN AND PROFIT

Bob Irwin (seated, left) at work on The Byrds' reissues in Sony Music Studios with bandmember Roger McGuinn (right) and Legacy Recordings VP of A&R Steve Berkowitz

You know that feeling you get when you're making the perfect car tape, when every song you add suggests the next one, and you can't wait to pop it in and crank it up on your next road trip? Well, Bob Irwin does. He's turned it into one of the most successful and respected careers in the remastering/reissue business.

Irwin is the guitar-player/music-seller/music-lover who put his passion and his savings into his own independent reissue label, Sundazed. In the mid-'80s, when the major labels were still stumbling around the technology needed to turn their vinyl into the new CD format, Irwin was researching unreleased material, working from original multitrack masters—creating the kind of reissues that we now know and take for granted. Sundazed's first releases were so exceptional in their sonics and content that the majors took notice. Sony Music (then CBS Records) recruited Irwin to help launch the wonderful Legacy label.

Today, Irwin continues to operate in both spheres. He still produces nearly every release on Sundazed, working in his own lovingly designed, all-analog mastering suite, situated in his hometown of Coxsackie, N.Y. The Sundazed catalog now comprises releases from artists including Buck Owens, The Byrds, Nancy Sinatra, The Hollies, and scores of other rock and pop acts from the '50s, '60s and '70s. He also produces dozens of releases for Legacy every year out of Sony Music Studios in Manhattan. Over the years, he's worked on more than 300 releases for Legacy, including reissues and packages of Santana, Janis Joplin, and a just-completed Stevie Ray Vaughan box set. He is also part of the team producing country reissues for Legacy's new American Milestones series.



Irwin loves his job; he takes the greatest pleasure in sharing his music discoveries with others, and so his joy is multiplied exponentially every year, as his resumé and his audience grow. We spoke with him just as he wrapped up the Stevie Ray Vaughan project and was shifting gears to dig back into Sundazed's packed schedule of fall releases.

What are you working on now?

At Sundazed, we have a lot of wonderful things on tap. It's our crunch time right now. We're spending a lot of time getting our year-end releases ready. Along with our flow of compact disc issues, we still do a lot of 180-gram audiophile vinyl here, and we've really stepped that up this Christmas season, because it's been embraced so well. So, in addition to

—CONTINUED ON PAGE 102

BY BARBARA SCHULTZ

Who Needs Another Mic Preamp?

"...the finest sounding preamp I've ever used...as close to being the perfect preamplifier as possible. It is made well and it sounds unbelievable."

Russ Long, Nashville based producer/engineer, Pro Audio Review, June 2000

"The 1100 is the sweetest, cleanest, warmest, most flattering preamplifier I've ever used."

Jon Barry, Radio Personality, WMXB (FM), Richmond, VA

"The Aphex Model 1100 is a good example of something different... A work of art...The results were astonishing, providing an awesome sound that was natural, dynamic and absolutely free of noise."

George Petersen, Editor - Mix Magazine, April 2000

Model 1100 Discrete Class A 2 Channel Tube Mic Preamp with 24-Bit 96kHz A to D from Aphex Thermionics

Yes, the Aphex Model 1100 Thermionic Preamp is different - it's a completely new design filled with Aphex proprietary circuitry. These inventions, combined with the absolute highest quality components, provide accuracy, clarity, detail, and depth that have never been available before with any preamp, at any price.

The Reflected Plate Amplifier™ tube circuit imparts all the wonderful characteristics of a conventional tube circuit without any of the sonic drawbacks. The MicLim™ provides up to 20dB of limiting on the microphone output- before the preamp gain- allowing hot levels without fear of overloading. And the Drift Stabilized™ 24bit/96kHz A to D converters make the transfer into the digital domain at the highest possible resolution. Specs? How about –135dBu EIN! This means that the Model 1100 adds less than 1dB of noise to the output of a microphone!

There are many mic preamps on the market, but if you're looking for something different, with awe-inspiring performance and unique features, **you need another mic preamp–you need the Aphex Model 1100.**

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AMERICAN MILESTONES

NEW VERSIONS OF COUNTRY CLASSICS

Producer Al Quaglieri (standing) with Sony Music Studios engineer Joe Palmaccio.

When Bob Irwin started dividing his time between his Sundazed label and Sony/Legacy, he not only brought his own wealth of musical and technical knowledge to the major label—he also brought Al Q. Al Quaglieri is a longtime friend and colleague of Irwin's, who has been producing pop and country reissues for Legacy since the early '90s.

As many country music fans may remember, in the late '80s, Legacy was deep into the Country Classics series of compilations. A few years ago, the powers that be at the label began working on reissues of classic country albums, all remastered to 20-bit, and each with bonus tracks. Irwin produced the two Johnny Cash prison albums, and the other eight (so far) in the series were produced by Quaglieri.

Work on the series is mainly done at Sony Music Studios in Manhattan. "Sony's primary core of mastering engineers—Vic Anesini, Joe Palmaccio, Darcy Proper, Ken Robertson and Mark Wilder—have the skill set, flexibility and the gear to deal with just about anything you can imagine doing to bring out the best in a vintage master," says Quaglieri. "Because they deal with everything from rap edits to new jazz to frontline pop and surround, they don't flinch when you haul in a crate full of sticky, undocumented, no-tone reels you've unearthed for a reissue."

Quaglieri mainly works with Palmaccio in a mastering suite that contains a customized Sony/GML console and Dunlavy SC-5 monitors, and a full-blown Sonic system. Palmaccio also uses a wide range of analog and digital processing gear; he says he'll use whatever box it takes to get the sound that's right for a recording.

Mix asked Quaglieri to share some specific experiences working on American Milestones, and Quaglieri spoke in-depth about the research and remastering of Tammy Wynette's *Stand By Your Man*.

"A lot of times, the more popular a record was, the more chance there is that the original master tape is either long-gone or demolished," says Quaglieri. "But you always want to go back to the closest original source that you can find, so we started digging through the tapes. There had been so many Greatest Hits permutations of Tammy's catalog—on Epic and it's been licensed all over the place—and every time they needed the cuts, they went to this album. I called up all the tapes, and we also called up what we could from Sony Nashville, which has its own tape library.

"As I expected, most of the ones in New York were noisy and copies. It's hard to reconstruct what happens, but I think that the original EQ'd master would be mildly EQ'd every time they did something with it, so every time they re-released it, it was further and further away; it was like a joke that was told to 100 people. But Nashville had the original 2-track mixdown master, which only had been mildly, initially EQ'd, and the 3- and 4-track half-inch analog masters, which had never been touched.

"I also asked them to pull anything from that artist during that period, looking for the bonus material. A lot of times, the titles weren't marked, or the project wasn't marked on a box. I waded through these, and we put up the 2-track, and then we also brought in a 3-track and did a little rough mix.

"[Producer] Billy Sherrill was a genius. These things would kind of mix themselves. You just set them all at zero and let it go, and the thing would mix itself, but you'd find that they laid a lot of effects down during the tracking, and they also did some compression during the tracking, so Joe Palmaccio and I tried to determine which was the better-sounding, the more authentic-sounding, the new 2-track that we had or a remix from scratch, and there wasn't much to be gained from remixing these, because the newly found tape was so clean.

"We tried remixing a bunch of original tunes, and not only was there a difference in sound between these and the other tracks, but it's impossible to completely reproduce all that vintage equipment that they used to mix this the first time. So, it was a choice of either remixing the whole album or letting the whole thing go from the 2-tracks. Another thing that nailed our decision was that a couple of guitar tracks were laid down during the 2-track mixdown and didn't exist anywhere else.

"Then we found a couple of tracks done during the same sessions that were either never logged or were forgotten. I have to figure it was some combination of both, because had anybody realized they existed, these would have shown up long ago.

"I think we had four or five bonus tracks in various stages of completion, three of which were actually very complete. One of the three was lopped off, because it wasn't a very good performance. There is obviously a reason some things get left in the can, and you have to honor that. What we ended up with is a new master that is certainly a good reflection of where the state of the recording art was at that time, what the production ideas were at that time." —*Barbara Schultz*

StellavoxST-2
D/A converter

Based on the Goldmund "Alize2" technology, the new Stellavox ST2 D/A converter is unique in its time alignment, ultra-low noise and distortion, providing a soft and delineate sound quality, with all the analogue advantages.

With its 3 separate inputs, selectable from the front panel, the Stellavox ST2 is very reasonable in price for its professional quality, but also extremely small in dimensions for its performance.
It uses the highest available quality components, most of military grade, and its mechanical construction is typical of the notorious "Swiss Made" precision and strength.

The New Stellavox ST-2 Calibration D/A Converter

- **INPUTS**
  Standard Version: 1 x XLR AES-EBU and 2 x RCA SPDIF.
  Front panel selection. Signal up to 24 bits 96kHz.
- **OUTPUTS**
  Standard Version: 2 x XLR balanced and 2 x RCA unbalanced usable simultaneously.
- **FREQUENCY RESPONSE**
  At 44.1 kHz: +/- 0.25 dB, 20 Hz - 20 kHz.
- **OUTPUT LEVEL**
  2V on 2.2kOhms in unbalanced.
  Up to 15 dBU in balanced.
- **GROUP DELAY**
  Propagation delay stable with frequency within 100 picosecond from 20 Hz to 20 kHz.
- **DISTORTION**
  Harmonic on 24 bits signal at 44.1 kHz: THD < 0.002 %.
- **DYNAMIC RANGE**
  At 44.1 kHz with 24 bits signal EIAJ A Weighted: > 104 dB.
- **SAMPLING FREQUENCY**
  30-96 kHz.
- **CHANNEL GAIN MISMATCH**
  < 0.2 dB.
- **POWER CONSUMPTION**
  At 44.1 kHz with digital silence: 2W.
- **SIZE AND WEIGHT**
  15 cm W x 20 cm D x 5 cm H.
  Weight: 1.5 kg net.

Stellavox

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PRODUCER'S DESK

—FROM PAGE 98, BOB IRWIN

our CD releases, we're coming out with projects such as the Otis Redding catalog on 180-gram LP, including *Dictionary of Soul*, *Otis Blue* and Otis and Carla Thomas' *King and Queen*.

A lot of those were already reissued by Rhino on CD. Is that something you get to do, because they're not doing vinyl versions?

That's correct. We've always had a uniquely wonderful working relationship with Rhino, going back to our infancy. [Owner/founders] Richard Foos, Harold Bronson and [engineer] Bill Inglot and I have long been friends, and we've always worked closely. We've been very fortunate over the years, as Rhino has accumulated different catalogs, they've come to us and said, for example, "We've just acquired The Meters catalog," which we've had wonderful success with this year, and they'd say, "We're doing a two-CD Best Of and an individual-CD Very Best Of. Are you interested in the album catalog?" And I'd always say yes, especially if it's a wonderful catalog like that. We continue to work well together to this day.

Is it safe, then, to say that Rhino's work is more to create new collections or packages, and yours is getting back to original versions in new editions?

That's correct in some respects. I think that because we are comparatively smaller and very focused on things that would tend to slip through the cracks at larger labels, those projects are often best served with a home on Sundazed, because here they're regarded as priority releases.

What else is on the schedule for Sundazed?

Coming this fall is a Gram Parsons collection of early, unissued material that was recorded by his bandmate and friend in 1965 and 1966. It's tentatively called *Another Side of This Life—The Lost Recordings of Gram Parsons*. Along with really cool folk standards, Gram is playing baby-footsteps versions of some of his songs like "November Nights" and "Brass Buttons," the earliest known recordings of these songs. It's a very insightful project.

Plus, we're re-releasing Buck Owens & His Buckaroos' complete Carnegie Hall concert from 1966—that will be the unedited show—and the first ever Don Rich anthology. Don Rich was the guitar player and the fiddle player for Buck Owens and passed away in the early '70s; he's been such an influence on so many players.

Also on 180-gram vinyl, we're coming out with a few titles from Booker T. & the MGs' catalog, two Spirit titles, and Bob Dylan's *Bringing It All Back Home* from the original mono master, which has been out of print for over 35 years, which is pretty awesome!

You're not the producer of every single one of these reissues, are you?

Well, actually, I am. We have a staff of 15 people here at Sundazed, and nearly everyone actively participates in A&R and the creative process. There are always several plates spinning, but everything is done in-house, from the conceptualizing of the project to the actual mixing and mastering to the graphic components.

So, you have your own studio there?

Yeah, two studios built right here. The first room is an all-analog room, which

Irwin recently completed a Stevie Ray Vaughan box set, working closely with Jimmie Vaughan (rear).

PROFESSIONAL RECORDING EQUIPMENT

MANLEY

Langevin

COMPANY PROFILE: Manley Laboratories, Inc. in recent years has expanded and thrived under EveAnna Manley's leadership. Our 11,000 sq. ft. building houses our own machine-shop, printed circuit board manufacture, audio transformer winding, engraving, and silk-screening facilities. All custom design, R&D, assembly, testing, and quality control processes are performed with precision and pride at the Manley factory, located just 35 miles east of Los Angeles.

NEO-CLASSIC: MANLEY ALL-TUBE GEAR

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Beyond this, Manley means reliability, real technical support, and a company attitude that professionals depend on.

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The choice is yours.

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has some really marvelous vintage machines and gear. We have a beautiful Michael Spitz-built ATR that we do all of our 2-track and full-track mono work on. I also recently acquired a beautiful tube-driven Presto half-inch 3-track machine from 1958, virtually unused. It's an absolutely gorgeous centerpiece of our vintage machine collection.

What kind of monitors do you use?

In my main room, I currently have both a pair of Paradigm Studio Monitors and Genelec 1030As with a 1092A subwoofer. The Paradigms are powered by Cary SLM 100 tube mono blocks. Much of the room is tube gear.

To be honest, my work, hobby, passion all revolve around Sundazed and the joy of acquiring new projects to release and vintage gear to use. I usually say to friends that I'm not looking to buy an island, but I flip out when I get a new piece of tube gear for the studio, and it's really true! We have just a beautiful array, the old meeting the new, ranging from vintage Pultecs, LA-2As and 3As, to new TubeTech, Sontec, Joemeek, API, etc., outboard gear.

I take it, then, that you prefer to work in analog.

Yes. All of my mastering work is done in the analog domain, unless something comes in on a digital source, but we prefer to work all analog as long as possible.

And the other room?

The other room is our digital suite that's equipped with a full Sonic Solutions system, and in this room we have an array of digital gear and converters that we're using, Apogee PSX 100s, AD122s. The monitors in the second room are Genelec 1030As, again with a subwoofer.

Did you design the rooms yourself?

Yeah. Our building was built in the mid-1800s. It's right on the Hudson River, and by saying that, I mean you could literally throw a rock out the window and plunk it in the river! It's a beautiful location, and the rooms upstairs are just naturally great-sounding rooms, to the point where we have a lot of people looking to work here, but the rooms already go, well, not 24 hours a day, but they easily could if *I* could go 24 hours a day! We just purchased another historic building just across the street. We will be putting another studio on the third floor there and use the additional space for the mountains of graphic and Web work that go on here.

Who are the other technical people on your staff?

There's Al Quaglieri. He's from my neck of the woods. When we first considered starting Sundazed, I took inventory of some of my closest friends and their various talents, and Al is one of the first guys I went to, because along with being a musicologist, he has wonderful studio chops. So, he and I together have worked on many, many projects. Al mastered most of The Meters releases that we did here. I also want to mention our assistant, Jayme Pieruzzi, who does a lot of Sonic editing and cleanup work.

While we've never looked to be involved in revisionist history, we enjoy being able to present things in stereo when there are recordings that *make* for good stereo.

Tell me about the Sundazed process. What happens from getting the permissions for an idea until its release?

That really varies from release to release. There are times, though not often enough, we'll get what we refer to as a "project in a box," when the licensor delivers all the multis and the masters to the door, along with a wide array of photos, and a great set of liner notes!

More often, we're working five or six months ahead of ourselves on the release schedule. Here's the breakdown: Tim Livingston and my wife Mary basically run the entire show here at Sundazed. They supervise a talented staff that includes both Efram Turchick and Stephanie Kennedy, who are in effect the general information officers and production coordinators of Sundazed. They are the conduit through which all components for a release will flow to get to the appropriate departments. They make sure that I have all the tapes here for the project when studio time is scheduled, make sure that Rich Russell, head of our design department, has all the photos and elements needed, that the liner note writer has been assigned and delivers on time, get appropriate ref's out, etc.

Once a project idea is put down on

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Over 90% efficient, as opposed to conventional class A/B designs, the powerful new LT and ST switching output series amplifiers from Crest Audio are the epitome of unconventional design excellence.

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paper, the potential licensor is contacted and, hopefully, a deal will be struck. That process can take anywhere from a day to a year. The agreement could be with an original producer, or an artist who owns their original masters, or with a major label. So, the process of getting a project onto the schedule can be rather involved. Once that's taken place, we always like to sort through all the masters up front, so that we have the most cohesive and deepest A&R possible. We want to find out if there's any unreleased material that might warrant being included, uncover any rare material, etc.

I'm assuming that your goal is to go back to the original masters whenever possible.

Absolutely. Al and I cut our teeth by digging around tape vaults for a good 10 years before Sundazed started, so we enjoy getting dirty and touching tape! A good example would be a project we're working on right now for our soul series. Oscar Toney Jr., an artist from the '60s, recorded a tremendous album for the Bell label along with a handful of wonderful singles, and because of our sleeves-rolled-up archeology, we now have the luxury of being able to work with all of the multitracks, all of the original mixdowns, session reels, and more.

At Sundazed, we say that we want our consumer to get a history lesson, but not know that they're getting one. It has to be fun, for sure.

Who had them?

Arista Records controls the Bell Records catalog, so the project is licensed from Arista. It's wonderful when all the masters are delivered here, then the real fun begins when you start combing through all the multitracks to see what's there. And in the case of Oscar Toney, we found a bevy of wonderful demos and outtakes, and because we have the vintage 1-inch 8-tracks and half-inch 4-tracks, we're able to create some beautiful first-time stereo mixes. While we've never looked to be involved in revisionist history, we enjoy being able to present things in stereo when there are recordings that *make* for good stereo. That said, simply having a multitrack doesn't necessarily mean that you can have championship stereo. It usually has to have been recorded with a potential stereo mix in mind. But sometimes, due to the budget constraints or time constraints at the time, there was no stereo mix done. That's where we'll step in.

With that in mind, tell me about your philosophy as a mastering producer. What's more important to you: perfect fidelity, or recordings that are historically accurate?

It's always the music first. At Sundazed, we say that we want our consumer to get a history lesson, but not know that they're getting one. It has to be fun, for sure. We try not to be analytically dry in our packages. Everything we do is presented in an upbeat, authentic, fun way, and that means that the music definitely comes first. If the question is, do we have a track that's an astounding performance where the fidelity is

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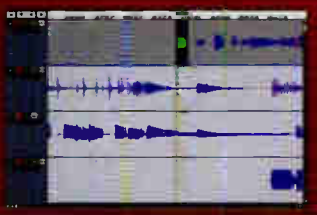

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less than exceptional, we would most likely opt to use that performance, with the artist's sanctioning, of course. The artists are involved in every release, whenever possible.

What we include also depends on the amount of material we have to work with. We just finished creating a Mighty Sam McClain package. Mighty Sam is enjoying a renewed career right now as a contemporary blues artist, but previously made some phenomenal R&B records in the '60s. For this package, there was such a wealth of material, it was either increase the track listing, which we did do, or go to a two-CD set, which we did not do, and that meant that some things had to be left behind.

When you have, as we did, 22 or 24 stellar tracks, and your track listing is confined to 20 cuts, then we might look at the sonics of a cut or two to see if that is perhaps the track that should be left off the package. But I don't want to make it sound like that's what we're shopping for, because we'd never leave an important, wonderful cut off because it was lacking in stellar fidelity. In the case of Mighty Sam, we had a wonderful bounty of performances. There were two or three demo sessions that we thought the performances were wonderful on, but on some of the cuts you could hear the limiters overloading, and we did make a couple of choices and excluded a couple of songs based on that criteria.

Have there been specific recordings for Sundazed over the years that you can single out as breakthrough successes for your label?

In the very beginning, 11 years ago, we started putting out wonderfully obscure '60s garage groups and wild surf and hot rod material from the '60s, and the *Pulp Fiction* soundtrack used five or six of our artists, so that was a great vehicle for visibility early on. Other tracks that we control are often used in soundtracks or commercials. So, what happens is, as the label grows naturally and as the catalog gets larger and more visible, that in turn attracts other artists and potential licensors to our label.

From what I understand, it was because of your meticulous and creative work with Sundazed that Sony Music became interested in you as a producer for their Legacy label.

That happened very early on. The first couple of Sundazed releases received high praise in places like *Stereo Review* and *The New York Times*, and I received a phone call from CBS Records. This was before there was a Legacy, and I began as acting as a consultant, suggesting titles that they might want to consider for re-release. That grew into a freelance production agreement as Legacy was formed.

When you produce for Legacy, you work in Sony Music Studios in Manhattan, correct?

Right. We use a variety of rooms, depending on whether we're mixing or mastering, but because I'd say probably 60 percent of my work is mastering-related, I primarily work with an engineer whom I consider to be one of the most talented engineers at Sony Music Studios, Vic Anesini. Our relationship began when I started my first CBS project back in 1989. The studio was in a different location, it was on 52nd street, and it was very modest in comparison to what it is today. There were no live rooms; it was for mastering, and any mixing was done right in the mastering rooms.

Tell me about the studios you use today.

One of the wonderful things about working at Sony that does filter down to the Sundazed level is that at Sony

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Studios, there's a wonderful, never-ending parade of cool new equipment to be auditioning and using, so we're constantly doing shootouts and comparisons. But the basics of the room that I work in right now include a pair of Dunlavy SC-4 speakers, four Sherwood Sax hand-built tube amps, bi-amped, to power them, and a custom Sony-built mastering console. There's also a lot of the same gear that is used at Sundazed: the Sontec EQs, a wide variety of stereo compressors and limiters, and, importantly, the same philosophy; we keep the mastering chain very, very pure. We work analog as long as we can and go to digital at the end, and it's very project-dependent as to what A/D converter we're going to use.

What have you been working on lately for Sony/Legacy?

The project that has occupied my past four months has been the upcoming Stevie Ray Vaughan box set. It was actually conceptualized years ago. Epic Records asked Legacy to examine Stevie's catalog, and the first thing we did was envision a box set, but we knew that it would take months or years of planning and research to do properly. So, what we did first was to re-examine each of Stevie's studio albums and prepare remastered, expanded editions of each.

But we still concentrated on the proposed box set; and I continued to research material with Jimmie Vaughan, Stevie's brother; seeing what was out there in the way of unissued performances and live recordings. And the answer was a lot. Because of the vast amount of material, this wasn't a project that could be put into focus easily. So, we worked on it for a long while, always keeping the file active and making notes.

Meanwhile, the expanded editions of Stevie's catalog, along with the Greatest Hits Volume 2 set, called *The Real Deal*, that we had done were successful, so Epic asked us for finalization of the box set for this fall. Jimmie and I again worked together, enlisting some help from friends that were Stevie experts, and we assembled this wonderful three-CD plus a DVD disc, 54-track box set, 36 tunes of which have never been issued before. It's studio material and live. Often, Jimmie and I felt that there was a certain vitality offered in a particular live performance that the studio counterpart recording might not have had.

We also wanted to showcase some of the early material that Stevie recorded before he got to Epic Records, so on Disc One, we used select tracks that were very powerful, outstanding early performances. The set opens up with a recording of Stevie with the band Paul Ray and the Cobras in 1977. This was a band he played with in Austin that was kind of like a pickup gig for him, but when they went into the studio, they let Stevie have the spotlight on a couple of tunes. He's doing a version of The Nightcaps' "Thunderbird," singing lead and playing a marvelous solo; it absolutely showcases what was to come.

The disc builds through various live recordings and club gigs, demos, soundchecks, up through the Montreux Jazz Festival performance in '82, where the audience was booing him because he was a rock 'n' roll guy at a jazz festival. But, that very commotion is what enhanced Stevie's visibility for folks like Jackson Browne, David Bowie, John Hammond and others. It was after the Montreux performance that Bowie asked Stevie to perform on the *Let's Dance* album and tour with him. All of this led to Stevie's deal with Epic Records.

So, the set is organized chronologically?

The set is roughly chronological, not strictly, because there were very obvious starting and ending points that revealed themselves as we worked. "This *has* to kick off Disc Two," and "this *has* to close Disc Three." It's hard to explain, but I guess it's similar to a runner's high. When you're that involved in a project, if you have passion for what you're working on, the project can often reveal itself as you go, and there are times that you can barely contain yourself as you're putting the project together.

Those are the best kind of projects, where your heart kind of pounds while you're putting it together, and you ***know*** what has to come next, and you ***know*** what has to follow that, and everyone in the room has the same idea at the same time. It's like sitting in the living room with a huge stack of 45s and running for the next one before the first one is over, and saying to your friends, "You think *that's* great, you've got to hear *this*!" ■

Barbara Schultz is an associate editor of Mix.

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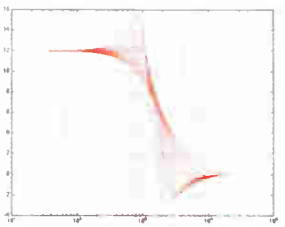

Typical low shelf analog EQ response in blue. SOME of the many low shelf EQ responses from FilterBank in red.

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FilterBank's Peak-Slope-Dip (P-S-D) control allows the user to adjust the critical response characteristics of low and high shelving EQ, replicating the sound of nearly every shelving equalizer ever made.

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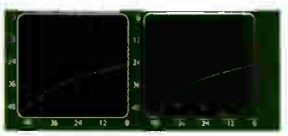
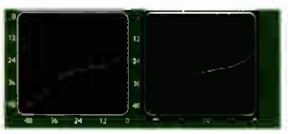
How close? - look for yourself. Better yet, download a demo from www.mcdsp.com.



dbx 165 vs. CompressorBank as measured by McDSP™



Teletronix LA2A vs. CompressorBank as measured by McDSP™

McDSP™ has developed emulations of the Teletronix LA2A, the dbx 165, the Neve 2254E/33609, the UREI 1176LN (blackface, including the '44' setting), and other classic high-end compressors and limiters. Look on our website for the latest batch of presets for the Fairchild 670.

These companies are not affiliated in any way with McDSP, nor do they endorse McDSP plug-Ins. The trademarks of these companies are used solely for the purpose of describing the sounds produced by the McDSP plug-Ins.

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Digidesign intros the fourth-generation DigiDrive 36|10k Ultra160/LVD. DigiDrive features transfer rates up to 160 MB/sec, and its larger capacity offers more room for uncompressed video with AVoption & AVoption|XL. The 36GB drive stores more than 74 minutes of a 64-track Pro Tools session recorded at 24 bit/44.1 kHz. Fitted with Digidesign/Avid's QuietDrive technology, DigiDrives reduce drive noise by up to 20 dB. The Ultra 160/LVD model supports increased SCSI chain length (up to 12 meters) and better data integrity. Up to four units can be clipped and interlocked together in a stack configuration, and an optional quick-release rack kit with a nonproprietary docking system lets users rackmount two drives side by side in a 2U space. Self-contained construction, including built-in power and connections, allows users to take the drive to various studios without needing a proprietary dock. Each unit comes with the DigiDrive Tuner application that optimizes the drive for use with Pro Tools. DigiDrives provide a certified guarantee of compatibility with Digidesign systems for Mac OS and Windows.

Suggested retail for the DigiDrive 36|10k Ultra160/LVD is $1,725 when purchased with a Pro Tools system.

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CODA FINALE 2001

The newest version of Coda's (www.codamusic.com) notation application, Finale 2001, includes a Web publishing feature for saving files as a Web page, posting music on Coda's Finale Showcase (a Web community for composers and arrangers) or distributing on Net4Music. Finale 2001 also includes Musitek's MIDISCAN technology to import TIFF scans of printed sheet music and convert them to Finale files. Other new features include a fretboard creator, page break selection, instant audition, even staff distribution across the page (aligned to top and bottom margins) and improved video training. Finale 2001 files are 70 to 80% smaller than previous versions for greater efficiency, and the new version offers the MicNotator microphone-to-score notation method.

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EMAGIC WAVEBURNER PRO ▶

Emagic (www.emagic.de) releases a new, more powerful version of its WaveBurner pro audio CD-mastering software. Upgrade highlights include the integration of mastering plug-ins and support for VST format plug-ins, along with the ability to directly load more audio formats, plus expanded driver support for a broader range of audio hardware devices. New plug-in support features allow plug-ins to be applied to individual regions, as well as to the final mix. Any number of plug-ins can be serially inserted, related to the amount of host processing resources available. Emagic Logic Audio plug-ins bundled with WaveBurner Pro include a compressor/limiter, multiband compressor, Fat EQ and audio restoration tools. WaveBurner Pro now natively supports 24-bit/96kHz files. In addition to .AIFF and SDII files and regions, .WAV files can now also be directly loaded into WaveBurner for editing. MP3 is also supported. Audio driver support now includes ASIO and Direct I/O, in addition to SoundManager and Audiowerk8/2. Other new features include expanded edit commands, multiple level meters and an improved user interface. Price: $299.

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SADIE4 SOFTWARE

Included with all SADiE workstations, SADiE4 runs on Windows 95/98, Windows NT, Windows 2000 and is available as a free download from www.sadie.com. Optimized for faster editing speeds, SADiE4's advanced features include: batch import of multiple files and project names; Playlists, Clipstores and Mixers can now be up to 64 characters long; and the number of auto-takes available has been increased tenfold. The EDL view can be split into two linked displays with different zoom levels in each, and there are advanced E-E monitoring options. SADiE4 also supports a range of DVD-RAM drives for backup, asset transfers and file interchange. Options include the CEDAR DeCrackle plug-in and DDP Image File, allowing an entire CD master to be written as a DDP image to a local PC or a remote drive on a network.

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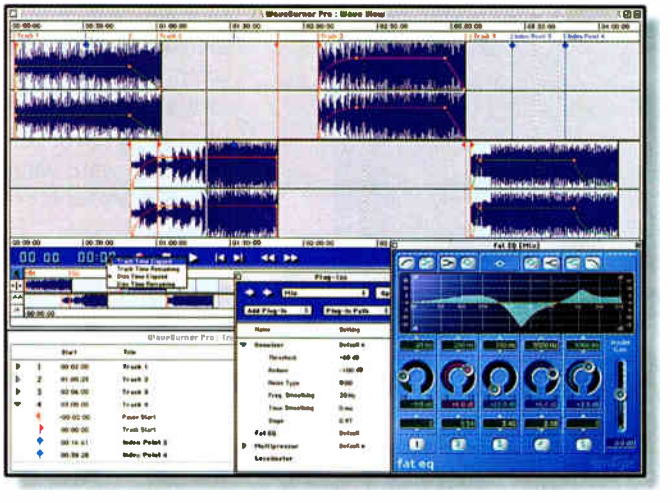

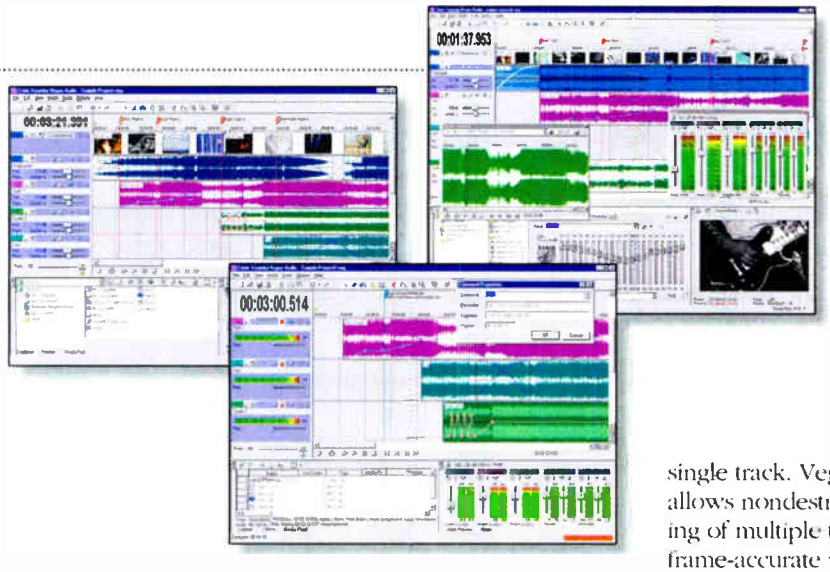

SONIC FOUNDRY ▲ VEGAS AUDIO 2.0

Vegas Audio 2.0, a PC-based, multitrack, audio recording and editing system from Sonic Foundry (www.sonicfoundry.com), is shipping. An upgrade and replacement to Vegas Pro, Vegas Audio 2.0 includes new audio features, such as XFX 1, 2 and 3; DirectX plug-ins with DirectX plug-in support on all tracks; envelopes that lock to events; cutting, copying and pasting of envelopes; Rubber, Audio time stretching with pitch correction; built-in metronome; destructive effects processing; an advanced media pool; and enhanced video support. Files can be arranged with different sampling rates, bit depths and file formats on a single track. Vegas Audio 2.0 allows nondestructive editing of multiple tracks and frame-accurate video and audio sync, real-time playback and the ability to add timeline metadata, such as captions and URL flips that automatically synchronize Web pages with media files. Support has been added for QuickTime 4.0, OpenDML AVI, and many other digital audio and video formats and hardware inputs and outputs.

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WAVES M1600

Waves (www.waves.com) introduces the M1600, a 16 stereo/32 mono integrated sound processor/encoder for Web audio streaming. The M1600, a new configuration in Waves' MaxxStream Internet audio processing product line, conditions up to 16 stereo or 32 mono audio streams over the Internet simultaneously. In addition to the M1600, Waves offers two other turnkey MaxxStream solutions, as well as a PCI DSP audio card and a MaxxStream software package. The line supports multiple encoders and multiple bit rates (target bandwidths) and can encode and condition audio for several different bandwidths simultaneously.

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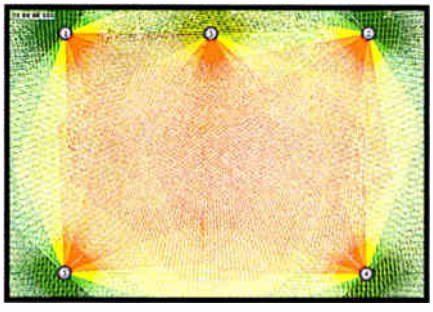
UPGRADES AND UPDATES

Soundscape (www.soundscape-digital.com) announced **its iBox line of audio interfaces.** Units will include an 8-channel ADAT-to-TDIF interface, 2-channel analog-to-TDIF, 8-channel 24-bit analog-to-TDIF/ADAT/Fiber Optic and more…**AlterMedia** debuted Version 5 of its StudioSuite studio management software. Check out the new features at www.studiosuite.com…**Lexicon** (www.lexicon.com) is now shipping **a Mac version of the Core2** desktop audio system; list price is $419…New from **Bitheadz: "Tempo Tantrum"** is a virtual drum loops sampling library for Mac and PC that combines the Unity DS-1 sample engine with more than 200 megabytes of stereo drum loops. In other Bitheadz news, **Unity DS-1 Version 2.0 for Windows** 95/98/ME is now shipping. Visit www.bitheadz.com…**Sonorus** (www.sonorus.com) announces **STUDI/O driver support for the GigaSampler/GigaStudio** PC-based sampler from NemeSys Music Technology…**Cakewalk's new Pro Suite** bundles Cakewalk Pro Audio 9, NemeSys GigaSampler LE, NemeSys GigaPiano sample library, Cakewalk Audio FX 1, 2 and 3, and more; visit www.cakewalk.com for more information…**Akai** introduces **Version 3.20 software for the DD 8 Plus and DD 16 PB Plus,** offering greater format compatibility. Download it at www.akaipro.com/postpro …**Digidesign** launched the **Digidesign Production Network, DigiPro Net.com,** featuring a suite of Internet-enabled audio production services, including review and approval, Rocket-powered DigiStudios, a talent pool resource and an audio marketplace for buying and selling sounds…**Synchro Arts' VocaLign** software for automatic audio alignment **is now available as an AudioSuite plug-in** running in the Windows 98 or NT environments. Visit www.synchroarts.com…**Mark of the Unicorn** (www.motu.com) announced that **Native Instruments' Reaktor 2.3.2** virtual instrument package and the **B4 virtual Hammond organ** are now compatible with Digital Performer…**APB**

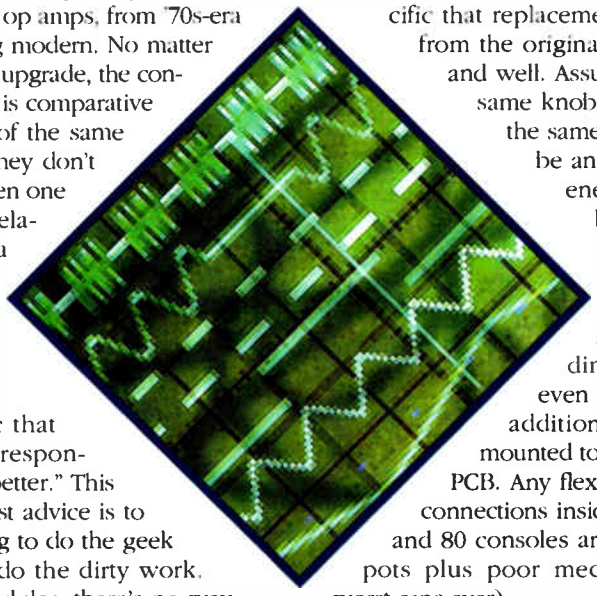


Tools (www.kgw.tuberlin.de/~y2371/SIGMA_1) released **Version 1.8 of its Sigma 1 surround panning Pro Tools plug-in (above).** New features include handling of multiple simultaneous Pro Tools sessions, improved playlist/handling, splittable stereo plug-in channels and MotorMix support…**CreamWare** (www.creamware.com) announced **Version 2.03 of the PowerSampler** DSP system, which now runs on the Macintosh platform and can sample at up to 32-bit resolution. ■

ANALOG MAINTENANCE AND UPGRADE CONSIDERATIONS

LOCATING PARTS, IMPROVING POWER AND GROUND DISTRIBUTION

This is the third part in a series on analog equipment maintenance for geeks in training. Part One hit the ground running, diving straight into troubleshooting capacitors (the weakest link in aged gear) by using a square-wave generator and an oscilloscope. (The traditional method of measuring frequency response requires a sine wave oscillator and an AC voltmeter. A 1kHz square wave provides an overall snapshot of both low and high-frequency response that is good enough for troubleshooting, and sometimes more.) The same tools were used in Part Two to evaluate amplifier performance, particularly to upgrade early IC op amps, from '70s-era products to just about anything modern. No matter whether attempting to repair or upgrade, the constant theme of troubleshooting is comparative analysis—take two examples of the same device and compare them; if they don't measure or sound the same, then one of them is defective. This is relatively easy in the case of a recording console or tape machine, because having one good channel to compare with the problem channel is a major timesaver.



Beyond repairs, the topic that most interests my e-mail correspondents is "how to make things better." This is a complicated issue. The best advice is to find a technician who is willing to do the geek stuff *and* show you how to do the dirty work. After changing caps on 24 modules, there's no way your soldering skill won't improve. But upgrades require a combination of skills, tools, time and money.

Before attempting any enhancements, you need to establish a solid foundation. Start with the obvious troublemakers—switches, pots and faders. Older American and British-made gear (from the '50s through '70s) can be easier to work on than their modern counterparts. Older stuff has more real estate (more room to work), while connections to pots and switches are hand-wired, making "off-the-shelf" replacement fun and easy. (Well, almost!) All you need are a few catalogs from digikey.com, mouser.com, newark.com, Antique Electronic Supply (tubesandmore.com) and New Sensor Corporation (sovtek.com), to name a few.

Why go to the trouble of upgrading an older console when newer digital gear is so cheap? In this analog-to-digital transition era, many "affordable" analog consoles—new and used—have found a niche as "monitor mixers" and are increasingly used for the relatively simple task of multitrack playback. In fact, analog mixers can simply resolve the digital latency issue—an analog mixer can provide a direct signal path from the mic/direct box to the musicians, free of unnecessary A-to-D and D-to-A steps. And, though no one denies the power of mixing in the digital domain, many miss the simplicity and ease of "playing" even the cheapest analog mixer. Dedicated knobs and switches make for tangible fun without the worry of clocks, masters or slaves.

Upgrades become more problematical on mass-produced equipment that has gone through an automated assembly process. The physical characteristics of pots mounted directly to circuit boards are often so specific that replacements can only be purchased from the original manufacturer, if still alive and well. Assuming you'll want to use the same knobs as on the original, finding the same shaft dimensions alone can be an ordeal akin to a wire-brush enema. An entire article could be written on the topic of finding replacement Clarostat pots for an MCI JH-600 Series console—nearly all the pots have custom dimensions and tapers. And even quality pots succumb to the additional physical stress of being mounted to both the front panel and the PCB. Any flexing will eventually break the connections inside the pot. Trident Series 65 and 80 consoles are prime examples of cheap pots plus poor mechanics (and some of the worst caps ever).

It's easy to point the finger at poor component selection in vintage gear, but new designs are not immune from design error. After installing a new 32-input mixer, a customer found the effects returns to be unacceptably noisy. Though the problem was omnipresent, the extra gain in the aux summing amps compared to the stereo mix bus resulted in the hum being processed by chorus and flanger effects into a swirling 3-D buzz.

THIS MONTH'S MOD

With that example in mind, here's a fairly simple mod. In most "budget" mixers, the power and ground connections are distributed to each module via a motherboard or ribbon connector. This is fine for an 8-channel, rackmount device—the original Soundcraft 200 Series, for example—but when the frame is extended to accommodate 24 additional modules, a ribbon cable is not capable of doing the job. Not knowing the original wire dimensions, I measured one conductor of an 80-inch section of 28-gauge ribbon cable. The resistance was 0.5 ohms or 0.075 ohms per foot, certainly not an effective ground. Each

BY EDDIE CILETTI

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module was at a slightly different voltage and ground potential, creating the internal hum.

The solution was to route a ground wire to each module—details at www.tangible-technology.com—a "fix" that not only lowered the hum but resulted in many users remarking about improved low-end punch and a better stereo image. Each console is different, so there's no way to tackle your specific problem here, but I will show how to "interrogate" a console. Plus, we'll examine a more recent upgrade.

BRIGHT LIGHTS, BIG TORTURE

In order to determine whether the source of the hum is internal or external, everything should be disconnected from the mixer, except for a pair of headphones or some sort of monitoring system. Knowing how hard this can be, the following procedure assumes everything is connected. Note that muting a channel module does not disconnect it from the busing system—only de-assigning the mix and/or groups will effectively take a module "out of the system" without actually removing it. (This doesn't apply to aux sends, which are typically hardwired to their respective buses.) Be sure that no video monitors, power supplies and wall warts, or power amps are anywhere near the console and its cabling.

To begin, monitor the mix bus for all noise, and then mute all effects returns. Expect the hiss to be reduced, because effects are notoriously noisy without any help from the aux sends. If hum is present on all buses, then it's probably worse in the aux sends and should diminish when the returns are muted. Now, mute all channel strips. What remains should be a minimal amount of hiss. If background hum is present, now is the time to de-assign all channels and returns (if possible). If the hum goes away, your console may be a candidate for improved grounding. But to fully qualify, disconnect all external wiring and repeat the test.

GREAT RIVER

Here's a recent upgrade story. Dan Kennedy, of Great River Electronics here in the Twin Cities, recently acquired two Trident Series 65 consoles, one with 24 and one with 16 modules. Kennedy combined the two with some fine and fancy metal work and improved the power and ground distribution in the process. He also modified the Master Module, which includes the mix bus and control room monitor section.

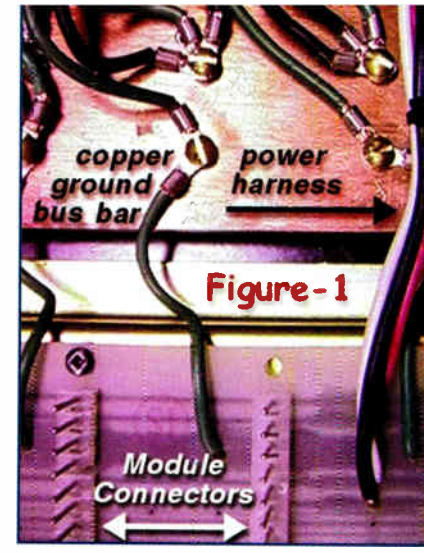

Figure 1: A new copper bus bar distributes a robust ground to each module via the green wire to the motherboard below.

In Fig. 1, the motherboard appears across the bottom, where a wire bundle—red, black, white and blue (hidden)—delivers power and original ground. Above is the new copper bus

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bar, distributing ground to each module connector via the green wire, when previously only the circuit board trace did the job. Power and ground were formerly distributed from "momma to momma," via jumper wires until a barrier strip was installed, as shown in Fig. 2. Now, each motherboard gets its own power connection. (Note: Some liberties were taken with the wire colors.)

A similar approach was taken on the Master Module. Highlighted in yellow in Fig. 3, a new solid ground wire is paralleled with the original ground trace. In addition, note the three black wires that branch off from the connector to reinforce the ground for the more "distant" areas in need. You really can't have too much ground.

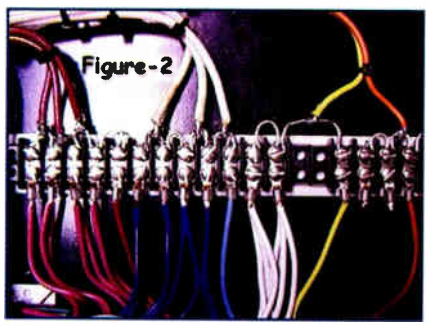

Figure 2: The newly added Barrier Strip is fed from the power-input connector on the rear panel from the top. Below, wires are "multiplied" to feed each of the motherboards individually.

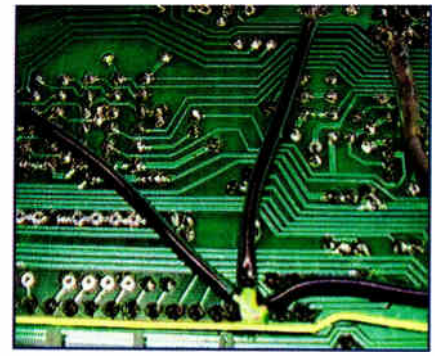

Figure 3: Ground distribution on the Master Module is beefed up by using a bus wire in parallel with the main PCB trace. Three black wires reinforce the "distant" areas.

On the flip side of the motherboard, two Burr-Brown OPA602ap op amps replace ICs 23 and 24—the stereo fader buffer amplifiers—as seen in Fig. 4. The Burr-Brown part has a minimum slew rate of 20 volts/microsecond and a quiescent (idle) current of 3 mA min to 4.5 mA max when hot. Both of these parameters are about twice that of the original TL071 part. Replacing just these two op amps in the Master Module might not be cause for worry—in terms of power consumption—but there are 23 op amps on this PCB alone! Kennedy felt the Master/Monitor module was very important. The old power supplies were replaced with a single redesigned supply with more than enough reserve power for any future op amp upgrades. ■

It's winter in Minnesota, and Eddie is feverishly removing the wheels on his roller skates hoping to upgrade them to cross-country skis with some leftover lumber. Drop by www.tangibletechnology.com and see if reindeer really know how to fly.

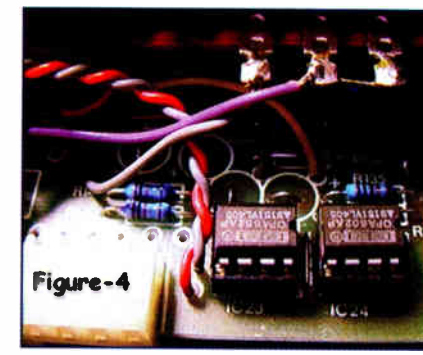

Figure 4: ICs 23 and 24 are the buffer amplifiers for the Stereo Master Fader directly above.


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-Steve Vai
GRAMMY®-award winner Steve Vai at the Neve Capricorn console in Studio C - one of Full Sail's 37 production studios.
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PREVIEW

CARVIN STUDIO MIC ▼

Carvin (www.carvin.com) introduces the CM-87S large-diaphragm studio condenser mic. Featuring a cardioid pattern, a frequency response of 30-20k Hz, and a maximum SPL of 145 dB (with 10dB pad), the CM-87S incorporates a gold-sputtered, 6-micron element and noiseless FET electronics, all suspended in a handsome machined casing. A low-cut switch engages a -6dB filter at 80 Hz, and a shock-mount eliminates low-frequency vibration and handling noise. The complete package includes a 48V power supply, an oxygen-free, 30-foot cable and a custom aluminum flight case. Price: $299.95.

Circle 327 on Product Info Card

TRUE SYSTEMS DIGITAL MIC PRE ▼

TRUE Systems (distributed by Neumann, www.neumannusa.com) has introduced the P2 Digital, a 2-channel 24-bit/96kHz mic preamp. Modeled on the TRUE Systems 8-channel Precision 8 analog preamp, the P2 Digital includes an M/S decoder, direct inputs, dual gain range, highpass filters and a stereo phase correlation display for optimizing stereo microphone placement. Digital outputs can be 16, 20 or 24-bit with sample rates to 96 k, and include AES/EBU and ADAT optical connections with multichannel routing facilities. Price: $1,995.

Circle 328 on Product Info Card

AMEK MEDIA 51 ▶

Now shipping, the Media 51 from Amek (www.amekusa.com) is an in-line analog multitrack console suitable for music, broadcast and film/video post-production. Media 51's mono input modules incorporate a new Rupert Neve-designed mic preamp and EQ section. Four-band EQ can be split between the channel and mix paths, and highpass and sweepable lowpass filters are switchable into the dynamics sidechain. The Media 51 can mix to any 4- to 8-channel-wide surround sound format; standard equipment includes Supertrue™ fader, switch, and event automation with SMPTE and MIDI sync. A Cue List function can trigger internal and external events against timecode with quarter-frame accuracy, and input channel parameters can be stored and recalled, along with Amek Virtual Dynamics™ data. Media 51 is available with 28 or 44 inputs; prices start at $49,995.

Circle 329 on Product Info Card

AVALON DUAL MIC PRE ▲

Avalon Design (www.avalondesign.com) is shipping the AD2022 Dual Channel Class A Microphone Preamplifier. The dual-mono AD2022 is Avalon's fourth-generation, fully discrete, symmetrical Pure Class A mic preamp and includes all of the original sonic capabilities and transparency of the M2, M22 and M5. Additional features include selectable impedance loading for optimized cable/mic matching, two front panel hi-Z instrument inputs, variable-passive highpass filter and silver point-to-point hand wiring. Outputs are both balanced and unbalanced. Price: $3,000.

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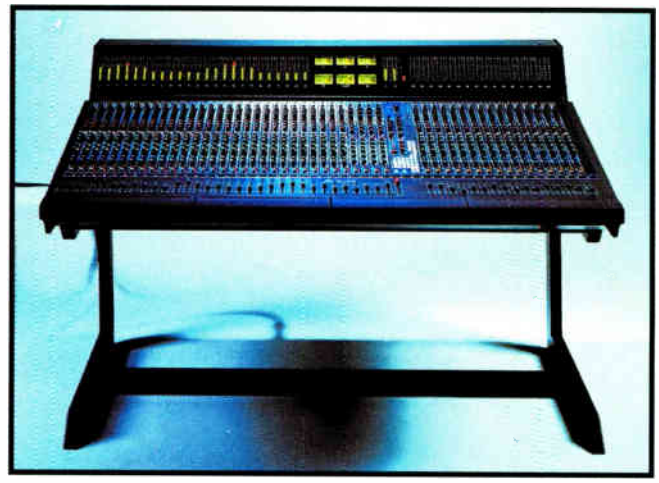


WESTLAKE LC 3W10V SPEAKERS

Westlake Audio (www.westlakeaudio.com) intros the 3-way Lc 3w10V Monitor Speaker System. The compact Lc 3w10V offers a passive crossover for single or bi-amp operation and mea-

PREVIEW

sures 24.25x12x14-inches (HxWxD). Drivers includes a 10-inch polypropylene woofer, a 5-inch midrange and a ¾-inch soft dome tweeter. Frequency response is rated at 42-20k Hz, and the system has an 80-watt continuous power handling capacity. Sensitivity is 88 dB @ 1 m for 2.83V input. Dual-banana, 5-way binding posts allow for bi-wire/bi-amp operation. The Lc 3w10V weighs 71 pounds, is finished in black and costs $3,029 per pair.

Circle 331 on Product Info Card

TASCAM MX-2424 SOFTWARE

Tascam announces two rounds of software updates for the MX-2424 24-track, 24-bit hard disk recorder. MX-OS Version 2.0 allows 12 tracks of 24-bit/96kHz recording and playback or 24 tracks at 24-bit/48kHz rates. MX-OS 2.0 also allows for audio file transfer via the MX-2424's Ethernet port and supports the HFS+ Mac drive format for larger drive sizes. Coming in spring 2001, MX-OS 3.0 adds detailed waveform editing capabilities for Mac and Windows computers. All MX-OS versions will be available to registered MX-2424 owners at www.tascam.com.

Circle 332 on Product Info Card

UNIVERSAL SHOCK-MOUNT ◀

Gary Plant (www.shockmount.com) offers a universal shock-mount that accommodates most microphones, from thin, probe-style models such as Shure SM57s to large studio condenser mics. The unit consists of a 3-inch-diameter tube fitted with four thick, 3/16-inch elastic cords to hold the mic in place. Price is $25, including shipping in the U.S.

Circle 333 on Product Info Card

SSL AVANT SOFTWARE UPGRADE

SSL (www.solid-state-logic.com) debuts V4 software for the Avant post-production and film console. Key features include new grouping options that enable panning and EQ to be linked. SSL's proprietary Panpoint™ Panning allows operators to design surround panning onscreen with a simple pen and tablet. Virtual Paddles provide additional monitoring and recorder control from a smaller number of physical paddle switches.

NEUMANN M150 TUBE MIC ▶

Neumann (www.neumannusa.com) has introduced the M150 tube condenser microphone, a modern re-creation of the vintage M50. The M150 features the same omni pattern but offers improved performance, lower self-noise (15 dBA), a transformerless tube amplifier based on the award-winning M149 tube microphone, and a sophisticated power supply. The M150's thin, 12mm capsule and lightweight titanium membrane provide smooth, extended frequency response. Provided with a head grille and capsule mounting that exactly replicate the original M50's, the M150 also reproduces the M50's famous pickup pattern: circular at low frequencies and increasingly narrow up the spectrum. Specs include a 119dB dynamic range, 20mV/Pa sensitivity and 134dB maximum SPL.

Circle 335 on Product Info Card

HHB CD RECORDER ▼

HHB's (www.hhbusa.com) CDR830 BurnIT™ is a low-cost ($795) professional audio CD recorder that records on pro-type CD-R and CD-RW discs and is SCMS-free. Converters are 24 bit; I/Os include S/PDIF (coax and optical) digital and RCA phono analog connections. An onboard sample rate converter accepts frequencies from 32-48 kHz; additional features include adjustable 1 to 12-second fade-ins/outs, five CD-RW erase modes, track skip ID recording and a CD Text facility for creating up to 120-character names for discs, artist and track titles, for display on compatible players.

Circle 336 on Product Info Card

ALESIS M20 SOFTWARE UPGRADE

Version 3.0 software for the Alesis ADAT M20 is available for free download—directly to M20s via MIDI—at www.alesis.com. Version 3.0 features improved functionality, better timecode sync compatibilities and faster lock times. New optimized transport software improves performance and reliability, and a new tape-format-verification feature tracks errors; an automatic standby function reduces

PREVIEW

head and drum wear. Developed by a cooperative Alesis and Studer effort, the V. 3.0 upgrade works on both the Studer V-Eight and Alesis M20 MDMs, and the software enhancements include improved integration with M20 peripherals (CADI/RMD) and legacy systems (BRC, XT20, XT).

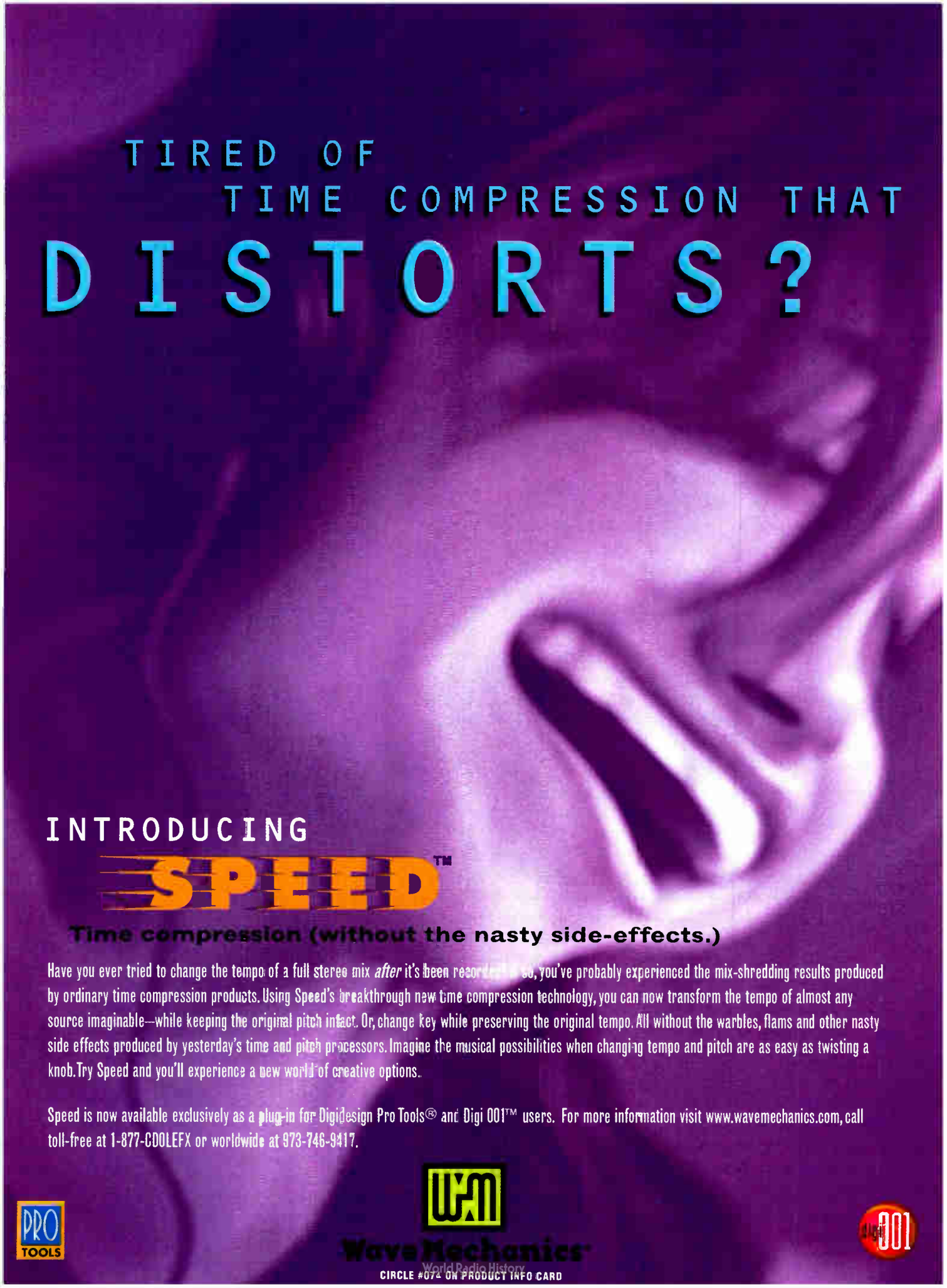
Circle 337 on Product Info Card

KURZWEIL PC2R ▼ Kurzweil (www.kurzweil.com) debuts the PC2R, a single-rackspace module that incorporates the feature set from Kurzweil's new PC Series, including 256 programs, triple-strike stereo grand piano, new stereo strings, multistrike classic keyboards and KB-3 tone organ models. Sixty-four voices may be expanded to 128 voices with split and layering capabilities, and dual-stereo FX processors offer flexible routing and extensive effects algorithms. Four performance knobs add real-time function control, and up to four split/overlapping zones can be put under MIDI control. Additional features include expandable sound ROM and 24-bit digital output. Price: $1,295.

Circle 338 on Product Info Card

HOT OFF THE SHELF

The NFIB Legal Foundation and the Atlantic Legal Foundation have teamed to produce a **handbook that explains the often-confusing maze of federal employment** laws affecting small businesses. The 40-page handbook provides easy-to-understand summaries of federal laws and includes a list of questions *not* to ask job interviewees, plus a checklist of all labor notices that should be displayed in workplaces. Check out the handbook at NFIB Legal Foundation's Web site at www.nfib.com/legal...**QSC amplifier owners** can now order factory-direct accessories and assembly kits online. Customers can browse descriptions and view photos of a variety of accessories that add built-in crossover, limiter, EQ, delay and other processing functions to most QSC amplifiers. The site will soon be expanded to include replacement parts, repair kits and technical documentation. The online Order Center is at www.qscstore.com ...Promusic Inc. offers *Let the Games Begin*, **a double-CD from the Promusic Soundtrax Music Library** that includes an array of sports music to support and complement any Olympic Games-related production. The discs include fanfares, signatures and slo-mo features in a variety of edits and alternate versions. Promusic CDs may be licensed for needle-drop, blanket and annual use. Visit www.promusic-inc.com ...**iZ Technology Corporation** launches a new support and service hotline to provide all RADAR users with timely, effective technical assistance. Call 800/776-1356 or visit www.izcorp.com...Syntrillium Software releases *A Short Course in Digital Audio Processing*, a free, animated tutorial that **covers fundamental digital audio concepts** such as waveforms, sampling, bit depth, and how sound travels from the air to the computer's hard drive and back. This latest tutorial joins Syntrillium's growing collection of free tutorials and How-To guides covering audio and music recording topics. Get a free download at http://school.syntrillium.com/tutor/shortcourse.htm...Wave Distribution announces a **distribution arrangement with CLM Dynamics for the DB500s Expounder Equalizer**, an adaptive equalizer that responds dynamically to program material (U.S. list price $1,999). The 2-channel Expounder provides four bands of EQ per channel, each having considerable band overlap. In action, the Expounder's LF and HF dynamics sections automatically adapt the degree of boost to suit the program material, expanding dynamic range by up to 5 dB and providing dynamic manipulation of frequency. For more info, visit www.wavedistribution.com/clmproducts.htm ...The Hollywood Edge has teamed with famed sound designer Alan Howarth to create the **Alan Howarth Signature Series, a five-CD sound effects library** culled from Howarth's own "best of" collection. Hollywood Edge also offers the seven-disc American Zoetrope Vehicles Collection, including hundreds of original vehicle and moving machine sounds. Call 800/292-3755 or visit www.hollywoodedge.com ...***Moving Up in the Music Business* by Jodi Summers is a career guide** for both veterans and newcomers to the music industry. Packed with practical tips and personal insights from such industry giants as Jimmy Iovine, Jon Bon Jovi, Mark Mothersbaugh and Will Smith, the 224-page paperback is priced at $18.95 and can be ordered from the Allworth Press at www.alworth.com ...**TM Century offers three new production music libraries.** "Audio Architecture" has high-energy tracks for TV, film, radio and new media, with both stereo submixes and .WAV file format. "Imagio Post" offers 10, 30 and 60-second commercial spots. "Rhythm Mixes" contains beds in rock, country, jazz, drama, international and specialty genres. Call 972/406-6800 or visit www.tmcentury.com. ■



CIRCLE #074 ON PRODUCT INFO CARD

FIELD TEST

MILLENNIA TCL-2

TWINCOM OPTOCOMPRESSOR/LIMITER

Over the years, Millennia Music & Media Systems has built an enviable reputation for its extremely accurate microphone preamps. Last year, the company garnered additional acclaim for its pristine NSEQ-2 2-channel Parametric Equalizer (reviewed in the October 1999 *Mix*). The NSEQ-2 broke new ground for Millennia by featuring dual-minimalist circuit paths, one solid-state and the other vacuum tube.

Millennia now enters the world of dynamics processing with the introduction of its TCL-2 Twincom Optocompressor/Limiter. Continuing in the tradition of the NSEQ-2, the 2-channel TCL-2 also features a dual-topology, minimalist audio path design.

THE INSIDE STORY

The TCL-2 is completely balanced from input to output. No transformers or amplifiers are used to unbalance the signal inside the unit. One Class-A, all-discrete amplifier stage provides separate, mirror-matched amps on pins 2 and 3. In order to keep sonic performance as pristine as possible, overall internal gain is kept to 20 dB (10 dB available as make-up gain), and the threshold range is limited to serve signals in the -20dBuHz+30dBu range. For this reason, systems set up for -10dBV nominal levels may not adequately drive the TCL-2. On the flip side, the TCL-2 can handle up to +30 dBu at its input and over +32 dBu at its output. I had no trouble pumping +26dBu mixes into the TCL-2 from my 02R's analog outputs.

A front panel button switches silently between vacuum tube (one 12AT7 and two 12AU7 tubes) and discrete J-FET audio paths. And, unlike the dual-topology NSEQ-2, there is no momentary dip in level when switching between tube and solid-state paths. Although front panel bypass switches are provided to defeat processing, input signals are always in-circuit—only the sidechain control is defeated. This design avoids the need for bypass relays and audio path switches that inevitably degrade over time. Sidechain dynamics control is provided by a Vactrol Type 5C1 opto element, which consists of an LED and LDR (light dependent resistor).

BY MICHAEL COOPER

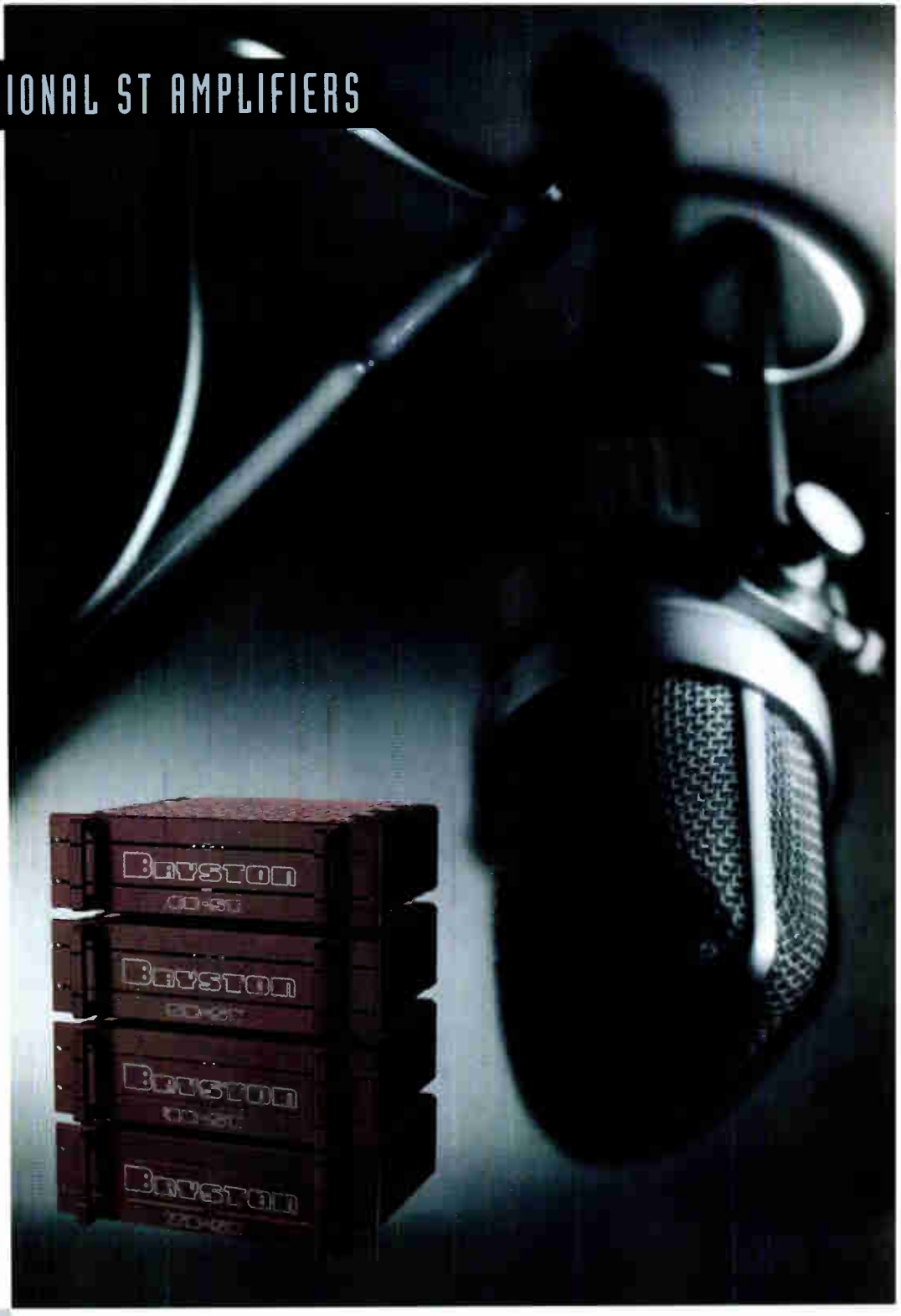
CONNECTIONS AND CONTROLS

The TCL-2 makes an immediate impression. Weighing in at a hefty 25 pounds, the two-rackspace unit is built like a tank. But what a gorgeous tank it is! Large, backlit Sifam VU meters, multicolored button switches with inset LEDs and beefy, knurled control knobs provide an elegant contrast to the mirror-finish, black, aluminum front faceplate. (A unique "platinum crackle" finish is also available.)

You'll want to leave one rackspace empty above and below the TCL-2 when rackmounting the unit. The tubes get so hot you can practically get a suntan off the top chassis panel when the TCL-2 is fully warmed up!

All connections are made on the rear panel. The XLR I/O accepts balanced or unbalanced signals. When feeding the TCL-2 an unbalanced signal, you must shunt pin 3 to ground at the TCL-2's input. To output to an unbalanced device, pin 3 should be floated at the TCL-2's output. An earth/audio ground jumper, AC selector (100–120 or 200–240 volts) and IEC detachable AC cord receptacle are also on the rear panel. Notably absent are sidechain inserts, precluding keying and frequency-conscious ap-

BRYSTON PROFESSIONAL ST AMPLIFIERS



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Power supplies are completely independent per channel and employ multiple smaller filter capacitors, rather than single large filter cans, improving high frequency response.

Wiring harnesses have been completely eliminated, so that channels plug directly onto the power supply PCB, reducing resistance and improving current flow.

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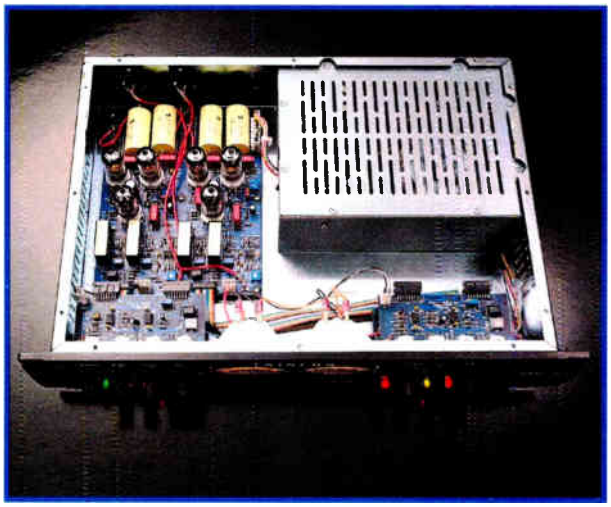
plications, and there are no internal sidechain filters.

Unlike many optos, the TCL-2's front panel offers much more than a two-knob control layout. Separate, continuously variable rotary knobs are provided to set threshold, attack, release, ratio and output levels for each channel. (The threshold knob adjusts the signal level to the LDR in the TCL-2's sidechain.) These controls can be ordered with detents for mastering and other applications, if desired.

Settings for all front panel controls are easy to discern at a distance. My only gripe is that decibel markings are not provided for the output level knobs, but Millennia plans to rectify this in a future revision.



The TCL-2 is completely balanced from input to output. Frequency response for both tube (VT) and solid-state (SS) signal paths is from below 2 to >100k Hz, -3 dB. THD + Noise figures, 20 to 30k Hz, are <.01%, .002% typical. Noise floor is at -87 dBu (SS) and -82 dBu (VT), from 20 to 22k Hz. The unit accepts a maximum input level of +30 dBu (VT or SS) and maximum output level is >+32 dBu (VT or SS).

Minimum attack and release times—at 2 ms and 100 ms, respectively—are somewhat slow, but fast enough for everyday compression applications. The wide-ranging ratio control varies from 1.4:1 to 30:1. Although most of the knob's turn is devoted to higher ratios, I found it quite easy to dial in subtle amounts of processing at the lower settings.

The Sifam meters can be switched to show output or gain reduction levels. Zero adjust trims are provided for the meters. In addition to the previously mentioned tube/solid-state audio path and bypass switches, a stereo link switch and recessed power switch complete the front panel interface.

IN SESSION

A discussion of the TCL-2 would be incomplete without describing its basic sonic signature. That's hard to do, because the TCL-2 is incredibly transparent. Both the tube and solid-state paths sound beautifully pristine. Depth and spectral balance of input sources are astonishingly well preserved, and every nuance clearly articulated without the slightest hype. The sound is full and beefy without imparting any bass or low-mid emphasis.

The differences between the solid-state and tube paths are quite subtle, yet different enough to double the unit's value and appeal. The tube path sounds a tad rounder, warmer and more lush, while the solid-state path is more precise and focused.

Compressing male vocals, sung through an AKG C 414-TLII mic and Millennia HV-3 mic preamp, the slightly more euphonic tube path sounded

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great. Dialing in a 4:1 ratio and 4 dB of gain reduction, the TCL-2's dynamics processing was totally transparent, adding no audible amplitude modulation artifacts. That said, the TCL-2 is not the easiest compressor to set up. You need to work with the controls a little to avoid pumping at higher ratios. To see what I could get away with, I set the unit to a 30:1 ratio on the same vocalist. With painstaking adjustment of attack and release times, I could attain about 10 dB of gain reduction before pumping became obvious.

On acoustic guitar, picking arpeggios with a flat pick and miked with a DPA 4011 mic, I prefered the more defined solid-state path. Many compressors tend to pump on acoustic guitar, but the Twincom held up nicely. With careful adjustment of the TCL-2's controls, I could quell the brunt of the track's overall attack, while preserving the leading edge "twing" of the pick strike. With 4 dB of gain reduction, the track was smooth and sparkly, with no perceivable pumping. And while 4 dB of gain reduction may not seem like an acid test for transparency, it's important to keep in mind that the Twincom's gain reduction meters offer true VU ballistics. So peak attenuation levels were probably considerably higher than 4 dB in this case.

I had similar, excellent results compressing lead guitar solos and bass guitar tracks. Depending on whether I wanted a slightly more pillowy or tighter bass sound, I chose either the solid-state or tube path. Again, the differences were subtle, and both audio paths sounded supremely transparent.

Traps are not the TCL-2's forte. I found the unit to be not quite fast enough to level an uneven kick drum track. And on both kick and snare, the TCL-2's envelope control was sometimes inconsistent. The same settings would unpredictably preserve or slightly squash the drums' shell resonance after the stick strike on isolated hits. But, to be fair, most optoelectrical compressors perform rather poorly on drums.

Finally, I fed the TCL-2 a stereo, full-band rock mix. Where subtle smoothing of a mix is desired, the unit sounds awesome. The tube path in particular sounds gloriously rich, without skewing the spectral balance one iota. That said, the TCL-2 is not a strong candidate for fighting the "level wars." I found it difficult to simultaneously beef-up average levels and control peaks, without introducing audible amplitude modulation artifacts.

CONCLUSIONS

From a sound quality perspective, the Millennia TCL-2 Twincom sits squarely at the top of the pro audio equipment heap. Those who demand equipment with the highest level of detail, realism, depth and transparency will not be disappointed.

The Twincom shines when using mild to moderate compression on individual tracks, or for subtle smoothing of dynamics in mix bus or remastering applications. It usually takes a little extra tweaking of attack and release times to get the sound just right, but the superlative end result is worth it. Best of all, having two discrete audio paths—tube and solid-state—to choose from makes the Twincom a two-for-one bargain at $2,995 list.

Millennia Music & Media Systems, 4200 Day Spring Ct., Placerville, CA 95667; 530/647-0750; fax 530/647-9921; www.mil-media.com. ■

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

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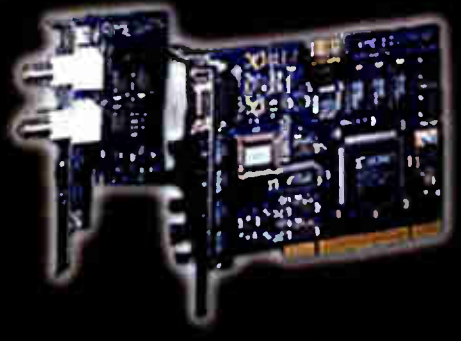

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CIRCLE #079 ON PRODUCT INFO CARD

YAMAHA MSP10

BI-AMPLIFIED NEAR-FIELD STUDIO MONITOR

Introduced more than 20 years ago, Yamaha's NS-10M (later upgraded to the NS-10M Studio) is a standard item in thousands of large and small studios worldwide. However, the NS-10M's popularity stems from the fact that it translates to a "typical" home consumer-style speaker; its performance is less than state-of-the-art. With the introduction of the MSP10, Yamaha has developed a powerful, wideband system that is designed for critical studio listening applications.

THE SYSTEM

The MSP10 is a two-way system, with an 8-inch butyl surround woofer and a 1-inch titanium dome tweeter set in a conical waveguide and housed in a 10.5x16.5x13-inch ported enclosure. The drivers are shielded to reduce picture distortion when the monitors are used near video or computer monitors. Attached along the rear of the cabinet is the amplifier/crossover section, providing 120 watts to the woofer and 60 watts to the tweeter, with a 2kHz crossover point.

The rear panel includes a balanced XLR input connector (pin 2 hot), an input sensitivity adjustment pot, AC switch, and three-position LF and HF switches. The LF control is a fairly gentle 50Hz filter that rolls off the bass with flat, -1.5dB and -3dB settings. The HF control is a 10kHz shelving adjustment with flat, +1.5dB and -1.5dB settings. Also included is a switchable 80Hz highpass filter, which would be employed when the MSP10 is used with an external subwoofer, such as the optional SW10 powered sub ($849 list). The speaker has an attached AC cord. A bi-colored LED set into the face of the tweeter waveguide glows green to indicate power on and flashes red when clipping occurs. Two inset mounting screws on the bottom allow for attaching the MSP10s to optional wall brackets.

Each speaker weighs 44.1 pounds —watch those meter bridges!—so some care in placement is essential. I found that they worked best when used on stands behind the console, at least five feet back from the listening position. The tweeters' conical waveguides do their job to provide smooth, even dispersion, resulting in a wide listening area. However. their imaging is substantially reduced if the speakers are placed too close together.

IN SESSION

The four rear panel controls offer ample versatility in adjusting the system to individual needs. The rotary input sensitivity adjustment is wide-ranging. although it lacks steps or a center detent, making exact balancing setup more difficult, unless your system has -10dB outputs and requires the control to be set in the full clockwise position. The MSP10s' bass sounded fine in my environment, so I left the LF roll-off in the flat position. Even at the flat setting, the speakers have an overly bright sound; the -1.5dB HF shelving took care of that.

The 80Hz highpass setting is ideal for using the MSP10s in a 5.1 situation, and although my listening tests were based on a stereo pair of MSP10s, the wide-dispersion characteristics of these monitors should be well-suited in a multichannel listening environment. The speakers worked equally well when fed from balanced or unbalanced sources.

The MSP10s are capable of delivering solid bass well below 50 Hz (the -10dB down-point is 40 Hz), and with the fairly small diameter of the dual front panel ports, they occasionally hit the listener with blasts of air in high SPL, close-listening situations. It's another good reason to keep the speakers back a bit and keep levels the same. Maximum rated SPL is 110 dB (1m, on-axis), so levels were never a problem with the MSP10s, and as I usually monitor in the 85 to 90dB range there was ample headroom for dynamic passages.

The MSP10s are priced at $749 each in basic black; but for those who want to make a fashion statement, the MSP10s in a distinctive maple-sunburst finish are $799 each.

Overall, the MSP10s offer a nice balance between lows, mids and highs, with well-damped, natural bass, smooth mids and highs that extend out to 40 kHz (-10 dB). Mixes translated well between the MSP10s and other systems, and the monitors are an excellent choice, either as mains in a project studio/edit suite/multimedia facility or as secondary near-field reference speakers in a larger studio.

Yamaha Professional Audio, 6600 Orangethorpe Ave., Buena Park, CA 90620; 714/522-9011; fax 714/522-9522; www.yamaha.com. ■

BY GEORGE PETERSEN

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CIRCLE #080 ON PRODUCT INFO CARD

AKG C 2000B

CARDIOID CONDENSER MICROPHONE

Not to be left off the low-cost condenser bandwagon, AKG has climbed aboard with the AKG C 2000B. The 2000B is a cardioid-pattern, small-diaphragm condenser (derived from the 3000B), featuring a switchable 500Hz bass roll-off filter, -10dB pad, internal shockmount and a built-in pop screen. According to AKG, the 2000B is suitable for a wide array of live sound, studio and home recording applications, and boasts a better-than-average frequency response of 30 to 20k Hz and maximum SPL level of 140 dB.

The C 2000B is touted as an all-purpose, entry-level mic, so I geared my tests toward home recordists, who, having probably made their first condenser purchase, will use this mic on everything from vocals to guitars to bass.

On vocals and acoustic guitar, the 2000B is a solid performer. With the mic positioned six to eight inches from the vocalist (and about half that distance for the guitar) with the -10 dB on, the mic produced a warm, clear, uncluttered sound with a slight midrange boost. The built-in pop screen worked suprisingly well, blocking out everything except the very worst plosives. The mic's overall sound will be a welcome improvement for those who are moving up from using handheld dynamic vocal mics in the studio. In fact, the singer I was working with, a newcomer to the world of condensers, said with a chuckle, "I can hear my *teeth* with this thing."

On electric guitar, I miked a Line 6 Flextone, placing the mic about four inches from one of the speakers at about 8 o'clock. For comparison purposes, I also ran a direct line and tracked both into Logic, with the -10dB pad in. The mic sounded clear and crisp, producing a much richer and punchier sound than the direct line. I then engaged in the cheap, but "why not" practice of miking a cabinet in a bathroom for that ever-elusive "bath tub" reverb. I set up the amp facing the tub and placed the mic about 18 inches from the sound source. Set to 0 dB, the mic did an

excellent job of capturing the sound of the room, giving an otherwise uncolored guitar sound an extra little sting and presence. With the recent flood of amp-modeling effects packages, it's easy to forget just how good a well-miked cabinet can sound, and the 2000B makes it almost too easy.

I wanted to test the 2000B in a loud sound situation. I set up a 130W Peavey TNT bass amp and let it crank. I inched up the volume, and the amp began to distort long before the mic did. The stated maximum SPL of 140 dB is no joke. The mic, again, did an excellent job in preserving the subtle qualities of signal. With the bass already set up, I then wanted to check the off-axis response to see if I could take some of that 2 to 5k, Hz "snap" out without filters or EQ. The result, again, was just what I was looking for.

However, I didn't like the mic's 500Hz highpass (bass roll-off) filter at all. I like to dirty vocals up as much as anyone, but in each of my tests, engaging the roll-off switch made a great-sounding signal seem thin and shrill. If you need to tweak the proximity effect or deal with breath pops on this mic, try experimenting with placement, wind screens or EQ for more flexibility.

Taken as a whole, the C 2000B is a great-sounding mic, especially considering its $378 retail. The average guitar player/hobbyist will have no trouble getting up and running quickly with the C 2000B. Its construction seems durable and sturdy and considering AKG's other products, this mic should provide years of trouble-free performance.

AKG Acoustics, U.S., 1449 Donelson Pike, Nashville, TN 37217; 615/360-0499; fax 615/360-0275; www.akg-acoustics.com. ■

BY ROBERT HANSON

Robert Hanson, Mix's editorial assistant, is a producer/musician living in San Francisco. He currently plays in three or four local bands and somehow manages to still drag himself into work every day by 9 a.m.

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DSP MEDIA POSTATION II

DIGITAL AUDIO WORKSTATION

Originally an Australian company based in Sydney but now headquartered in the U.S., DSP Media Inc. is well-known in high-end professional audio circles as a manufacturer of audio post-production systems. Now in its second generation, the recently introduced Postation II is a sleek looking, all-in-one audio production center that combines dedicated hardware controls with a touch screen interface to provide a comprehensive, fast and easy-to-navigate digital audio workstation.

The Postation II is a fully integrated system consisting of three primary sections: the Digital Editing Processor (DEP); the Non-Linear Digital Video Processor (NLV); and the Digital Mixer (composed of the VCS Virtual Control Surface and the DMP Digital Mixing Processor). Additionally, a fourth section—the Monitor section (MP-1)—ties closely into the digital mixer. While the Postation II may be categorically divided, it should be noted that it is a fully integrated system, with the emphasis on *integration*; the company's intent was to create a system that gives audio engineers the ability to execute commonly required digital audio tasks from one integrated station. Control processing for the DEP, VCS, MP-1 and NLV are five rackspaces each; the DMP unit is 3U and the VCS power supply is another two rackspaces.

My observations during a comprehensive, hands-on session at the company headquarters indicated that speed and integration were paramount in the Postation II design. If you are performing recording/editing tasks, then you work with the DEP. If you're locating to timecode or performing other video-related operations, then you work at the NLV. Finally, all mixing and monitoring functions take place at the VCS.

All operations cross-reference the three divisions of the Postation II. So if you locate to a particular video frame with the NLV, then the DEP positions itself to the corresponding timecode address, while all mixing, monitoring and automation aspects similarly follow suit. This way, as you move from one component within the Postation II to another, you are always exactly where you need to be, and every aspect of operation is touch screen-accessible.

BY ROGER MAYCOCK

THE DIGITAL EDITING PROCESSOR

The centerpiece of the system, the DEP, can be configured for 16, 24 or 32 tracks at 44.1 and 48 kH, with 16 to 24-bit resolution.

With its associated buttons and switches positioned directly in front of the editing processor's display, the DEP's keypad is referred to as the "Speed Console." This control surface has been ergonomically designed to accommodate one-handed operation. The system's transport controls and various editing functions are logically arranged so that your fingers can access a surprising number of actions, while requiring very little actual movement of your arm. At the heart of this area is a large scrub wheel. The illuminated buttons in the upper left represent the track-select keys, while the 10-key pad is used to enter timecode addresses and locate points and related parameters.

The Postation II opens into the AudiOS production environment, the operating system designed to work exclusively with audio. The editor uses its own unique interface, as opposed to employing a Windows or Mac-based interface. This is a hybrid system using an Intel motherboard for processing that is complemented by DSP's own proprietary boards. This arrangement enables DSP to swap out older motherboards as newer, faster CPUs become available, without having to modify other components to gain faster processing capabilities. At the component level, the Postation II operates on DOS (for fast boot-up)—but this is only evident when it is first started or when a

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support technician steps the user through diagnostic routines in order to check the system.

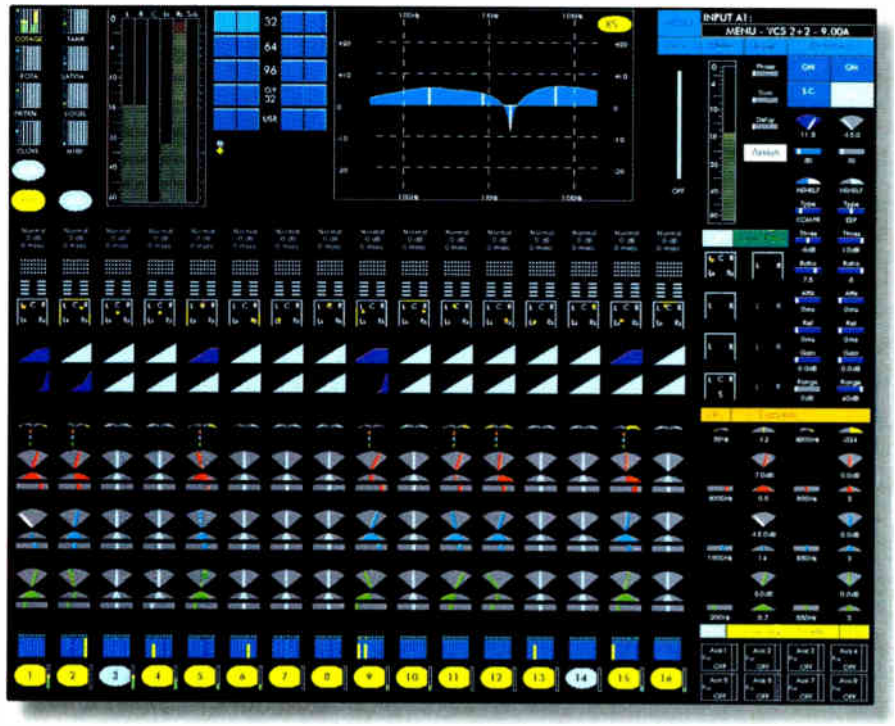
One of the most important aspects of Postation II's operation is that there are dedicated function keys for every task. This enables the operator to work quickly, because there are no nested menus to wade through in order to access a particular function. DSP refers to this method of operation as "single action editing."

The Postation II's display area consists of a single page for all functions, making the system quite intuitive. As all edit, locate and transport parameters are located directly beneath the screen area on the Speed Console, there is no need to access different display screens for different functions. The design concept was to make every aspect of editing as fast as possible.

The editing processor's display area is split into three segments. The Track Window is the top portion of the display area where you can see all 32 tracks laid out according to where they fall within the overall timeline of the audio. Audio data (or audio clips) is represented by elongated blocks. You can also have waveform displays on the Track Window. This screen provides start and end information, along with the particular audio clip's name. A vertical line (cursor) that spans the Track Window from top to bottom represents the play head—enabling you to see precisely when any one segment of audio data is about to play.

Beneath the Track Window is the second part of the display, the Scroll area. Most editing takes place here, as this area shows the waveform for the currently selected track. By selecting different views, you can—for example—reduce the Track Window to show eight tracks of audio clip information, along with two tracks of waveform data. These two waveforms can represent a stereo pair, two adjacent mono tracks or two non-adjacent tracks.

Along the bottom of the screen, the third section of the editing processor's display consists of the Smart Window, which shows the system's In/Out Marker points, current timecode address, Clock status and additional parameters. The Smart Window display changes depending on the particular task. The display panel shows the machine setup status of the total environment, LED ladders for individual tracks and a host of additional views. When



The Digital Mixer screen's fader bank of 16 onscreen channels aligns with the corresponding hardware faders. EQ, pan and aux send settings are displayed on individual channels.

writing automation moves, the Smart Window displays miniature fader moves, in addition to the actual moving faders on the adjacent mixing/monitoring component.

On the far right of the Smart Window is the Overview, a collapsed view of the current project. The highlighted yellow section of this collapsed view represents that portion of the total project that is displayed on the upper Track Window. Beneath this area, the system provides data entry prompts, the current project's name and edit status information.

The Postation II's editing processor provides an array of DSP functions, including time compression/expansion, pitch shift, varispeed, reverse clip, gain adjust, compression, gate and limiter. Mixing DSP functions—such as reverb, delay and chorus—are handled by the mixing processor. Therefore, when working at the Postation II, it is important to distinguish between your various tasks. If you want to perform mixing, then you focus your efforts to the left portion of the system at the Digital Mixer/Monitoring Section. If you seek to de-ess and normalize dialog, then you focus on the Digital Editing Processor.

WORKING WITH SAMPLE LIBRARIES

For accessing and working with your sample libraries, the DEP's Quick Import function is a process where sound effects can be loaded into the system, organized in the database by category and keyword and made readily accessible. The Quick Import button calls a list of sound effects that are currently in the background and places that list in the editor's Smart Window.

You can search for particular types of sound effects, then audition the desired sound effect in context. When you find the sound that's just right, pressing the Select key makes that sound effect a permanent component of your project.

DSP Media is currently expanding this system to include Quick FX, a system similar to the CDDB commercial CD database that identifies a disc's content solely by its unique ID. Once incorporated, Quick FX will be able to identify sound effects CDs and capture all the pertinent content (such as file name, size, duration, etc.) and retrieve that data so that it becomes part of your Postation II effects library—sparing you from the drudgery of having to import, label and otherwise identify your files.

THE NLV

The NLV section handles the video portion of your project and functions as a picture-driven locator for the entire system. The NLV revolves around a touch screen interface. The entire control interface is occupied by pictures—more specifically, frames from your project

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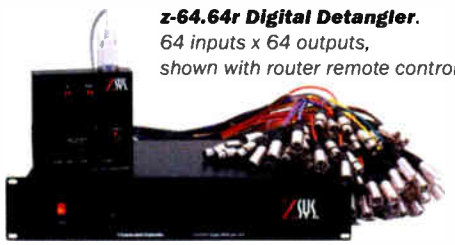

z-32.32r Digital Detangler. *32 inputs x 32 outputs,*
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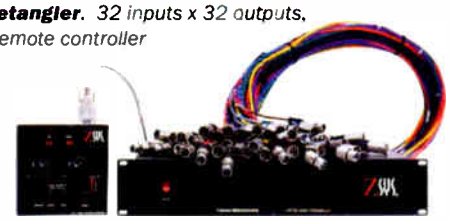

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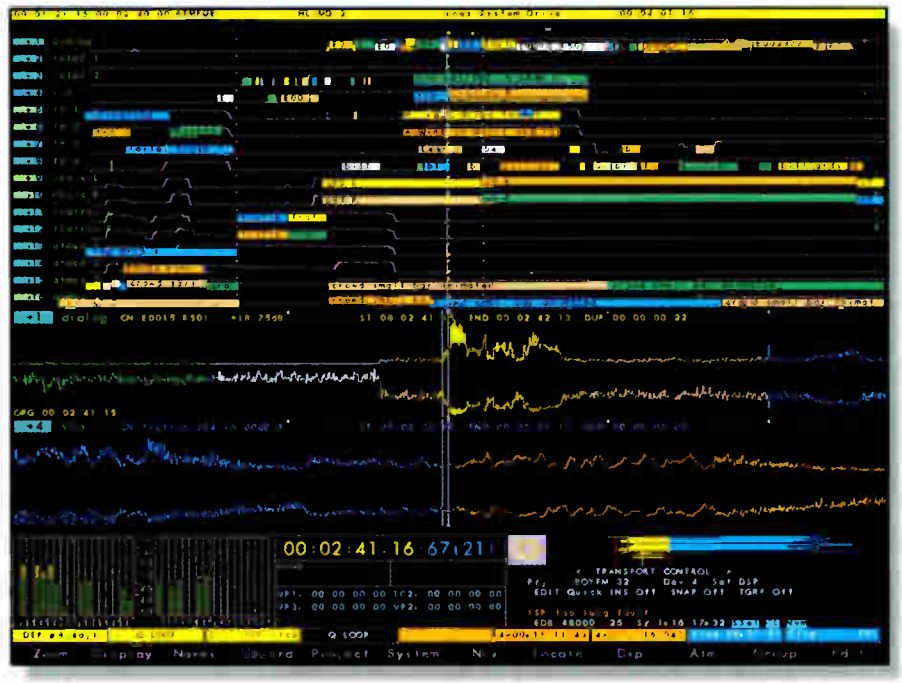
that can be "jumped" to by simply touching the picture. It should be re-iterated that if you scrub video, audio scrubs right along with it.

The NLV is divided into two primary sections. The main picture window in the display shows the video in context (you would also typically use a larger external video monitor), while 20 locate tiles surround the main picture. These "tiles" are your timecode locators. Touching any one of the 20 pictures instantaneously transports picture, audio and mix data to the associated timecode address. Capturing a location is as easy as pressing Mark and touching a blank tile. This approach enables the operator to work with visual cues, as opposed to always focusing on timecode.

The NLV also includes an ADR mode for dialog replacement that provides onscreen text, visual cues to prepare the talent for record entry, along with countdowns and beep tones. The NLV can be used to drop the DEP into record—enabling the operator to work from the NLV during an ADR session. Takes can be accumulated into a "clip stack" and reviewed directly from the NLV, with the DEP automatically following. Further, as every audio track is precious, the NLV also has the ability to capture an audio guide track, thus freeing up the DEP for actual production work.



The Digital Editing Processor display is divided into a Track Window (top), a Scroll Area with waveform display (middle) and the Smart Window (bottom), showing In/Out markers, timecode and other parameters and settings.

While most audio post-production is done to a "locked" video, there are oc-

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casions when a producer may decide to cut a segment or make some other edit. For such purposes, the NLV includes basic video editing capability—enabling you to perform these tasks at the Postation II. If you delete a three-second segment of video via the NLV, the Postation II automatically deletes the associated audio and mix data. Because digitizing video into a random-access system is a real-time process, the NLV's editing functions can save substantial amounts of time should any unforeseen changes be required.

THE DIGITAL MIXER

The mixer portion of the Postation II is divided into two elements. First, there's the VCS, which consists of the moving faders, touch screen interface and its own processor. The Digital Mixer's audio engine is the DMP (Digital Mixing Processor), a 32x32 mix engine. To the left of the VCS is the MP-1 and its Speed Monitor controller, which itself has 48 digital and 24 analog inputs and can accommodate up to eight multiformat mix stems. There are eight keys available to select your various mixes.

SPEC SHEET DSP POSTATION II

DIGITAL AUDIO
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CIRCLE #087 ON PRODUCT INFO CARD

(More on this in a moment.)

On the VCS, the screen aligns with the hardware faders, providing 16 onscreen channels at a time (known as a fader bank) that corresponds directly to the hardware faders below. The upper left screen area shows the user the available fader banks—with support for up to 96 channels. For reference purposes, this display also shows the fader positions within each bank. This area tracks the real-time movement of the faders, enabling you to see at all times precisely what's going on in any fader bank.

The onscreen display shows all the various EQ, pan and aux sends on a per-channel basis. There are two dynamics banks per channel with a full assortment of processors, including compressor, limiter and expander, among others. There is also sidechain capability.

As the system is optimized for surround sound mixing and monitoring, the Postation II's pan control is referred to as the Sound Field, identified by an onscreen rectangular box. To position a sound (track) within the Sound Field, simply move your finger to the desired position onscreen. The Postation II also provides an active hardware knob and button for this purpose. Furthermore, the system includes a Divergence parameter for positioning a track just in the center speaker, as opposed to the center of the left-right field.

As a sound for picture production tool, the Postation II's surround sound panner (Sound Field) can be positioned onto the NLV video screen. This gives you the ability to move, for example, the sound of a train from left to right as the corresponding picture moves across screen, tracing the position of your sound as the picture progresses.

All sound positioning, EQ, dynamics and other parameter adjustments are automatically written and saved into the Postation II's automation system, which, along with scene recall, is stored in the DEP. The Postation II provides dynamic and snapshot automation.

The Postation II incorporates a sophisticated bus matrix capable of providing simultaneous, multiformat mixing for output and monitoring. Multiple audio formats—including mono, stereo, 4-channel (Dolby Pro Logic), 5.1 (Dolby Digital, DTS, DVD) and 7.1 (SDDS)—are supported. The VCS display shows the bus outputs, aux sends, metering and a real-time EQ curve, in addition to dynamic settings. While providing a

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number of controllable parameters, the Postation II is capable of, for example, creating a "downmix" from 5.1 to stereo and, similarly, makes the necessary adjustments to accommodate other mix formats.

With its 32 output buses, the system can output multiple mix formats and control up to three transports via Sony 9-pin protocol. This enables you to dump mix stems to a DA-98HR and perhaps a mix minus (dialog) to Digital Betacam in a single pass.

AVAILABLE OPTIONS

For networking multiple Postation IIs, DSP Media offers the Total Editing And Mixing (TEAM) system, which provides a means of integrating multiple units via a high-speed Local Area Network. With TEAM, projects can be shared among the various interconnected systems in real time, while providing access to a RAID array server for central file access and storage.

To facilitate file transfers between two Postation IIs, DSP Media provides AVtransfer, a comprehensive Windows NT-based OMF (Open Media Framework) file interchange utility. The application facilitates faster-than-real-time transfers between the DEP and other OMF-compatible devices.

SO WHAT'S THE WORD?

Cool—very cool, in fact. The Postation II provides a wealth of features in a surprisingly easy-to-grasp interface. The abundance of visual feedback, coupled with dedicated function keys and an intuitive touch screen interface makes the Postation II a first-rate audio post tool. The system's visual appearance is as state-of-the-art as it gets, and the layout of both hardware and software makes sense from beginning to end.

Pricing begins around $77k to $233k for a large system featuring 96 inputs/64 bus outputs, group processing and 32-track editor. A typical 32-track editor/32-output mixer system is approximately $148k.

Cheap? Not exactly—but if you're serious about a new, high-end DAW, you owe it to yourself to test drive the DSP Media Postation II.

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Roger Maycock is a Mix *technical consultant.*

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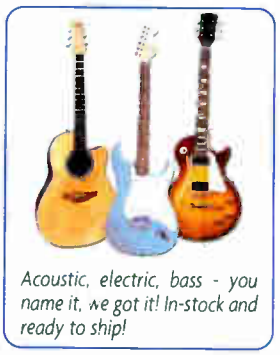

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BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

GO RENT THE DVD!

HIDDEN GEMS IN FILM SOUND

by Larry Blake

My ambivalence toward critical movie reviews began at the beginning: I became interested in filmmaking after reading director Peter Bogdanovich's response to critic Pauline Kael's essay on the making of *Citizen Kane*.

Bogdanovich's eloquent prose, published in *Esquire* in the fall of 1972, caused two reactions in me. First and foremost, his detailed and loving descriptions of the sleight-of-hand behind that classic film enthralled me with the act of filmmaking. Second, I was aghast that such a renowned critic as Kael could write such patent drivel. Bogdanovich dissected and dispatched her arguments one by one, and in the process, revealed what has since been proved to me time and time again: Anyone can be a critic. You just have to be hired.

This would be brought home to me four years later when I wrote film reviews for the *Daily Reveille* newspaper at LSU in Baton Rouge. While I was probably as qualified as anyone on campus if you judged by knowledge of films and filmmaking, in retrospect, I know that my words contained few revelations or insights. (Okay, smartass readers, nothing's changed.)

Yet I was always amazed when people would meet me, *The Reveille*'s film critic, fixing me with a solemn stare, waiting for the nuggets of wisdom to fall from my lips. The reason for such unearned respect was quite clear: I had been hired, and I had the byline. The next semester, they would be watching someone else's lips.

As long as there are records and movies to be reviewed, cretins will be hired to pontificate on subjects of which they know painfully little. The past decade saw a new breed of reviewers arise full-blown in the age of laserdiscs and DVDs, with their high-quality picture and sound.

The writings are not so much reviews as they are write-by-the-numbers. Dialog is/is not "ADR-processed" (whatever that means), the low-frequency effects do/do not kick ass, there is very little/a lot (but never too much) surround information. These are the primary bonehead criteria, although most DVD reviewers graduate to give the THX program the credit or blame for a DVD sounding good or bad, or simply not having enough surrounds. Give me strength!

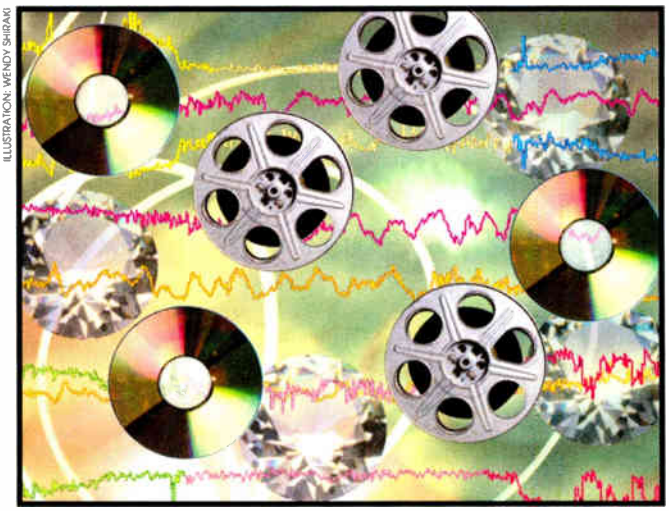


ILLUSTRATION: WENDY SHIRAKI

The sad truth is that these publications waste a great opportunity to educate the filmgoing (and DVD-buying) public about what *really* matters in a track and in a film. The tasty stuff of a good sound job is lost on these reviewers, and I'm here to try to set the record, if not straight, then on the right path.

My comments will not only have little to do with subs 'n' surrounds, but about what good filmmaking is, with special emphasis on the soundtrack, naturally. Most of these examples are simple and modest, but they are filled with much more love, much more juice than any three of your 6-track digital mixes at your local multiplex. Because, after all, the bottom line is that we're helping to tell a story through the filmmaking medium.

DAYS OF HEAVEN

That this is one of the most beautiful films ever made is almost beyond dispute. But where so many films these days have a cool "look" that's usually a variant of some trend in music videos or commercials, they're all flash on the surface. This second feature film by director Terrence Malick, however, moves me more with each viewing.

The soundtrack was also the subject of much-deserved praise. While the dialog (both production and ADR) is spotty-sounding at times, the sound effects were spectacular. (As a historical footnote, it's probably the first "good sound job" [being released in 1978] that was cut on a digital audio workstation, the ACCESS system at Neiman-Tillar & Associates in Hollywood. ACCESS cost over $1 million to build and was fed by a roomful of refrigerator-size hard drives, with data stored on 300-megabyte packs the size of bundt cakes.)

—CONTINUED ON PAGE 158

FACILITY SPOTLIGHT

BUILT FOR GAMES

ELECTRONIC ARTS, VANCOUVER

by Tim Moshansky

Walking into the Electronic Arts Canada facility in Burnaby, B.C., near Vancouver, is a bit like entering a NASA research complex. But after you pass through the security gates and walk into the open, modern foyer, it quickly becomes obvious that the work being done here, while not exactly rocket science, is an awful lot of fun. A huge backdrop of TV screens behind the reception desk plays video intros from various games, while people meet for a workout in the gym or on the private soccer field, watch a movie in the surround sound movie theater or play the newest video games in the amusement area. There's even a cappuccino bar on every floor.

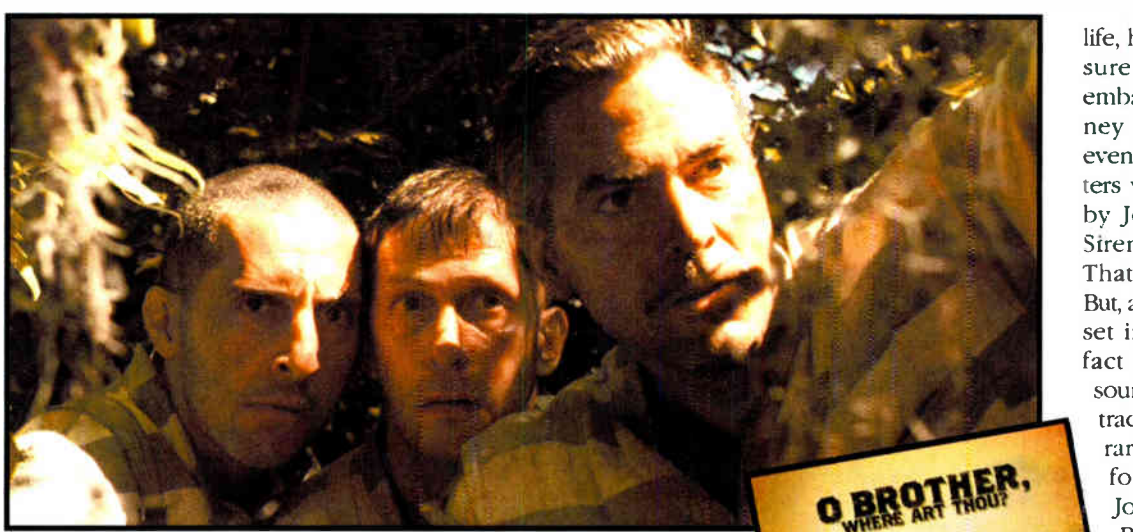
PHOTO: TIM MOSHANSKY

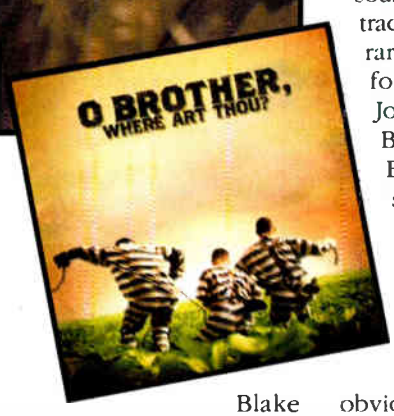
PHOTO: WOLSCH/POLLARA PHOTOGRAPHY

With sales from games developed here reaching half a billion dollars, EAC set out to build the ultimate workplace for its more than 600 employees. Ground-up construction on the 210,000-square-foot development house began in 1997 and was completed in early 1999. Decisions were made early on to keep creative teams intact on the upper floors, in an open cubicle environment. Sound design, computer graphics and programming takes place on the desktop within those creative teams, with finishing work in the basement, where 14 video edit rooms, three audio studios and two composing rooms share about 9,000 square feet.

The A/V area in the base-

—CONTINUED ON PAGE 148





ROOTS MUSIC ODYSSEY

THE COEN BROTHERS' "O BROTHER, WHERE ART THOU?"

by Maureen Droney

Films by the Coen brothers tend to be eagerly anticipated. *Blood Simple* and *Raising Arizona* have their cult followings, as do *The Big Liebowski*, *Miller's Crossing* and *Barton Fink*. And who didn't love *Fargo*? So it's not surprising to note the advance buzz on their latest effort, *O Brother, Where Art Thou?*, set to open December 22. Called "cheerful and uproarious" by the *L.A. Times* after its Cannes debut in June, the film stars George Clooney, John Turturro, Tim Blake Nelson and Holly Hunter.

Picture this: Clooney, manacled to Nelson and Turturro, breaks out of a chain gang and makes a run for his life, his wife and buried treasure. Together, the three embark on a perilous journey strewn with magical events that include encounters with a Cyclops, played by John Goodman, some Sirens and a blind seer. That's right, *The Odyssey*. But, a very American Odyssey, set in 1930s Mississippi, a fact underscored by the soundtrack, which features traditional and contemporary Southern music performed by the likes of John Hartford, the Stanley Bothers, Norman Blake, Emmylou Harris and Alison Krauss.

Serious Southern music fans, the Coens turned *O Brother* into an in-depth exploration of the genre. And, in a move both obvious and inspired, producer T-Bone Burnett (Los Lobos, Counting Crows, Elvis Costello, Roy Orbison, The Wallflowers), with the help

—CONTINUED ON PAGE 150

—*FROM PAGE 147, ELECTRONIC ARTS*

ment, if it's fair to call a space with windows a basement, was designed by John Storyk of Walters-Storyk Design Group, with technical consulting by local studio guru John Vrtacic, supervision by Edwin Dolinski, audio operations director at EA Canada, and construction by Kodama Woodworking Inc. Studio A, the main mixing room, features a Euphonix CS2000M console with a 48x12 Cube, configured for mono, stereo and 5.1 mixing.

Dolinski says, "In addition to the sound designer offices upstairs, we needed some isolated studios to handle music recording and mixing, audio post and dedicated speech recording. When we contacted John Storyk, we were looking for something that not only provided the functionality that we needed but also looked as good as the rest of our stunning new building."

The initial challenge for Studio A, Dolinski says, was to somehow increase the height to gain cubic volume. "We already had the studios located on grade," he says, "and we had the best chance of keeping things quiet in the basement. But Studio A, our showpiece, was planned for just 900 square feet, with a 600-square-foot control room, so we needed the extra height. When John Storyk came onboard, he was able to talk the planners into digging down an extra four feet to solve the problem."

"It had to be a tracking room, it had to work as an overdub, Foley and ADR-type of room, and it had to be a post-production room with a screen that comes down, a projector and 5.1 monitoring," Storyk explains. "Once I knew I could get my volume, I made the room sort of down the middle. It's a middle-of-the-road reverb time, so it can work when you need it dead, with rugs and goboes, but it's also bright when you want to bring in five or 10 strings."

The Studio A control room houses a 5.1 Westlake monitoring system (BBSM12s all around, powered by passively bi-amped Bryston 4Bs; two Bag End subs), and a producer's desk can be used to lay out drum machines and keyboards, both of which regularly make their way into sessions. To counteract the problems of front-facing glass, the team went with a motorized screen and projection system.

"The rest of the plan for the basement is pretty straightforward," Storyk says. "There are three audio rooms that are detached acoustical environments, but they are all on one side of the universe, all talking to a central audio machine room. Then on the other side of the facility, the video editing suites have their own machine room. And the two machine rooms talk to each other through a wire raceway system. If you look through the geometry, which has some interesting angles, then you'll see that it's a simple circumnavigational corridor scheme. On top of the corridor scheme is a circumnavigational conduit raceway scheme. Very simple. Very elegant. No room is more than one wall penetration from a wire highway. It's not earth-shattering, but it was there from the beginning."

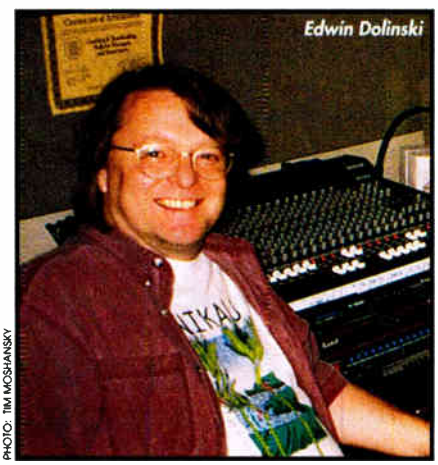


PHOTO: TIM MOSHANSKY

NEW TECHNOLOGIES

The key to the success of the EA Canada sound team was fostering an environment of cooperation and collaboration among employees. "We all learn from each other all the time," Dolinski says. "Each sound designer, speech specialist or composer was hired for their ears and digital audio skills—not their ability to write computer code.

"Then again, the thing that makes this approach work is the fact that we've got four full-time, top-notch programmers that are writing the audio libraries and the audio tools that enable us to put the sound into the games," he adds. "It's only a function of scale that we can afford to do that. The game programmer can then put the control in the hands of the sound designer, who says, 'This is how I want my sounds to work.'

"For example, we have a program that deals with the randomization and building of sentences for speech," he continues. "It's called SED, or Speech Event Designer, which handles seeking out the individual samples and streaming them off the CD and loading them into RAM so that they're ready for the code to control. Sentences are then automatically built on the fly following

certain randomization criteria to help keep the variety up. We also have an orchestration program so that you can build the banks of the sound effects that are going to go into RAM and be fired off by the game. Each sound effect comes with a number of parameters to it so you can place it in 3-D space, set its volume and then randomize, within certain limits, its pitch, volume and pan on sample playback."

Currently in the works is a prototype called the Audio Event Management System, which provides even more control based on game events. If the AI passes an event that says a goal is scored, for instance, it kicks off a new stream for the crowd reaction, music over the P.A., and so on. A whole cascade of sonic events can come from one game event.

The sound department at EA Canada will go to great lengths to re-create an audio experience for a game, in many ways similar to the way a big-budget feature film would. Sounds recorded in different environments at different times are layered together seamlessly to provide a realistic, believable world within the games. If you're not watching while someone is playing a basketball or hockey game, it's easy to be fooled into thinking you're hearing an actual broadcast.

NBA 2000

For a title like NBA 2000, the sound team might start by renting a gymnasium or arena and recording isolated sounds, such as shoe squeaks, balls dribbling and shooting, hoop swooshes, backboard hits, and so forth. Once they are happy with those, they will arrange to go to Vancouver Grizzlies or Canucks games for more recordings. Because EA Canada has a relationship with the major sports leagues, the broadcasters that work the games allow access to the mic feeds already in place. In addition, they have people roaming the crowd with mics and DAT machines, recording everything from hecklers to vendors to crowd cheers. The sound team assigned to each game may also go through tapes of games and grab isolated sound bites.

"We put huge efforts into the crowd sounds in the sports games," says Dolinski. "There's layers of 'crowd' streams dovetailing on top of each other with real-time filters and crossfading so that it responds organically like an actual crowd. It's pretty easy to spot weak sound design, where you hear a basic white noise crowd looping the

COURTESY ELECTRONIC ARTS

The EA Canada sound crew went to gyms and arenas to capture dribbles, shoe squeaks and crowd sounds for the enhanced visuals of NBA 2000.

entire game." The next step is to have the real play-by-play announcers and color commentators come into the studio to do scripted lines, as well as on-the-spot improv banter.

"The planning that's up front is huge," says Dolinski. "Not only do you have to assemble all the different bits of source and put them into a coherent whole, you've got to work with the rest of the team to make sure you've got the resources, the RAM, the access to the CD, and so on. And even that gets changed as the game evolves, and you have to respond to that."

At some point, the main studio will record music for the game intros, transitions and menus. Although most music is composed and created in-house, in the case of NBA 2000, a group dubbed the "NBA Orchestra" was brought in one by one to do their drum, bass, guitar and horn parts in Studio A. The segments were then mixed and chopped up in Digital Performer by composer Traz Damji to create seamless music sequences. In other instances, EAC will take tracks from local bands like Facepuller, Templar and Econoline Crush and remix them for game intros; in other cases they've collaborated on new material with Mixmaster Mike and Montel Jordan. Typically, guitar tracks are re-recorded by in-house guitar whiz Saki Kaskas, while mix engineers Ken "Hi Watt" Marshall and Francois Lafleur apply processing and remixing techniques to fit in with EAC's "signature" sound.

One of the more interesting aspects of game design is that there never really is a "final mix," because the mix is created as the game is played. Although there are similarities between film sound and game sound design and mixing, Dolinski maintains that there are also some significant differences. "In some ways film sound is a lot easier than this, because you know exactly what's going to happen, you know what action is coming up," he says. "You can foreshadow, you can do sounds in response to things, and you have unlimited resources in terms of how many sounds you can layer, how you mix them, how you pre-process them, because you've got a very set sequence of linear events that is going to happen. With games, you've got hardware restrictions on the number of voices that a game will play, and then how do you prioritize that? When you run out of voices, do you steal them from the P.A. announcer or let the crowd go?"

The future of games is in some small way tied to the shift to DVD, which will allow the sound designers and programmers to expand the capabilities of the games. One of the most enjoyable aspects of playing an EA game, like NHL 2000 or Need For Speed, is the realism that is achieved both in the graphics and accompanying soundtracks. With the coming generation of DVD-based game platforms, including the new Sony Playstation 2, there will be a giant leap to push the reality aspect of games further.

"We're certainly developing more elaborate tools to put more power into the hands of the sound designers," concludes Dolinski. "In terms of DVD, we're hopeful that we can start squeezing in some of the 5.1 surround encoding. It gets that much more immersive, the whole game experience, if you can specifically tailor the entire aural environment. There's nothing more powerful than hearing a sound coming at you from somewhere, like a car passing, before you see the visual. It's pretty amazing." ■

Tim Moshansky is a freelance writer and film location scout based in Vancouver, B.C.

—FROM PAGE 147, O BROTHER

of singer/songwriter Gillian Welch, was tapped to supervise. Given Burnett's longtime passion for folk and bluegrass, and his sonically iconoclastic points of view, it turned out to be a match made in heaven.

Because the music was such an integral part of the movie, Burnett was involved earlier than might be expected, and began researching songs and casting singers soon after the script was completed. Working on *O Brother* offered him a unique bonus: the opportunity to meet legendary artists he'd revered for much of his life.

"I listened to bluegrass and folk as a kid," he comments, "so Ralph Stanley, for example, has been an imaginary being to me for almost 40 years now. To have the chance to work with him was wonderful. And when I started doing research and listening to this music again, I discovered a whole wealth of other things. It's a very deep well—a deep, long story of beautiful music."

Burnett and engineer Mike Piersante spent countless hours searching record bins in vintage vinyl stores. "T-Bone and I got together and did preproduction by going to record stores and buying CDs of vintage recordings," explains Piersante. "He found the songs he wanted, and I compiled them and sent them to the Coen brothers to say yay or nay. I think we went through six CD compilations of music trying to get the right songs."

"Looking in those sections for interesting things and tracing them down, it's really like getting into wine," Burnett laughs. "We probably listened to a thousand CDs and records. There are so many exquisite old pieces of musical history that you can still get. I ended up finding artists like Washington Phillips, who was an itinerant preacher in Dallas in the '20s and played a dolceola [a zither-like instrument with a small keyboard]."

Along with listening for songs, the two were listening for sounds. "We would decide what we liked or didn't like about the character of each record," recalls Piersante. "T-Bone then earmarked different musicians and groups for different songs, and [music coordinator] Denise Stiff tried to schedule everyone to revolve in and out of Nashville, where we'd decided to record."

While some of the performances, such as those by the Fairfield Four and Chris Thomas King, were done live on camera, much of the music was

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recorded prior to filming. Unusual as that was for a feature film, it was necessary, because many of the characters, including Clooney, perform in selected musical scenes.

"I guess it's almost like a musical," explains Burnett. "But people don't break out into song in the middle of a gang fight or something like that—all the music was motivated by the characters." [Laughs.]

The Odyssey theme made for multiple psychological and emotional levels in the film, which are also implied in the music. For example, the Sirens have their own song, performed by Emmylou Harris, Gillian Welch and Alison Krauss. "If you remember the story," notes Burnett, "the Siren song was magical. It was alluring and seductive, yet frightening, beautiful and eerie. Everyone hears something different in it. And, I believe, it had a certain soporific effect on our heroes. So we took an old Negro lullaby and twisted it to give it the seductive, magical qualities that a Siren song would have."

Burnett's strong sonic opinions come through clearly in the recordings. "I don't think, in general, that recent technology has improved sound," he states. "In fact, if you listen to a well-tuned Edison 78 player with an emerald needle, it's cleaner, louder and fuller range than anything we have today. To me, it was as good as sound reproduction has gotten. Digital may eventually get there, but it's got a long way to go."

In keeping with that philosophy, the choice of recording studios was key. The project was mixed in Los Angeles at Sunset Sound's Studio One, but the bulk of the recording, over a four-week period, was done in Nashville at Sound Emporium's Studio A. "Cowboy Jack Clement, who was a sonic genius, built that room," Burnett comments, "and whatever wood it's built of, whatever the combinations are, it really works. Recording in that room is like being inside the body of an acoustic guitar. Rooms have tunings, and whatever the tuning is there, it's perfect for acoustic music. Bass, guitar, violin, mandolin—all those wooden instruments sound extraordinary in that room."

While Burnett was researching and compiling music, Piersante was doing his own research into vintage recording, using books, including Huber and Williams' *Professional Microphone Techniques* and the Web site "A Brief History of the Decca Tree Microphone Technique." The Decca Tree technique, named for Los Angeles' Decca Records studios, where it was developed, became his main tool.

"As best as I could tell," says Piersante, "the technique was first used in the late '40s to record orchestras and choirs. It's basically a wide stereo pair with another center mic that's placed forward. There are special stands made to hold all three mics, but we did our own setup with measurements that I got from a couple of books. The pair gets placed about nine feet high and about eight feet apart. The front mic becomes pretty much an isosceles triangle, face forward, and what you get is a nice stereo spread with a defined center.

"Apparently, Neumann M50s, in omnidirectional, were commonly used back then, but we'd been thinking about using ribbon mics on this project, so we put up three RCA 77-DXs," he continues. "The tall ceilings at Sound Emporium were a real asset, and because we were using the ribbons with their figure-8 patterns, we got all the nice wall reflections and such. And, because we'd measured, every time we'd come back we could set them back up in the same array.

"The Decca tree was probably about 50 percent of our sound," Piersante adds. "Because of that, the biggest con-

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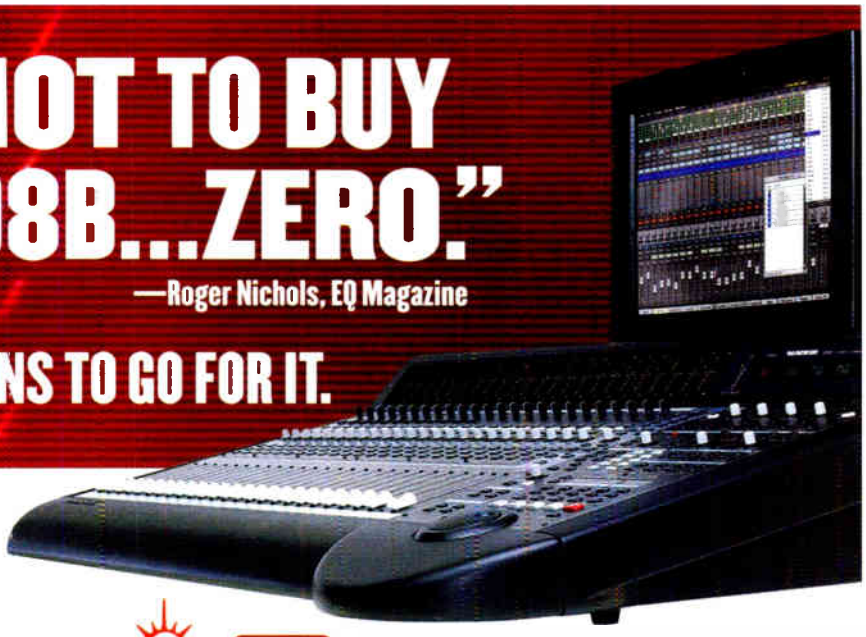

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cern for me was getting the phase dialed in. I'm pretty much a phase nut anyway, and I'm constantly flipping phase, or more correctly, the polarity switch, and moving mics to see which way sounds the best. Once I got the phase dialed in well on the mics in the Decca Tree, and we got the proper distance between them and whatever spot mics we put up, I could keep a lot of the mics in a straight line.

"That was important, because, with most of the musicians who came in, it wasn't a typical tracking date. Instead, it was just a group of people who played and sang live, did a few takes and that was it. Most of them stood, and a lot of times we'd use just one mic on the floor. They would step in for their solos, step in for vocal parts—they're all great performers who know how to work a mic."

For the first few sessions, Burnett and Piersante had mic "shootouts," shortly settling on favorites, which were rented in Nashville from both Bill Bradley and Underground Sound. Besides the 77-DXs, standbys were an RCA 6203 for guitars and male vocals, an RCA 10001 for female vocals and an RCA 44BX, primarily used on bass.

Emmylou Harris, Gillian Welch, Alison Krauss, The Sirens, at the O Brother concert.

"I set the 44 off to the side of the bass to get a more ambiguous bass sound," Piersante notes, "to make it a little more enveloping. Something that I heard time and again on the old recordings was that the bass wasn't as defined as we often try to get it today."

Rounding out the complement were a U67, an M49, a Coles and another 77-DX. "We didn't use ribbons for everything," admits Piersante, "but the ribbon sound did complement a lot of the music that we were recording. It was true and natural, but it also had a good midrange edge."

For the most part, Piersante bypassed the console, relying on a selection of outboard mic preamps including

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Engineer Mike Piersante on location.

API and Tube-Tech, augmented by LA-2A, Summit and 1176 compressor/limiters. Tracks were recorded to 2-inch analog tape on a Studer 827 to Quantegy 499 tape at plus 9 over 185. "I wanted an 800, but in Nashville it was too hard to rent one," laughs Piersante. "With all the digital work they do, there aren't many around. And, I think the rental companies don't like hauling those giant things around."

Although the goal was vintage sound, the technology required to make frequent mixes that would play back flawlessly on a movie set was anything but vintage. "There was a lot of upkeep and housekeeping," says Piersante. "Matt Andrews, my assistant at Sound Emporium, was always on top of it; he was integral to the project. We probably had 90 reels of 2-inch tape, not to mention the safeties. And we were rough mixing to timecode DAT, sending weekly tapes with final code to the set down in Mississippi, where they were shooting locked to music. If there was anything wrong with the playback or the sync, it could be catastrophic. There was no room for error, so sometimes it felt like a little pressure-cooker."

Memorable moments in the studio abounded on the sessions, beginning with the first day of recording. "The second person to come in was Ralph Stanley," recalls Piersante. "He sang a song called 'Oh Death,' a cappella in one take, and it was truly bonechilling. Everyone in the room was frozen with their mouths open. It was a moment that pulled your head out of all the technology. I'm sitting, worrying, 'Is it loud enough to tape? Is it compressing? Am I missing anything?'—all those tech things you think about. To have something just stop you in your tracks and fixate you in a total listener's perspective for a while, that's pretty uplifting. All in all, it felt like recording this music was about heart—and capturing something that may never exist again in this world." ■

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

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—FROM PAGE 146, RENT THE DVD

But we're not playing Championship Calendar here, and indeed the "good sound" example that I cite for *Days of Heaven* (Chapter 7, 1:03:40 elapsed time) is really nothing more than skillful dialog re-recording. Bill, played by Richard Gere, is coming back to The Farmer's house, where his girlfriend is falling in love with the man of the manor. The music is very light, as are the background sound effects, creating a sense of ominous anticipation that will pay off very soon. But not yet, and Malick breaks the tension of the scene with the laughter of Linda Manz as she runs on the porch to greet Gere.

Simple enough, but its effectiveness is heightened by the almost-total absence of sync sound (either production or Foley) in the first part of the scene. Manz's first steps on the porch are also kept silent so she appears to float through the frame, even though it's not in slow-motion. It's one of dozens of great moments in this magnificent film.

JULES AND JIM

Anyone who acquired a love of film in the '60s or early '70s eventually fell prey to the charms of this French *Nouvelle Vague* (new wave to you) classic directed by François Truffaut. Depending on your politics and mood, one can view this film and its nutcase heroine, Catherine (played by Jeanne Moreau), either as a feminist tract or a piece of misogynist crap. But that discussion is for another time and another magazine.

When the titular characters set their eyes first on a statue and later on the similarly featured Catherine, the camera dances around it/her with a giddy sense of joy and wonderment that has been imitated *ad nauseum* by scores of films, commercials and rock videos. Martin Scorsese, in particular, has tried every possible variation of zoom, pans, dollies and freeze frames.

After Jules and Jim get to know Catherine and start to take her a bit for granted, ignoring her while they play chess, she slaps Jules (played by Oskar Werner) in the face (Chapter 2, elapsed time 0:24:10). When she laughs and makes faces at them, Truffaut chose to freeze on shots of Catherine, while on the soundtrack her laughter continues under the static image. (I'm sure that film theorists have a five-syllable name for this usage of sound, but I'll call it effective and leave it at that.)

It was just another of his clever ways of redirecting our attention. I remember reading years ago that Truffaut purposely ADR'd the whole film to distance us from his characters, and in seeing the film recently, it is indeed interesting to see the effect that sonic approach has. (A few scenes have sync production sound.) While, of course, there are some countries, such as Italy, where total looping of every film was then considered the norm, this has not been the case in France. Other notable examples of directors who have looped entire films for effect were the Australian filmmaker Bill Bennett with his *Kiss or Kill* and UK director John Boorman,

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who has done this on many films, most notably *Deliverance*. He feels that actors can use the quiet and control of the ADR stage to create, outside of the chaos of film sets, the vocal side of their performance.

As much as I respect any director who takes a new look at how to create film soundtracks, I don't think I'd ever like to try out this approach, wedded as I am to the idea of a well-recorded production track as the foundation for a good sound job.

AMERICAN GRAFFITI

This 1973 film by future *Star Wars* creator George Lucas shows off its subtle, unique sonic style exactly two minutes after the film begins. Playing Bill Haley and the Comets' "Rock Around the Clock" over the opening credits was nothing new; it had been used 18 years earlier in the film *Blackboard Jungle*.

But as the credits are winding up, the music starts to fall back until it makes a full transition from dry score to sopping wet source. At the same time the song is fading away, we come to realize that we have been listening to a radio the whole time, specifically Wolfman Jack's show.

What happened, of course, was that Lucas and his sound editor/re-recording mixer Walter Murch were telling the viewer that they were transported into this world. And for the rest of the film, the filmmakers would serve up every conceivable way that one could play music as score/source, aka "scource."

The primary technique that they used was what has come to be known as "worldizing," or playing back a track in a similar sonic space that is portrayed in the film. Then, by adjusting the ratio between the dry and the re-recorded track, you can easily "rubber-band" the track's presence. Murch and Lucas took this a step further by re-recording the whole radio show for the film twice, each worldized track containing random movement of microphone and speaker. In addition, the second worldized track was offset a frame or two as necessary, giving them three tracks to adjust at the final mix: dry, in-sync worldized Number 1 and slipped-sync worldized Number 2. Murch also built a mock interior of a car in an edit room and fed the sound through a speaker in there during the mix as needed to help the feel of the many cruising scenes.

This all sounds so quaint now, what with the power of digital reverb units to dial up virtually any space you desire. Yet, you would be hard pressed to find any film these days that has anything resembling a distinctive sonic style. It's important to note that while *Graffiti* is heard these days in stereo, the original mix of the film was in mono, and the sense of space and depth that Murch created with the manipulation of a handful of tracks was outstanding. Downright humbling, in my opinion.

JAWS

The stereo re-do of *Graffiti* was done by Murch himself a few years after the film's release, and can in every sense be considered the definitive mix that simply presents the original sound design in stereo. Recent re-issues of two other '70s classics, *Jaws* and *The Exorcist*, have taken a different approach, with many additional sound effects added to the original mix.

When I got the DVD of *Jaws* a few weeks ago, I immediately looked for my favorite sound moment in the film, when Hooper goes down into the cabin of the Orca, and there's an explosion in the engine compartment (Chapter 16,

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elapsed time 1:48:49). I was told years ago that the cool, phasey sound of the explosion in the original mix was the result of punching-in mid-explosion, with some tracks having slipped. Legend has it that the mixers wanted to fix the "mistake," only to be stopped by *Jaws* director Steven Spielberg. I was saddened to find that the original explosion has since been replaced by a more standard, modern (and presumably stereo) effect. Sigh.

I don't know who to "blame" for this (admittedly minor) transgression. Maybe Spielberg grew to hate that sound of the explosion and waited for a chance to correct it. But the point is that the ability to re-visit a film after many years is a Pandora's box and should be regarded with extreme caution. I certainly agree that it makes sense, if original stereo music tracks exist, to create wide-range stereo music in films that were originally in mono. This is not a large leap, but moving too far beyond this can be dangerous, in my opinion.

sex, lies, and videotape

I don't feel like an egotistical twit in nominating a moment from a film that I worked on, because I can't take any credit for the example that I'm about to give.

When Ann (played by Andie MacDowell), discovers her sister's earring in her bedroom, she finally comes to the realization that her sister has been sleeping with her husband (Chapter 19, elapsed time 01:08:00). She walks out of her house in a daze, and when she gets in her car, she puts her hands over her ears because of the loud garbage truck nearby.

This seamless transition was built into the design of the film by director Steven Soderbergh in the picture edit, before the sound was ever cut or mixed.

We then cut to a frontal view of the car, and the sound of the garbage truck abruptly goes away, although she still has her hands over her ears. Our first impression is that we're looking at the scene in real time, or at the very least, we haven't moved locations, only jumped forward in time. A few seconds later we realize, when Ann gets out of the car, that she has driven to her friend Graham's house. (The sound goes away completely on the cut and comes up gradually when she opens the door.) In a simple instant, the filmgoer is told that she probably has no memory of the drive from her house.

This seamless transition was built into the design of the film by director Steven Soderbergh in the picture edit, before the sound was ever cut or mixed. Although we often can create moments like this at the mix, they are invariably best accomplished by being integral to the design of the film from the script, shooting and picture editing stages.

Let me know your favorite (subtle!) moments in film sound by writing to me at P.O. Box 24609, New Orleans, LA 70184 or via 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 it is the city whose sound he knows the best.

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TOUR PROFILE

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Dr. Dre

Hip hop's dominance of the airwaves and charts has completely revolutionized the sound of popular music. But the genre, especially in its infancy, has trailed traditional rock music in one crucial area, live performance—a DJ rig and a handful of vocalists can look a little out of place in arena-sized venues where you either "go to 11" or go home.

But live hip hop has moved with the times. And much of its evolution can be attributed to the "godfather of gangster rap." Dr. Dre, who in the late '80s and early '90s brought to hip hop a level of production and professionalism that was lacking. This year's Up In Smoke tour, with Dr. Dre as the headliner, furthered the idea that large hip hop tours can be viable and boasted a level of production and sound quality that stands shoulder-to-shoulder with any arena rock juggernaut.

In addition to Dr. Dre, the lineup featured Dre's longtime partner-in-crime Snoop Dogg and Dre-protégé Eminem. The three headliners collaborated with one another throughout the show, as well as performing with a host of other support acts on a stage set that blended influences from both Broadway productions and Kiss concerts, complete with a storefront backdrop reminiscent of L.A.'s seedier sections, a descending chrome skull and pyrotechnics galore. *Mix* caught the tour when it pulled into the San Jose Arena last August.

Crew chief Mark Bernich (L) and FOH engineer Tim Colvard

BIG BOTTOM

Accurately reproducing material that is heavy with loops, samples and sound effects is always a challenge for live

BY ROBERT HANSON

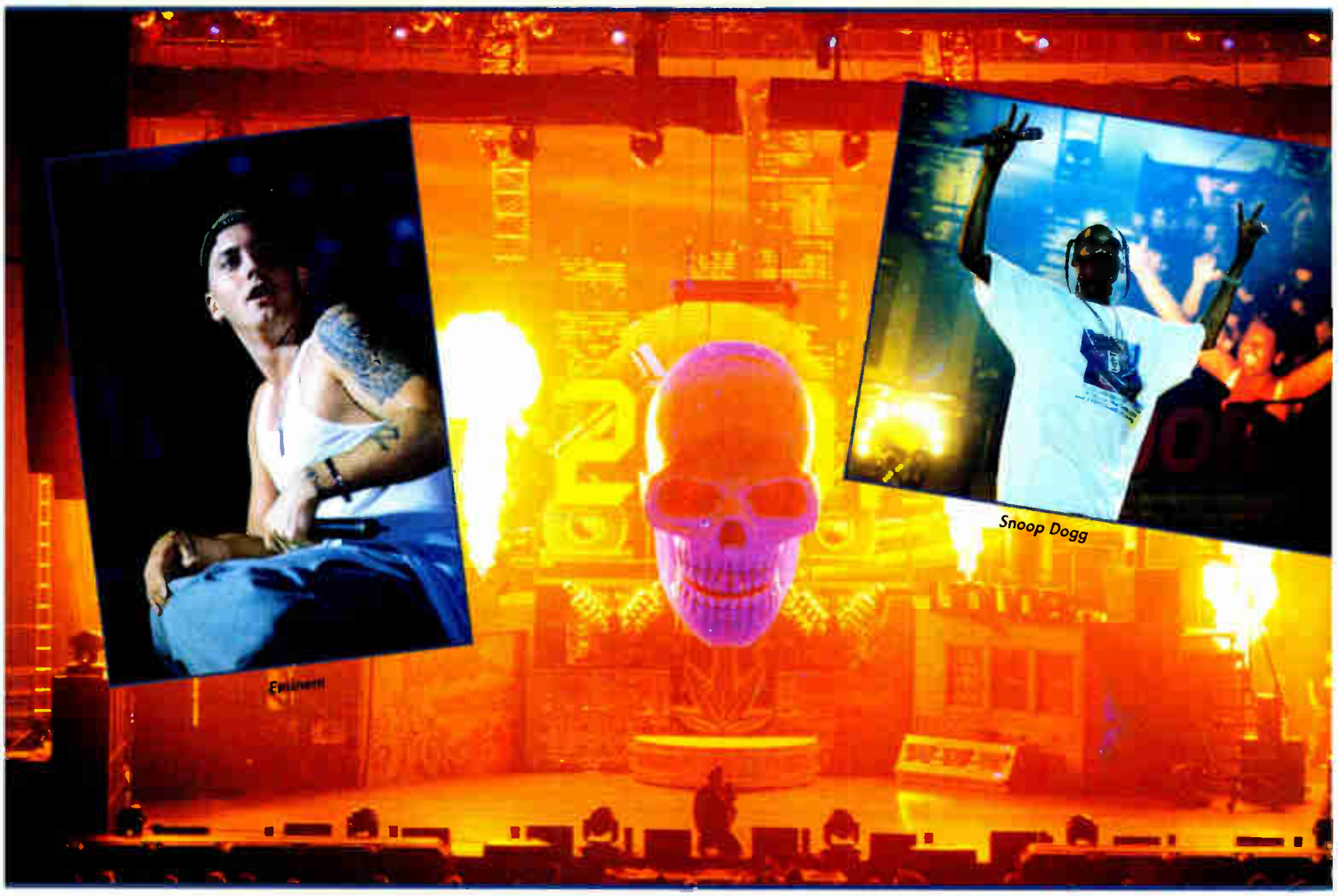
With a grip of Sennheiser SKM-5000s, L to R: monitor tech Aaron Graves, monitor engineer Sean Sturge and Ishai Ratz of Maryland Sound

sound engineers, and hip hop, with its dependence on an often heavy and distorted bottom end, presents a unique set of problems. Many "out-of-box" P.A./monitor packages are not engineered to produce the kind of low-end fidelity that hip hop requires. This point was not lost on FOH engineer Tim Colvard, who was involved in almost every aspect of the tour, beginning with pre-production back in the fall of '99. Colvard, a veteran of tours with Whitney Houston and Earth, Wind & Fire, handpicked the components that he felt were best suited to hip hop's unique sonic qualities, including a V-DOSC system. "We had come across the V-DOSC system several times, and I knew it would cover me as far as the fidelity from probably 150 to 20k," recalls Colvard. "The question was getting the subwoofers that I needed to do this. So basically we had to get three different vendors lined up to do this tour, which can be tricky."

The main P.A., including a total of 52 flown V-DOSC cabinets, was provided by ProMix, with 24 additional subwoofer cabinets provided by Maryland Sound. Eighth Day Sound provided two Midas XL-4s for FOH and monitors, as well as the complete monitor array.

Colvard is running between 14 and 16 inputs on his XL-4, not including effects returns. Eight to nine of the channels are dedicated to vocal mics, depending on the particular set list and guest performers. The remaining channels are reserved for the onstage turntable setup, the Instant Replay system and a MiniDisc player, which contains the bulk of the backing tracks and sound effects. "There is no instrumentation onstage, so you're doing just a little coloring of the tracks and adding some room feel with the reverb and gates." Colvard's rack includes an Eventide Orville Harmonizer, TC 2290 multi-effects, Roland SPDE-3000 delay and a Yamaha SPX990 multi-effects.

"Basically, we're utilizing all of the automation on the console to do level changes from song to song," says Colvard, who relies on the board mutes to switch among the eight or nine different live performers. "Because there isn't a live band, the dynamic curve has to happen by way



of the automation so that it gives the same feel that a band would give. You can bring your levels up and down to help the ear not get fatigued by just blaring music; it moves around a little bit. I think from that standpoint, using the XL-4 gives us a great option as far as dynamics and effects changes.

"[Dre] allows me the freedom of doing what I think should happen," Colvard continues. "He comes out every day and he usually listens to see what's going on and hears what it sounds like—he's amazed at how venues sound different each night and make his songs sound different. At the same time, he's given this trust to me to make it happen. It's a great working relationship for both of us. He's backed me as far as what I needed from the creative end to make the hip hop sound re-created live, the way it should be. So from that standpoint, it's a pleasure to work with him.

"The main thing was making sure that we had the proper amount of subs in ratio to full-range cabinets. A lot of shows really don't cater to the sub end of the spectrum; this one has to. We have 24 DB-8 subwoofers that are from Maryland Sound. We also have 12 SB 1000s, which are the EAW sub. All of those subs are on the floor, and they give a great feel throughout the audience. And if you stand in front of the venue and listen to the cars going by, they have that same feel to them. The object is to re-create that live."

LOUD STAGE

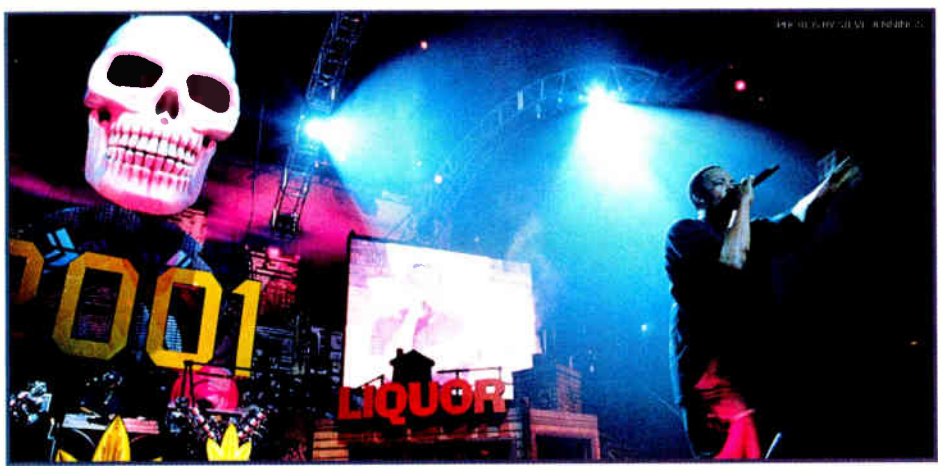
Handling monitors and mixing on a Midas XL-4 was Sean Sturge. Sturge, who has managed monitors for a number of hip hop artists, runs a stage monitor setup, including 22 single 12-inch EAW 850 wedges and sidefills, with 12 SB 1000 subs.

"The new Sennheiser [SKM-5000 Platinum] mics and the new dbx 160 SLs make a pretty good combination," Sturge notes. "I'm still stuck on my XL-4. With rap, I don't think there's any other console you can use, because you can go through scenes; artists switch microphones and go back and forth, so it's very helpful. Dre, being a producer, his stuff has to sound like it's in the studio. Everything has to sound correct, which is the same for any artist. But with an artist who doesn't produce their own music, it's more your judgment than anything else. With him, he can definitely let you know, 'Hey, that's not cool; I can hear it, because it's my music.' But that hasn't been a problem. It's been a cool, smooth tour.

"We're basically running tracks off the MiniDisc, and all I'm using are some 160 SLs with a straight, flat EQ. I've got a lot of sidefills, six 850s, 12 SB 1000s, onstage. It's a loud, loud stage. There's 10 wedges across the front, all 1-by-12s. Very loud."

"The biggest challenge [with this tour] was probably taking the three different sound companies and putting them together," concludes crew chief Mark Bernich. "In general, we've been very lucky considering the amount of gear. A lot of times you take two different companies, and you run into a mess of problems. We were actually lucky; it worked perfectly. We didn't have to change anything." ■

Robert Hanson is Mix*'s editorial assistant in da house.*



Dr. Dre on stage

NEWSFLASHES . . .

U.K. sound rental company **Tiger Hire** is supplying two Soundcraft FIVE monitor consoles for Radiohead's current tour. The rig also features a Series FIVE at FOH, a Spirit 324 digital mixer for effects and a Series TWO console for the support act. www.soundcraft.com...The audio system at the new **Olympic Stadium** in Sydney, Australia, is based completely on a Peavey CobraNet system and features two MediaMatrix Mainframes. Installed by Sydney-based The P.A. People and its manufacturing arm, Creative Audio, the P.A. system design for Olympic Stadium is the largest ever installed in Australia. www.peavey.com...Built in a 100-year-old castle in the heart of Helsinki, Finland, the popular music club **Kaarle XII** has recently taken delivery of a new NEXO PS15 P.A. system. HedCom, NEXO's Finnish distributor, supplied installers **Design Electric Service** with a PS Series system, including four full-range PS15 cabinets driven by a Crown Macrotech 5000 power amplifier and controlled by a PS15TD controller ...Closer to home, **Concert Systems USA**, of Ocean Springs, MS, has taken delivery of a 48-cabinet NEXO ALPHA rig. The new system can be configured as one large system suitable for arena/outdoor festival use, or as two/three smaller systems. www.nexosa.com...MTX Audio offers a detailed guide to stage monitor use designed for worship center musical directors who face acoustical challenges. MTX's **The Monitor White Paper** explains the basics of sound, emphasizing the differences between direct and indirect sound sources and how each type affects worship service teams' performances. The guide is available at www.mtxaudio.com/css...Some 40 million visitors are expected to visit **EXPO 2000** in Hanover, Germany, and the EXPO's Culture and Events program presents

musicians and performers from around the world for 153 days and nights. RockSound, the contractor responsible for the Culture and Events program's audio requirements, supplied 11 stages and ordered Midas XL-4, Heritage 3000 and Heritage 2000 consoles to augment its existing Midas inventory. www.telex.com...Dave Thomas and assistant Jordan Zur of Cleveland's **Eighth Day Sound** used an InnovaSON Sensory Live all-digital console to mix sound for the **2000 NFL Hall of Fame Festival** in Canton, OH, where a record crowd exceeding 20,000 came to attend "Pro Football's Greatest Reunion." Thomas had some 40 inputs to juggle and used 17 of the Sensory's 24 outputs to feed a 360° arrangement of d&b Audiotechnik E9 loudspeakers in a multidelayed configuration... **Sennheiser**'s growing line of Evolution microphone promotional packs offer an off-the-shelf, everything-you-need-in-a-box pack for musicians. First introduced at Winter NAMM 1999, the Promo Packs now include the ePack, Drum Pack, Three Pack and Kick Pack. www.sennheiserusa.com...The **Hubert H. Humphrey Metrodome** in Minneapolis is known as one of the loudest sports arenas in the U.S. In 1998, the Metrodome installed a permanent, four-way EV speaker system with more than enough power for baseball or football. But for basketball, which requires a different configuration, something more was needed. The NCAA tournament is the first event where the new X-Array Xi system is being used. The new installation—a temporary one comprising 10 Xi 2153 cabinets—is hung around the new scoreboard, adding more power to the current house system...LT Sound in Venezuela has purchased a complete EV X-Array system, including a Midas 48-input Heritage 3000 and a 52-input XL250 console and Klark Teknik processing. The sale was put together by Steve Mendez of Sam Ash music retailers in New York and Josh Radin of Metro North Marketing. LT Sound is a full-service production company and is a subdivision of the Trama Corporation ...**Atlantis Audio** of Scottsdale, AZ, used its new Yorkville TX Speaker System for a recent **Phoenix Symphony POPS** concert, featuring Doc Severenson. Atlantis Audio is currently using four TX8 three-ways, two TX4 two-ways and four TX9S subs, all powered by Yorkville Audiopro amplifiers.www.yorkville.com...**dB Sound**, of Des Plaines, IL, recently purchased its first 70-input ATI Paragon II console and used it immediately on **Savage Garden**'s worldwide tour. dB Sound monitor engineer Scott Pike cites the console's noise floor, sound quality and mixing flexibility. Other ATI Paragon II users include Alabama, Ricky Martin, Tina Turner, Sting, Bob Dylan, Bryan Adams, The Judds, Barry Manilow, Backstreet Boys, Sheryl Crow, Faith Hill and Amy Grant. www.audiotoys.com...**Audio Art Sound** of New York chose a pair of Turbosound TQ-440SP enclosures for music playback in the play ***True West***. Jim van Bergen, owner of Audio Art Sound and sound designer for *True West*, placed the TQ-440SPs upstage on the three-quarter thrust stage. www.turbosound.com...Auburn's **Muscleshoot Casino**, located in between Seattle and Tacoma, is the largest casino in the Northwest. **MZW Prductions** of Marysville, WA, designed and installed a multizone sound system, made up of over 300 Community compact CPL 23 loudspeakers. Mike Woods, president of MZW, used Allen & Heath DR66 and DR128 matrix mixers to control 18 zones within the casino with a fully integrated paging and music system. www.community.chester.pa.us ...For the third consecutive year, rental giant **ProMix West** provided an all-Apogee sound system to the Beverly Hilton International Ballroom for the **57th Annual Golden Globe Awards**. The distributed system, designed and installed by Emmy Award-winning sound engineer Carlos Torres, included Apogee SSMs, AE-2s and AE-5s. www.apogee-sound.com...**Allen & Heath** has released new software for the **MixWizard Series** of compact mixing consoles. The free software, which provides full control over Mix Wizard effects parameters, plus access to additional noise gates and EQ, may be downloaded from www.allen-heath.com. ■

PHOTOS AND TEXT BY STEVE JENNINGS

Alice Cooper's Brutal Planet 2000 Tour

started in June with two months in Europe, wound up a U.S. leg at New York's Roseland on Halloween and will continue in Europe in the New Year, to be followed by legs in Australia and Japan. Featuring a half-dozen songs from Alice's new album, Brutal Planet, the set also included the hits "Under My Wheels," "Billion Dollar Babies" and "I'm 18." No Alice Cooper show is complete without some spectacular stage routines, and the ever-popular straitjacket and guillotine are both featured to the delight of long-time fans and Alice Cooper newbies. Mix caught the show in late September at the Sacramento Memorial Auditorium, California, during a U.S. tour of theaters and small arenas.

ALL ACCESS on BRUTAL PLANET

JEFF MANN - DRUM TECH

Drum tech Jeff Mann takes care of drummer Eric Singer's kit. The all-Shure mic plot is as follows: Beta 91s in the kicks, SM57 on snare top, SM81 on snare bottom, SM81s on hi-hat and ride cymbals, Beta 98s on rack toms and KSM32s as overheads. The D-Drum 4 system is set up with triggers on all the drums, supplementing the microphone sound with an electronic drum sound. "You have a little more continuity and consistency in the sounds you're getting every day," notes Mann.

KEVIN MCCARTHY - MONITOR ENGINEER

A veteran of tours with Santana, Metallica and Bob Seger, monitor engineer Kevin McCarthy is mixing 37 inputs to 14 outputs on a Harrison SM-5 with an extender panel. "The Harrison is an old console now, but it's far superior in terms of EQ and headroom and the way you're able to dump matrix to mixes—there's no other console that can match it," says McCarthy. Like Toth, McCarthy is using mainly Behringer equipment in his effects rack: two Virtualizers and two Modulizers, both multi-effects processors, for effects and an Ultra-Curve Pro DSP 8024, which he uses as an RTA across the console cue bus. McCarthy also has two of Behringer's Vintager Technology tube-based units, the Tube Ultra-Q T 1951 4-band parametric EQ and the Tube Composer T 1952 dynamic processor. "They're inserted on Alice's vocal, with the parametric being first," says McCarthy. More Behringer Tube Composers handle dynamics on bass, backing vocals, keyboards and Leslie channels, and McCarthy assigns Behringer gates to the drums. "And then I have a couple of Klark Tekniks, which I barely use, for the graphics," he adds.

CREW IN CONTROL

L-R: Kevin McCarthy (monitors), Kenny Barr (stage left guitar tech and keyboard tech), Jeff Mann (drum tech), John Jensen (stage right guitar tech and bass tech)

ALICE COOPER

STEEV TOTH - F.O.H./ROAD MANAGER

FOH engineer/road manager Steev Toth is mixing on a Yamaha PM4000 and using two Yamaha SPX990s and a TC Electronic 2290 digital delay for effects. "I have 10 stereo channels in the board for effects returns, but I don't always use them," says Toth, who endorses Behringer gear for dynamics control. "I'm also using the Behringer Virtualizer Pro DSP 1000, which is a digital multi-effects unit—it's basically a reverb box with 100 presets, which you can edit on a PC. I also carry the DSP 1100P, which is called the Feedback Destroyer—it finds peaks in Alice's vocal and notches out any feedback frequencies. Then I have the Modulizer Pro DSP 1200, another effects box that takes care of flanging, guitar and keyboard effects and gives a little coloration to separate one guitar from another." All of the band members, except Alice, are using in-ear monitors. "Alice prefers wedges—if nothing else, he likes using them as props," says Toth. "But the guys move around the stage a lot, sometimes singing in each other's vocal mics, so having them on in-ears makes sense. The advantage of in-ears for me is I get a lot lower stage volume with less coloration, and I can control it a lot more."

FROM THE STAGE

Main P.A. for the U.S. leg of the tour is a Showco system, with SRM wedge monitors onstage for Cooper. In addition to Behringer, the tour endorses Shure microphones, Shure IEM systems and Atlas mic stands. "They all hold up and do the job, so it's great to work with them," notes monitor engineer Kevin McCarthy. Vocal mics are all Shure SM58s, guitar mics are all KSM32s and the bass mic is a Beta 52.

New Sound Reinforcement Products

QSC DSP 3 MODULE ▼

The compact DSP 3 Digital Signal Processor module from QSC (www.qscaudio.com) attaches to the back of most QSC DataPort-equipped amps, including the PowerLight 2. The DSP 3

offers two channels of independent DSP, including crossovers, shelf and parametric filters, signal delay, compression and peak limiting. Function and signal flow configuration are via "drag-and-drop" software using icons and simple drawing tools, interfaced via an RS-232 serial port. The software allows real-time control, and all settings can be stored for later recall. Additional DSP 3 functions include a two-to-one mixer, signal splitter, signal mute, 0.1dB attenuation steps, polarity reversal, 24-bit/48kHz converters, built-in tone and noise generators, and selectable 1.5v/4v/9v/18v input sensitivity.

Circle 314 on Product Info Card

GOLD LINE 5.1 AUDIO TOOLKIT DVD

Gold Line (www.gold-line.com) has introduced the 5.1 Audio Toolkit DVD for ensuring correct surround sound system setup for recording studios, theaters and any venue requiring room tuning. Developed as a joint venture between Gold Line and surround sound specialist Tony Grimani, the Audio Toolkit DVD contains over 80 test signals and music tracks for calibrating and debugging 5.1 channel systems using Dolby AC3 and THX Surround EX surround formats. Features include pink noise (midrange, wideband and LF), ½-point check signals, imaging tests, LF headroom tests, ⅓-octave burst headroom test, noise leakage tests, and static and swept sine wave signals. Price: $99.

Circle 315 on Product Info Card

RADIAN MICROWEDGE MONITOR

Radian Audio (www.radianaudio.com) adds a second two-way monitor to its MicroWedge line. The RMW-1152 is loaded with a coaxial 15-inch woofer/2-inch compression driver (rated at 500 watts continuous), and its coaxial transducer reduces front baffle area, making it up to 50% smaller than comparable stage monitors. Featuring a 55-18k Hz frequency response and capable of 124dB continuous SPLs, the RMW-1152 is made of ¾-inch, 13-ply Baltic birch with a water- and scratch-resistant black Duradian™ finish. A 12-inch RMW-1122 MicroWedge is also available.

Circle 316 on Product Info Card

MACKIE ACTIVE SPEAKER ▶

The SR1530 from Mackie Designs (www.mackie.com) is a three-way, tri-amplified, horn-loaded active loudspeaker system. Featuring RCF components in a trapezoidal cabinet, the SR1530 has a 15-inch woofer, a horn-loaded 6-inch midrange and a 1-inch exit compression driver on a wide-dispersion horn. Powered by an integrated 3-channel amplifier (500 watts total), the SR1530 features active electronics for time correction and phase alignment, electronic equalization and protection. Frequency response is 55-18k Hz, and maximum SPL is 125 dB (1 m). The enclosure is heavy-duty, multi-ply laminated wood with molded composite resin top and bottom sections. The 98lbs. SR1530 offers side, top and bottom handles and is weight-balanced for stand mounting. Price: $1,199.

Circle 317 on Product Info Card

RADIAL STAGE FLEA

Radial Engineering (www.radialeng.com) offers the Stage Flea subsnake, a 6-input stagebox attached to a Radial Torsion multicore cable (in various lengths). Manufactured in 14-gauge steel, the Flea measures 3x5-inches and features six XLR inputs and two ¼-inch TRS jacks paralleled to inputs 1 and 6. Stage Fleas may be ordered for audio, video and speaker level distribution and routing, with numerous connector options. It's priced from $125 to $350, depending on configuration.

Circle 318 on Product Info Card

NADY POWER AMPS ▼

The SRA Series of 2-channel power amps from Nady Systems (www.nadywirelessless.com) includes the SRA 2150 ($409.95; rated at 150 W/channel @ 4 ohms; 250 W bridged mono @ 8 ohms) and the SRA 2250 ($579.95; 250 W/ch @ 4 ohms; 350 W bridged @ 8 ohms). The single-rack-space units feature detented volume pots, headphone output, switchable low-cut filters, switchable 2/4/8-ohm operation and a stereo/mono-bridging switch. Both units include ¼-inch TRS and XLR balanced, RCA unbalanced inputs, and ¼-inch and binding post speaker outs.

Circle 319 on Product Info Card

JOAN OSBORNE

A RIGHTEOUS RETURN

by Blair Jackson

It's been five years since the release of Joan Osborne's Top 10, multi-Platinum, major-label debut album, *Relish*, and three since she got off the road promoting it. That's a long time to be without "product" (if you'll excuse the record biz parlance) and out of the public eye. Sure, radio has continued to occasionally play her quirky smash hit, "One of Us" (and to a lesser degree, "St. Theresa"), and she had a song in the 1999 Kevin Costner baseball drama *For the Love of the Game* and dueted with Bob Dylan on the soundtrack for the TV miniseries *The '60s*. But for someone who was on the cover of *Rolling Stone* and whose album placed high on many critics' year-end lists, Osborne did quite a fade-out. Hell, even her record company, Mercury, forgot that she made them millions of dollars. When, after cutting a number of tracks for a new album with several different producers, she came to the label for an advance so she could record some tunes with the renowned producer Mitchell Froom (Los Lobos, Crowded House, Suzanne Vega, et al), instead of ponying up the cash, they dropped her from the label! How dumb is that? But that's what the record business is like now: It doesn't matter what you've done; if the label doesn't smell *big* bucks, you're gone.

"I was trying to make a record I liked, working with several different producers in a number of different situations, and I guess the label got tired of waiting," Osborne told one writer. "It was a frustrating, difficult time, but it enabled me to make a fresh start. You gotta have a little faith, and as an artist, you can't wait around for someone else to validate you. I was pretty confident that if I made a good record I'd have a place to go."

Indeed. Teaming up with Froom, despite the lack of label support, turned out to be a brilliant move—they clicked immediately and together made an exceptional CD, *Righteous Love*, that was eagerly picked up by Interscope Records. The disc reflects Osborne's tremendous growth as both a singer and songwriter. It's brimming with smoldering R&B and rock grooves, strong and confident vocals, and imaginative instrumental arrange-

—CONTINUED ON PAGE 178

PHOTO STEVE JENNINGS

Keyboards galore for producer Mitchell Froom's use in Studio A at Sound Factory. The vocal mic is a Telefunken 251.

PHOTO JOHN PATERNO

GREEN DAY

STILL PUNK AFTER ALL THESE YEARS

by David John Farinella

Mothers don't let your children grow up to be second engineers...The scene you hear at the opening of "Blood, Sex and Booze" from Green Day's latest offering, *Warning*, is second engineer Tone getting a workout from dominatrix Mistress Simone. "I don't know how much I should say about that," says engineer Ken Allardyce with a laugh. "You can say there were a couple of dominatrixes in the studio. We needed a whip sound; that's how it started." Lo and behold, there was a mic hanging in the room. "This sort of went down incidentally. We found it afterwards and grabbed it."

Really, would you expect anything different from the godfathers of neo-punk rock?

PHOTO: MARINA CHAVEZ

Tre Cool, Billie Joe Armstrong and Mike Dirnt.

Warning, the band's follow-up to the 1997 bestseller *Nimrod*, was recorded at Studio 880 in Oakland, Calif. The lads—guitarist/singer Billie Joe Armstrong, bassist Mike Dirnt and drummer Tre Cool—started writing songs for the album after the final *Nimrod* tour and rehearsed five days a week. The songs, explains Cool, "came together very organically throughout the time that we had off. They all came out of real experience. We went home and hung out with our friends and families for a while, then we got together a couple months later and started writing and practicing new songs."

Engineer Allardyce reports the band's comfort with the material enabled them to record efficiently. "They'd really done their homework, so they were nailing stuff really quickly," he says. Last time, he explains, they recorded 30 songs. "So, it was way less focused when we did *Nimrod*. We just went in, recorded a bunch of songs and sorted out how it all fell together. On this one the guys pretty much had the album mapped out, blueprinted in its entirety."

Before recording started, Allardyce and executive producer Rob Cavallo had their work cut out for them. Cavallo oversaw the installation of a new wood floor in the recording room, and Allardyce brought in an API console, as well as some Neve 1073s.

—CONTINUED ON PAGE 184

THE CHARLIE WATTS JIM KELTNER PROJECT

DRUMS AND BEYOND

by Chris J. Walker

Two drummers collaborating on a project is a fairly rare occurrence. And when those two drummers are stalwart session man Jim Keltner and the Rolling Stones' legendary backbeat man Charlie Watts, one can assume it won't be a run-of-the-mill production. In fact, the *Charlie Watts Jim Keltner Project*, released this past summer, doesn't fit neatly into existing musical categories. There are elements of both avant-garde and electronica due to the project's unorthodox and highly percussive orientation. However, it lacks the mind-altering dissonance of so much avant-garde and goes beyond the pulsating drum 'n bass grooving of electronica.

To truly appreciate Watts and Keltner's efforts, you have to know the history of the project. This could have very well been one of those many well-meant efforts that end up collecting dust on a shelf in an anonymous storage vault or suburban garage. Luckily that didn't happen, but with the disc being released three years after the initial sessions, it came damn close. "It grew into what it is," the always-reserved Watts says from his home outside of London, England. "It was Keltner's idea to begin with, then I carried on."

Keltner, who has played with an incredible array of artists of every style through the years, was recruited by the Stones as an additional percussionist on their sessions for the *Bridges of Babylon* CD in 1997. This association with the Stones led to his collaboration with Watts. "I didn't want to mess with any of [Watts'] grooves at all," Keltner comments from his home in Los Angeles, in respect to the sessions. "[The Stones] wanted to know if I wanted to play double drums, and Charlie was into it. But I refused. First, it's not something I like to do, and secondly, it would be a crime to interfere with somebody like Charlie's groove. It would almost be sacrilegious. So basically, I'd sit back and play around his

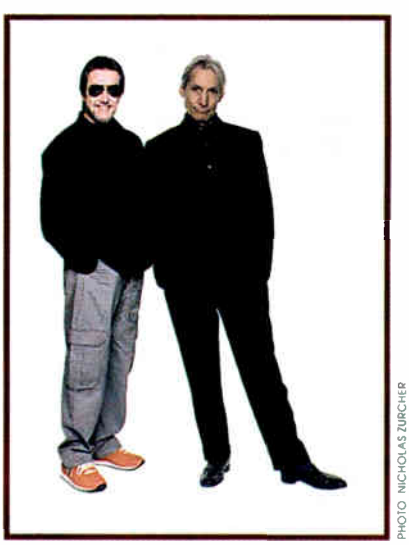


PHOTO: NICHOLAS ZURCHER

Jim Keltner (left) and Charlie Watts

—CONTINUED ON PAGE 188

"RAG DOLL" BY THE FOUR SEASONS

by Dan Daley

The Four Seasons were part of America's last Caucasian bulwark against the British invasion of the early 1960s. The group, who formed on the streets of Newark, N.J., in 1961, epitomized the doo-wop harmony sound and street attitude of the duck-tailed '50s, but they also blended in R&B vocal influences that kept the sound and the attitude fresh. From 1961 through 1967—the year the Beatles changed music forever with *Sgt. Pepper's*—The Four Seasons made the Top 10 13 times, with hits including "Sherry," "Big Girls Don't Cry," "Dawn" and "Let's Hang On." These came after nearly a decade in which the members of the group—lead vocalist Frankie Valli, whose piercing falsetto was the group's trademark; keyboardist and vocal arranger Bob Gaudio; guitarist Tommy DeVito; and Nick Massi on bass—had kicked around the music business, collectively and individually. Valli had formed a nascent version of The Four Seasons, called The Four Lovers, which included DeVito, in 1956; Gaudio was a member of the Royal Teens, along with Al Kooper, and had penned the group's biggest hit, "Short Shorts." As The Four Seasons, they filled in small-time club appearances with studio work as background singers in the Manhattan studio scene.

But it was when the group connected with producer Bob Crewe that all four cylinders began to fire. Starting with "Sherry," in 1962, The Four Seasons began a string of radio hits for the Vee-Jay label, until litigation kept the group out of the studio for almost a year before they were able to resurface on Philips Records, and "Dawn" put them back on the hit track. So, "Rag Doll" would be an important record for The Four Seasons—it was the follow-up to their first hit in a year. But the record, which would go on to spend 10 weeks in the Number One position on Billboard's music charts, was anything but a major production. In fact, for a record that performed so well on the charts, it was completed very quickly—in a single session, in a single day.

"It was such a helter-skelter session," recalls Bob Gaudio, the group's main songwriter, vocal arranger and, later, its co-producer with Bob Crewe. "It was a Sunday and we were leaving town the next day for a lengthy tour. We couldn't get into any of the usual studios we used in Manhattan, or get any of the engineers we usually worked with." Those included Atlantic Studios and Olmstead Sound, and engineer Tom Dowd, who had engineered "Dawn."

Scrambling to find a studio, the group located Allegro Sound, a 4-track demo studio at 1650 Broadway, on the ground floor of a midtown West Side hotel, not an unusual location for a studio in Manhattan in those days, when many studios of the previous two decades had used hotel ballrooms as tracking rooms. The group was also able to pull a favor from engineer Lenny Stei, who owned Stei-Philips Studios, where the group had recorded before. "It wasn't our first choice of studio, especially since we had already moved to 8-track recording with 'Dawn,'" Gaudio says. "And Lenny was more of a studio owner than an engineer and not our first choice—or even our twentieth choice—as an engineer, as I'm sure he would agree. It was really a favor on a Sunday morning, and we were getting desperate."

Gaudio had written "Rag Doll" not long before this session: "I was driving into [Manhattan] for a session and I got stopped at Eleventh Avenue, which back then seemed like the longest traffic light in the world; like three minutes long," he recalls. "If you got stopped there, you'd have these homeless people come up and try to wash your windshield for spare change. I saw this hand come up to my windshield and connected to it was a woman whose clothes were all tattered and who had this dirty face, like something out of *Oliver* [the Broadway show based on Dickens' *Oliver Twist*]. I didn't have any change on me. All I had was a ten-dollar bill, so I gave it to her. I drove off and saw her in the rearview mirror just staring at it. That image stayed with me. Within the next day, I had the chorus and the first verse. I couldn't finish it, so I called in Bob Crewe to help and we had it done two weeks later."

Convinced that "Rag Doll" was a smash hit and necessary to maintain the head of steam that "Dawn" had created, The Four Seasons and Crewe wanted to get it on tape before their tour began, prodded further by Philips Records' desire to put out another song in its stead. Gaudio, DeVito and Massi, along with session drummer Buddy Saltzman, set up to play the basic track. Allegro had a small studio room, but it had what sounded like a huge live echo chamber,

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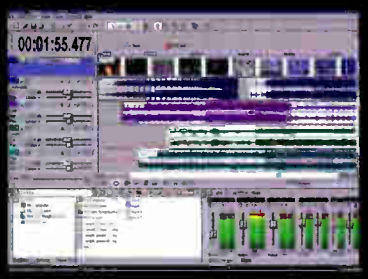

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which would become part of the record's sound.

"The overtones of that chamber were unbelievable," Gaudio recalls. "We were concerned that it would be a bit too extreme, soundwise, especially if we also used it for the vocals. We really thought we were on thin ice. But we were stuck with that and the 4-track."

What they also had were a bunch of rented percussion instruments lying around, left over from the previous week's sessions, and not slated to be picked up until Monday. Gaudio and Crewe chose an African hair drum that happened to be there, and Saltzman, who was set up in the middle of the room with the rest of the band, played it along with a rack tom to create the opening bars of the song and the rhythm tattoo that carried the choruses. An open tambourine was also placed on the snare drum, which enhanced the fourth beat of the chorus measures, creating a sharp smash, which was in contrast with the tom/hair drum combination's lower tones.

"The overtones of the tom and hair drum were very pronounced," says Gaudio. "And the damn echo was slapping everything around. But it's interesting that we noticed it mainly in retrospect. The media of the time—like AM radio—simply couldn't reproduce it, so you didn't hear it over the radio. The same with the monitors of the time, especially in a demo studio. You play the CD now and you think, that's not what I heard back then."

The track was laid down without a guide vocal. The group had learned and rehearsed it around a piano before the

Cool Spins

Holiday Favorites

This month we're deviating from our usual Cool Spins format so I can give a tip o' the Santa hat to some favorite holiday CDs in different genres. In our household, we listen to *a lot* of Christmas music during December. Herewith, a dozen time-tested classics for the Twelve Days of Christmas.

—Blair Jackson

Frank Sinatra: Christmas Dreaming (Columbia)

Not surprisingly, there are several different Sinatra holiday collections available, the most popular being *The Sinatra Christmas Album*, which includes several tracks performed with his kids in the mid- and late '60s. I prefer this admitedly rather short set recorded in the '40s and early '50s; it's

the young crooner Frank, and his voice has rarely sounded more angelic. The emphasis is on Christmas ballads, with "White Christmas" and a truly heartbreaking rendition of "Have Yourself a Merry Little Christmas" the clear standouts.

No recording information available, but it was cut in New York and Los Angeles.

The Mormon Tabernacle Choir: *Joy to the World* (CBS, 1964)

This is Christmas bombast at its most stirring, with the famous 375-voice choir backed by the Philadelphia Brass Ensemble and the largest pipe organ in the world. The group is more convincing on "serious" religious material than lighthearted carols, but all are performed with gusto and feeling. This is the musical equivalent of putting too many lights and beautiful ornaments on a tree—but it still dazzles.

Producer: Thomas Frost. Engineers: Edward Graham and Arthur Kandy. Recorded at the Mormon Tabernacle (Salt Lake City).

Leon Redbone: *Christmas Island* (Private, 1989)

If you know Redbone's ouevre, you can guess what this disc sounds like—sort of a '30s swing approach; Django Reinhardt meets Burl Ives. Redbone is in excellent form vocally and he's got a great acoustic group backing him, including Dr. John on piano (and shared lead vocals on a delightful version of "Frosty the Snowman"). Redbone's crooning is clearly Sinatra-influenced, but he has both the chops and a certain whimsical quality that makes his retro approach pretty darn appealing.

Producers: Beryl Handler and Leon Redbone. Engineer: Doug Epstein. Studio: Manhattan Recording Studio.

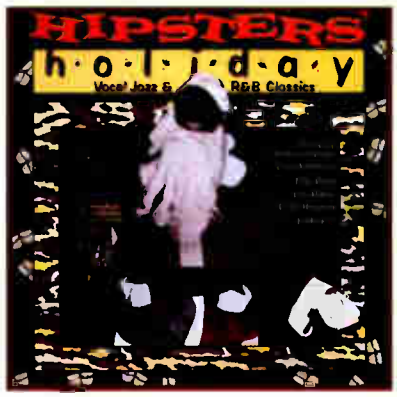
George Winston: *December* (Windham Hill, 1982)

A beautiful solo piano voyage through the holiday season ranging from Winston originals such as "Thanksgiving" and the three-part "Night" to variations on Pachelbel's "Kanon" (which by its inclusion on this popular CD is now considered by some to be a holiday piece), "The Holy and the Ivy," "Carol of the Bells," and more. A true modern classic.

Producers: William Ackerman and George Winston. Engineers: Steven Miller and Karen Kirsch. Studio: Different Fur (San Francisco).

Various Artists: *Hipster's Holiday* (Rhino, 1989)

This totally swingin' and often hilarious disc features 18 tracks, most of them from the '50s. What a cast: Louis Armstrong, Lionel Hampton, Pearl Bailey, Lena Horne, Miles



Davis and Bob Dorough, Eartha Kitt, Lambert, Hendricks & Ross and more give the holidays a fresh twist on songs such as "Cool Yule," "Santa Baby," "Dig That Crazy Santa Claus," "We Wanna See Santa Do the Mambo," "Christmas Night in Harlem" and "Zat You, Santa Claus." Wild!

Compilation Producer: James Austin.

Various Artists: *Phil Spector's Christmas Album* (Warner/Spector, 1963)

From the first note of this famous holiday record, you know it can only be a Phil Spector production; in its own way it's as grand as the Mormon Tabernacle Choir. The Wrecking Crew's inimitable Wall of Sound is in all its glory on tracks sung by Spector stablemates The Ronettes, Darlene Love, Bob B. Soxx & the Blue Jeans and The Crystals. Some of this is over-the-top even for

—CONTINUED ON PAGE 192

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session. It is a very Spartan track; aside from the drums and percussion, only the bass, a bit of DeVito's Fender electric guitar, and a counterpoint melody, played by Gaudio on a Farfisa organ, peek through the wall of echo-laden vocals. "We might have orchestrated it a bit more if we had the time," Gaudio says. "But once the vocals were on, we could see it wasn't needed."

The background vocals went on first, with Valli singing as part of the four-part ensemble arrangement that Gaudio had come up with, typically Four Seasons, with the top and bottom notes the same. It was an approach used by The Four Freshmen, a group that Gaudio admired and emulated early in his career. Background vocals were double-tracked, with each vocal track and the basic allocated to a single track of the Scully 4-track deck, and then bounced down later to allow for overdubs, such as the upbeat Gospelesque handclaps that appear only on the rideout, another tambourine part, and Valli's lead vocal. All the vocals were recorded with a Neumann U47 microphone, Crewe recalls. The Four Seasons arranged themselves around a single microphone, much the same way they had around streetlights in Newark, and usually only with half the headphones on. "We were very into balancing ourselves," Gaudio explains.

"There was a lot of generational loss on that record, because it was 4-track and we had to bounce," Gaudio notes. "But again, radio forgave a lot of that. And while we were sensitive to that, and often relied on mastering to fix it, ultimately we were always into the feel of the record. That always came first."

The tracking and vocals took the better part of the day. But thanks to the track-bouncing during the session—and the fact there were only four tracks—the mix was fast and easy. "We were definitely committed on the drum sound, including the echo chamber," says Gaudio. "Fortunately, the echo fit in nicely with the same chamber on the vocals. It wasn't swimming in reverb, which was the original concern. All the track needed—and all we could do, anyway—was add a little bit of EQ here and there and a little extra echo."

Like many recordings from that era and before, CD versions and FM radio reveal all sorts of anomalies on the tracks. You can hear the bangles of the tambourine being moved away from the microphone in between verse and chorus, and there's one spot where the tine sound is slightly out of time and sounds like it was accidentally hit. Recordings like "Rag Doll" were never intended for this kind of microscopic scrutiny, but Gaudio says it wasn't an issue then or now. "It really became part of the sound," he says. "It created a sound that was fresh and worked on radio."

The hurried nature of the making of "Rag Doll" didn't end with the session that Sunday night. Gaudio remembers that it was rushed to mastering and was on the radio within 10 days of the session. But The Four Seasons were old hands at doing things quickly. "We once did an entire Christmas album in 28 hours," Gaudio says proudly. "And right after that we did five shows at the Apollo. Now *that's* fast." ■

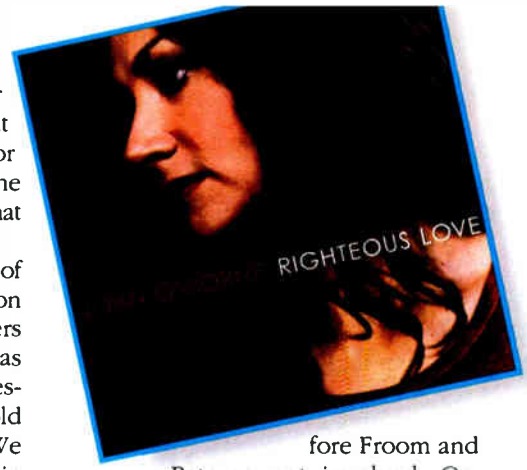
—FROM PAGE 172, JOAN OSBORNE

ments that offer considerable textural variety under Osborne's commanding voice. There's a definite Middle Eastern influence in a couple of songs (a by-product of Osborne studying with the late, great Qawwali singer Nusrat Fateh Ali Kahn during her recording hiatus), some finger-poppin' funk (including a raucous cover of Gary Wright's "My Love Is Alive"), dashes of Beatles-inspired pop, gospel touches, and even an ethereal Dylan cover ("Make You Feel My Love"). It's an eclectic melange, but Osborne has the voice and personality to pull it all together. There may not be a song on *Righteous Love* with the quirky, naïve charm of "One of Us," but the new CD is solid through and through. It's that rare CD with no weak songs.

PHOTO: JOHN PATERNO

Studio A's control room crammed with gear, some of it brought in by Mitchell Froom and John Paterno.

The CD ended up being relatively easy to make—it was recorded in just 28 days at the Sound Factory in L.A. by Froom and engineer John Paterno, then mixed by Bob Clearmountain at his Mix This! Studio. But for many months before Froom and Paterno got involved, Osborne was foundering, unsure of which direction she wanted to take the material. "She tried a bunch of different scenarios, and for whatever reasons they weren't satisfactory to her," Froom comments. "It's daunting when you're coming off a big success. It's like for some reason nothing is ever good enough.



"We had originally talked a little bit back toward the beginning and the timing hadn't worked out," Froom continues. "I liked her, and we met up once or twice over those years, and at a certain point she was getting pretty frustrated, so finally I was in a position where I had some time and we were talking and I said, 'Well, if you want, give me everything you've done so far and maybe we'll try something.' She originally talked to me about working on two songs, 'Righteous Love' being one of them because she thought I'd like that. And, when I heard the tapes, I liked quite a few of the songs, so I said, 'Instead of looking at one song as a single kind of thing, I'd like to start in and do four or five songs, and if we like it we'll just keep going.' And she was into that idea.

"A lot of the songs had been cut to be records by various people, and there were different versions of different songs. There were a lot of very good ideas on these tapes they'd done. She had developed a lot of vocal ideas, and there were some musical things that were pretty good. But a lot of it seemed sort of sonically dark to me and not outgoing enough for her voice and the way she delivers things. So in talking to her and listening to what she had done, I developed a concept of the way I thought the record should sound."

The first thing Froom did when he came onboard was bring in some of his favorite players to be a *band* on the

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record: The core group of drummer Pete Thomas (of Elvis Costello fame), bassist Davey Faragher and guitarist Val McCallum have played on many records in L.A., have worked as the backing band for Vonda Shepherd on (and off) *Ally McBeal* and even have a semi-serious club band called Jackshit (as in "you don't know jackshit") that plays unusual country and rock cover tunes. Besides being a producer, Froom is an accomplished keyboardist and arranger, so he plays on the album, too, and he enlisted sax player Steve Berlin of Los Lobos for a few cuts; all in all, it's a cookin' little unit that frames Osborne's vocals wonderfully.

"She's truly an amazing singer," Froom says. "She didn't feel her first record showed her vocal talent, and I'd have to agree. If all people have heard is 'One of Us,' they haven't heard the real Joan. She's not like a white pop singer. She has a *lot* of soul influence. You can hear blues and R&B in her phrasing. She's also listened to a lot of Indian music, and we let that creep in there, too. It's just a different kind of soul singing, really."

Froom has used the Sound Factory as his main base of operations for nearly 15 years, and the studio has an illustrious history that stretches back many years before that, to the golden age of the L.A. singer/songwriter boom. Often Froom works in Studio B, but *Righteous Love* was cut in the larger Studio A; both rooms are equipped with API consoles, and the facility as a whole is noted for its fine mic collection and extensive outboard gear. Froom knows the rooms and the equipment inside out, and the same could be said for engineer John Paterno, who was an assistant at the Sound Factory for many years and first worked with Froom and his usual studio partner-in-compression, engineer Tchad Blake, on the groundbreaking Los Lobos album *Kiko*. Froom and Blake still work together often, "but more and more we've taken a break from each other, which is healthy," Froom says. "John trained under Tchad for a long time, but over the past couple of years, since he's stopped as a second engineer and established himself, he's really come into his own. I thought the engineering on this record was magnificent.

"He doesn't do what Tchad does at all," Froom adds. "He has his own taste and the way he likes things. I think he likes things slightly less eccentric. But I know when he goes for something it's going to be good. He doesn't settle for any kind of weak engineering, and he's really fast and easygoing, and he's gotten into Pro Tools, which is very handy for some things. He's a guy of the future. I know when Bob Clearmountain mixed it, he was very impressed with the quality of the engineering."

PHOTO: JOHN PATERNO

Pete Thomas' drums were recorded with a combination of close and room mics, and even through guitar pedals.

Paterno notes, "I love what Tchad and Mitchell do, but I'm not Tchad; I don't hear everything the same way he does. I have a different aesthetic. I don't think I sound like him, but a lot of my approaches come from working with him. I'm indebted to him for the rest of my life because I learned so much from him. He's a great friend of mine to this day. But I didn't think for one second about it sounding or not sounding like this or that. I just did what I thought the music required, talking to Mitchell and Joan and the musicians and hearing the sounds they were starting with. My gig is to make everybody comfortable and to make it sound like a record as soon as possible."

Most of the backing tracks were cut with the trio, plus Froom, laying down their parts live. A few arrangements began as loops cut to Pro Tools: On the Qawwali-influenced "If I Were Your Man," for instance, "we created a loop for that rubber-bandy guitar figure, and that gave an atmosphere to start around," Froom says. "That was a guitar tuned funny and then played by the drummer hitting it with a pencil [while McCallum did the fingering]. Then the notion was to surround that exotic sound with some things that were sort of pop." The bass drum, snare and shakers on that tune were also looped.

Much of the art and innovation in Froom's productions come from the choices that he and his musicians make in instrumentation and then, in conjunction with the engineer, determining how those instruments are recorded. He loves to combine instruments in unusual ways, loves to try different amplifiers, microphones and sonic treatments. For example, one of the hallmarks of his partnership with Blake, which Paterno also embraces, is using funky, old guitar effect pedals on drums and vocals.

I asked Froom if he keeps a zillion keyboards on hand to give himself as many options as possible. "Actually, I just had six or seven keyboards, but I had a lot of guitars and guitar pedals. Sometimes it's a good idea *not* to have everything there because it gets way too crowded, and secondly you're more likely to get more out of an instrument if you have less around. It forces you to try new things so you don't settle quickly for things you've done before.

"I'm into textural combinations. Sometimes a song needs an actual rhythmic keyboard part that contributes to the combo sound, but I'm as likely to look for a guitar part. I primarily think of myself as an orchestrator, putting things together. A lot of that comes from the George Martin school, where you combine a few instruments to create a sound of a new instrument, or doing things in octaves or whatever to make them bigger."

"There are a couple of things on this record that people are going to think are guitars but they're actually Mitchell," Paterno notes. "There's a part on 'Grand Illusion' that's a Wurlitzer through a ring modulator, and then on top of that there's a high guitar note, and it's panned together and becomes one sound, but it's actually two different instruments."

For the most part, McCallum's guitars were recorded using an SM57 and a KM86 a couple of inches off whatever amp was chosen for a song. "We used mostly small amps, which is a Mitchell thing," Paterno says with a chuckle. "We also ended up doing some direct guitar on this record. 'Running Out of

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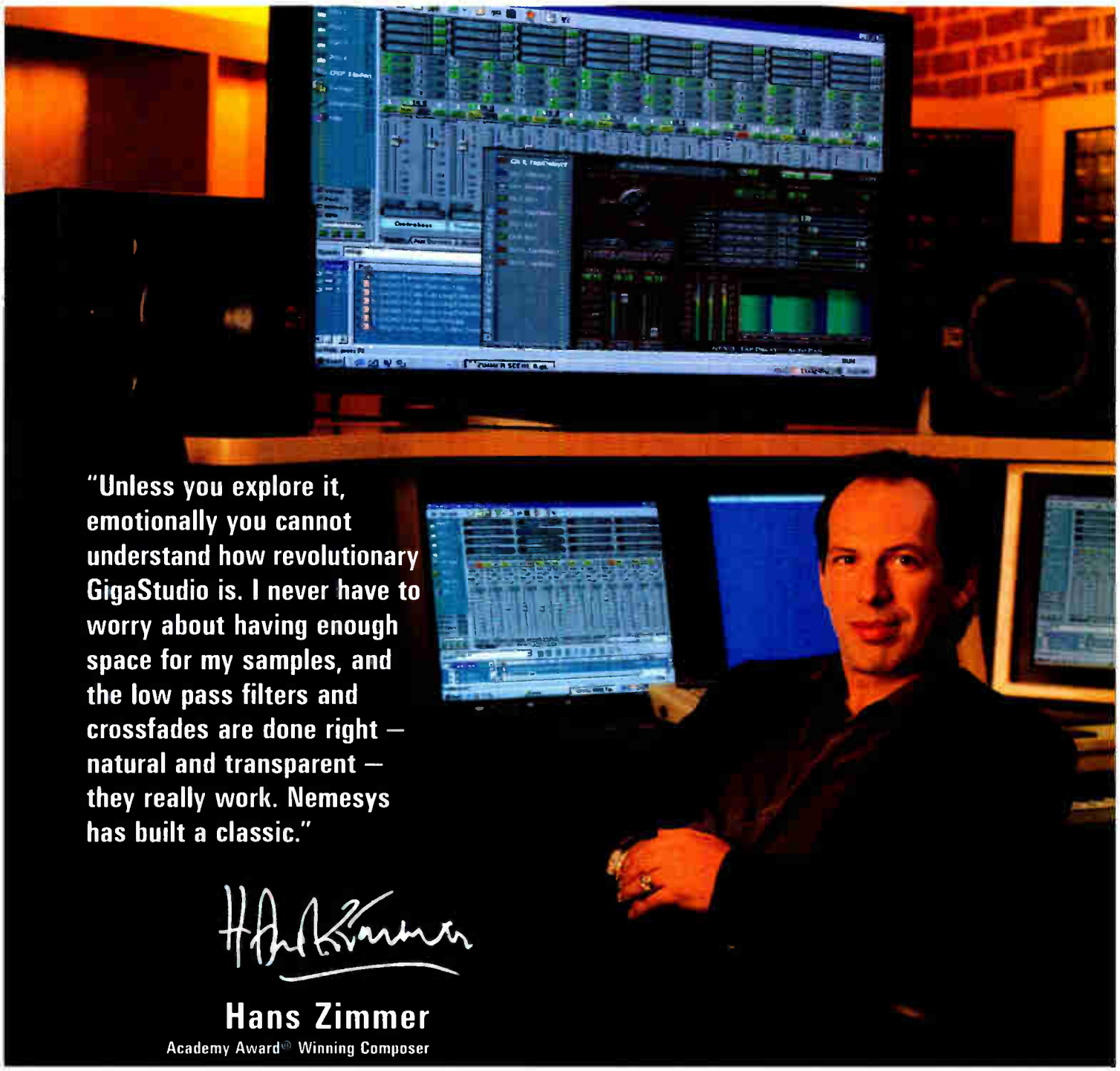

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Time' has that. We used a Les Paul a lot for direct sounds. 'My Love Is Alive' is a Fuzz Factory directly into the board." Besides the Les Paul, McCallum's arsenal included various Telecasters, a Fender Jaguar, a Gibson Firebird and a White lap steel. "The room where we had the guitars is really bright," Paterno notes. "It has plaster walls and a linoleum floor. It's really ambient and sounds great. I think it was the lobby of the Studio A building when it was originally designed and built for the Stones by [producer] David Hassinger. I don't think the Stones ever set foot in the building, though."

Osborne was in a nearby vocal booth singing into a Telefunken 251, run through a Hardy M-1 preamp and an ADL 1000 compressor directly to tape, which was BASF 911 24-track, 15 ips with Dolby SR. "The vocals and drums didn't go through board mic pre's," Paterno comments, "though the drums were bused together using the console, and sometimes I might have even added a little API EQ after the Neve modules used on the kick, snare, toms and overheads; those were all Neve 1073s."

As for drum miking, Paterno likes to experiment with different combinations and notes: "I also usually have this mono trashy thing going on. I put up a couple of mics around the kit—sometimes it's just an Altec salt shaker that I leave on the floor underneath the snare drum and it immediately sounds like distortion. So I'll put up a couple of mics and if I want a more distant sound, if I've got a mic, like a Sennheiser 441 or a U47 a little further away from the kit, I'll bring that up and put it through some kind of compressor or Dynacomp or something. And that's usually blended into the big picture. That's something I got from Tchad—great sounds and then some mangled things to go along with it.

"'My Love Is Alive' had a completely different approach," he continues. "The phaser on that was printed. It was a Moog phaser on one of the overheads, and then I gated the drums quite a bit and had a couple of 87s up in the room and pounded them with an 1176 or a Spectrasonic 610."

The 610 is part of the arsenal of equipment that Paterno personally owns. Some of the other gear he brought includes Hardy preamps, Amek 9098 EQs, Calrec PQ15 EQs, Little Labs DIs, various guitars and pedals, Sansamps and a Distressor, which he says is "the best piece of gear to come out in the last several years."

Rather than recording the songs piecemeal over an extended period and then putting it all together, the musicians and technical team "worked on one song at a time," Paterno says. "We'd do one song completely before we'd move on, including fixes and overdubs. We'd do tracking one day, then do the vocal the next morning, then overdubs, and when we ran out of tracks it was done," he says with a laugh. Osborne's vocals were usually comped from just a few takes, and in the case of "My Love Is Alive," "We got the track, and Joan went out and sang it once; she nailed it," Froom says. For the couple of songs that required strings, Froom eschewed using a large orchestra—"I usually don't get a big section," he says. "I'm a bit intimidated by it. So I usually just get about six people and then make sure that it works right and then track it." (Two of the songs on the album came from the sessions that took place before Froom and Paterno got involved, though some new parts were added to them.)

PHOTO: JOHN PATERNO

Froom and Paterno like to record guitars through many different-sounding, mostly small amps. The mics are an SM57 and a KM86.

After the month of recording, Froom and Paterno turned the tapes over to master mixer Bob Clearmountain. Froom says, "I took the roughs and met with Bob and talked to him conceptually. I told him I wanted it a bit more raw than some of the things people associate with him, but at the same time you still want it to be like one of his mixes that sounds great on all systems. I wanted *his* version of in-your-face raw and loose and funky; not too polished. Some of the mixes are magnificent, like 'Angel Face' and 'Hurricane.' And I couldn't even tell you exactly what he did; it's just a way that he has of putting things together and how he puts things in their own space and the dimension he creates. Even on some of the panning, he went a different route than he did on some of the things I've worked on with him before. For a record like this to come out great you've got to give people space. You've got to hire the right people but then give them as much space as you can and kind of go with their concept as much as you can."

"It was a team effort all the way," Paterno agrees. "In a way, everybody had something to prove and everybody really stepped up."

Osborne wanted to prove that she could successfully follow up *Relish*. Paterno wanted to show that he could handle such an important, high-profile project. And Mitchell Froom wanted to break out of his pigeonhole as a guy who makes sonically adventurous but not particularly commercial records.

"With Joan, there will probably be some people who are horrified that I worked on it, thinking that I'm going to make it completely, willfully strange," Froom says. "But the reality is I look at each record in a very different way. I'm more and more now of the frame of mind that if you set out to make a pop record, you make a pop record, and hopefully you make a cool one that's not completely generic, and hopefully it shows the personality of what the band or the singer's about. In Joan's case we did what we thought was a cool pop version of what she's about. We could have made a very dark, bizarre record all based on strange sounds, and it would've worked, but it never would've been released.

"An engineer told me that some record company guy had screamed at him, 'I don't want this sounding like a Mitchell Froom-Tchad Blake record'; like, 'Don't do anything weird.' In the late '80s I was thought of as this kind of pop guy, and when the '90s came we did [Los Lobos'] *Kiko* and people started to say, 'Oh, they're up to something interesting.' Then a few more years go by and you're suddenly pigeonholed in this other way. It's the same with musicians, it's probably the same for writers—that the very thing you're loved for you're all of a sudden despised for. So in order to survive, you have to reinvent yourself while holding on to your integrity and continuing to do interesting stuff. And Joan's album fits in with that. It was a situation where everything was right. There were very few failures and it felt lucky and it was real exciting. It just flew together." ■

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—*FROM PAGE 173, GREEN DAY*

"There was an SSL 4000 in there, but it wasn't something I wanted to record through," says Allardyce. "I'm not a fan of the older SSLs; we used it to monitor through, but not to record through."

While *Nimrod* was recorded to tape, the *Warning* sessions were tracked right into Pro Tools. "I suppose they just wanted to stay abreast of technology," explains Allardyce of the band's choice. "It was the ease of everything, and we tried to speed things along. I'm not convinced that it's quicker, really; in the long run, you get more options that you can play around with it more."

Still, even with all the options Pro Tools presents, "it was incredibly fast," he says, "to the point that we were getting three [drum] tracks a day. That's pretty quick for these guys; certainly with *Nimrod* we would spend a day per drum track. On this record we just blew through them within a week."

Cool's kit remained consistent, with snares, cymbals and drum tuning being changed only sporadically. Allardyce turned to many of the usual suspects when it came to drum kit microphones: The bass drum got an AKG D-112 and Neumann U47 FET, the snare had a Shure 57 on top and a Sony C-55P on the bottom, and the toms were recorded via AKG C-12As. There was a C-55P on the hi-hat and an AKG 414 on the ride cymbal. Occasionally, Allardyce threw a Neumann KM84 on the hat, too. He used Telefunken 251s as overheads; room mics included 251s on a close room, Neumann M50s farther away, and one M149. They also used a Neumann U87 and several Shure SM57s for cool tones that were compressed room reflections.

Bassist Mike Dirnt had a setup that included three different Mesa/Boogie cabinets—a 4x10, a 2x15 and one with four 10s and a 15, each with its own tone. "Between those three, you could get from a real rich bottom end, to midrange, to click-y, kind of attack-y, bright things," Allardyce explains. "So, basically we had all three running at the same time, and you could do a blend of what you wanted out of it. That was a bit of departure, but I'm really pleased with how that came out."

Armstrong's guitars also received careful attention, especially considering he was playing more acoustic guitars than ever before. "We changed guitars a lot; we played probably 10 different guitars," Allardyce says. "The different colors come from the different guitars. We had a couple of 4x12 Marshall cabinets; on one we put a Marshall through it, and through the other we put a Fender Bassman. The basic Marshall, Fender Bassman was the sound each time." The acoustic guitars were either miked with a pair of 251s or went through a direct box or miked at an amp.

As for the vocal tracks, Armstrong is an interesting study because he prefers to sing his vocals alone in the control room. No engineer, no bandmates—just him, a pair of headphones and a controller. It's a formula he and Allardyce uncovered during the recording of *Nimrod*. "I've done it both ways with him," Allardyce explains. "He's sung with me just sort of being there and working with him, and it gets done, but on *Nimrod* we hit upon this method of doing it by himself. This time I suggested it to him again. At first he said he didn't know, then I said, 'Let's try it, I know it works well with you.' He tried it and said it was the most comfortable for him."

Allardyce used a Sony prototype microphone run through a Neve 1073 and a dbx 160. "He'll bang off a few takes and then we sit down together and comp it," he explains. "Again, he did it really quickly. He didn't have his voice strong enough to do one song after the other, but we'd do one a day."

Cool explains the recording dates simply: "We record what we sound like; we don't try to put it into a computer and change what we sound like. We're actually good musicians who can play and we're good singers, so there's no need for any of that tricky business, you know. We're just trying to get as many good sounds as we can."

And rather than turning to an outside producer—Rob Cavallo had produced the band's previous offerings and served as the executive producer for *Warning*—the band opted to produce themselves. "We know how to make records and we know what we want to get out of it," says Cool. "We don't really want to put it through another translator or filter the process. We want to make it a genuine statement from us, as far as even recording it at home in Oakland. It's just a true statement of where we are in our lives."

Allardyce says he kept his use of Pro Tools very simple on the project. "To be honest, with a band like Green Day I wouldn't want to take the approach of using Pro Tools to do a lot of what it's capable of, because that's a little self-defeating in their case," he says. "Basically they're a live band who play, so if we started to get too tricky—the temptation

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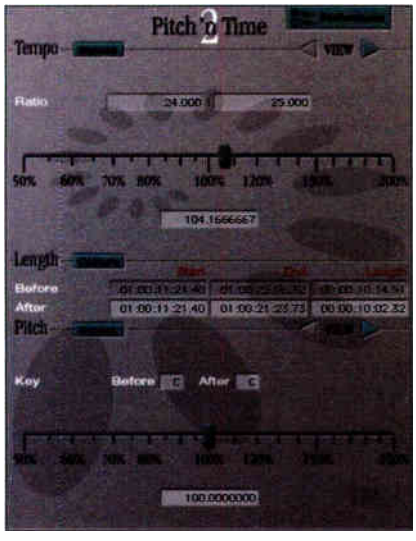

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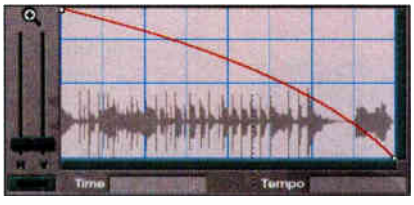

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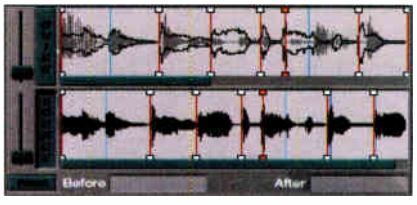

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is always there, of course—but I figured it would homogenize their trip too much. It would take a bit of the rawness out of them, if we started to get too tricky with the Pro Tools. So, we stayed clear of that."

Cool adds, "If you go pristine in recording, you're going to sound like Sting, and over-thought and over-clear, too sweet. We get good sounds that represent our attitudes and where we're coming from. If they're dirty, if they're buzzy, but we like it, that's what we like. Yeah, in some cases the pristine is called for, so there it is. In some cases we want a transitory sound on something, or more pushed."

While most of the songs on the disc are fairly straightforward in their arrangements, a few stretched the band in ways they never have been before. One track in particular, "Misery," has layers upon layers of different styles grafted into one rather messy whole. "Yeah, bloody hell, that is covered in shit," Allardyce says. "That was a tough one in that it's got so much different stuff on it. I think what we did was put a bunch of stuff on it and it was kind of selected in the mix a little more, because there was such a wide range of instrumentation on it and a whole bunch of styles as well."

"We got David Campbell to do strings, we had a Mariachi band, [keyboardist] Benmont Tench and an Italian band," Cool says. "We knew when we designed it that we were going to have a ton of stuff on it, but it's interesting to put it on and hear it back. That was 80 tracks." And that's where the calm and collected mixer Jack Joseph Puig came into the fold. "It's funny—Jack Joseph loves that shit. He doesn't even trip."

We record what we sound like; we don't try to put it into a computer and change what we sound like.

—Tre Cool

Puig comments that mixing the album at his room at Ocean Way Studios in L.A. (see the October 2000 cover of *Mix*) was an exciting time. "It's an album full of really great songs, without a doubt," he says. "They're an amazing band, they play really well together. They're great record makers, actually. They produced this one themselves, so they were very involved in it, they were very hands-on, and very in-there, and gave great input.

"Some albums have a lot of variety emotionally," he continues, "and some start off one way and that's what they are and that's fine. This album has quite a bit of variety to it."

Looking back now, Cool is proud of the album and explains that the band is not reacting to any style of fashionable music today. "That doesn't affect us at all, man," he says. "We're not the kind of band that goes around jumping on bandwagons, as you can tell from our catalog. We're more like the people who start it. That's where we're at now—we've got a new batch of shit for bands to copy. You won't find any Limp Bizkit or Korn in my record collection; you might find it in my refrigerator. We're an incredibly successful band, we don't have anything to prove. We just want to make music to make ourselves happy and sound good." ■

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—FROM PAGE 173, KELTNER

stuff on part of a drum-set without a bass drum or snare."

During breaks between the sessions at Ocean Way Studios in Hollywood, the drummers sometimes had long down periods. To amuse themselves, they would often jam and then listen to the results on tape. Taking advantage of the situation, Keltner thought it would be a great time to experiment. "He asked me to play on some of these 'things' that he'd done," Watts recalls. The "things" that Watts refers to were Keltner's sequences made from his collection of samples. "I started back in '85 collecting samples," Keltner says, "anything from a metallic shelf that you find in a basement to a fish steamer. I mean *anything*, but I don't use other people's samples. I have things I transferred from a cassette tape that I've had for 10 years. Then I sampled them into an SDS-7, then later into sequencers. I don't actually have many drum sounds; I do have a real bass drum in there somewhere.

"Also I have a lot of sequencers. One of my favorites is still the old E-mu SP-1200. I would throw [the samples] together in a groove, but they aren't loops. I'm careful about doing those, because they're very boring. Anybody can do a loop, basically. I live by the 'Song Mode' on my sequencer. What I created are songs that go from a verse to chorus to a bridge.

I play the same drums and the same way that I play with the Rolling Stones, except that the songs I'm playing to are electronic instead.

—Charlie Watts

They don't come off that way to the average listener unless you have a vocal or a strong melody. The ones I brought down weren't completed with a melody, but structurally they were. So I just wanted to see what it would be like to have Charlie's drums on there."

Upon first hearing the sequences, Watts didn't know what Keltner had in mind. "So I asked where would I come in or if I could just climb in," Watts recalls. "Jim's a drummer, and a very fine one, so I said, 'You do them.' But he said, 'I want you to play on my little songs.' So I said fine; we had the opportunity and did it. I personally play the same drums and the same way that I play with the Rolling Stones, except that the songs I'm playing to are electronic instead. The selections are a bit more than jams, however, because of Jim's sequences. But it wasn't like we came in every day strictly to work on this; it was actually rather loose."

Keltner, who at the time of this interview was working on a similar solo CD, affirms, "The Stones and Charlie aren't very precious about the stuff they do. They're very spur-of-the-moment."

One interesting aspect of the CD is that all of the tracks are named after various distinguished jazz drummers. "I like all the tunes," Watts points out. "I used the drummers' names because Tony Williams had just died that week, and his was the first cut. That gave me

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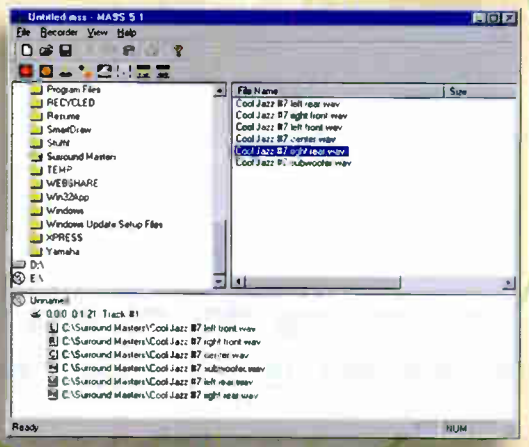

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the idea to call all the rest after drummers. Jim titles [the samples/sequences] by where he recorded them, and what he used on them. 'Elvin' [after Elvin Jones] is actually structured to be Africa, Airto is Brazil, and the others are all around."

After the *Babylon* sessions wrapped up, the Stones went on tour in support of the CD. Watts' and Keltner's pet project went untouched for more than a year. After reviewing the tapes, which were recorded on 24-track analog, Keltner realized that more studio time and a program such as Pro Tools were needed to complete it. While hanging out in Paris in 1998 during an interlude between tours, Watts started looking into fashioning the tapes into something workable. He recalls the scenario: "Jim had said [the project] needs Pro Tools, and I didn't know what the hell he was talking about. So I walked into this studio [Twin Studios] in Paris and said I needed someone to Pro Tools these [tapes] properly. I had already chopped them up. So they said there's a man down the end of the corridor sitting in his little room. And there he was—Phillippe Chauveau. He Pro Tooled the tapes pretty quickly, so then I started having him arrange things. At the end of the month, it came out like it is."

Of course, there was a lot more to the process than that. Watts freely admits he only likes being in studios to play. He loathes all the other aspects of studio work, such as mixing and editing. "I would hate to do what Phillippe does for a living," he says. "Sit at a screen and working with Pro Tools would drive me mad." Fortunately for both Watts and Keltner's sake, Chauveau, who had worked on many world music and ambient recordings, didn't subscribe to those sentiments. "When I first met Charlie Watts," he recalls from his studio in Paris, "it was only to fix one part of the drumming. I had never worked with him before, but I knew immediately who he was, because he was one the legends of rock 'n' roll. He's actually on-track with the technology, but he doesn't know how to fix things. But he did want to learn and asked a lot of questions about how the equipment worked. So I ended up working with him for 29 days to fix everything. Charlie kind of knew how he wanted to translate the jams into compositions."

They added ambience, samples and even some real musicians—Kenny Aronoff and George C. Recile on percussion, Marek Czerwiawski on violin, Emanuel Sourdeix on piano, Remy Vignolo on bass, Blondie Chaplin on vocals, and Keith Richards on guitar. Watts, however, wasn't at the studio with Chauveau for the entire process.

"Sometimes he would stay with me to help me find things," the engineer/programmer says. "Other times he would prefer to let me work on my own to check and find things. It was a real pleasure to work with him. He's an uncomplicated man and very honest. What I remember most was that he took the time to listen, he'd let me work, and at the end he'd tell if he liked or didn't like what I had done. Then he would explain either way."

Augmenting Keltner's samples, the Frenchman contributed Middle Eastern-flavored voices and samples along with his own percussion playing. "[Watts] asked me to find things for atmosphere," he says. "He didn't care if it was sampled or real. He was really attracted to the weird stuff. I used Pro Tools mostly because it's more efficient when it comes to moving things around." Many of the effects on the disc were

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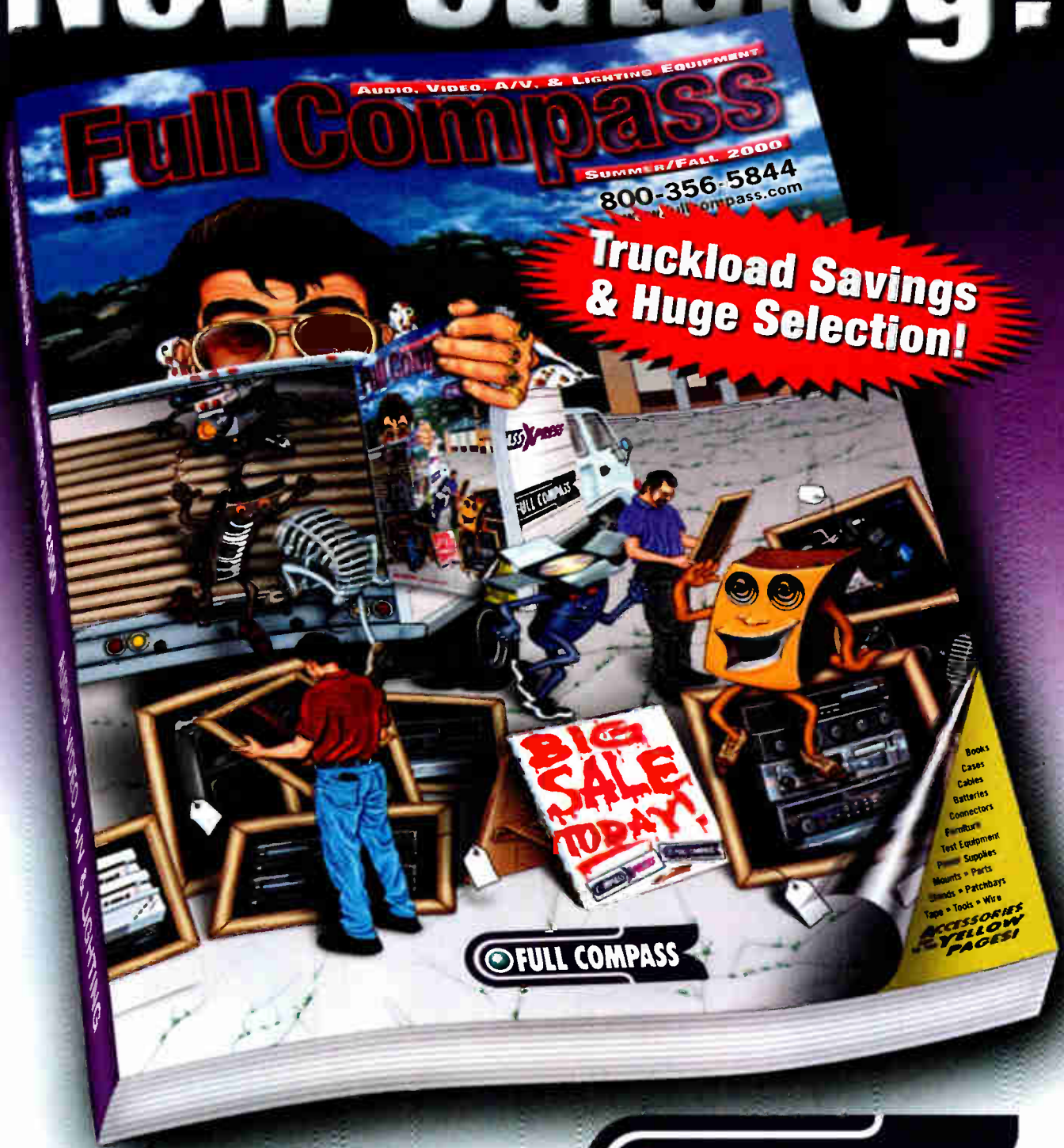

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created using a Sherman Filter Bank. The mixing was done at the Paris studio, which encompasses two large rooms for recording/mixing sessions and a smaller room with an abundance of digital equipment for editing and commercial production.

Although the *Charlie Watts Jim Keltner Project* is essentially an electronic work, it still has blemishes, quirks and uneven qualities that are rarely heard on recordings of this type. Though not totally by design, these are some of the characteristics of the recording that Keltner is most proud of.

"Charlie has great taste in everything he does, always has," says Keltner. "He left all the little quirky parts and loose bits in, and rightfully so. That's the way it went down at the time, so let's go with that." Chauveau, who once played drums on sessions with Stevie Wonder and Nina Hagen, never met Keltner and had to figure out what his intentions were. "I only really know [Keltner] through the recordings," he says. "I did speak with him several times to check into a few things, such as the sequences and programming he'd done. That was to make sure I fully knew the way he wanted things to be organized."

Keltner, on the other hand, had to trust both Watts and Chauveau to sculpt the many hours of jamming into something palatable. "I wasn't a part of that at all," he notes. "I was completely surprised. I had encouraged Charlie to go to someone with Pro Tools to mess with it a bit and edit some things. But I had no idea he would go to such lengths. It would have been a very expensive proposition for me to go to Paris. I trusted Charlie implicitly with this. In some people's hands, they would have used the Pro Tools to 'make it better,' such as chopping it up a lot, using only the good bits, and they would have wanted to straighten out the beats where the time went a little screwy. But thank God that Charlie was in charge, while I was thousands of miles away in Los Angeles." ■

—FROM PAGE 176, COOL SPINS

Christmas, but the best songs are so overflowing with Spectorian spirit that only a Grinch would complain. The arrangements are by the late, great Jack Nitzsche.

Producer: Phil Spector. Engineer: Larry Levine. Studio: Gold Star (Hollywood).

The Roches: *We Three Kings* (MCA, 1990) Sisters Maggie, Terre and Suzzy Roche put their beautiful and distinctive harmony blend to marvelous use on this 24-song collection of mostly

well-known holiday tunes. Whether soaring through religious hymns or scampering through playful numbers, The Roches' deft touch always sounds fresh and inspired. My one disappointment with the disc is that it does not include their fabulous arrangement of Handel's "Hallelujah Chorus," the Easter chorale that's become so closely identified with Christmas.

Producers: The Roches and Jeffrey Lesser. Engineer: Jeffrey Lesser. Studio: RPM (NY).

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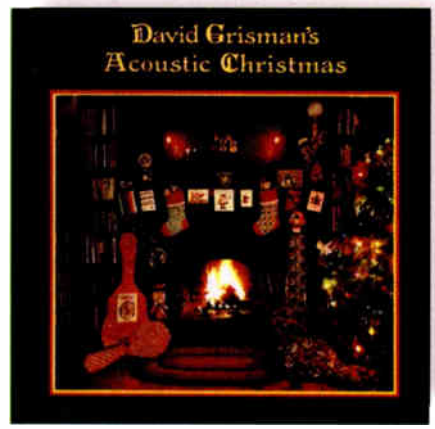
Wynton Marsalis: *Crescent City Christmas Card* (CBS, 1989)

In a mainly up and lightheartec mood, jazz trumpeter Marsalis leads his late '80s sextet through a well-chosen collection of holiday standards, many of them rearranged to have a little N'awlins feel. High-profile guests include clarinetist Alvin Batiste and singers Kathleen Battle and Jon Hendricks.

Producer: Stephen Epstein. Engineers: Tim Geelan and Dennis Ferrante. Studio: CBS (NY).

***David Grisman's Acoustic Christmas* (Rounder, 1986)**

Like everything mandolinist David Grisman does, this CD is loaded with chops, spirit and



good taste. His group on this outing includes some of the best players of the new acoustic movement, all of whom have gone on to do great things since their days with Dawg Grisman: Mike Marshall, Darol Anger, Rob Wasserman, Martin Taylor and Bela Fleck, augmented by recorders (the instrument), piano and sax on several cuts. The ensemble's jazzy take "God Rest Ye Merry Gentlemen" has a fluttering bebop flavor, while the ballads "White Christmas" and "Auld Lang Syne" are warm and affecting.

Producer: David Grisman. Engineers: Bob Shumaker and Phil Sawyer. Studio: 1750 Arch Studios (Berkeley, CA).

Various Artists: *Narada Christmas Collection* (Narada, 1988)

At its best, so-called "new age" music (an odious term) has a soothing and relaxing quality that does elevate the spirit and set the mind to wandering in pleasant directions. This collection features some of the best-known pioneers of the genre—including David Arkenstone, David Lanz & Paul Speer, Peter Buffett, Eric Tingstad and Nancy Rumbel—floating through some familiar and obscure seasonal numbers. Synth washes abound, as you'd expect, but there is also lovely soloing on cello, guitar, lute, harp guitar, ocarina, piano and other instruments.

Producers: Eric Lindert, Spencer Brewer, Peter Buffett, David Lanz and Paul Speer, Nancy Rumbel, William Elwood, Billy Oskay. Engineers: David Vartanian, Russell Bond, David Scott, Paul Speer, Lary (sic) Nefzger, Ian Thomas, Billy Oskay. Studios: DV Productions (Milwaukee), Edenwood Studios (Dallas), Music Annex (Menlo Park, CA), Independent Sound (San Francisco), Miramar Studios (Seattle), Triad Studios (Redmond, WA), Ian Thomas Productions (Winona, Ont.).

Various Artists: *Jingle Bell Jazz* (Columbia, 1962)

This is the granddaddy of the many fine Christmas jazz compilations, a record so good you might even play it after the holidays are over. There are lots of big names here—Duke Ellington, Lionel Hampton, Carmen McRae, Paul Horn, Chico Hamilton, Herbie Hancock, Miles Davis, Dave Brubeck and more—and, without fail, the arrangements and the playing are stellar, whether for a large group or an intimate ensemble. A couple of these tracks also appear on *Hipster's Holiday*; both are worth owning.

Producers: Teo Macero, Irving Townsend (one track), Frank Driggs (one track). Engineers: Frank Laico, Murray Zimney, Harold Chapman. Studio: Columbia (NY).

King's College Choir: *O Come All Ye Faithful* (Argo/Decca, 1984)

This is a CD of traditional religious and secular carols and a few lesser-known holiday folk tunes, beautifully sung by the world-renowned King's College Choir of Cambridge, England. It's

a relatively small group (especially compared to the Mormon Tabernacle Choir), and that means you can hear more character in the individual voices rather than just a giant choral schmear. The KCC has put out a number of CDs of Christmas music since this one—in fact it's become something of a cottage industry for the group—but this is the only one I can vouch for personally. Pass the roast beef and Yorkshire pudding!

Producer: Chris Hazell. Engineer: Simon Eadon. Recorded at King's College Chapel. ■

COAST TO

Over at American Recording, L to R: producer/engineer David Z, John Mayall and bassist Dovid Smith

PHOTO: LYNN CAREY SAYLOR

L.A. GRAPEVINE

by Maureen Droney

Dropped in at American Recording where I found legendary blues/rock artist John Mayall recording a new project with producer/engineer David Z (Collective Soul, Johnny Lang, Prince). The laid-back atmosphere at the secluded Calabasas studio must have been deceiving, because according to Z, the team had cut 12 tracks in five days on American's Trident A-Range console.

Mayall, as anyone who doesn't know should, is often called the "elder statesman of British Blues." His seminal group The Bluesbreakers have been deemed more a concept than a band (largely because of its rotating personnel), and they influenced a generation of British musicians. Mayall made his first record in 1964, and he's still prolific, with five albums alone released since 1995. The new album (his 52nd, not counting compilations!) is the third that he's recorded at American. This time around, the project will be a bit different, featuring all-star cameos—many of them by Bluesbreakers alumni—and tunes composed entirely by outside writers.

During the first week of recording, the core band—comprising Mayall on guitar, bassist David Smith, drummer Joey Yuele and rhythm guitar player Buddy Whittington—were joined by keyboardist Billy Preston on clavinet, melodica, Wurlitzer and vocals, plus ZZ Top guitarist Billy Gibbons, Bonnie Raitt, organist Tom Canning and jazz saxophonist Red Holloway. Set to participate in the next round of recording in England are Jeff Beck and Jimmy Page. Also part of the scheduled lineup are Steve Miller and Fleetwood Mac's Mick Fleetwood

—CONTINUED ON PAGE 198

NY METRO REPORT

by Gary Eskow

Often framed as a debate between die-hard analog adherents and digital "have-to-haves" that catch studio owners in the crossfire, the evolutionary state of the recording industry may in fact be at a stage where coexistence is the key. Peter Denenberg and Rory Young recently celebrated the 20th anniversary of their facility, Acme Recording, located in Mamaroneck, N.Y., by renovating part of their space, which overlooks the scenic Mamaroneck Bay, and installing both a vintage Neve console and a fully blown out Pro Tools|24 MIX Plus system. Why?

For one thing, Denenberg cites the way that the tracking process has changed. In a sense, the window separating studio from control room has become a kind of Berlin Wall that had to fall. "Many of Acme's clients now have their own studios at home," he says. "Rory and I wanted to design an environment that would be more flexible and comfortable for these clients instead of jamming them and all their gear into a conventional control room. The control room has evolved from being the booth where just the engineer sits to being the room *everyone* wants to be in."

This fall, Acme opened Studio B, a suite of rooms designed to accommodate the new way clients work. "In addition to taking advantage of a perfect harbor view, the new rooms embrace Acme's 'big living room' concept, where artist, producer and

—CONTINUED ON PAGE 202

Seated, from left: artist David Mead and engineer John Holbrook. Standing, L to R: producer Adam Schlesinger, studio owner Walter Sear and assistant Aaron Franz at Sear Sound Inc.

COAST

PHOTO COURTESY OF SWING STUDIO PHOTOGRAPHY

Tree Sound studio owner Paul Diaz, left, and Speech of Arrested Development

NASHVILLE SKYLINE

by Dan Daley

End-of-the-year activity in Nashville is positive, though there are some harbingers of a shakeout even more fundamental than what the studio business has experienced in the past two years. On the one hand, the pace of smaller studio startups has increased, and those studios have been attracting new blood to the city. On the other hand, it's entirely possible that the beginning of the end for country music as a major genre is at hand. More on that in a moment.

The new generation of Nashville studios is characterized by small, affordable rooms run by young people with equal parts enthusiasm, optimism and attitude—three necessary components to even getting out of bed in the morning in this business. Nashville's new generation rely on a combination of mid-level digital and analog technology.

Take Brett Blanden's Brett's Place, for example: Two years ago, Malcolm Springer worked as the second engi-

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Engineer Jack Conners (left) and artist Jim Davenport at Perfect World Studios

PHOTO: DAVID GOGGIN

L to R: engineer John Hanlon, co-producer Ben Keith, Bernie Grundman and Neil Young

SESSIONS & STUDIO NEWS

NORTHEAST

Hip hop's seldom-dressed answer to Cher, Lil' Kim, and producer Fury were in Sound On Sound Recording (NYC) mixing some new material with engineer Axel Niehaus and assistant Richard Furch. Ed Cherry was tracking a new Justin Time release with producer Jim West, engineer Ian Terry and assistant Stennett Cyril. Def Jam artist Ja Rule mixed a new project with producer Top Dawg, engineer Duro and assistant Bart Migal. Also at Sound On Sound, Leon Redbone and producer Beryl Handler were in mixing some new cuts, with Tom Greto engineering and Migal along to assist... Over at Sear Sound Inc. (NYC), BMG artist David Mead was tracking with producer Adam Schlesinger and engineer John Holbrook. Producer Rob Friedrich worked with Telarc Records artist Freddie Cole on a new album; the effort was also co-produced by Todd Barkan. Vince Gill and producer Randy Scruggs were chipping away at a forthcoming MCA release. Producer Ralph Fall and engineer Eddie Miller were sifting through material for a Doors tribute album set for release on Elektra...On the other side of the tunnel, at Big Blue Meenie Studios (Jersey City, NJ), The Rosenbergs have been tracking and

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—FROM PAGE 196, L.A. GRAPEVINE

and John McVie.

Mayall and Z had not previously worked together. "I think he heard Johnny Lang's record or something," laughs Z. "He called me up out of a clear blue sky and said, 'I like what you're doing. Want to make a record?'"

Although he is Nashville-based, Z finds himself traveling a lot and easily gets comfortable on the road. Just prior to the Mayall project, he put in a long stint in England on a solo record for singer/actor Roland Gift of Fine Young Cannibals fame. (Z was producer and engineer of the Cannibals' monster '80s hit "She Drives Me Crazy.") "I travel pretty light," he notes. "I usually bring a few tricky little things, like guitar foot pedals, but John already has all sorts of weird stuff. The only thing I brought this time was my miniature Marshall amp."

The project is being recorded to analog 2-inch tape: Quantegy 499 at plus 5 hit hard (Z: "You're not supposed to see the meters move, right?"), with editing and looping done in American's fully loaded Pro Tools|24 MIX Plus system. American studio manager/staff engineer Bill Cooper has been handling Pro Tools chores, and he says that in the past year editing and DVD sessions have become mainstays at the facility. "We were actually getting bored a couple of years ago and thinking of getting out of the business. Then we bought Pro Tools. I like it and really have fun using it—it's kind of the ultimate video game!"

"It's been a very good experience working here," comments Z. "Bill's a very good Pro Tools operator. And they've got everything I need, really, as well as some stuff I haven't used before—like these [VacRac] vacuum tube limiters. We used them on Billy Preston's melodica, and John and Billy both sang through them. It's a very cool-sounding unit."

No release date is set yet for the record, and all involved are looking forward to the continuing process of recording it. "It's great to be working with John and all the others who are sitting in," says Z. "He's been a catalyst and responsible for inspiring a lot of people. In some ways, he's like everybody's uncle, and they all give him a lot of respect."

At Sonora Recorders in Los Feliz, Meredith Brooks was laying down some mean guitar on a track for the David Darling-produced debut album by Australian artist Gary Pinto. Sonora, owned by engineers Richard Barron and Jeff Peters (who was busy working on the Pinto session), is a word-of-mouth favorite with artists from Elliott Smith to Bruce Hornsby and Nancy Sinatra, popular for its friendly vibe, well-stocked snack table and primo combination of classic and new equipment.

Fitted with an API console, the facility is also home to dual Stephens 16/24 analog tape machines, two Pro Tools systems and an extensive vintage keyboard collection, as well as scads of other eclectic gear that both partners have collected over the years.

Barron was the previous owner of Boulevard Sound in Hollywood, and he recognized the value of Sonora's convenient, freeway-close location. "Boulevard Sound was upstairs over Woolworth's," he recalls. "A huge, old bizarre room. It sounded great, but you had to carry Marshall amps up two flights of stairs, and the neighborhood was a little too scary."

When Sonora, then owned by his friend Dennis Moody, became available, Barron made the move. "Dennis built it from scratch," he explains. "His ideas and basic design were great, but there

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wasn't much money available to realize them, so we've had to beef everything up. We've insulated, rebuilt walls, and for our latest project, we just had Art Kelm and Van Jordan redo the grounding and wiring.

"The performance space has always sounded really good, so we haven't changed it. It's got a lot of fans—many of them drummers. A lot of our business comes from drummers like Jim Keltner, Curt Bisquera and Hal Blaine. They bring projects here, because they like the sound of the room, so we've never wanted to mess with that."

Barron and Peters hooked up a few years ago when both were engineering on the same project. They hit it off, and it was a natural progression to become partners. "We liked the same kind of music and the same kind of gear," relates Barron, "and I liked the way he worked. We started talking, time went on, and he began dumping equipment over here. Like one day this huge package shows up with two RCA BA-6As that Jeff had found at a radio station in Scranton when he was on the road with the Beach Boys. It was 'I didn't know what to do with them, so I sent them to your studio!'

"There was lots of stuff like that," Barron continues. "Jeff's influence on the studio has been great. I'm more 'get it up and get it done,' and he's very detail-oriented. Jeff makes sure that everything gets nailed down and done properly. It's a combination that works."

Sonora has always been an API room, although the original console was smaller than the current desk, which was installed 10 months ago. The new 32x16x24 desk, one of the few light-colored versions, was previously owned by Laura Nyro. "I have to say one of the happiest days of my life was when this console finally arrived," says Barron. "It was originally built for Kendun Recorders in Burbank. It was at Kendun eight years, and then it went to Laura Nyro. She had it rebuilt and repainted at the API factory, supervised by Art Kelm. Art, who worked at Kendun and at Record One, which was an all API studio, also helped with our install.

"It's a good board to have," he continues. "There are a million studios with Neves and only a few with API. It's simpler, and it has its own sound that people adore. One of the nice things here is that because of the Stephens machines, you can have a Class A, discrete electronics path clear up to the tape head. That's what makes it sound so open. And since the Stephens has no pinch rollers, the high end stays on the tape!"

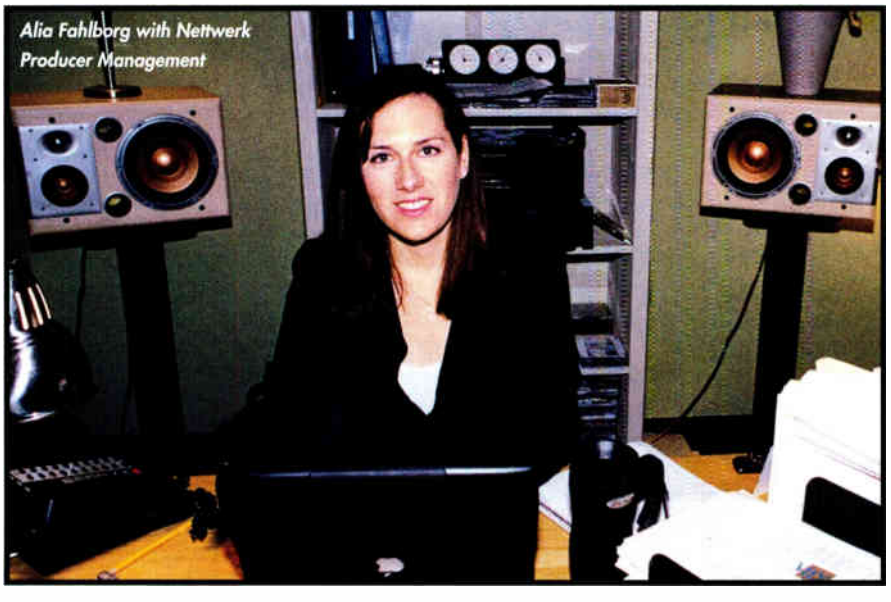
L to R: artist Gary Pinto and studio co-owners Jeff Peters and Richard Barrow at Sonora Recorders

Sonora is definitely the kind of relaxed, comfy place that makes you want to sit down and stay for a while. ("It's a musician trap," chuckles Barron.) Mood lighting and lots of comfy couches create the ambience, and then there's that gear: an original, double-wide Mellotron, a Chamberlin, a Kawai grand piano, a B3 with Leslie, a Fender Rhodes 72 and several very cool guitar amps.

In the control room: outboard mic pre's by Pultec, Manley, Neve, Jensen and Langevin, unusual stuff like Pye limiter/mic pre's, RCA BK-6 and 25, Manley, Summit and UREI limiters, and two EMT 140 plates, one tube and one solid-state. The mic selection is also good, encompassing the normal complement plus a fair amount of tubes and ribbons.

The main monitor system is a custom three-way with Altec 604Es and Mastering Lab crossovers. There are numerous near-field choices, including Event, Tannoy, Yamaha, KRK, Alesis and Mackie, all powered by Phase Linear 700s.

A separate room will soon be online for that second Pro Tools system, which currently resides in the front office. Other than that, plans at Sonora are just to keep moving and grooving. "We've got great clients, and we love what we're doing," concludes Barron.



Alia Fahlborg with Nettwerk Producer Management

Nettwerk Producer Management, a division of the vertically integrated Canadian entertainment entity that's home to Sarah McLachlan, Barenaked Ladies, Dido and Groove Armada, among others, is now up and running in Los Angeles. I stopped in for a visit at their Beverly Hills office with principal manager Alia Fahlborg, who filled me in on the

DECEMBER 2000, MIX 203

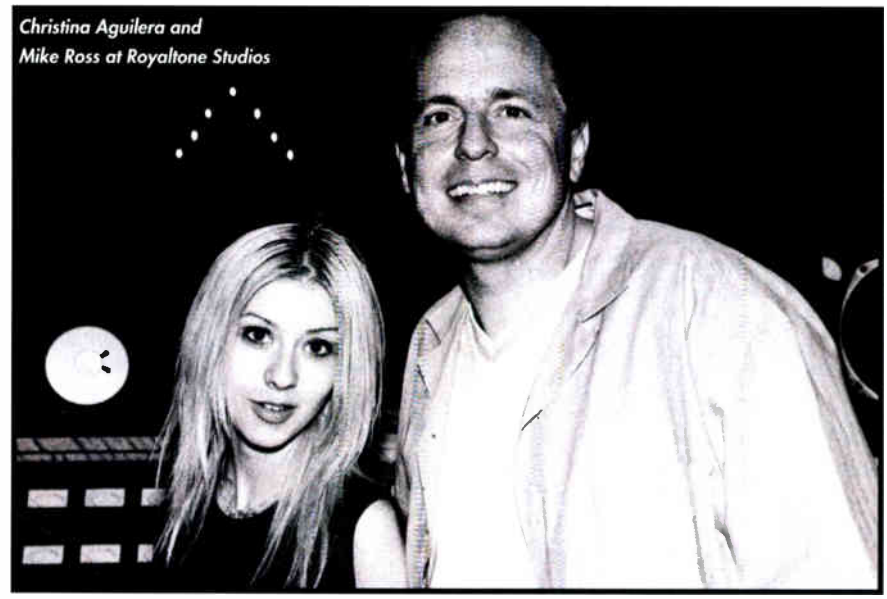
Country has lost nearly half its sales from its high-water mark of just over 18% of the market share in 1994, and as mentioned before, Nashville's main studios still derive more than half their revenues from that stream. And that situation is further compounded by the dramatic increase in producer-owned studios in the city in the past two years. The math is painfully simple and simply painful.

Milan Bogdan, the dean of Nashville studio management, with stints at Masterfonics, Emerald and now East Iris, agrees. He estimates overall Nashville studio revenues from country music projects are down between 50% and 60%, and Bogdan has purposely redirected East Iris' marketing strategy away from country and toward rock and pop with some success. Furthermore, he also agrees that country music could be headed for niche status, along with jazz, Christian and classical, which would further erode country as a revenue stream. "When you take Faith Hill and Shania Twain out of the equation—and they're hardly country anymore, anyway—then that's where it looks like it's going: into niche status," he observes.

On the other hand, the new smaller facilities provide multiple entry points for new music and new money. They never depended upon country in the first place. If they can act as catalysts for new artists, they could also serve another purpose in helping maintain Nashville's existing conventional studio infrastructure, acting as feeders for them.

The bottom line is that instead of a quiet period of stabilization that everyone was expecting after the Great Studio Shakeout, Nashville may be entering an even more turbulent, more revolutionary period, in which the large studios follow the lead of the smaller ones. It's going to be an interesting year, and Skyline will have a ringside seat. ■

Send comments and information to Dan Daley at danwriter@aol.com.



Christina Aguilera and Mike Ross at Royaltone Studios

The trio also worked on some overdubs for Myrrh Records artist **Shiley Caesar**.

SOUTHERN CALIFORNIA

He's not just mutton chops and a sunny disposition; **Neil Young** stopped in after another successful North American tour at **Bernie Grundman Mastering** in Hollywood. Young was joined by his bandmates **Duck Dunn**, **Jim Keltner**, **Ben Keith** and **Spooner Oldham**, along with **Pegi** and **Astrid Young**, to put the finishing touches on a December release. Keith co-produced the project with Young, and **John Hanlon** was tapped to engineer...What a girl wants: teen idol/blonde bombshell/multimedia empire **Christina Aguilera**, producer **Ron Fair** and studio owner/engineer **Michael C. Ross** took over Hollywood's **Royaltone Studios** to work on some of Ms. Aguilera's new material for a forthcoming RCA release...Busy, busy, busy at **Cello Studios** (Hollywood): SoCal punk/pop outfit **Blink 182** and producer **Jerry Finn** were in Studio 1 mixing; producer **Rick Rubin** was pulling double duty, tracking with **Rage Against the Machine** in Studio 3 and P.O.D with Dave Schiffman in Studio 2; **The Offspring** were mixing some long-awaited new material with Finn in Studio 3; **Sir Elton John** was holding court in Studio 1, tracking with producer **Patrick Leonard** and engineer **Brian Scheuble**; still suffering from *Californication*, the **Red Hot Chili Peppers** and engineer **Jim Scott** were splicing away at a forthcoming DVD release...Still in Hollywood: Producers **Rapture** and **Eric** were out at **Music Grinders Studios** working on the new **Aaliyah** record with engineer **Peter DiRado**.

SOUTHEAST

Grab the holy water and garlic: **Smash-**

The Rosenbergs at Big Blue Meenie, L to R: guitarist Joe Mahoney, bassist Evan Silverman, vocalist David Fagan, producer/engineer Dan Iannuzzelli and drummer Joe Darone

—FROM PAGE 197, SESSIONS & STUDIO NEWS

mixing new material inside studio A. **Joe Mahoney** of The Rosenbergs and **Mike Ward** engineered the tracking sessions; the effort was produced by Mahoney and **Dan Iannuzzelli**, who also mixed the project...Out at Philadelphia's own **Indre Studios**, **Budd Ellison**, **Nathaniel "Crocket" Wilkie** and **Robert Johnson** were working on pre-production for **Patti LaBelle**'s forthcoming release, *When a Women Loves*, for MCA.

ing Pumpkins frontman/rock's reining vampire **Billy Corgan** treated 100 radio contest winners (99X FM) to a private performance inside **Tree Sound Studios'** (Norcross, GA) studio A. Corgan ran though a wide sampling of the Pumpkins' catalog and even included a cover of "Rock On" by Dave Essex...**Ed Roland** and **Collective Soul** were also hanging out, putting the final touches on their latest Atlantic Records release with engineer **Robert Hannon**...A long time coming: **Arrested Development** decided they weren't ready to rollover just yet, reuniting a Tree Sound for a six week session that yielded a brand new album. The effort was produced by **Speech Thomas** and Arrested Development, with **Blake Eisman** engineering and **Mark Rains** along to assist...And the guitar-player egos clashed at **Seventeen Grand Recording** (Nashville); six-string legend **Vassar Clements** was in Seventeen's Neve room tracking new material along with a few guests: **Bela Fleck**, **Sam Bush** and members of **the Nitty Gritty Band**. **Hugh Moore** produced, and **Jake Niceley** and **Chris Scherbak** were in to engineer. The first lady of country music, **Dolly Parton**, and longtime engineer **Gary Paczosa** worked on new track entitled "When Love Is New," which will appear in the upcoming film *Song Catcher*; **Thomas Johnson** was in to assist this **Steve Buckingham**-produced project. Engineers **Brad Jones** and **Robin Eaton** (Alex The Great Studio in Nashville) cruised into Seventeen to work with Nicely on a 5.1 mix for **Jill Sobule**. Jones and Eaton produced the project with **Rob Clarke** assisting.

SOUTHWEST

At **Saltmine Studios** (Mesa, AZ), producer **Toby Wright** (Korn, Alice In Chains, Sevendust) and **Soulfly** booked out the studio's new digtial mixing and live room to work on the band's new album *Primative*, which features guest artists **Chino Moreno** (Deftones), **Tom Araya** (Slayer) **Corey Taylor** (Slipknot's #8) **Grady Avenell** (Will Haven), Phoenix locals **Cutthroat Logic** and **Sean Lennon**; **Lance Dean**, **John Gray** and **Mike Schomig** were all brought in to help engineer.

NORTHWEST

Somehow finding a vacant piece of real estate among the numerous thriving, dying and dead Bay Area start-ups, the recently opened **Studio 880** (Oakland, CA) hosted a lengthy session with local multi-Platinum, punk/pop outfit **Green Day**. The lads recorded all of their new album, *Warning*, inside the soon-to-be-famous studio with engineer **Ken Allardyce** and Pro Tools wiz **Tone**. For more on the project, read our Recording Notes Section, page 173. Also in at 880, Dreamworks artist **The KGB** finished up their EP entitled *Space Cadet*. The effort was produced by **David Bianco** and **Michael Urbano**, with Michael Rosen engineering and **Ben Conrad** on to assist...Up north at **Prarie Sun Recording** (Cotati, CA), **Primus** stopped in to work with engineer **Toby Wright** on a Black Sabbath cover for a soon-to-be released Ozzy Osbourne tribute album. Also at Prarie Sun, **Fuse**—a new band on **Steve Harwell's** (Smashmouth) Spunout Records—were in to record a full length album with producer/engineer **Bryce Goggin** (Lemon Heads, Spacehog). ■

Please send your session and studio news to robert_hanson@intertec.com or fax 510/653-3307.

—FROM PAGE 80, LINDA RONSTADT

bequeathed to Ronstadt in Massenburg's will.]

What studios were you fond of in L.A.?

I didn't care particularly, as long as it had an ambient room. We worked out of Sunset Sound for a long time. I didn't record at Gold Star, but I remember walking into a session that Phil Spector was producing, and there were three rhythm guitars stacked up and three different-sized tambourines and maracas and castanets, all stacked up on the backbeat. That's what gave it that wall of sound. They were orchestrated records; they put strings on them, but that wasn't part of the effect—it was really how he stacked the backbeat. And for my whole life, I wanted to do that.

You had big drum sounds on your records.

All big drums do is knock the vocal out. Those records, the way they were stacked, there was room to put the vocals in. The stuff was stacked above and below, and Phil Spector knew how to record women's voices. The problem with rock 'n' roll, if you take a Neil Young song that was written in the right key for his voice, when you change the key you lose the voicings. But he sang in a falsetto, so it was easy for me to cover, because there was room for the vocal to fit. That's why for me to sing a song like "Back in the U.S.A." is just a waste of my time. As interesting and innovative as that material and Chuck Berry were, it was written by a guitar player to give him something to do while he was waiting to take his guitar solo and do a duckwalk across the stage. There's nothing for a singer to do. Ditto for Buddy Holly.

So why did you do those songs?

Because we didn't have enough songs. I'd come into the studio with five ballads, like "Heart Like a Wheel." And we needed uptempo material to fill out the records.

And how did you feel about the fact that those were the ones that became such big hits?

I was so sad that those were hits. I always hoped that something like "Heart Like a Wheel" would be the hit. Then I got stuck singing them year after year, until I decided to stop singing them.

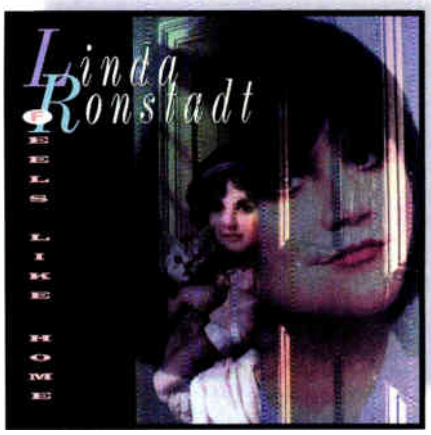
Was your dissatisfaction with that situation part of what drew you to such a radical shift in focus toward the big band material?

That came about because I was sick of what I was singing, and I knew there was better material. All of pop music written in the first 50 years of this century was better than all of the songs written in the second 50 years. I wanted those songs. I don't like to take material out of its period, which I had done with country-rock, but all of a sudden I wanted to seat it firmly in its period.

See, it's not fair to those songs [to sing them] without a context. And I'd always been the queen of eclectic mania, with R&B and country and Motown on the same record. But the standards were meant to be supported a certain way. If you put an orchestra on three chords, it's just a waste of the orchestra, because there's just not enough musical complexity for the orchestra to speak. But things that were written by Gershwin had a lot for the orchestra to get its teeth in. All of those passing tones and incredibly complex chords that came out of the New Modernism of the turn of the 20th century. Charles Ives was the first one, and Gershwin took it up with a vengeance and made it accessible. Why Nelson was so important was that he took jazz and combined it with the orchestra and compromised neither genre. Both of them flourished under his approach.

With Winter Light, We Ran ***and your records of the 1990s, you finally chose to credit yourself as producer. Around the same time, you also produced records for other artists for the first time, including David Lindley's*** Very Greasy ***(1988, co-produced with Edd Kolakowski), Jimmy Webb's*** Suspending Disbelief ***(1993, with George Massenburg) and Aaron Neville's*** Warm Your Heart ***(1991, also with Massenburg). What led you into production?***

The reason I produced Aaron and David's records, they both had played as sidemen on my records, they saw how I worked and saw how much input I had on the records, and they asked me to produce them. And the reason I really wanted to do David's record was I had heard him live and wanted to make a record that sounded like it was onstage. For me, recording is always working from memory. I have to have heard something, and it plays in my head like a jukebox. And because I'm a technophobe, you have to have a good working relationship with a good engineer who understands how you speak in metaphor, and you have to have enough of a common bibliography of records. So I can turn to George and say, "Remember how the guitars sounded on that record?"



With Jimmy's record, we stretched the budget so we could get the orchestration on it that we wanted. I think he, along with Brian Wilson, are the songwriters in the second half of the century that really can write for singers. And there's no one else but Jimmy who can write for the orchestra, as well. His songs are so range-y that few people could actually sing them. Whereas Gershwin could write for the sweet spot of the singer, Jimmy will send his own vocals off the edge—he takes incredible chances.

Maybe a lot of your pop career in the 1970s was, in a sense, building up a kind of capital to allow you to do what you wanted later.

Yeah! And I did! [Laughs.] [The record label] said, "We don't think you should work with Nelson Riddle—it's going to be the end of your career." And I just looked at them like they had four heads. I thought, this isn't a joke, or a choice. When I open my mouth, that's what's going to come out. It was the same way with Mexican music. It wasn't a choice. I opened my mouth, and everything came out in Spanish. It had just been waiting in line, backed up like cattle in the chute in my brain, all waiting to come out.

Has George Massenburg been your main technical translator?

There's no one like George. One time I had Russ Kunkel playing on "Don't Talk" [from *Winter Light*]. I told Russ I wanted a cymbal swell. I said I wanted it to sound like a bubble coming up from a lava lamp, and he got it right away. I relate sounds to real things. When I was a kid growing up, all the B-29 [bombers] came back from the war to Tucson, where the aircraft graveyard is. Every B-29 that went to the war flew over my house on its way home. And the sound of it is like the cellos and double basses that I've put on my arrangements. It's a low grind, the way those engines would [resonate] with each other. It's on "After the Goldrush" we did on *Trio*. They're stacked under the vocal, and it's the same way the engines would tune against each other. And on *Winter Light*, I tried to make everything understated, like it was just a halo or a shadow of what the parts were.

Very different from the big hits days when everything was loud and brash.

That was the style in those days. And who's to say what's better? I don't like any records. I don't ever listen to records at home. I don't like recorded sound, because I'm used to hearing it live. I hate CDs, because, more than anything else, they destroyed my interest and my ability to enjoy recorded music. Also, CDs are small. You needed a space in your home to play vinyl—the records were big and the equipment you played was big. You didn't just bring it up to the bathroom. I don't like to listen to music as background. I like it live, but I won't go to an arena. I don't like it in a huge hall. And I prefer it acoustic. Once it goes through electronics, it's never going to be the same. Medieval churches—those places were sound machines. They were wonder machines. The architecture stimulates different hemispheres in the brain. So who wants to go into the Staples Center [in L.A.] and try to play music? It's a dramatically hideous place from the outside and the inside. When things shifted from the Troubador era to the arena era, people stopped going to see each other play. When I would see Joni Mitchell at the Troubador, I would stay for every song and hear it all. Same with Jackson and Neil Young. You just don't do that with arenas. You can't hear the nuance in the music. It's changed the way that we play music. Then television finished music off. It was the deathblow.

It used to be that people would go to hear gifted musicians who were in their area. Recordings tend to invalidate local productions. And the recording industry's most damaging aspect has been that people don't do their own singing anymore. We delegate singing to professionals. We put it on a disc. In the 18th century, there were volumes of music that were written for various stages of intimacy. It was a way to identify and process your feelings. You could sing out your broken heart all alone or use it to express your feelings to another person. We've taken away from people the ability to do it themselves. I think everyone should sing, and everyone should dance. ■

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—FROM PAGE 24, A DIFFERENT KIND OF ROOTS

sometimes hard to know where one piece ends and the next begins), it's impossible to cover the huge spectrum of electronic music, even within the 32-year span. Co-producer Thomas Ziegler says that although using 1980 as a cut-off date made sense, in that the mainstreaming of electronic music was well under way by then, plenty of electronic music continued to be produced after that date. And, of course, there was plenty of earlier music that he would have liked to include, as well.

The legal and logistical issues involved in such a project were, as you might imagine, tremendous. "What appeared on the final product changed considerably from our initial list," Ziegler says. Luciano Berio, for example, doesn't appear in the collection, because the composer's agents proved difficult to reach. A piece by Gordon Mumma came in too late to be included. The pieces by Robert Ashley and Steve Reich that ended up on disc were different from what the producers originally wanted, because the composers didn't like the original choices.

But the effort was so rewarding, and hopefully so successful, that Ziegler is thinking there might be a Volume Two of *OHM*. If so, I would like to humbly offer some recommendations for pieces I think would be extremely educational for modern ears to hear, pieces that inspired me to get into the field: Mario Davidovsky's brilliant juxtapositions of real instruments with tape in his "Synchronisms" Series; Berio's electronic fantasies based on the voice of his wife, the incredible singer Cathy Berberian; the dazzling *musique concrète* pieces from the late '60s by the young Turkish composer Ilhan Mimaroglu; and the far-ahead-of-its-time electronic rock of a group called the United States of America led by Joseph Byrd.

There's plenty to enjoy and learn from this remarkable set. In the new millennium—yes, it's finally here!—a new generation of composers need to hear these pioneers and be inspired by them to do their own pioneering. So buy *OHM*, sit back and listen to your past—whether you know it or not—and perhaps also the future. ■

Paul D. Lehrman, editorial director of Mix Online, doubts his teenage experiments will ever be anthologized, but you can listen to his current craziness at www.antheil.org.

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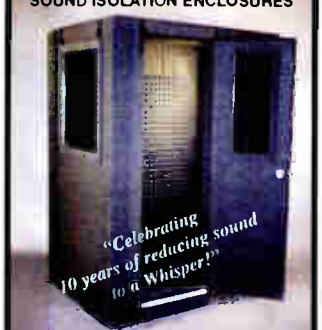

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SOUNDSCAPE TIPS

GETTING THE MOST FROM YOUR SSHDR-1 AND R.ED SYSTEMS

Soundscape's R.Ed and SSHDR-1 PC-based workstations are intuitive and robust, and—as all number crunching takes place within external, rackmount hardware—the computer is simply used as an interface for data entry, screen draws, etc. Unlike virtual ("native") competitors that rely on a host computer's CPU, Soundscape can operate on a simple, basic Pentium and does not struggle or glitch—even if I run Photoshop and edit a multilayer image while playing back a 24-track mix.

Here are some tips and features, some unique to Soundscape, others universal to workstation users.

KEEP COOL

On the hardware side, any fan-cooled device really should have a filter. Most don't. What you will need to do is unplug the unit, remove the cover and check for inhaled dust and dirt. Vacuum if necessary.

HOT LINKS

Two SSHDR-1s can be linked for 24-track capability via AES/S-PDIF or by TDIF, the latter being my preference to maintain subgroups, especially when mixing surround. TDIF presents one obstacle: The inputs *and* outputs are on the same 25-pin connector. As DTRS repair is my specialty, schematics provided the roadmap to dividing the highway between send and return. After cleverly fashioning an adapter cable, my DA-98 now thinks it's connected to one Soundscape when, in reality, there are two in the loop. (For more details on this, visit my Web site at www.tangible-technology.com.)

MANUAL COMPRESSION

Prior to moving-fader automation, I used the "cut" tool to establish regions within a track so that levels, panning tricks and mutes can be applied. This puts all the changes ahead of the compressor/limiter, keeping the vocals from sounding overly aggressive in sections that are supposed to be delicate.

TOOL ACCESS

In addition to keyboard shortcuts, Soundscape's tools can be easily configured and interrogated. There are nine blank Tool Bars where users can custom arrange the 40 or so tool icons. Click between any of the icons, and the Tool List appears. Then touch any icon for a description of what it does. As most PCs have a 2-button mouse, Soundscape allows users to assign any four tools to those two buttons. Load and access the alternate set by pressing the ALT key before clicking the mouse. Under the icons, black or red lines indicate tools assigned to the mouse.

MUTE THE BEAST

On Soundscape, any track or region can be muted via the mute tool. From Version 2.03 on, mute can also be applied to any channel strip on the mixer, preserving but graying the configuration to reclaim DSP resources for another purpose.

BY EDDIE CILETTI AND KASIM SULTON

PROCESSING ECONOMICS

For any DSP-hungry workstation, resource management—making the most of the available processing power—becomes the primary job description. Soundscape's built-in plug-ins, such as equalization and compression, are effective yet economical in their use of processing power, but use a third-party multiband processor *plus* a reverb, and the system will quickly run out of resources. A simple solution is to "capture" power-hungry effects (such as TC Works Dynamizer or Wave Mechanics Reverb), and then play them back as tracks rather than tying up the processor.

AUTOMATION ECSTASY

My friend (singer/arranger/multi-instrumentalist/R.Ed user) Kasim Sulton added the following. The words "mixing automation" imply an overly complicated manual, images of restless sleep and the recurring nightmare of losing a perfect mix after pushing the one button that deletes instead of saving. Rather than scrap a nearly perfect take, select Touch-Up from the Settings menu and go to the particular area you want to fix. Position the Left and Right markers at the beginning and end of the trouble spot, hit Record and make the changes to the automation track. It's really that easy. ■

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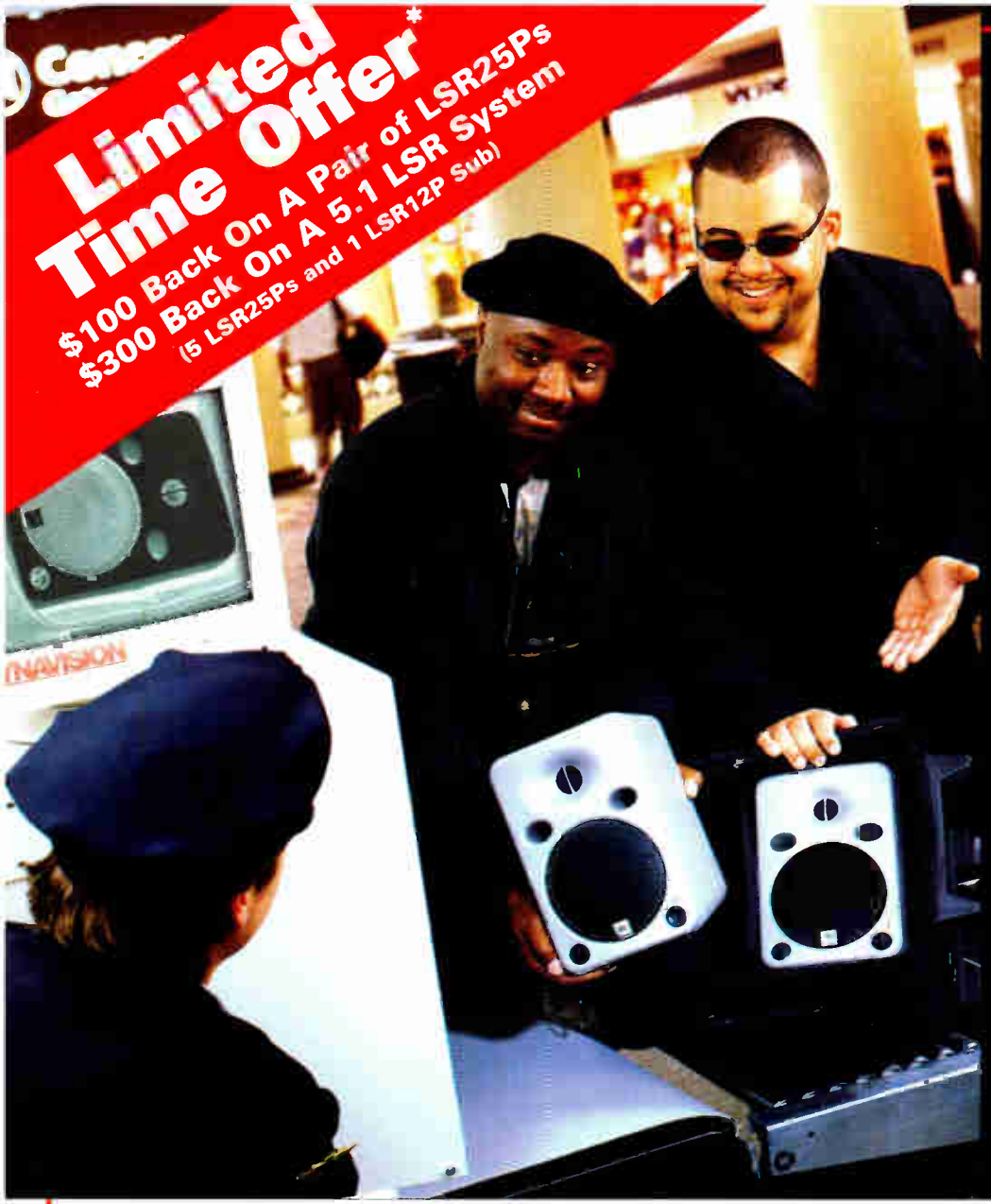

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