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# MIX®

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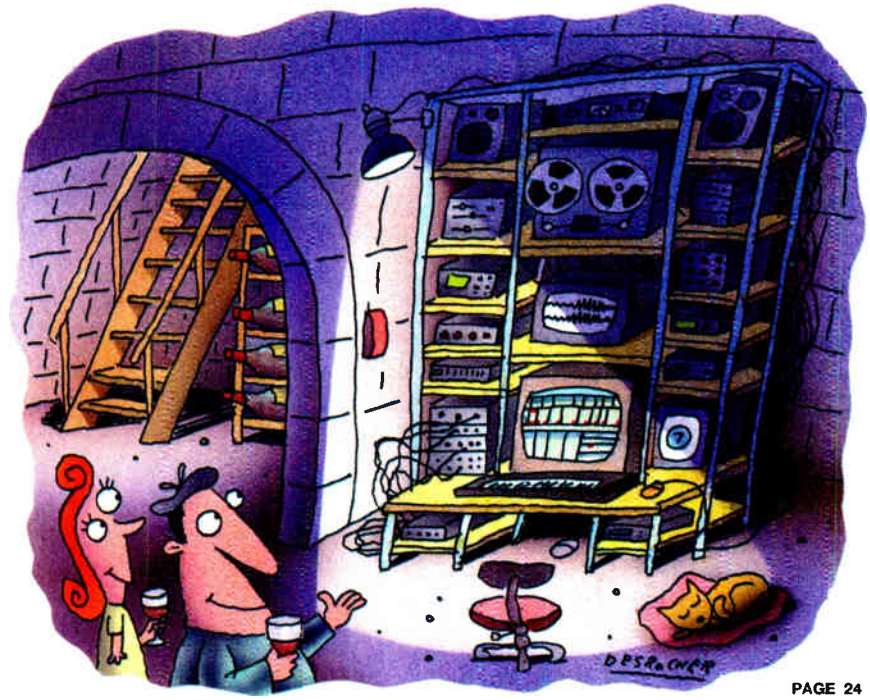

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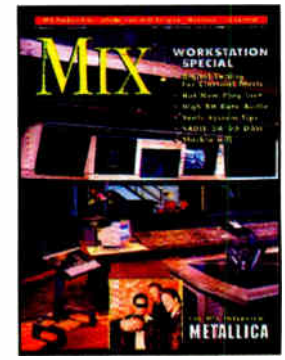
**On the Cover:** The new AMS Neve Capricorn room at Chicago Trax opened last month and was designed by Doug Jones with 5.1-channel mixing in mind. For more, see page 42. **Photo:** Michael Kardas. **Inset:** Melanie Weiner/Retna.

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## Gate

Start with the gate. Set parameters for threshold, ratio, attack, hold, release, and output gain. See the effect of your settings on the graphical display, as well as on the gain reduction and audio level meters, they all interact in real time with your manipulation of the parameters. Start with a threshold setting of about -60dB to clean off the noise in between the vocal takes. You can save your final gate settings as a "gate preset" building block and recall it into any other setup you do.

## Compressor

Then move to the compressor. The effects of the gate settings are still visible on the graphic display, so let that help you determine where to set your compressor threshold. The parameters you change here will also effect the curve on the graphical display in real time. Move through all the regular parameters, like threshold, ratio, attack, release, and output gain. For vocals use a threshold of about -25dB, a ratio of about 3:1 or 4:1, and a slow attack and fast release for the most natural sounding effect. Your compressor settings can also be saved off as a building block to be called up into any other preset.

## Limiter

On to the limiter. Changes you make to the limiter settings are also seen on the graphical display. Adjust the level up or down to suit your needs. The flat top line of the display moves up and down as you adjust the level. You can also set the speed at which the the limiter lets go of the signal as it goes below the threshold. This is truly smooth limiting, with patented dbx PeakPlus™ algorithms, so rest assured that where ever you set your threshold level, your tape will not distort, and your signal will not get butchered as it goes across the threshold. And like the other parts of the processor, your limiter settings can be named and saved for later recall.

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Compression controls: threshold, ratio, gain, OverEasy®, auto, attack, hold, and release

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Hi-res graph shows composite output vs. input plot of audio signal

Gate controls: threshold, ratio, attack, hold, release

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Limiting from -60dB to 0dB, with gain, attack and release.

Precision control over every parameter

De-ess from 800Hz to 8kHz, vary the amount.

Utils: sample rate, A/D input and output, Midi functions, Sysex functions.

XLR and ¼" balanced ins and outs.

Sidechain functions for advanced filtering applications. Sidechain monitor included

EQ offers 20Hz to 20kHz, Q, ±12dB, and SCMonitor.

Midi bypassable via midi program changes.

## De-esser

De-essing works the same way: see the effects of your settings displayed on the graph. Parameters here are the common ones: threshold in frequency, 800Hz to 8kHz, and amount in percent. Other available processing includes EQ - both in-path and sidechain, for special-effect types of processing. When you are editing any of the building blocks, its icon is visible on the display, and the parameters are shown on the graph, so it's always easy to know where you are. Parameters are easy to see in this page driven operating system. When it's as complex as this, it's nice to know somebody was thinking when it was put together.

## and More

You can also work in stereo, or set up a completely different and independent processing chain for the other channel. Also, notice that the audio meters are capable of showing both peak and average levels for input and output. Optional digital output with the TYPE IV™ Conversion System with TSE™ (Tape Saturation Emulation) provides up to 24-bit output in either AES/EBU or S/PDIF formats with the trademark digital processing of TYPE IV™. The DDP also has full MIDI/Automation capability, with separate midi in and thru jacks. Entire processing setups may also be saved into one of 50 user defined presets, or use one of the 50 factory setups.

## It Forgives

**• New dbx technology, the TYPE IV™ Conversion System with TSE (tm) (Tape Saturation Emulation) gives you the pleasant overload characteristics of analog tape without the harsh distortion of most digital input systems. No more dancing around with the input levels to protect the integrity of your audio.**

**• Ultra-wide dynamic range 24 bit A to D converters with TYPE IV™ make your signal sound better than you ever thought possible. Capturing the full dynamic range of your analog signal and coupling it with the powerful dynamic range of this patent-pending dbx process, TYPE IV™ will make your digital signal sound like it came from the quietest high-quality analog source you could imagine.**

**• With the extensive metering of the DDP, you can see EXACTLY what is going on with ALL parts of your signal: input, internal processing, and output, with peak and VU, as well as gain reduction for both sides of the stereo image.**

**• And speaking of stereo, you can work in stereo with dbx's True RMS Power Summing™ for phase-coherent tracking, or in dual mono mode, without the two channels interacting at all, making the DDP a great processing value.**

## It Never Forgets

**• The DDP works right out of the box. It comes with 50 factory setups that are guaranteed to knock your socks off. There are presets for every application you can think of, and then some. dbx engineers are musicians and recording engineers. We know what a compressor is supposed to sound like, and we know it better than anyone else. We invented compression. We eat, sleep and breath compression.**

**• Want to duplicate that perfect compressor set-up? Each processor in the chain has all the parameters you would expect. After you set the parameters the way you want them , save it as a processor preset, available to be recalled any time. These building blocks allow you to save entire setups just for the way you like to work. It doesn't matter that you are doing a live gig one night, then mixing the tracks in the studio the next night, the DDP will be there, just the way you left it.**

**• When you save a preset, you also save the information that makes it work behind the scenes, too. Digital output (optional), sample rate performance, MIDI setup, as well as any of the other utilities, like sidechain setup and monitor, EQ settings, and SysEx functions.**

**• When you make changes to any parameter, you can see where your adjustments are effecting the signal, simply by looking at the Hi-Res graphical display, which shows the processing curve in real time as you make your adjustments.**

**Check out the DDP at your local pro audio outfitter, and experience DIGITAL performance you'll never forget.**


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# FROM THE EDITOR

## THE MISSING PIECES TO THE PUZZLE

Remember jigsaw puzzles? Ever get to the very end and find that you're two pieces short? You'd look on the floor, flip the box over at least 11 times and accuse your little brother of hiding them. But at the end of the day, the picture still wasn't complete. Checking out last month's AES in San Francisco, I was dazzled by the array of cool techno-gadgets (many of which are featured in this issue, starting on page 30), but what impressed me most about AES was seeing new products that filled in pieces of the puzzle, providing solutions to specific needs, rather than simply being "technology for technology's sake."

For example, I noted a dozen under-$10,000 digital consoles—from Allen & Heath, E-mu, GeneralMusic, Mackie, Panasonic, Spirit, Tascam and Yamaha, and half of those say they offer 5.1 surround mixing capability. But one thing bothers me about such marketing-driven claims: All of these consoles can output six discrete signals, yet none has 5.1 monitoring capability! If a console touts its 5.1 capability, it should include a way of listening back to those tracks you just created, with a master volume control, and mutes and solos for each bus. Fortunately, several AES product debuts address this dilemma, including the Adgil Director (www.sascom.com), Studio Technologies (www.studio-tech.com) Model 68/69, Martinsound's (www.martinsound.com) MultiMAX™ and the GML Model 9800 (www.gmlinc.com). The latter even skirts the issue of VCA control by having servo-controlled motorized faders for volume changes. Slick!

Digidesign turned heads on the floor with its new Windows NT version of Pro Tools|24, which not only offers full session exchange with Mac PT files by mounting HFS drives, but also ships with software for both formats, allowing users to upgrade to either Mac or PC at a later date. Meanwhile, Fairlight signed a format exchange agreement with Digidesign; it includes playing PT session files directly on Fairlight hardware. One step at a time, the world comes closer to universal file exchange...

Perhaps the most talked about product at AES was Yamaha's D24, a magneto-optical 8-track MDM with 24-bit capability (or 4 tracks at 96 kHz) in a three-rack-space package. As with other MDMs, the D24 can be expanded for more tracks by simply adding more transports, but at $2,995—not all that much more than a DAT machine—this box may be the MDM solution we have all been waiting for.

At the other end of the price spectrum were useful pocket gizmos. Neutrik's MR1 Minirator is a $149, VCR remote-sized box that generates sine/square waves, and pink/white noise. And TerraSonde's (www.terrasonde.com) The Audio Toolbox™ is a DSP-powered tester/session assistant packing *lots* of functions (signal generator, SPL meter, RTA, RT/ETC meter, polarity check, cable tester, phase meter, digital metronome, guitar tuner, monitor amp, SMPTE reader/generator/reshaper, waveform scope, level/frequency meter, sweep generator and even video games) into a chassis barely larger than a fuzz box. At $899, this is one slick tool that any audio pro could use.

Concepts, ideas and innovations are what make AES special. It's always nice to see that practical solutions are part of the equation.

I like that.

George Petersen

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**MIX MAGAZINE**
6400 HOLLIS ST., SUITE 12
EMERYVILLE, CA 94608
(510) 653-3307
SALES ADMINISTRATION MANAGER Dan Hernandez
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Founded in 1977 by David Schwartz and Penny Riker Jacob



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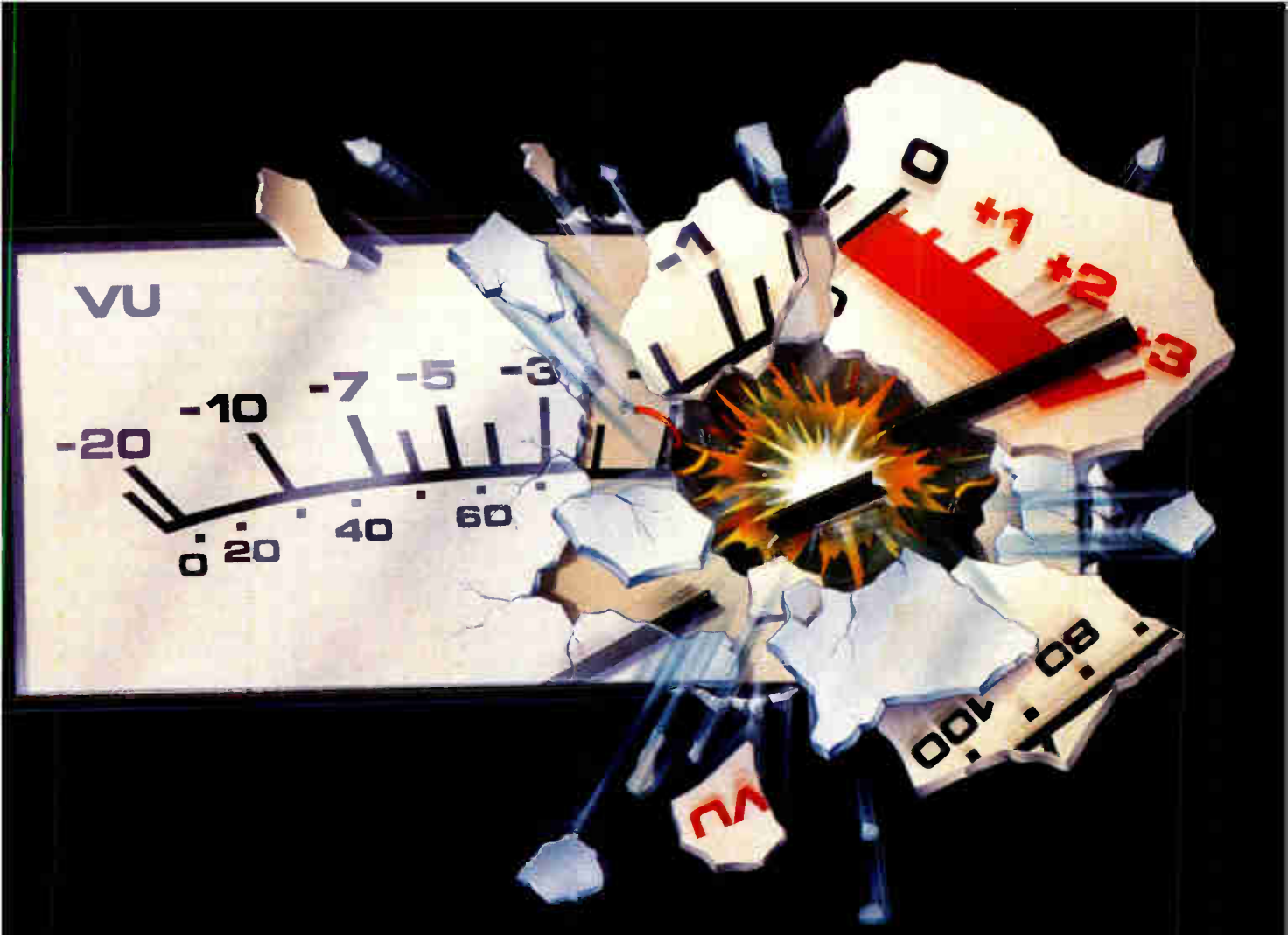


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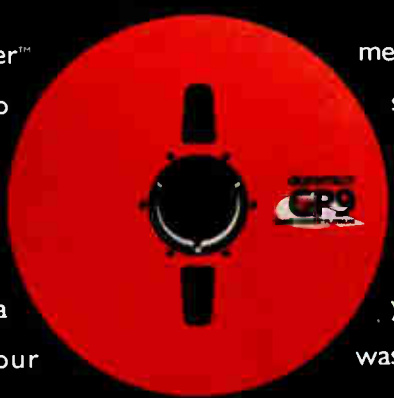


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World Radio History

CIRCLE #005 ON PRODUCT INFO CARD

# FEEDBACK

### DVD HAS ARRIVED

The DVD ["Closing in on a Final Spec"] and 5.1 surround (Dolby Digital) [Post Script: "Constructing a New Audio Signal Path"] articles in the July *Mix* were superb. I am dedicating my studio efforts these days to generating 5.1 DVD (old AC3? heh heh) source where the musical intent and presentation are geared for surround environments.

I think that source material generated specific to this market is so scarce that there will be a niche for me as a producer. So, I went to a local high-end to buy the latest Panasonic DVD player with 5.1 Dolby Digital. I thought that I would be one of those high-end oddballs wanting one.

Nope. I am on a four-month waiting list for it. The consumer has spoken already. This is gonna be BIG.

*Jeff Johnson*
*dianeljohnson@worldnet.att.net*

### HDCD WAS ALREADY HERE

This is in regards to the information from the September issue of *Mix* magazine (Media & Mastering News: Mastering Notes). Airshow Studios "announced" that they are the only facility offering the HDCD processor between the West Coast and Nashville. However, we have had the HDCD processor since Oct. 1996. SAE Mastering has been providing quality mastering services to the music industry here and abroad since 1986.

Our main engineer and owner, Roger Seibel, has been mastering since 1981. He has a few Gold records, namely the Veruca Salt *American Thighs* CD and two of Liz Phair's releases, *Whip Smart* and *Exile in Guyville*. Our studio also masters releases for Delmark Records, Blind Pig Records, Evidence Records, RCA Records, Matador Records, Sub Pop Ltd., Lookout Records and Thrill Jockey Records, to name a few. We offer mastering services for CD and vinyl. We also offer NoNOISE processing and analog tape restoration.

*Mary Seibel*
*SAE Mastering*
*Phoenix, Ariz.*

### MEA CULPA

My pleasure at seeing the excellent review by Larry the O of our new Axiom-MT digital multitrack console in your October edition (nicely timed to coincide with the U.S. launch at the San Francisco AES show of this important new console) was marred when I looked at the photograph which accompanied the text.

Axiom-MT extends Solid State Logic's A range of digital consoles, which already includes the Aysis Air digital broadcast console and the Avant digital film console, into the multitrack music marketplace. Like the other consoles in the range, Axiom-MT uses SSL's "knobper-function" concept to provide a familiar, intuitive control surface.

However, although the control surfaces of Aysis Air, Avant and Axiom-MT share the same concepts, they are not by any means identical, and the photograph you used was of an Avant, not the Axiom-MT. Hope you can find some room in the next issue to run the correct photo and caption.

*John Andreus*
*Marketing Director*
*Solid State Logic*

***Here is the correct photo, token in SSL's Axiom-MT client demonstration studio in Oxford, UK. Mix regrets the error.—Eds.***

### EXCUSE ME

I enjoyed Peter D'Antonio's article on project studio acoustics (June '98 *Mix*). However, he seems to be another person who confuses harmonics with overtones. In Fig. 1 and in the text, he refers to the fundamental *and* the first harmonic.

Excuse me, but the fundamental *is* the first harmonic. The *second* harmonic is the *first overtone*.

*Captain Analogue*
*Missing Link Audio Services*

### TIMING IS EVERYTHING

In September '98 *Mix*, you put together a nice piece on The Village's 30th anniversary. However, the top photo should read "The Village Studio D circa 1979-80." Please notice the Dolby A units in use! As captioned, a reader might think that is how the room is equipped today! Also, the photo is flipped if one checks the VU meters on the A80 24-tracks.

*Keith Hatschek*
*Keith Hatschek & Assoc.*
*San Francisco*

Check Out MIX Online
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CIRCLE #006 ON PRODUCT INFO CARD

World Radio History

# CURRENT

### BOB SEIDERMAN, 1947-1998

Bob Seiderman, one of the true giants of broadcast audio, died October 9 from complications relating to cancer. In his more than 20 years with CBS, and in his recent tenure as senior audio consultant with Fox Sports, Seiderman was at the forefront of the revolutionary changes that have taken place in sports programming. In 1987, he mixed the first Super Bowl in surround. According to Fox Sports, the 1999 Super Bowl telecast will be dedicated to Bob's memory.

In his three decades in the business, Seiderman, with his infectious giggle and unflappable style, sat behind the board for NCAA Final Fours, World Series, NBA Finals, Daytona 500s and countless other major events. He has been the exclusive mixer for the John Madden and Pat Summerall NFL Game of the Week since their days at CBS, and he continued with them in the move to Fox.

Seiderman was laid to rest in a private ceremony on October 11, and a memorial service was scheduled on Long Island for October 19. Longtime friend and colleague Jerry Gepner of SportVision has set up a Web site for those who wish to share remembrances (www.sportvision.com/bobs.htm).

Seiderman is survived by his mother, Dorothy, his wife, Andrea, and three children—Ashley, 15 months, Troy, 10, and Alexander, 13. The family requests donations be sent in Bob's memory to the American Lung Association, Cancer Care or American Cancer Society, all located in New York City.

### MPGA NAMES NILE RODGERS PRESIDENT

The Music Producers Guild of the Americas met during the AES convention in San Francisco and announced that Nile Rodgers is the organization's new president.

Rodgers formed the legendary band Chic in 1976 with Bernard Edwards and Tony Thompson, and the band enjoyed success with hits "Dance Dance Dance" and "Le Freak." Rodgers later gained prominence producing David Bowie's *Let's Dance* and has continued to be an innovative and successful producer, working with artists such as Diana Ross, Paula Abdul and Steve Winwood. One mission Rodgers is interested in is securing credit for producers whose work has been sampled by other artists. "I don't get paid as a writer when 'Let's Dance' gets sampled and turned into a Number One hit," Rodgers says. "Someone else gets paid big-time for what is essentially my work. We're no longer in the days

Nile Rodgers

of 'Moon River,' when copyright credits could just be 'words and music by.' If someone brings in 'Moon River' nowadays, I guarantee you that's not what the record is going to be about."

Departing president and MPGA founder Ed Cherney was installed as Chairman of the Board. The new board of directors is listed at the guild's Web site at www.musicproducer.com.

### PEAVEY ENTERS ALLIANCE WITH CREST

Peavey Electronics Corp. and Crest Audio Inc. announced the formation of a strategic alliance. The allied companies will be able to share resources and blend their proprietary technologies. Each company will continue with separate operations in their existing locations. "I've stated that 1998 will be the year of change for Peavey Electronics," says Peavey CEO and chairman Hartley Peavey. "This alliance with Crest will position both companies for explosive growth for the next millennium."

### BIAS ACQUIRES DECK

Berkley Integrated Audio Software Inc., manufacturers of audio software products Peak, Peak le and SFX Machine, has acquired Deck Audio Software from Macromedia Inc.

Steve Berkley, president of BIAS, says, "Now that Deck is part of the BIAS family, it's a perfect multitrack companion to Peak." BIAS also announced that active development has commenced on Deck 3.0 (ship date TBA). The forthcoming version will support the ASIO industry standard, giving users a wide choice of audio hardware and interface options. Deck 3.0 will also offer support for VST plug-ins. Upgrades to Deck 3.0 will be free for anyone who purchased a new copy of BIAS Deck 2.6 after October 31.

### TVT AND UNITED PRODUCERS CREATE NEW LABEL

TVT Records entered into a partnership with United Producers, a collective made up of Brad Wood, Danny Kortchmar, Kevin Bacon/Jonathan Quarmby, Ted Niceley, Jimmy Douglass, Tim Palmer, Peter Denenberg, Roger Greenawalt, Ed Tuton and Steve Hitchcock. The members have joined forces to sign, develop and produce new talent. The label's debut release is expected in spring of 1999. Under the multimillion-dollar pact, TVT Records will invest in the label and provide a variety of marketing functions including promotion, publicity and distribution. For further information, contact Lisbeth Cassaday at TVT Records, 310/289-3800.

### UPCOMING SHOWS

Lighting Dimensions International's LDI 98 takes place at the Phoenix Civic Plaza this month. As many as 350 international manufacturers and distributors are exhibiting from November 13-15. There will be intensive pre-show training at the LDInstitute from November 9-12; and workshops, tutorials and mini-courses November 12-15. For registration, call 800/288-8606 or visit www.etecnyc.net.

The World Research Group's Musicom 4 occurs November 9-10 at Loews Santa Monica Beach Hotel (Santa Monica, Calif.). Panel discussions include "The State of the Union: Music and the Internet—Where are We Now? Where

—CONTINUED ON PAGE 16



World Radio History

# We'd Like To Thank The Academy...

We don't actually set out to win awards for ourselves. Instead, we endeavor to build the finest micro-phones in the world so that YOU win the awards. In fact, many artists have already brought home the gold for performances captured with this incredible microphone. Combining the best of our classic designs with the most advanced modern electronics has resulted in a microphone that even our most demanding customers call "stunning." Try the M-149 Tube and hear the magic for yourself.

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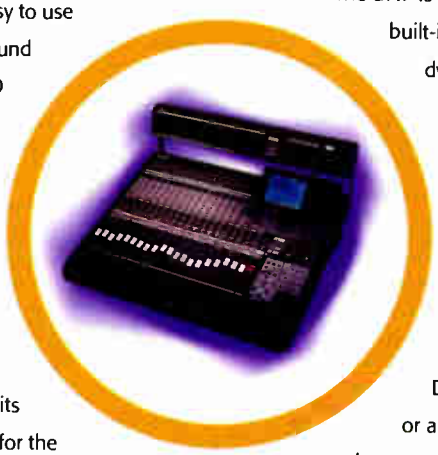
CIRCLE #007 ON PRODUCT INFO CARD

World Radio History

# Advanced Digital Mixer

Panasonic is taking digital further today with the DA7 digital mixer, an entirely new standard in quality, flexibility, affordability, ease-of use and value. 24-bit converters, 32 inputs, 8 buses, 32-bit processing, moving faders, instantaneous recall of all settings, surround sound mixing...nothing this fully featured has been this easy to use or affordable... and it's available NOW! Incredible sound quality, Internal 32-bit processing and 24-bit A/D and D/A converters give this mixer sound worthy of consoles costing several times its price.



**Easy-to-use.** The DA7 is one powerful mixer. If you know how to run a traditional mixer, you already know how to run a DA7, since it has a smart, user-friendly design. To access any of the 32 channels, just press its select button and all parameters for the channel-EQ settings, bus and aux assignments, and dynamics and delay settings come up on the large backlit LCD screen. To access individual parameters, just touch the appropriate knob in the console's master section. This automatically calls up the sub-menu on the LCD screen and zooms in on the appropriate function. No more digging through menus or getting lost in functions; just adjust EQ, Pan/Assign, Dynamics/Delay, or Aux... and you're there.

**The power to control.** The EQ section offers 4 true overlapping parametric bands active on every channel (with the top and bottom bands switchable to low or high peak/shelving, or low pass, or high pass filters). Each Aux return also provides two bands of fully parametric EQ. The dynamics section offers variable attack/release times and levels for threshold and ratio on each channel, and delay is adjustable up to a maximum of 300ms. 50 Memories each are provided for EQ, Dynamics and individual channel settings. In addition to full dynamic moving fader automation of 32,000 events, there are 50 "snapshot" or "scene" memories. Plus, a Macintosh and windows software package (that greatly expands the capabilities of the DA7), will soon be available.

**Surround sound at your command.** You'll be mixing surround soon. The DA7 is equipped to mix 5.1 channel today. The DA7 has 3 built-in panning modes, and all modes provide full dynamic control of panning, and can be copied, stored, and transferred to any other channel. An optional MIDI joystick gives you yet a fourth method of surround control.

**MIDI and more.** The DA7 features 4 up/down/left/right cursor keys that can be switched to output MIDI Machine Control commands to MDMs, sequencers, or workstations. Data entry is done through the large parameter dial or an alphanumeric keypad. There's also an undo/redo button, a solo-mode set, and a built-in Talkback mic.

**Take on the world.** The rear panel sports 16 analog mic/line inputs (8 XLR with individual software-switched phantom power, and 8 with TRS); 16 channel inserts (pre-A/D); and 6 auxiliary send/return jacks (1,2 use S/PDIF; the rest use +4dB 1/4inch connectors). Along with the 2 digital and 4 analog Aux returns, the DA7 has 38 total inputs. Digital I/O, provided via XLR connectors switchable between AES/EBU and S/PDIF, offer the master out signals and they can be assigned to inputs 15 and 16.

The DA7 rear panel also offers MIDI In and Out, word clock I/Os, both a 9-pin RS-422/485 serial port and PC port for Mac or Windows with software support for both, a 1/4 inch footswitch jack for controlling Talkback on/off or automatic punch in/out, and a D-15 subconnector for the optional meter bridge. So, take your digital mixing further today by going to the nearest Panasonic dealer and auditioning the DA7 for yourself!

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For more information call:
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# DA7 Digital Mixer

1-Step Functionality

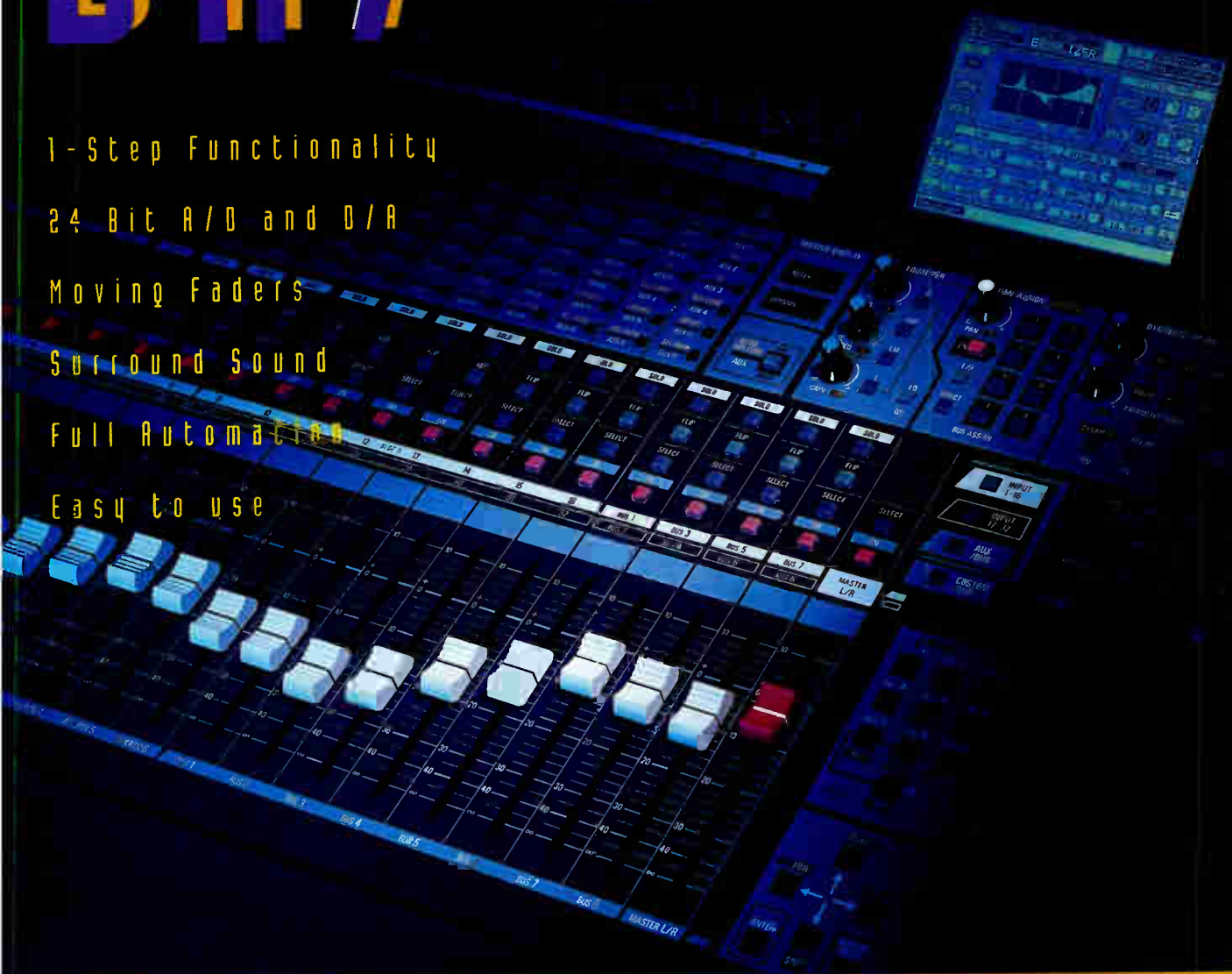
24 Bit A/D and D/A

Moving Faders

Surround Sound

Full Automation

Easy to use



Taking Digital Further

Panasonic

Broadcast & Digital Systems Company

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# INDUSTRY NOTES

**Craig Devin** was promoted to corporate vice president of business development for both **Alesis** (Santa Monica, CA) Studio Electronics and Alesis Semiconductor. Devin is a longtime employee of Alesis engineering and manufacturing. **Ron Wilkerson**, a 25-year veteran of the music and pro audio industries, was appointed to vice president, strategic development...**Piers Plaskitt** was named VP, director of sales and marketing, at New York City's **Post Perfect**. Plaskitt was president and CEO of Solid State Logic from 1983 to 1997, and prior to joining Post Perfect served as VP, worldwide sales and marketing for Montage Group...Happenings at **Panasonic** (Los Angeles): **Fred Jones** assumed the role of marketing manager, overseeing all aspects of the company's advertising, public relations and collateral development programs while retaining his current responsibilities as product manager. **Chris Hinson** was brought onboard as a sales and marketing development specialist for the Eastern region, and **Carl Marinoff** joined as a technical support specialist, providing field reinforcement for Panasonic's digital product series. Panasonic Pro Audio announced that it became a sponsoring member of the MPGA (Music Producers Guild of America)...**Opcode Systems'** new address is 365 East Middlefield Road, Palo Alto, CA 94043; phone 650/429-2400; fax 650/429-2401...Petaluma, CA-based **Furman Sound Inc.** announced that **Plus Four Marketing** is its new rep for Northern California, and **DiModica and Associates**, Furman's rep in Florida, will now also cover Georgia, North and South Carolina, Alabama, Mississippi and eastern Tennessee...**Steve Burdick** returned to **Westlake Audio** (Hollywood) to serve as vice president of recording services...**Group One Ltd.** (Farmingdale, NY) brought **Tim Bensen** onboard as sales manager, professional audio products...**BIAS** moved to new headquarters at 1370 Industrial Ave., Ste. A, Petaluma, CA 94952; phone 707/782-1866; **Andrew Calvo** was promoted to vice president of sales...Knoxville, TN-based **Waves Ltd.** entered into a strategic licensing agreement with Motorola's Semiconductor Products Sector. Waves' MaxxBass technology will be embedded in Motorola's audio DSPs, the SDP56362 and the DSP56364...**Quantegy Inc.**'s new address is 800 Commerce Dr., Peachtree City, GA 30269...**Purple Audio Inc.** (New York City) opened a London office, phone 44 181/960-3561. **Iain Roche** was appointed director of sales and marketing...**The Recording Industry Association of America** opened a new office in Miami and appointed **Ricardo Dopico, Esq.** as director, Latin music. Dopico can be reached at RIAA, 800 Douglas Road, Ste. 373, Coral Cables, FL 33134; 305/444-3114; e-mail rdopico@riaa.com...The **Advanced Systems Group** has moved to 1226 Powell St., Emeryville, CA 94608. **David Tinsley** was recently brought onboard as DVD Product Specialist...Surrey, UK-based **Digital Audio Research** (DAR) appointed **Romco Trading Company** as its distributor in Kuwait...London-based **HHB Communications** reached an agreement with Singapore-based **Sennheiser Electronic Asia PTE Ltd.** for the latter to distribute all HHB digital audio equipment and recording media products in 14 Asian territories. For complete information, contact S.F. Ho, director/general manager, at SF_Ho@sennasia.com.sg.....**Federico Serrano** was appointed to the sales staff at **Apogee Sound** (Petaluma, CA) and will focus on the Latin American and European markets...**JBL Professional** (Northridge, CA) announced the promotion of **Simon Jones** to senior product manager...**Howard Zimmerman** was named VP of sales and marketing at **Sound Bridge Acoustic Labs** (Waxahachie, TX). ■

—FROM PAGE 12, CURRENT

are We Headed?" "Licensing on the Internet: Legal Issues and Business Implications" and much more. There will be a post-conference workshop on November 11 on developing and managing the infrastructure to netcast a live event. For more information call 800/647-7600 or e-mail info@worldrg.com.

## NEW WEB SITES

Although not new, the Audio Guys Web site deserves mention (and congratulations on their second anniversary). The free service, located at www.audioguys.com, features tons of audio links, Tip of the Month and Audio Tools on the Net. The Audio Guys will also answer recording-related questions, and there's an archive of questions and tips by category.

The indieCantina is an e-mail discussion list focused on the Canadian music business. Musicians, labels, media, studios and managers are invited to check out www.onelist.com/subscribe.cgi/indieCantina.

George Massenburg Labs has a new site at www.gmlinc.com, which includes a comprehensive listing of all GML products with photos, descriptions and applications, plus manuals in easily downloadable PDF formats.

Videohelper is a group of former broadcast promo producers and major label artists who banded together to create a new music library. By visiting www.videohelper.com, users can hear up to 10-second samples of every track and search for music by genre, style, instrument, composer or description.

Akai's updated Web site features a "Spotlight" section, which showcases top musicians and facilities using Akai products. Also on the way is a User's Forum, allowing customers to communicate directly with the factory. Visit www.akai.com/akaipro.

Bag End Loudspeaker Systems' new site, www.bagend.com, offers technical information and specs on products, information on different types of applications, product reviews and more.

Studiofinder.com, a service of Disc Makers, has a list of over 5,000 recording studios, searchable by name, location, equipment, price and/or area of expertise. Studios can get a free listing and become a StudioFinder member. ■

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The PSX-100 features a full range of options on the A/D section. Sync to word clock, digital input, optional video or crystal at all the standard sample rates including 88.2 and 96 kHz. Output full 24-bit resolution, or create flawless 20/16 bit with UV22. Send to 2xAES, ADAT, TDIF, S/PDIF coax or optical.

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Use the D/A to check the A/D for confidence monitoring. Return digital signals from your MDM, S/PDIF coax or optical, or either of two AES inputs. Select the channel pair coming back from your MDM in multiple PSX bit-splitting configurations. Lock to the input signal or to the A/D.

*The full range of sample rates from 44.1 to 96 kHz!*

96k

## With the PSX-100, the answer is "yes."

APOGEE ELECTRONICS has a reputation for producing the very best sounding digital conversion products available. You might also think of us as being quick off the mark. But in fact, we think very carefully before we release a new product.

That's how it was when we came to design our first 24-bit, 96kHz converter system: the **PSX-100**.

Anyone can make 24 bits dance up and down 96,000 times a second. The question is, does it sound any better? *In many cases, the answer is no* – and to our engineers, there was no point if the sound wasn't significantly improved. So clock circuitry had to be even more rigorously designed to minimize jitter. Analog components required special characteristics to realize the performance we specified. And much more.

We wanted to give our first 96kHz system all the features needed to make it truly indispensable. AES, S/PDIF, ADAT and TDIF I/O for highest flexibility. Bit-splitting for 24-bit, 96kHz mastering to 16-bit, 48kHz MDMs. UV22® for flawless 16- and 20-bit output. Soft Limit® for maximum level without overs. Digital copy, confidence and monitoring modes. Sync to word clock and optional video.

The result: a total stereo conversion solution. ***Fully independent A/D and D/A converters in a single 1U package.***

People kept asking us, "Does it do 96kHz?" and we said, "When we're ready, it will." Now, with the **PSX-100**, we're ready. Are you?

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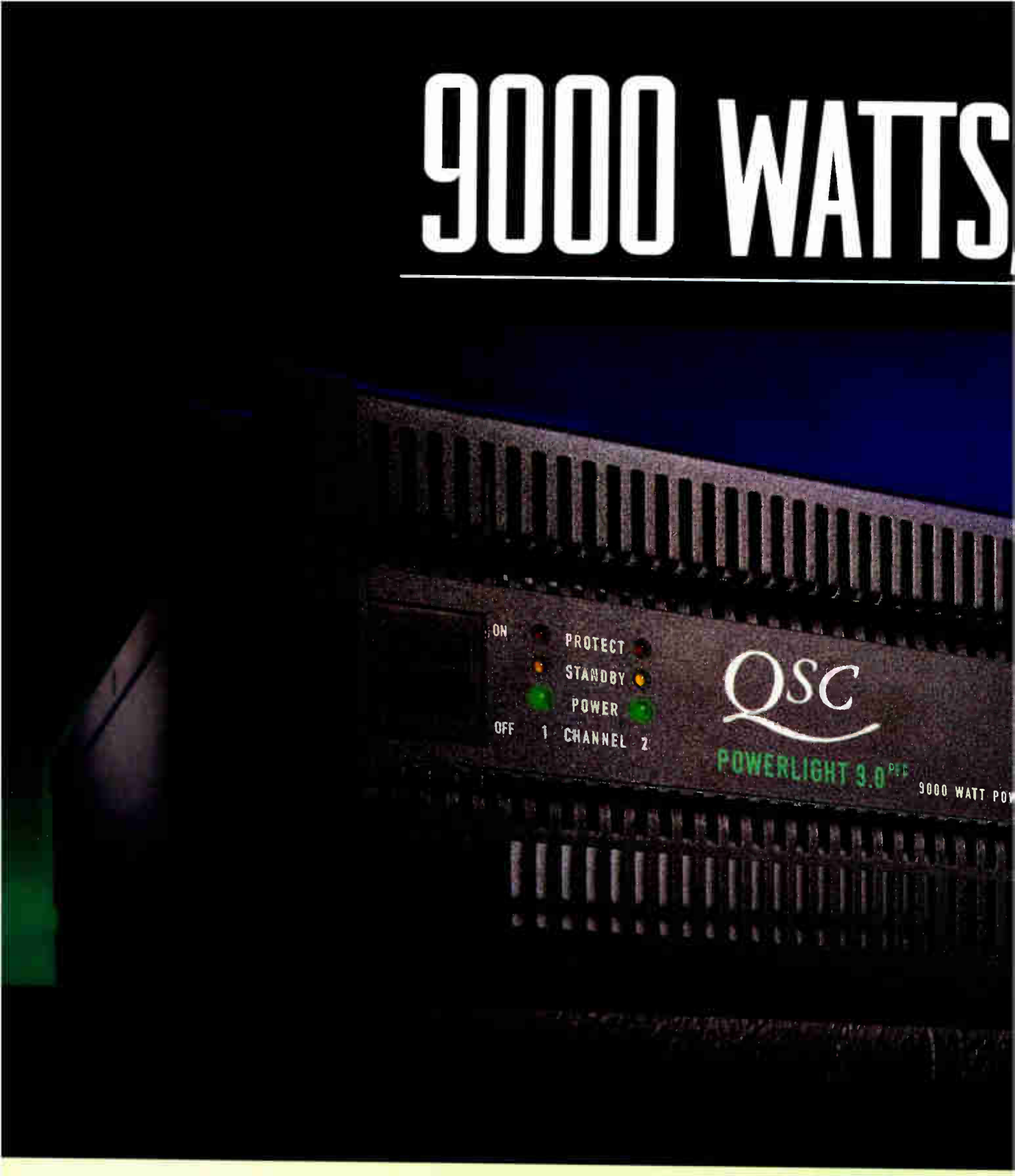
CIRCLE #008 ON PRODUCT INFO CARD

# 9000 WATTS




## PowerLight™ 9.0PFC Features

- Power Factor Correction Technology (PFC)
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- Constant high damping, 2000 or greater (up to 1kHz), even during clipping
- Four-step Class H Current-Cell™ MOSFET output
- Uncompromised 20Hz-20kHz full bandwidth performance.
- Distortion- <0.03% THD, 4Ω, 20Hz-2kHz @3200 watts

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- Variable speed fans

- Lowest AC current draw per output watt
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- Patented Output Averaging™ short circuit protection
- Balanced inputs, Neutrik "Combo" (XLR & 1/4") and Phoenix-type detachable borrier strip
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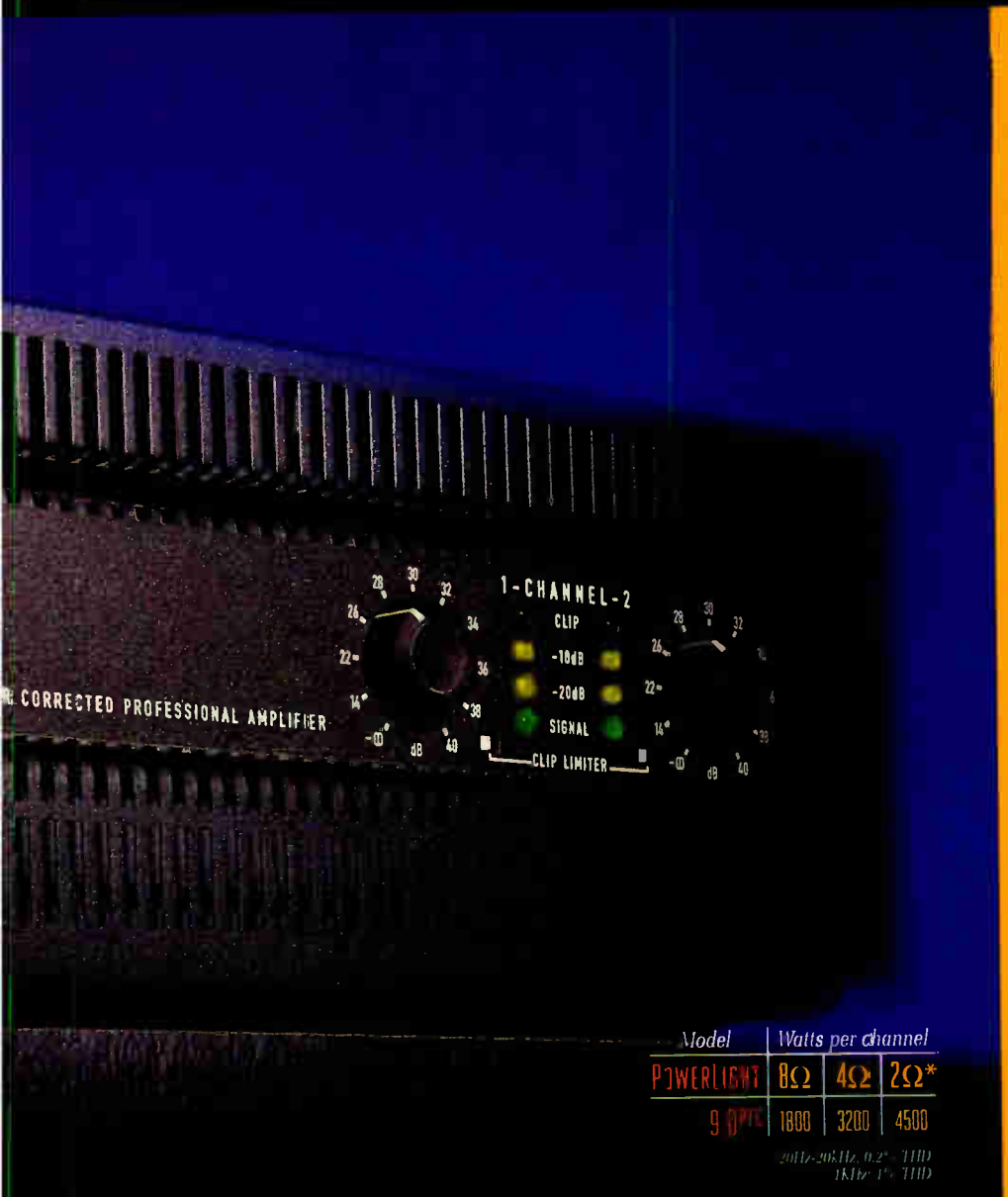
# 3RU, 59 LBS.




| Model | Watts per channel | | |
|---|---|---|---|
| POWERLIGHT | 8Ω | 4Ω | 2Ω* |
| 9.0PFC | 1800 | 3200 | 4500 |

20Hz-20kHz, 0.2% THD
1kHz, 1% THD

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The new flagship of the PowerLight family, the PowerLight 9.0PFC, delivers the highest continuous output capacity of any audio amplifier. With an unequaled 4500 watts/ch at 2 ohms, even the most power hungry subs will never run out of gas again. And because it includes our exclusive Single-stage Power Factor Corrected (PFC) power supply combined with a four tiered DC supply, average AC current draw is 30-50% lower than conventional amplifiers.

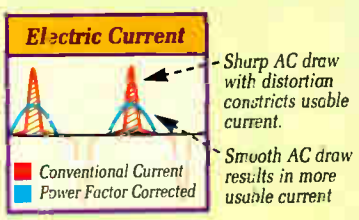
The 9.0 delivers more than just raw power. State-of-the-art high-speed components and high-power MOSFETs ensure the lowest distortion and noise, while its high damping factor maximizes speaker control. And because it's a PowerLight, you'll have a compact 3RU chassis weighing only 59 lbs, so you can drop the name "B Breaker" from your amp rack.

So check out the most powerful amp on the planet. Better yet, listen to it. For the dealer nearest you call (800) 854-4079 or visit our website for more infomation.

***www.qscaudio.com***

## *Power Factor Correction: The Ultimate Power Supply.*

The non-linear current draw of conventional amplifiers severely distorts the AC waveform, using less than 70% of the power. The smooth current draw of the PowerLight 9.0PFC uses 99% of the AC energy — the result is 9000 watts of undistorted music with an average current draw of less than 25 amps at 120VAC.

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QSC™ AUDIO

*HEAR THE POWER OF TECHNOLOGY.*

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# ONE
## IS THE LONELIEST NUMBER

### DESERT FLOWER THAT I AM

When I was 15, circumstances in my life changed, and I left the Indian reservation in Arizona to move to Baltimore. This roughly equates to leaving Earth with no notice, and while thinking you were going to the moon, finding yourself relocated into an alternate universe within hyperspace. Nothing was the same. Nothing was as I had grown to trust or understand. Nobody watched out for snakes and scorpions—instead, they stressed over what type of paint their houses had, or whether their car was newer than their neighbor's. The people in this new galaxy didn't know that the planet itself was alive. They wore madras on their way to get cosmetic surgery to mark their passage out of childhood. I wore nothing when I set out to spend two weeks alone in the deep desert finding my spirit guides.

### MONO A MONO

But not *all* was alien in my new world. I clearly remember that during the one year I went to a mixed (not all American Indian) school in Scottsdale, several of the white kids simply disappeared. Eventually, we learned that they had left school because they had mono. I hadn't really paid that much attention, as in that same year, three of my classmates from my own reservation had been shot and killed (we were considered fair game). I *did* notice, however, that though my brothers never returned, a couple of the kids with mono did, and they looked pretty bad. And so I learned that mono was bad, but not as bad as death.

When I came to Maryland, I was eventually placed in an elite private school, as my reservation education did not meet the standards for a regular school. Palominos became Alfa-Romeos, and peyote became Heineken, but this mono thing persisted. And not only was it here, too, but they all acted exactly the same about it as they did in Arizona. Mono was

—CONTINUED ON PAGE 225

BY STEPHEN ST.CROIX

ILLUSTRATION: DAVE EMBER



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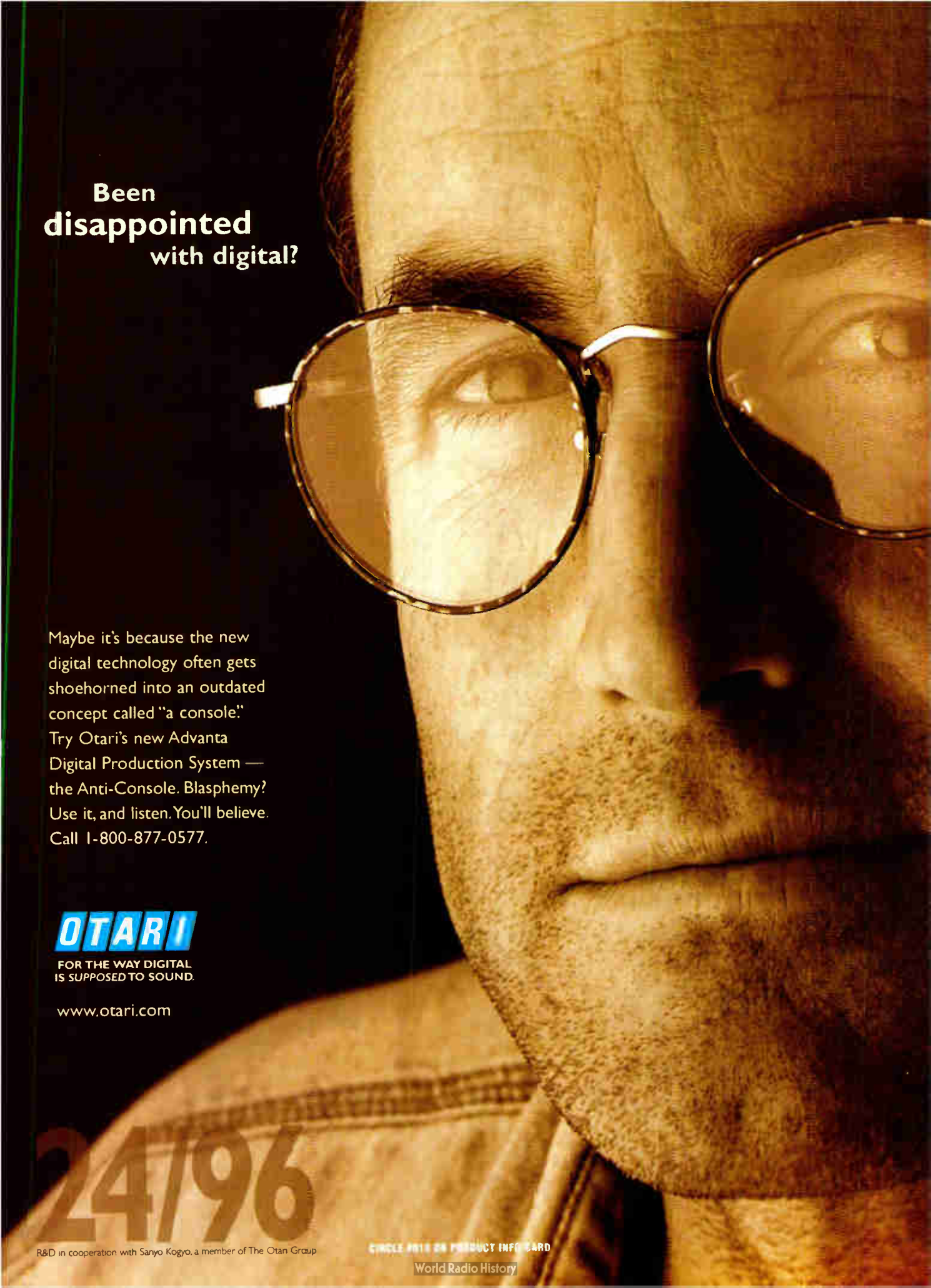

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# VETERAN ENGIN

## THE GROUNDSWELL OF HR824

Everybody makes glowing claims about their monitor speakers. But only Mackie Designs' HR824 Active Near Field Monitors have gotten this amount of acclaim from credible outside sources so quickly.

Here are some verbatim comments gathered by our roving Mackie video crew on a recent visit to Nashville and Los Angeles (call us toll-free for a copy of the finished epic production), interspersed with recent review excerpts.

We know you're as serious about your creative product as these folks are. So why compromise with less than the best near field monitors? Visit your nearest Mackie dealer for a demo or call us toll-free for more info.

HR824

**"Mackie asserts that the HR824s are 'smooth from 39 to 20kHz (±1.5dB)' and our tests corroborated the claim. This is no mean feat for monitors this size. The HR824s performed admirably, allowing us to distinguish very fine shades of tonal color and to establish subtle timbral and harmonic relationships between sounds. If you are in the market for a pair of compact active monitors and you are not afraid of the truth, do yourself a favor and give the Mackie Designs HR824s a critical listen."**

*"When I was tracking for Robert Redford's* The Horse Whisperer, *I put a lot of low end musical instruments onto the tape. When it came time to mix, no way could I have thrashed it out without the Mackie speakers. They really saved my life. My next job is in Calgary, Canada. I'm bringing four Mackies."* Brian Ahern, Engineering Legend

*"Very musical. Very accurate. We actually move them between our five rooms."* Glenn Meadows, TEC-nominated mastering engineer, Masterfonics

*"The most balanced pair of speakers I've ever had. I haven't heard anything better. The Mackies bring the full spectrum of sound into my room. They bring the full scope of the sound in an area that encompasses me AND my clients. You get subsonics — a terrific fullness of acoustic guitar, the lowest end of bass drum. When you have an upright bass you get low end that I normally don't get in a room like this."* Stephan Oberhoff, independent L.A. producer/engineer/keyboardist

*"I love the [HR824's] bottom end — it sounds real. You don't have to compensate or guess. It's nice to FEEL a speaker. Producers also say they feel really good."* Stanley Smith, feature films soundtrack composer, co-producer of Jordan Hill

**"Performance, features and a cost-not-barred design at a retail price of $1500 a pair* make this product a very good value. In the words of one person involved in these listening tests, 'I have a feeling that [the HR824s] will become the NS-10 of the late '90s and beyond' ...ubiquitous."**


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*suggested U.S. retail.


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# EERS AND REVIEWERS CONFRONT REALITY.

## MONITOR RAVES BECOMES A TIDAL WAVE... AND OTHER MIXED METAPHORS.

**"HR824s give systems costing twice as much a run for their money in terms of sound quality... they deliver a solid low end that's surprising for their size and a flat transparent response across the spectrum."**

*"Very clean. Spectacular. Very impressive. You can listen to them for a long period of time. They work in a lot of rooms. What we get on these speakers comes out when we take the tapes other places."* Milan Bogdan, General Manager, Emerald Studios (Billboard Magazine-rated "#1 Country Recording Studio")

*"On material I've mixed using another monitor brand, I'm now hearing things I missed. Imaging is wide and very even. The whole spectrum is equally represented. Great frequency response... midrange is smooth... no low end hypiness."* Bill Smith, Grammy-nominated recording engineer

*"You can sit and listen to them all day long. You get exactly what you hear. They're totally natural — I can't say the word enough — NATURAL."* Lee Roy Parnell, Grammy-nominated singer/songwriter/producer

*"[HR824s] sound incredible — I was extremely surprised by the low end response. Clarity, detail and reproduction in reverb tails is real good."* Pat McMacon, Facility Director. Sony/Tree Studios

*"Very tight bass... clean mids... crystal pristine highs. There's a truth to them once you hear you can't go back."* Frank Serafine, Hollywood motion picture and television sound designer

**"Their treble output is detailed and extended yet very smooth. Words like 'open' and 'silky' come to mind... and these adjectives apply to a very wide sweet spot. The Mackies put out the kind of deep, warm bass normally considered the sole domain of huge drivers and subwoofers. I would consider these speakers a bargain at twice the price, but at list they are a steal."**

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# MY FAVORITE VINTAGES

## GOOD OLD GEAR DOESN'T HAVE TO COST A FORTUNE

ILLUSTRATION JACK DESROCHER

BY PAUL D. LEHRMAN

While the rest of the world is standing on its collective head and in line for the privilege of doling out a week's worth of billings for a matched pair of 12AU7s, made by slave labor in China out of parts from dead Soviet nuclear plants, I look around at my surroundings and think about what "vintage" means to me. Here's some of the stuff I've had in my studio for years that nobody makes any more and that I couldn't do without. And no, none of it's for sale.

**JVC XL-Z335 CD player.** I didn't make that up, that's really its name. It's a pretty ordinary consumer model and doesn't even have multiple trays. It's eight or so years old, and I bought it from the Crutchfield catalog on a sell-off for about $250. It has the usual array of cueing options, remote control, fast play, etc., etc., plus one amazing feature: an S/PDIF out. Now, I think the CD-audio-extraction routine built into Apple's QuickTime is incredibly cool, and there are some very slick audio CD-copying programs out there. But for speed and flexibility, when you are trying to find something on a CD to load into the computer, nothing beats an ordinary consumer CD player's transport controls. With this puppy, I can go right into my Pro Tools' digital input without skipping a bit. And with the remote control, I don't even have to move from my keyboard. I can't imagine getting sound effects or stealing licks off a CD any other way.

**Rectilinear XI speakers.** I bought these hulking things my first week of college, and I've never been without them. Built like trucks, they were considered very hip back when there was a controversy raging in hi-fi circles between the "New England" sound and the "California" sound. These were East Coast with a vengeance: Their sound is so reserved they make Advents sound harsh. Terrific for playing in the background while I'm trying to write, they also make great secondary (or in my case, tertiary) monitors: If I can get a mix to sparkle on these, it'll sound good on damn near *anything*.

**TOA 280 ME speakers.** The op-



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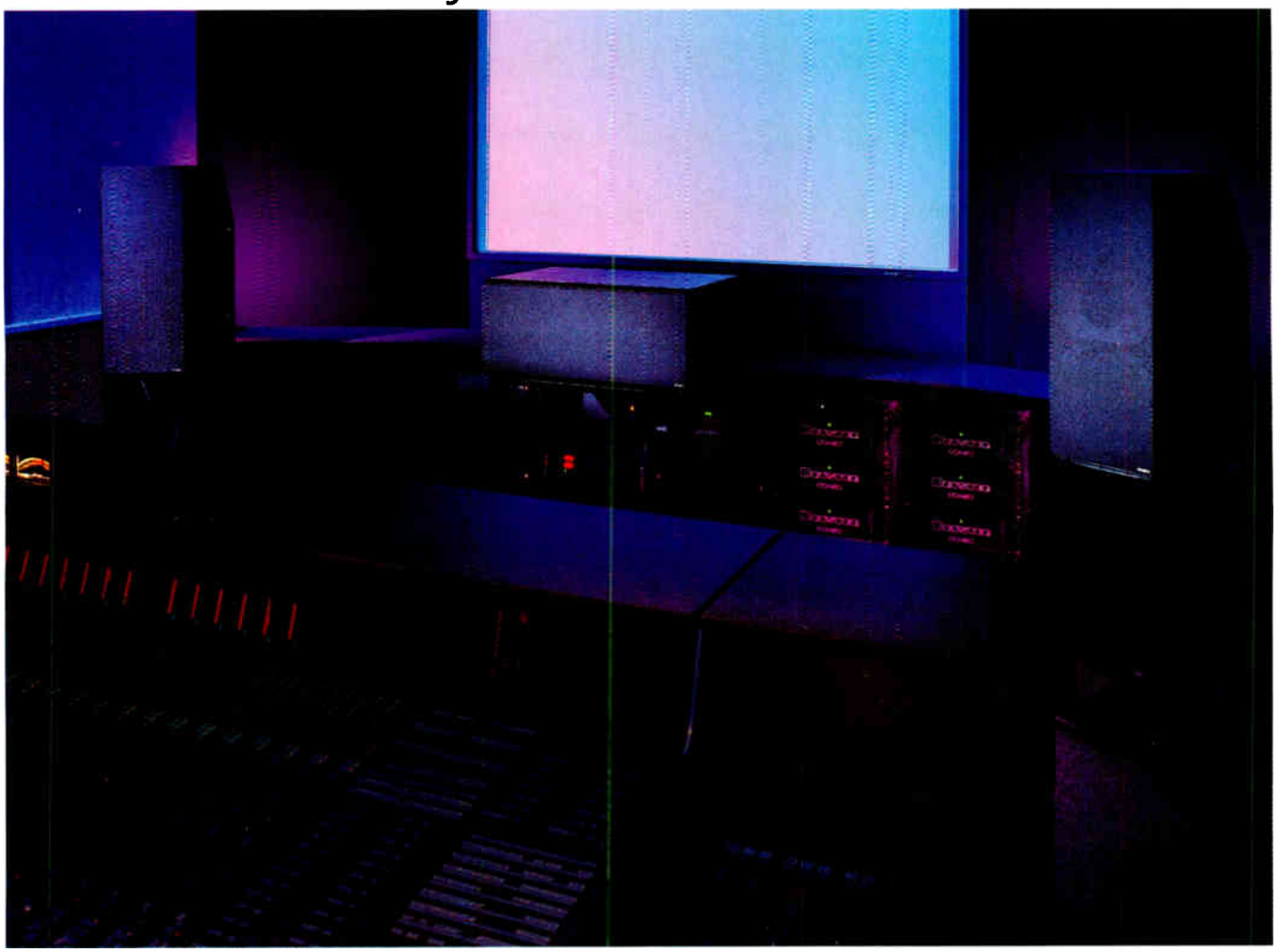
# PMC and Bryston — The Final Mix



"I am completely blown away with our PMC/Bryston surround system."

*James C. Hodson, Advantage Audio, Burbank, CA*

The fusion of PMC loudspeakers and Bryston amplifiers delivers unprecedented accuracy in professional sound systems. Designed to offer exceptional low-frequency extension, low coloration, neutral yet dynamic performance, balance at all levels and high SPLs without distortion or compression; PMC/Bryston surround systems excel in translating with exactness, what is actually happening at the microphone and in the mix. For more information on the PMC/Bryston professional sound systems contact us today. **1-800-632-8217 or www.bryston.ca**

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posite side of the coin. No bottom, really beamy top, lots o' midrange. When a symphonic mix sounds smooth on these babies, I know I've got it. I mixed my first electronic album, *The Celtic Macintosh*, on them over a dozen years ago, and the mix still holds up (the album's not bad either). One of the drivers went out last year, and guess what? TOA still makes parts! So maybe this doesn't quite qualify as vintage...

**Auratone 5Cs.** I would never have bought these, but the company that made them called me up after they saw an article I had written, in which I quoted a remote engineer as saying that the only speakers he really needed for a certain high-visibility gig were Auratones. They offered me a pair of these little post-industrial suckers in exchange for permission to use the quote in an ad. Of course, they didn't really *need* my permission (it was just a sentence, and that's usually considered "fair use" under copyright law), but I appreciated the gesture, and certainly didn't want to disappoint them, so I took the bribe. The ones I got are the "portable" version: plastic grilles that look like drive-in speakers, tough vinyl covers, a metal latch to lock them together, and a leather handle so you can tote the things around. The latch rattles, the grille buzzes, and the hardware makes it impossible for them to sit flat on a surface. Glorious. Today, most television speakers (and certainly most car stereos) sound better than these, but they're still great for that final check before you send off the master.

**Last year I had to do a cartoon for a medical technology company, which featured the life and death of a red corpuscle, and I used the Yamaha TX7s for 90% of the sounds.**

**TOA D4 and D4E mixers.** Little rack-mount mixers that I pull out of the closet for live gigs, extra tracks for mixdown when I'm using multitrack tape, or location recording, since they've got a couple of great mic preamps in them. Clean, straightforward, built like a Sherman tank and just ridiculously useful.

**AKG ADR68K reverb.** When the old Ursa Major company was bought in the mid-'80s by AKG, this is what they were working on: a multi-effects unit way back before anyone else thought of the idea. Besides being a true double-stereo processor, sounding great (although a bit noisy) and having the best MIDI implementation of any studio processing gear before or since, it had a brilliant user interface—none of this "one-parameter-at-a-time-because-that's-all-there's-room-for-on-the-stupid-LCD" nonsense; you can see six parameters at once, and quickly look at and adjust up to 40 more without going through menus, directories or other horrors. This came at a cost—the original price tag on this baby would today get you three digital multitracks—but it was worth it, and it's still the most-used processor in both my home and school studios. (Disclosure department: I wrote the manual for the thing and helped devel-


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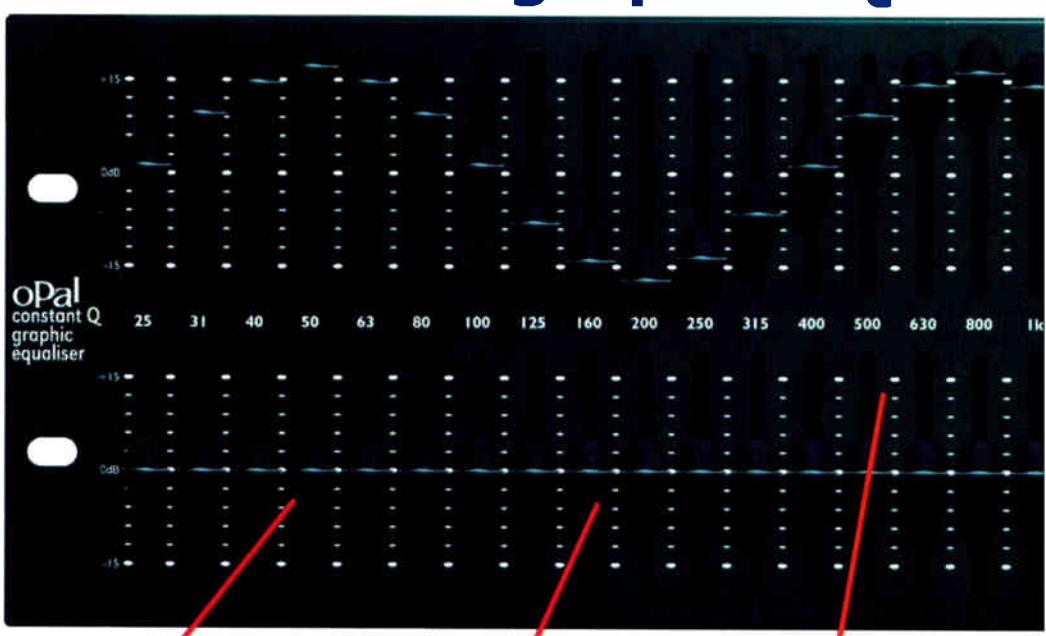
So, what's different about *this* low-cost graphic EQ?...




Center-detent filter bypass for maximum performance?

Custom finger-fit knobs?

±15dB of gain on every fader?

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op the MIDI side. So shoot me if I really liked what we came out with!)

**dbx 166 comp/limiter.** Set for very light limiting and peak elimination at +10, with stereo channels linked. I just leave it there at the end of the signal chain and tweak it ever so slightly when the meters on my DAT deck object. Silent and totally deadly. Yes, I know the "Peakstop Level" isn't brick-wall, but that's what the "over" light is for. And right underneath it: a pair of the amazing **dbx 163x** half-rack thingies. One easy-to-adjust slider, one hard-to-adjust level knob and a stereo-linking jack in the back. Just nudge the thing back and forth until the bass and the kick sit in the mix right where you want them.

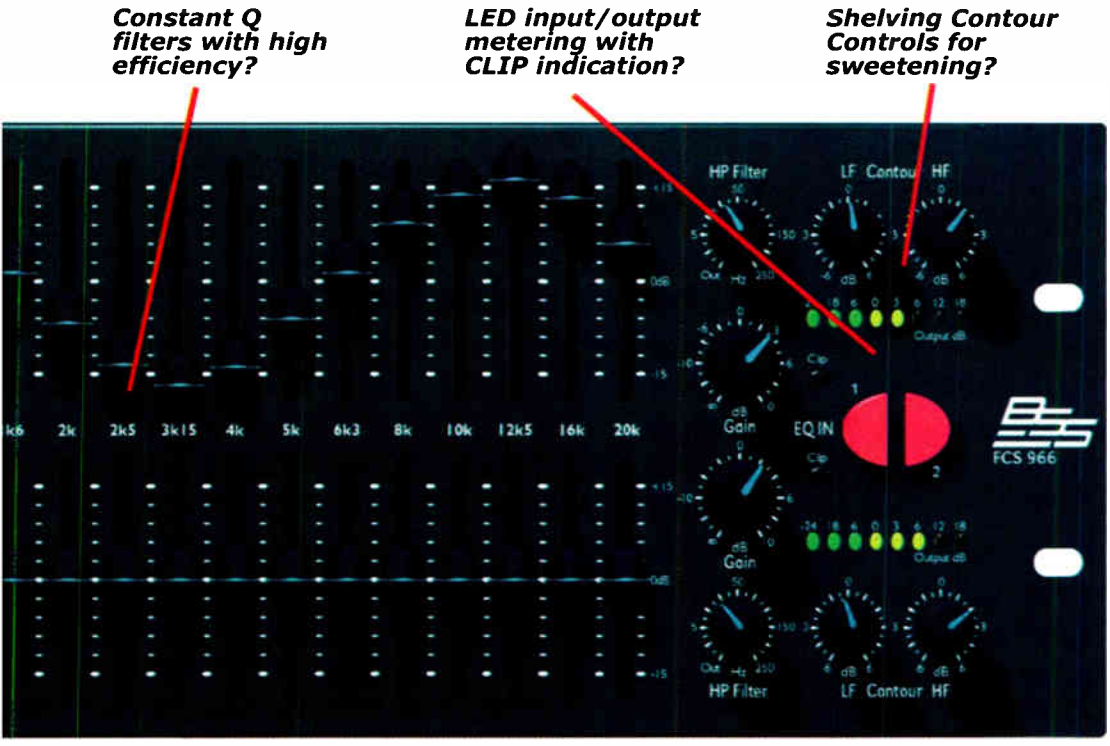
**UREI Platform.** (Disclosure again: I did the manual here, too. How do you think I end up with some of this stuff, anyway?) An ill-fated series of brilliant processors, developed in conjunction with a Danish company. Vertical half-rack modules including mic preamps, parametric EQs, mixers, compressors, limiters and gates—sort of like the SCAMP or dbx 900 racks of old, all of which could be under MIDI control. The fastest, most versatile and most downright astonishing dynamics processors I have ever come across. Control-voltage linking means that up to 11 units can be slaved in series with each other, making for ridiculously complex limiting/ducking/gating/de-essing/EQ-ing schemes. For cleaning up problem material, these babies are unparalleled.

**When you crank it up all the way, the Bogen MX-6A mixer makes a fabulous distortion box, complete with the microphonics and compression that cause digital designers weeks of sleepless nights.**

**Yamaha TX7 synth modules.** Remember these? The venerable DX7 without a keyboard. Better functionality and quieter output than its older brother. Made to stack on each other in a weird but very cool way—I have three of them. FM is supposedly completely passé, but you'd never know it among the academic community, and they have a point: When it comes to real-time control over sound, nothing that's appeared since—with the exception of physical modeling and maybe granular synthesis, both of which make FM programming look like third-grade arithmetic—comes close. And nothing does clangs, bells and nasty metallic noise better. Last year I had to do a cartoon for a medical technology company, which featured the life and death of a red corpuscle, and I used the TX7s for 90% of the sounds. They wanted to know where I got all the cool samples.

**Mark of the Unicorn Video Time Piece.** I've already written about this a lot, but it's always worth mentioning. The new Digital Time Piece can do most of what this thing did, but it's a far more complex piece of gear, so therefore there's a lot more you can do to screw it up. The VTP does SMPTE-to-MIDI, VITC, jam synching, punches and streamers, graphic overlays onto video,

—CONTINUED ON PAGE 216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# THE 105TH AES CONVENTION

## HOT PRODUCTS FROM SAN FRANCISCO

Studer V-Twenty[4] ADAT system

**By the *Mix* Staff**

In September, thousands of audio professionals headed out to San Francisco for the Audio Engineering Society's 105th convention. Here are some highlights of the hot new products and technologies, direct from the show floor.

**RECORDERS**

Making a big splash in the digital recorder market was **Yamaha**'s (www. yamaha.com) D24, a magneto-optical multitrack unit offering 8-track simultaneous record and play at 16/20/24-bit audio, 44.1 and 48kHz sampling rates, and 4-track record/play at 96 kHz, for $3,000. The three-rackspace, stand-alone device, profiled in last month's *Mix*, stores data on removable, 640MB MO discs, with a capacity of one hour (2-channel. 16-bit/44.1kHz), or more than four minutes at 8-track, 24-bit/96kHz.

**Studer** (www.studer.ch) is shipping its V-Twenty[4], a 24-track system with three ADAT Type II, 20-bit V-Eight MDM modules in one package, with an autolocator, studio rack and remote metering. Retail is about $30,000.

New *analog* tape formulations were introduced for the first time in four years: **Quantegy**'s (www.quantegy.com) GP9 Grand Master Platinum is formulated to sound like 3M's 996. The UK's **Zonal** (http://ourworld.compuserve.com/homepages/zonalco) introduced 999, a new high-output, low-noise tape, and in the MDM scene, **Emtec** introduced Formatted ADAT Master, a pre-formatted tape for 16-bit ADATs.

The **Sonosax** (www.sonosax.com) Stelladat II portable timecode recorder offers 4-channel recording to DAT, weighs only 8.8 pounds (including battery) and offers recording at rates up to 96 kHz.

The **Euphonix** (www.euphonix.com) R-1 is a stand-alone, random-access digital recorder with 24-track, 24/96 capability, featuring 24-bit conversion and 40-bit floating-point internal DSP (four Analog Devices SHARC processors). The system has a rackmount CPU and storage/backup units, plus a remote control interface (with MADI interface), and is designed to emulate traditional analog tape recorder interfaces.

Designed as a direct replacement for mag film dubbers, **Sony**'s (www.sony.com) DADR System 5000 is a 16-channel disk recorder with selectable 16/20/24-bit resolution in a four-rackspace box. Recording is to Jaz drives. Units have so far been installed at Sony Pictures, with a "global commitment" from Todd-AO. Features include jog/shuttle wheel control, chase lock at all frame rates and reverse play. Base price is $15,860, less sync card.

CAD VSM-1

B.L.U.E. Cactus

Neumann M147

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Arboretum Harmony vocal processor

Euphonix R-1 controller

Yamaha D24 optical recorder

**HARDWARE/SOFTWARE NEWS**

A big buzz at the show was **Digidesign's** (www.digidesign.com) long-awaited announcement of a Windows NT version of Pro Tools, and the introduction of the Pro Tools|24 MIX card, offering three times the DSP power of Pro Tools|24 and up to 64 tracks on a single PCI card. For more details, see last month's *Mix*.

On the VST front, **Cycling '74's** (www.cycling74.com) Pluggo lets Mac signal processing applications created with MSP audio objects (DSP algorithms for the MAX graphical programming environment) work as a VST plug-in. **Steinberg** (www.steinberg.de) showed Quadra Fuzz, a multiband distortion plug-in conceived by Craig Anderton (the "faceplate" even bears his signature—could this be the first designer plug-in?) and designed by Spectral Design for VST, WaveLab or Direct-X-compatible applications. In other Steinberg news, the company's Nuendo is now Windows-compatible.

**Arboretum Technology's** (www.arboretum.com) Harmony is a formant-based vocal processor that—in addition to providing eight-part harmony generation, pitch correction and DSP effects—can impose the sonic characteristics of one voice onto another.

**MICS, MICS, MICS!!!**

New mics (AKG C3000 Pro, Audio-Technica AT-4060, Audix CX-101, BPM CR-95/TB-95, CAD VX2, Earthworks SR71, etc.) were the rage at summer NAMM. At fall AES, the trend continued with more than 35 new microphones. Distributed by G Prime (www.gprime.com), the **Microtech Gefell** KEM 970 is a cardioid plane mic with 30 x120° coverage from eight phase-matched condenser capsules in a line array. Retail? About $7,500. **Beyer's** (www.beyerdynamic.com) MCD 101 is an omni version of its MCD 100 digital studio microphone, which places the condenser electronics and A/D converter with AES/EBU output within the mic body.

Bring on the surround mics! The 5.1 Surround Sound Processor from **SoundField** (www.proaudio.co.uk/sndfield.htm) uses its existing SoundField MKV or ST250 4-capsule mics to create stereo, LCRS, 5.1 or (optionally) 7.1 surround, with control of front/rear width and rear focus. **SPL's** (www.proaudio.de/spl) ATMOS 5.1 surround mixer (with five mic pre's, surround panning and subwoofer output) works with **Dirk Brauner's** (www.dirk-brauner.com) ASM5 Adjustable Surround Mic for 5.1 recording. Based on a classic Decca Tree, the ASM5's three (LCR) rotatable capsules are spread

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# TOP 10 LIVE SOUND PICKS FROM AES

Congratulations to manufacturers that demo'd products with live audio at the San Francisco AES. Tuck & Patti could be heard in Meyer's booth, while CAD introduced its VSM-1 tube mic with Roger Hodgson singing selections from Supertramp's *Breakfast In America* in a hotel room! Eastern Acoustic Works used its newest speaker in the acoustically challenging Fillmore club with a live concert by Edwin McCain and a no-soundcheck support act. That said, here are my ten live sound highlights from the AES:

1. **EAW** (www.eaw.com) celebrated its 20th anniversary by introducing the KF 750, a compact three-way horn-loaded tour speaker. The rear of the cabinet has a 10-inch cone driver with an elaborate phase plug, and a nearly square horn mouth is the entire front of the trapezoidal cabinet. Directly in front is a compression driver on its own horn, and sharing the mid-horn on its top and bottom walls are two 12s. The KF 750 is tri-amped with a CyberLogic amp module attached to the cabinet's backside, or traditional amp racks can be used with EAW's MX 8600 processor. At 31 inches high, three cabinets stack in most trucks.

*EAW KF 750*

2. **Acoustic** (realacoustic@earthlink.net) debuted the SubTeq 2.6 subwoofer along with the rest of its revamped speaker line. It employs a 13-ply Baltic birch cabinet and piston motor (no belts or chains) to impart three-inches (!) of excursion to a 26-inch cone with a specially designed spider.

3. **Crane Song** (www.cranesong.com) unveiled the Trakker, a discrete Class-A single-channel compressor, which, like its STC-8 (used by TEC Award winner Dave Kob), offers a wide palette, from clean to vintage. Engineers seeking an insert for the "money channel" should take a listen.

4. **Crown**'s (www.crownintl.com) new USP PIP-2 card does more, sounds better and costs less. This $600 remote-control-and-monitoring IQ card puts a dedicated full-featured 24-bit digital signal processor into your Crown amp.

5. **Eventide**'s (www.eventide.com) UltraShifter software for the 4000 Series Ultra-Harmonizer provides an incredibly natural-sounding vocal pitch shifter.

6. **Neutrik** (neutrik@total.net) introduced the MR-1, a small handheld, multifunction signal generator that looks like a Star Trek tricorder. It has both XLR and RCA jack outputs, produces white or pink noise, sine or square waves (which can be swept), and runs on two AA batteries. Very cool.

*Neutrik MR-1 signal generator*

7. **Pure Sound** (www.puresound.net) introduced the next generation of the optical proximity switch for vocal mics, the MM-3 Mic Mute, which now runs on, and passes, phantom power.

8. **Radial Engineering** (www.radialeng.com), the Canadians with the Class A JDV DI, introduced the Stage Slug, a snake system sub-box with its 12 XLR connectors in a row on one side to lower its profile on stage and make it impervious to being stepped on.

9. **Sabine** (www.sabineinc.com) unveiled the Graphi-Q, a 24-bit digital processor that looks like a graphic but offers 31 bands of EQ, up to a second of delay, 12 anti-feedback filters and compression. It's available in single- and dual-channel models, plus blank front-panel slaves, all controllable from Windows software.

10. **UltraSound**'s Don Pearson showed his Analyzer Interface System, which controls BSS VariCurve EQs directly from JBL's TEC Award-winning Smaart Pro (www.siasoft.com) software. It provides the bridge between +4 dB XLR signals and a computer's -10dB ¼-inch stereo jack without loading down, causing ground loops or unbalancing the signal. Precision-stepped attenuators allow accurate, repeatable measurements.

*— Mark Frink*

in an equilateral triangle, with two spaced-pair (surround) capsules at the back of the tree. And **Josephson Engineering**'s (www.josephson.com) C7000S is a stereo version of the Josephson studio mic, with three capsules allowing users to derive stereo or surround sound from a single microphone.

Sixty years in the (re)making: **Audio Engineering Associates**' (www.wesdooley.com) $2,000 R44C is a painstakingly accurate re-creation of the classic 1938 RCA 44BX. And **Royer Labs** (www.royerlabs.com) showed two ribbon studio mics: The $995 R-121 combines old and new, placing a 2.5 micron-thick ribbon within a neodymium magnet assembly. And the Speiden coincident stereo ribbon mic (a cult favorite) is now the $1,950 Royer/Speiden SF-12.

Affordable large-diaphragm condensers were big. **Shure**'s (www.shure.com) KSM32 is a studio cardioid with transformerless Class-A electronics. Retail is $1,029 with case and shockmount, or $959 *sans* accessories. The **Soundelux** (www. soundelux.com) U97 is a $599 mic with transformerless FET electronics and four polar patterns. **B.L.U.E.—Baltic Latvian Universal Electronics** (www.bluemic.com)—launched several mics in cool new shapes/colors and with discrete, Class A electronics with transformer outs. Blueberry ($1,200) is an entry-level cardioid model; Cranberry ($1,400) adds interchangeable capsules; and Kiwi ($2,200) is a 3-pattern version. Color-coordinated mic cables are optional. **Marshall Electronics**' (www.mars-cam.com) MXL 2001 has a 1-inch, gold-sputtered cardioid capsule, transformer out, bass-cut switch, shockmount and roadcase; retail is $399. CAD's (www.cadmics.com) Equitek E-350 ($898, with shockmount) combines a 1.10-inch capsule with servo design electronics and a choice of three patterns.

Under-$1,000 tube mics? AES delivered! **RØDE**'s NTV (www.event1.com) combines a new 1-inch capsule in a cardioid design with Jensen output transformer, flight case, power supply and shockmount. **Alesis** (www.alesis.com) announced the formation of its GT Electronics division to market vacuum tube technology, based on the mic, amp and outboard designs of **Groove Tubes** founder Aspen Pittman. The first products are the AM51 ($549) and AM52 ($699) cardioid and 3-pattern FET mics, and the AM61 ($999) and AM62 ($1,299) cardioid and 4-pattern tube mics. All Alesis GT mics include hard case and shockmounts. Pittman will independently operate Groove Tubes as a tube supplier and is working with Alesis on future products.



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World Radio History


CIRCLE #015 ON PRODUCT INFO CARD

# FIVE PICKS YOU MAY HAVE MISSED

With hundreds of exhibits and only a few days to see everything, some products may have gone unnoticed. Here are five AES product hits you might have overlooked:

*TerraSonde Audio Toolbox*

• **TerraSonde's** (www.terrasonde.com) The Audio Toolbox™ is a DSP-powered, *wunderbox* packing dozens of functions (signal generator, SPL meter, RTA, RT/ETC meter, polarity check, cable tester, phase meter, digital metronome, guitar tuner, monitor amp, SMPTE reader/generator/reshaper, waveform scope, level/frequency meter, sweep generator, etc.—even video games!) into a fuzzbox-sized chassis. At $899, every audio pro needs one.

• Another "big function/small package" is **Line 6's** (www.line6.com) Pod, a palm-sized $399 processor providing emulations of 16 classic guitar amps, along with reverb, flange, chorus, delay, compression and more.

*Line 6 Pod guitar processor*

• Not exactly high-tech, but **Quik-Lok's** (www.musicindustries.com) Optimum Series is a stylish solution to the studio console stand dilemma. They're rugged, solid and affordable, and even offer optional near-field speaker shelves. Cool!

• Digital amplification is finally reality. Forget that phony "put a DAC inside an amp chassis" stuff: **Tact Audio's** Millennium [from Denmark's Toccata Technology (www.toccata.dk) and London's NAD Electronics] is a *real* digital power amp that converts AES or S/PDIF PCM inputs into PWM signals that directly control the output devices. Efficiency: nearly 90%; power output: 250 W/channel (4 ohms).

• **Tracer Technologies'** (www.tracertek.com) Diamond Cut Live is a $995 PC program offering a trainload of audio restoration applications, including paragraphic EQ, tube simulation, dynamics, reverb, click/pop/noise/hiss/ hum removal, de-essing, bandpass/highpass/lowpass filters and aziumth correction. Near-real-time processing (>100ms delay) and a simple interface make this a winner.

*—George Petersen*

Got a little more to spend? Tucked into a corner of ATR Service Company's (www.atrservice.com) booth was the $12,000 Swedish **Didrik De Geer** stereo microphone, using two modified AKG C-12 capsules in a stunningly beautiful bronze/gold body with state-of-the-art tube electronics. **Neumann** (www.neumannusa.com) celebrated its 70th anniversary with its $1,999 M147, a cardioid mic using the same capsule as the U47/U47 FET and a tube circuit based on its M149. **Soundelux** unveiled the U95S (priced at $3,599, it's designed to offer a U47/M49 sound with low-noise/wide dynamic range) and showed the $1,199 cardioid tube PTM model. **Brauner's** $3,495 VM1U uses the same capsule as its $4,995 flagship VM1, but in a 2-pattern, no-frills package. Brauner's $2,695 Valvet is a lower-cost cardioid tube mic for the project studio market. The $1,299 cardioid VSM-1 from **CAD** combines the valve technology of the VX2 with the servo technology from the Equitek series with a 1.1-inch capsule. And the $3,000 **B.L.U.E.** Cactus mates the 3-pattern capsule from its Kiwi mic with high-end tube electronics in a cool desert-tan housing.

## MONITORLAND

**Event Electronics** (www.eventl.com) has added a powered subwoofer to its 20/20 line of monitors. The new subwoofer offers six inputs, one of them designed to monitor the Dolby Surround LFE (low-frequency effects) channel. Alternatively, the other five inputs may be summed to a second bass channel in the subwoofer for conventionally derived sub-bass.

**Genelec** (www.genelec.com) showed its 1034B Active Monitoring System, a three-way system designed for large control rooms. Featuring two 12-inch woofers, a 5-inch mid and a 1-inch tweeter, the 1034B is designed to be flush-mounted or free-standing and produces peaks of 125dB SPL at 1 meter. Genelec also showed the new 2029A, a version of the Model 1029A powered monitor with an integrated 24-bit D/A converter.

**HHB Communications** (www.hhb-usa.com) launched its Circle 5 studio monitors. Available in active and passive configurations, the Circle 5 system includes an 8-inch woofer, paired with a soft-dome, fluid-cooled tweeter. The active Circle 5 includes a 2-channel amp delivering 120 watts to the woofer and 60 watts to the tweeter. Prices are $1,399 (active) and $749 (passive).

The TRM6 Active Monitor Speaker System from **Hafler** (www.rockford-corp.com) is similar to the TRM8, but smaller; a pair of the two-way, biamplified speakers is $1,399. Comprising a 6.5-inch polypropylene cone woofer and a 1-inch soft-dome tweeter powered in a mag-shielded cabinet, the TRM6 features a frequency response of 55 to 21k Hz, ±2 dB and peak output of 120 dB.

The KRK 813 from **KRK Systems** (www.krksys.com) is designed to the exact dimensions of the venerable UREI 813 monitor, easing replacement of the latter. The KRK 813 features dual 15-inch woofers, a 7-inch cone midrange, two 1-inch Kevlar inverted dome tweeters and a 24-bit DSP stereo crossover with level and delay/phase adjustment controls. The triamped system can achieve levels of 120 dB SPL.

Making its first appearance at an AES show, **NHTPro** (www.nhtpro.com) showed powered monitors and amp/monitor systems. The $1,900 A-20 system combines two two-way speakers and a control unit, with a 250 W/channel stereo power amp. The A-10 is similar, though smaller and powered by a 150 W/ch amp; price is $1,200. The compact M-00 system consists of two powered near-field speakers priced at $350 each.

## SIGNAL PROCESSORS

**Drawmer** (www.transaudiogroup.com) offers three new processors in its Digital Masterflow Series: The DC2476 ($2,995) is a 24-bit 96kHz ADC/DAC with programmable stereo mastering processing, such as multiband compression, EQ, limiting, de-essing, auto fade and tone shaping algorithms. A stereo "mic channel" and high-res 44.1/48/88.2/96 kHz converters round out the Masterflow line, which all feature comprehensive I/Os (including TDIF and ADAT optical, word clock and MIDI interfaces) and a PCMCIA card for

*—CONTINUED ON PAGE 217*



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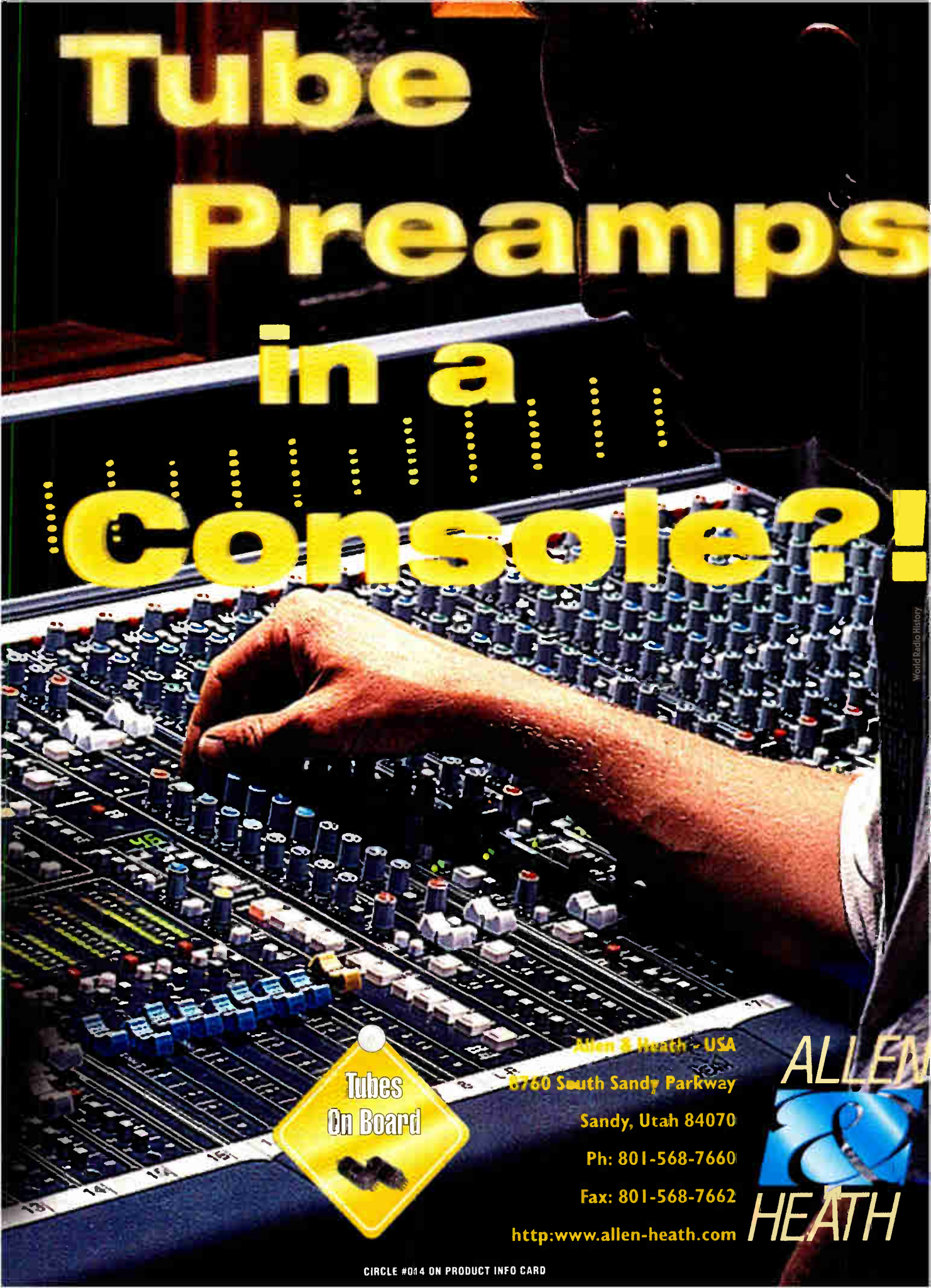


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CIRCLE #014 ON PRODUCT INFO CARD

# 14TH ANNUAL TEC AWARDS WINNERS

It was standing room only as 800 audio industry professionals watched 27 winners accept their TEC Awards at the 14th Annual Technical Excellence & Creativity Awards, held September 27 at the Fairmont Hotel in San Francisco. Other highlights of the evening included Colin Sanders being inducted into the Hall of Fame and Neil Young accepting this year's Les Paul Award. For a complete wrap-up, see the December issue of *Mix*.

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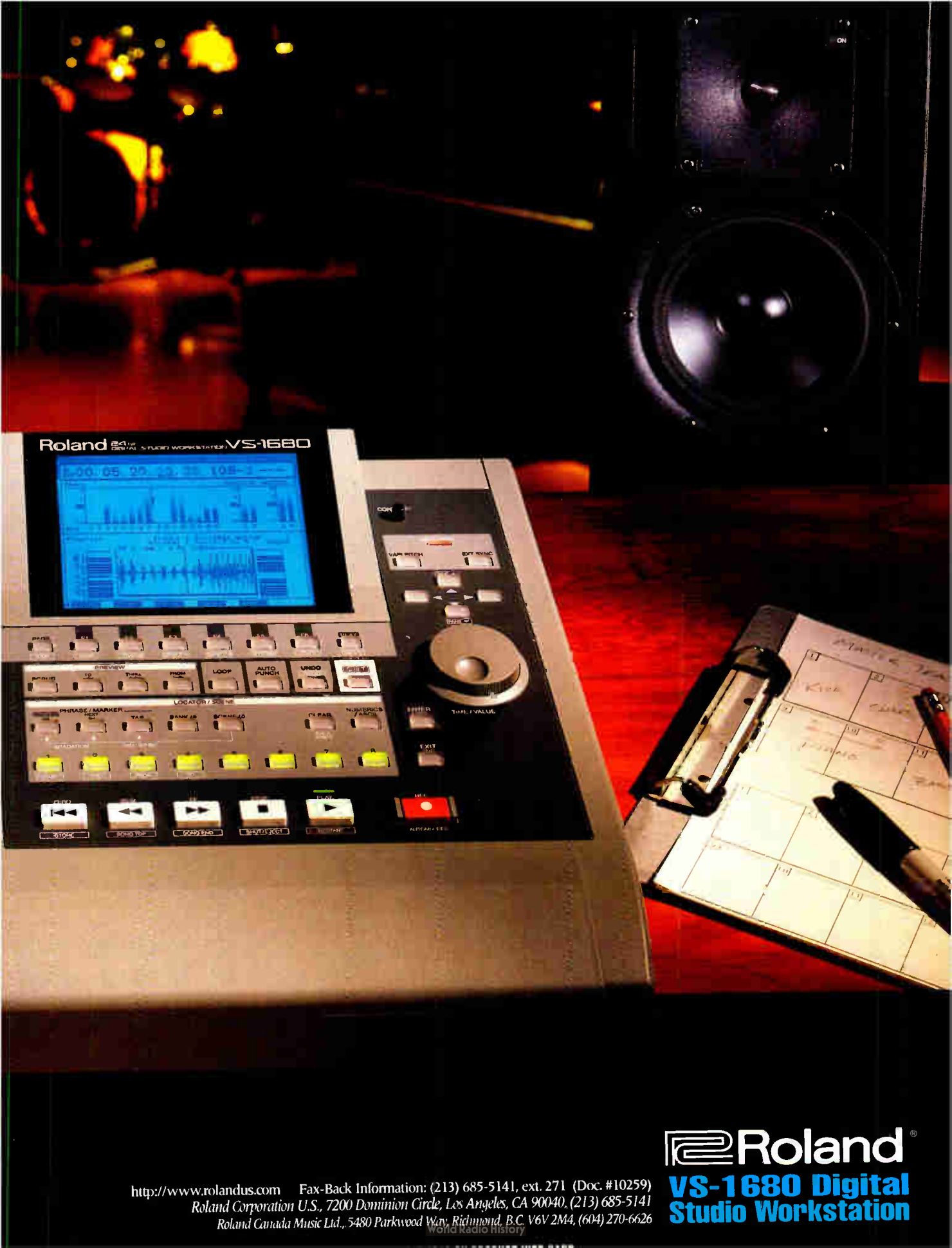


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# CHICAGO TRAX BRINGS DIGITAL DOWNTOWN

**ON THE COVER**

Reid Hyams can finally take a vacation, or at least get a breath of fresh air. As the co-owner/operator of Chicago Trax, a rock 'n' rolling music institution in the city since 1979, he has spent the better part of the past two-and-a-half years relocating the facility to the River North neighborhood. The first two rooms, the SSL 4000 E and G rooms, opened in April and July 1996, leading the move from the North Side. Then, just a month ago, the fine-tuning of the AMS Neve Capricorn 5.1 room, pictured on this month's cover, was completed.

"It took a lot more planning, time and capital to build this [Capricorn] room," Hyams explains, "because it has all-digital recording technology from the ground up and is *not* a retrofit. We really had to re-evaluate the building and redo some structural elements so that we would be able to isolate the control room and studio properly from outside noise and vibration, which is much more forgiving in analog recording but extremely sensitive in a digital environment."

PHOTO: REID HYAMS

*(L) Chris Steinmetz, Chicago Trax director of recording/project engineer, and Dan Pritzker, guitarist/songwriter/producer of Sonia Dada, at a 5.1 mix.*

The move to Larrabee, eight blocks west of the Hancock Center and Watertower Place, was, in effect, forced on Hyams when his landlord on Halsted decided to expand his bar business. But it turned out to be fortuitous: Trax went from 3,000 square feet to a 22,000-square-foot complex, with a 20,000-square-foot secured parking lot. The company now owns its building. "We learned our lesson the hard way, and hindsight is 20/20," Hyams says.

More space, however, means more space to fill. Besides the main mixing room and studio, the new building holds Music I (80-input SSL 4072E), Music II (48-in SSL 4040G) and Music III (36-in Harrison MR-4); a digital editing suite with Pro Tools and Sound Designer; a dub/transfer room; MIDI production space; and all the necessary lounges/offices, with all the amenities of home.

Music VI, the Capricorn control room/studio, was designed by Doug Jones of Electro Acoustic Systems (he also did both SSL rooms), in consultation with the staff at Trax. Audio/video design interface was by chief tech Jeff Schroeder, and Steven Panno handled the general contracting, working closely with Jones. Hyams knew he wanted another live, ambient tracking space, and he ended up with a 1,500-square-foot studio with 32-foot ceilings. A mezzanine level surrounds the east end and opens out into the main room and contains one of six iso booths. Mic lines are wired into the ceiling and can be raised and lowered remotely. Video, audio and ISDN tielines run throughout the facility.

While Hyams knew what he wanted in terms of physical space, he wasn't initially sold on a digital board. He and Chris Steinmetz, director of recording services, looked at the Rupert Neve-designed Amek 9098, deciding it was an incredible console but that it would work better as a future upgrade to one of the other rooms. They also looked at the SSL 9000J and Neve VX, and he says both have serious possibilities for Trax's future.

"We were fighting the analog vs. digital choice," Hyams recalls. "So we took a trip to New York with Adrian Weidmann of AMS Neve and argued with him the whole way there, at dinner and on the way to see the console—that analog was still the way to go. His only reply was, 'You'll see.' We went to Chung King for a demo, and John [King] was really excited about it. I brought two of my guys out, chief engineer Bill Garcelon and well-known Chicago freelance engineer Tom Carlisle, and within an hour, they were flying through it and having the time of their lives doing so. It just came down to the fact that it had so many capabilities and there are all these plans for future expansion. It was a natural move for us, and we'd be the first studio in Chicago to introduce this high-end digital technology in a music room. We knew it would be a hard sell initially because our industry is generally conservative, but once engineers and producers get their hands on the console in that room, their whole outlook changes. We still support both analog and digital formats and feel that they are equally valid and sound great. It's the user's choice, not the studio's."

Hyams and the staff also thoroughly evaluated and tested high-end monitoring systems, knowing that they wanted the left-right pair and the subwoofer soffit-mounted, with free-floating surrounds. They decided on an active Quested system, with Q412-Cs left-right, a 212-C in the center, a QSB121 subwoofer and two H208s in the rears. Amps (and digital crossovers, with personal presets for the clients) are all from Quested; Genelec 1031As, Quested near-fields, Yamaha NS-10s and other monitors are also available.

"We first did some work with MC Hammer and mixed the Tyrone Davis album in the Capricorn room," Hyams says, "but it wasn't until Mickey Hart came in [working on *Supralingua* for Rykodisc] that we made full use of the room and did our first serious 5.1 mixes. We realized what the room was capable of and how creative, enjoyable and fun it was. Mickey was actually orchestrating where all the elements were going, and everything made sense artistically and technically. It was beautiful, and it was a historic moment for Trax, Mickey Hart and his longtime friend and engineer Tom Flye." ■



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# METALLICA'S JAMES HETFIELD AND LARS ULRICH

## METAL WITHOUT COMPROMISE

Success was a long time coming for Metallica. The band formed in 1981, when drummer Lars Ulrich moved to Los Angeles and met singer/guitarist/sticker-factory worker James Hetfield. The two musicians shared a disdain for the commercial rock music dominating the airwaves, and Ulrich, a Denmark native, turned Hetfield on to the dark, heavy metal sounds circulating the European underground. A creative partnership was born, and together with bass player Ron McGovney and lead guitarist Dave Mustaine, they formed Metallica.

A couple of years later, Ulrich and Hetfield migrated to San Francisco, partly in pursuit of Bay Area-based bassist Cliff Burton, but also to escape a burgeoning glam-metal scene in L.A. where they didn't fit in. Guitarist Kirk Hammett replaced Mustaine, and although the extended songs, dark lyrics and aggressive, loud speed-metal sound of their debut album *Kill 'Em All* were shunned by mainstream radio, the band's popularity exploded through word of mouth and live performances. The band developed a huge underground following, and their next release, *Ride the Lightning*, went Gold, even while Metallica continued to be overlooked by MTV and commercial radio.

Then, in 1986, tragedy struck the band. As they embarked on their first headlining tour of Europe, bass player Cliff Burton was killed in a tour bus accident in Sweden. The group put things on hold for a while, then rebounded with Jason Newsted as bassist.

The group made further commercial inroads two years later with the release of...*And Justice for All*, which spawned singles and a video for the first time. Nineteen ninety-one marked another turning point as Metallica joined forces with producer Bob Rock to release their eponymous fifth album (also known as the Black Album). The hit single "Enter Sandman" shot up the charts, taking heavy metal into the Top 40, and the album went quintuple-Platinum.

PHOTO ©MELANIE WEINER/RETNA

*The band today: (L to R) Lars Ulrich, Kirk Hammett, James Hetfield, Jason Newsted.*

In 1995, Metallica and Bob Rock returned to the studio for a year to record *Load*, took a break to headline the Lollapalooza tour, then went back into the studio to finish *Re-Load*, a continuation of the *Load* project.

Seventeen years and more than 40 million albums since they started, Metallica continue to evolve, while staying true to their metal roots. Many credit Metallica with changing the face of rock music—paving the way for alternative bands by successfully breaking through the pop barrier without compromising their music. Recently, James Hetfield and Lars Ulrich sat down before a gig in Irvine, Calif., to talk to *Mix* about their latest project (a collection of cover songs due out this month), their process of reinvention through collaboration with producer Bob Rock, and how they've developed as bandmembers and matured as musicians.

**BY SARAH JONES**

***So you're getting ready to release a new record...***

**Ulrich:** It's basically a compilation of all the cover songs we've ever recorded up to date. Most of those cover songs have been scattered on EPs and B-sides, and we're basically just putting them all under



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one umbrella, and then we are also going to go in the studio for about three weeks and record six or eight new cover songs. We thought we'd do some new cover songs, based on where our heads are at in 1998. The reason we do cover songs is really because it's such a great polar opposite to the way we treat our own material. When we write songs and record songs that we've written, we get very particular. And when we interpret other people's material it becomes much looser and it is a different relationship. But most of the cover songs we used to do in the early days were really more like these obscure British metal bands, and we would do note-for-note renditions. Most of the stuff we're going to be doing this time around, the new material that we're recording, is going to be a little more adventurous.

*What kind of material are you going to cover?*

**Ulrich:** We're looking at some artists that are a little different than we've done before. We haven't made final decisions, but we're throwing a couple of Blue Oyster Cult things around, we're throwing some Lynyrd Skynyrd stuff around, and a couple of singer/songwriters that are pretty different from what you would associate with Metallica. And then there's a couple of things that are maybe a little bit more obvious.

**Hetfield:** This new album is a re-release of the *Garage Days Re-Revisited* album, which was all cover tunes. We put this thing out, and we took it off the market for a while, and we're just re-releasing it with your [The Anti-Nowhere League's] "So What," your [Queen's] "Stone Cold Crazy," all kinds of wacky B-side stuff we've done, and we're adding about eight more cover tunes, after this tour is done. The day after we're finished, we're in the studio.

*You're going back to The Plant in Sausalito?*

**Hetfield:** We are going to The Plant again. We've got a running tab [laughs]. *I was at The Plant a couple years ago, talking to your producer, Bob Rock, when you guys were in tracking* Load. *They showed me the extensive renovations that were done when you went in.*

**Hetfield:** We've always worked at places like One on One in L.A., and in Denmark, the other albums we did, they've always been in one studio, one big control room. It's just one band in there at a time; you basically just lock the door and you're in Metallica world. You know, you don't have to have Joe Blow from Big Hair band sticking his head in, "Hey, sounds killer, dude!" That's how it was in a lot of other places. And also, we really wanted to stay at home [in the San Francisco Bay Area] and do recording.

**Ulrich:** If you threw a dart at the Bay Area, the center point would be right where The Plant is, in terms of being the center point between the four guys.

**Hetfield:** We talked to Arne Frager, the owner; he said he was up for a revamp of the place so we kind of combined efforts, and so it kind of made it the Metallica second home. He built a nice lounge, and opened up the main room there, to make a bigger, kind of live sound. That place was designed around '70s tight, really dry productions. You couldn't really expand the room except going up, so they blew the roof out and added more space upward.

*So before you recorded, you went in there and gave them a vision of what you wanted...*

**Hetfield:** Yes. It was kind of strange sit-


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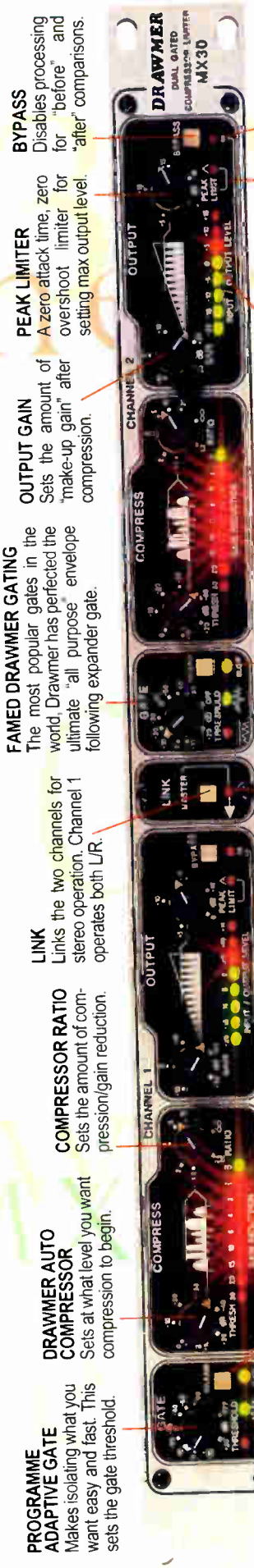


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ting down with the owner of the studio going, "What kind of couch do you want over here?" We're not really interior designers or anything. We just know what we like as far as comfort, and that is privacy.

***Especially since you invested so much time there. You were there for a year?***

**Hetfield:** We've been there quite a bit between *Load* and *Re-Load*.

***When you recorded* Load, *you originally intended it to be a double album, and then you decided to release* Re-Load *as a second album, later. In between, you went out on the road. What was it like to come back to that material after being away from it?***

**Hetfield:** There were two trains of thought, and I didn't really want to think about either one: You write all these songs, you record half of them, and you go on the road, and a year later you're going to record the rest of them? You have all your notes, and it's whether you're going to hate the song in a year, and it's not going to feel fresh anymore, or you're going to rework it to death and you're not going to recognize the song. So we got back in there, and all four of us had this big long list of notes—"I think we should do this and that with this song." It was like, wait a minute, let's go back and listen to the original demo of what our original idea of this song was. And then we got the feeling back again and added some of the cool ideas to make it feel a little fresher. We thought it would be a bigger deal, and it really wasn't.

**Ulrich:** I was worried that the material was going to date, and when I realized that it didn't date, I was pretty happy. I was surprised that when we came back, there were no issues about material that didn't work.

I'm not going to give you all this horseshit about "Well you know, being on the road brought a lot of great energy into the studio..." That's all crap. We got away from the material for a year, and we got back into the studio, and the way we want to work now is we don't want to be in the studio for a year-and-a-half, we don't want to be on the road for a year-and-a-half. We want to do everything in shorter spurts, end of story. And that's pretty much what we're doing. And so taking something like *Load* and splitting it into two separate records is just a great thing because it shortens the cycles.

***On your latest single from* Re-Load, *"The Memory Remains," you feature Marianne Faithful as guest vocalist. How did that come about?***

**Hetfield:** It came down to a combination of the lyric and we wanted a haunting voice there. I had a vision of what this whole song was to be—the *Sunset Boulevard*, Norma Desmond vibe; you know, the lost star. And I had this vision of a lady in a ballroom, swinging around, going "la, la, la," just twisted out of her head. And I was singing, "la, la, la," and our engineer, Randy, said, "Wow, you should just keep those lyrics," and I thought, well, I don't know if I really want to sing "la, la, la," but maybe a female voice would fit in more with the lyrical content. So we all put our heads together in a rock pile, and we came up with a few names, and Marianne was the one that held the most water. She was more of an icon; she almost lived the Norma Desmond life, kind of got caught up in the stardom with the Rolling Stones and all that. And it just felt right. And she has this voice, that kind of been-there-and-done-that kind of voice. It really fit in.

**When we write songs and record songs that we've written, we get very particular. When we interpret other people's material it becomes much looser and it is a different relationship.**

**—Lars Ulrich**

***Tell me a little about how you work in the studio in general.***

**Ulrich:** The way we work, it's a lot like juggling. Once the basic tracks are done, in one room we'll be doing guitar overdubs, and in another room we'll be setting up bass gear, and in the third room we'll be doing Pro Tools editing, then maybe in one room we'll start mixing while we're still doing guitar overdubs in here while James is singing in a third room.

***You have a reputation for being perfectionists and meticulous in recording sessions. How do you maximize the time when you're there?***

**Hetfield:** We've worked out a theory where however much time we allow ourselves, that's how much time we will use. If we've got three songs to do, and we've booked six weeks, we'll use that whole time. But we use every second, for sure. The way we record, we're in the studio maybe every five years, and you have to kind of get used to being back in that atmosphere.

**Ulrich:** This record, for instance, we set a release date—When are we going to release this thing? Okay, when do we need to hand in the masters? How much time do we need in the studio? We work backward. And in between, it's totally crazy, it's manic, it's out of control, but we get it done somehow, and out of that energy comes something that is pretty cool, because when you make records that way, you don't end up sitting fretting over every last detail until the cows come home, like we used to on the early records.

**Hetfield:** With the *Load/Re-Load* sessions, we hadn't been in the studio in five years, and we were still writing songs, and we were up to song number 30, and we had to get in the studio and start putting some of this down. So we were still writing as we were in there, and we slowly eased into it, just doing a few of the songs that were further along than the others, and eventually Bob [Rock] started hitting Record.

Working with Bob has opened up so much for us. When Lars and I were doing the production thing, we'd be out there playing and run back in—"How's that sound?" We'd run back out and it wasn't the optimum situation. We needed another set of ears that we trusted.

***How did you pick Bob Rock?***

**Hetfield:** We loved the sounds he was coming up with. The last project we had done on our own was *...And Justice for All*, and it sounded like the drummer and the guitar player mixed it. We knew that we needed to get some band vibe back. We needed to get some muscle, get solid not only songs but sounds. We had listened to some of the sounds he was getting, and we were very up for that, and the first time we worked for him was very intimidating on both sides. He heard our reputation was "Don't suggest anything or you'll get your head ripped off," and we were testing the waters with him—"Who's this guy that's going to come in and mess with Metallica?"

And really, at the end of the day, he

—CONTINUED ON PAGE 228



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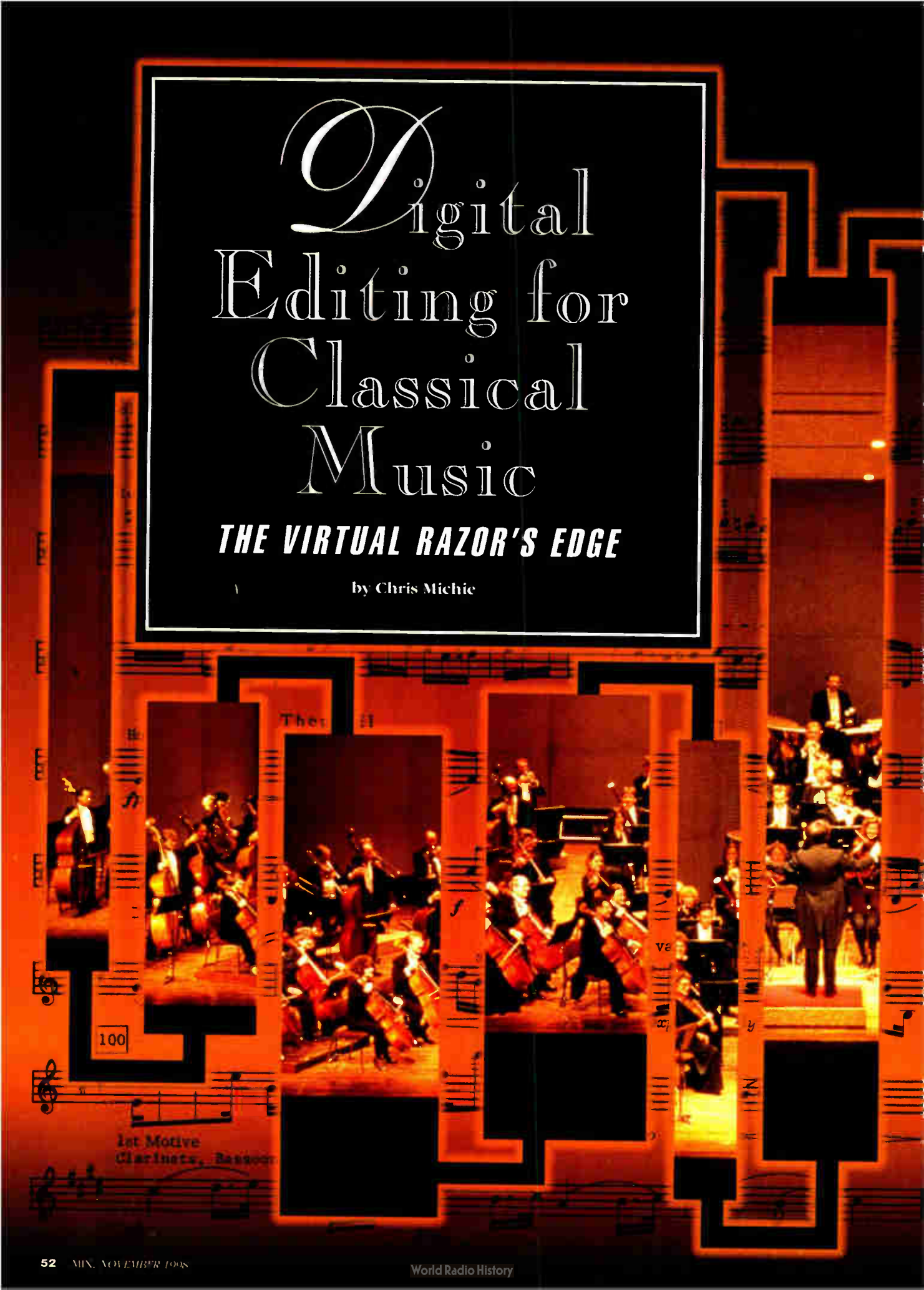
# Digital Editing for Classical Music

## THE VIRTUAL RAZOR'S EDGE

by Chris Michie



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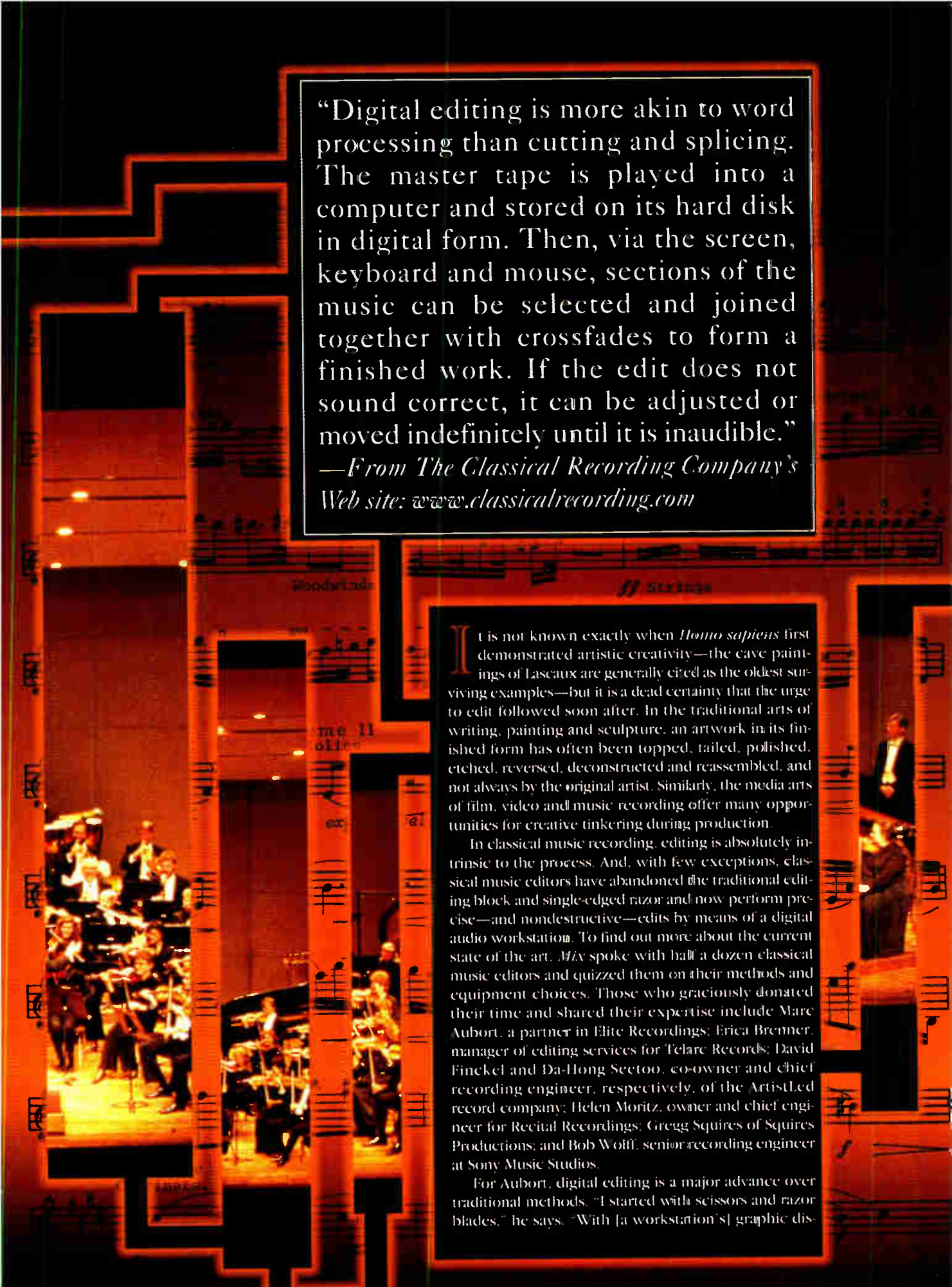
"Digital editing is more akin to word processing than cutting and splicing. The master tape is played into a computer and stored on its hard disk in digital form. Then, via the screen, keyboard and mouse, sections of the music can be selected and joined together with crossfades to form a finished work. If the edit does not sound correct, it can be adjusted or moved indefinitely until it is inaudible."
*—From The Classical Recording Company's Web site: www.classicalrecording.com*



It is not known exactly when *Homo sapiens* first demonstrated artistic creativity—the cave paintings of Lascaux are generally cited as the oldest surviving examples—but it is a dead certainty that the urge to edit followed soon after. In the traditional arts of writing, painting and sculpture, an artwork in its finished form has often been topped, tailed, polished, etched, reversed, deconstructed and reassembled, and not always by the original artist. Similarly, the media arts of film, video and music recording offer many opportunities for creative tinkering during production.

In classical music recording, editing is absolutely intrinsic to the process. And, with few exceptions, classical music editors have abandoned the traditional editing block and single-edged razor and now perform precise—and nondestructive—edits by means of a digital audio workstation. To find out more about the current state of the art, *Mix* spoke with half a dozen classical music editors and quizzed them on their methods and equipment choices. Those who graciously donated their time and shared their expertise include Marc Aubort, a partner in Elite Recordings; Erica Brenner, manager of editing services for Telarc Records; David Finckel and Da-Hong Seetoo, co-owner and chief recording engineer, respectively, of the ArtistLed record company; Helen Moritz, owner and chief engineer for Recital Recordings; Gregg Squires of Squires Productions; and Bob Wolff, senior recording engineer at Sony Music Studios.

For Aubort, digital editing is a major advance over traditional methods. "I started with scissors and razor blades," he says. "With [a workstation's] graphic dis-

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play complementing the audio, you can edit totally sustained material, even string passages that have no attack whatever, which was not possible before. You can do much more sophisticated editing jobs today with digital editing than you could by mechanically taking the tape apart."

Wolff explains the editing process: "After the session or, with some producers, during the session itself, the producer marks up the score." The producer's markup indicates where each edit should be and which takes should be used. Of course, not every edit works exactly as planned, and most experienced editors use their own judgment.

"Some producers make a very light first edit—their philosophy, I think, being that we'll get something put together and then we'll fix what needs to be fixed," continues Wolff. "In that case, one expects that there will be two or three subsequent edits. At the other end of the spectrum are some producers who spend a great deal of time and effort and care in choosing and laying out their editing plan, such that they really expect very little to have to be fixed."

## OUR PANEL OF EXPERTS

**Marc Aubort** was born and raised in Switzerland and has worked in the recording industry since 1949. He spent eight years at Vanguard as chief engineer and assistant producer to Seymour Solomon and started Elite Recordings in 1965. Partner Joanna Nickrenz, a professional pianist and member of several chamber music groups, joined him in 1969. They have been recording classical and contemporary music for major and smaller labels in the U.S. and Europe ever since: a total of well over 1,000 LPs and CDs.

**Erica Brenner** holds degrees from the University of Colorado at Boulder and Yale University, both in flute performance. While performing with the Canton Symphony, she met Elaine Martone, then director of production at Telarc Records, who suggested that Brenner learn to edit. Upon starting at Telarc as a trainee in 1989, Brenner learned to edit on the Sony 3000, a linear tape-to-tape editor. Brenner subsequently mastered the Sonic Solutions system and now heads up Telarc's editing department in addition to producing several projects each year for the company.

Cellist **David Finckel** made his stage debut at age 15 with the Philadelphia Orchestra. Finckel has made over 100 concert appearances worldwide with the Grammy Award-winning Emerson String Quartet, and he is known internationally as a recitalist, soloist with orchestra and chamber musician. Together with pianist Wu Han, he manages the ArtistLed record label, the first musician-directed and Internet-based recording company. The company's innovative recording and marketing techniques have been the subject of numerous feature stories in publications including *The New York Times* and *Billboard* magazine.

**Helen Moritz** grew up fascinated by her family's reproducing grand piano and took piano lessons from an early age; her lifelong interest in classical music led her to become a recording engineer. Now the owner of Recital Recordings, Moritz has consistently pursued "very high-end, spiffy, fine equipment. I learned early on that if it was of lesser quality, I wasn't going to be happy with it." Moritz's live remote recording company tackles a range of projects, from poetry readings and solo recitals to full symphony orchestras and large choral ensembles, in addition to session recordings on location.

**Da-Hong Seetoo**, chief recording engineer for ArtistLed, was born in Shanghai, China. Trained as a violinist from the age of five, Seetoo studied at the Curtis Institute of Music in Philadelphia and the Juilliard School. While still at Juilliard, Seetoo became one of the industry's most respected audio engineers, specializing in equipment design and recording. He now produces recordings for many major labels and continues to give concerts and make solo recordings. He first met David Finckel and Wu Han at the Aspen Music Festival in 1982 and has worked closely with them ever since.

**Gregg Squires**, a classically trained French horn player, started editing at the Radio City Music Hall recording studio. When one of the first digital machines, the JVC DAS90, arrived in the country in the early '70s, Squires learned to edit on it and subsequently consulted with Mitsubishi on the design of its X-80 and X-86 systems. He founded Squires Productions in 1976, has three full-time editors on staff and records mainly in New York and London.

**Bob Wolff** is a classically trained oboist and first worked at a studio while in college. While working at Atlantic Studios and the Digital Sound Works mastering house, Wolff became familiar with the first digital editing systems and was an early adopter of Sonic Solutions. This expertise led to an editing position at Sony Classical Productions (now part of Sony Music Studios) in 1990. Though Wolff occasionally goes out on sessions, he now mostly edits. ■

### INTRICATE CUTTING AND PASTING

The mechanics of editing are fairly straightforward. The selected takes are loaded into the workstation, the editor selects all the best bits and then joins them together by means of butt-splices or crossfades. Certain types of music are easier to edit than others; choral and organ works can be difficult because of the lack of definition of edit points, for example. Erica Brenner points out that there are typically many more edits in a chamber work than in an orchestral work. "That's mostly because it's much more exposed," she says. "The kind of detail that the producer and the artist want—the way they want themselves represented—just takes a little more intricate cutting and pasting for chamber music than it would for a large orchestral work."

Da-Hong Seetoo has developed his own system for editing. "We've invented our own kind of musical score book," he says. "It allows us to draw on the page a kind of musical diagram of exactly all the material we have recorded. It's then indexed on the computer in a very organized way, and we can access all of the music very quickly for purposes of comparison. We found that this is extremely helpful in choosing the music."

In theory, a musically correct edit will work, but there are often unforeseeable reasons why it may not. Seetoo explains: "If you just slap all of the good takes of every note together, you find that the record is not coherent—it makes no sense. It doesn't matter how beautifully played every note is. For example, after you've edited a whole sonata together, you may find that one of the movements doesn't make any sense, even though when you listen to it by itself, it may sound perfect."

Artist/producer David Finckel elaborates: "When you're working on small sections, it's like a painter working on a very large canvas. When you're painting in detail, you have to stand very close. The painter has the option to step back from the canvas and see how something looks. But for musical editing, it's not until you sit and listen to all 74 min-


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## THE CLASSICAL RECORDING COMPANY

The Classical Recording Company, based in London, has been using a SADiE portable system for location recording and editing of classical sessions for both CD and broadcast since mid-1996.

During the City of London Festival in the summer of 1998, CRC was contracted to make ten location recordings of Mozart string quartets in seven London venues and to produce from them eight broadcast programs for the BBC. Each completed program was planned to consist of material recorded at two or three different concerts, with linking speech.

"It sounded straightforward enough," says CRC's chief engineer, Simon Weir, "except for the fact that the programs were to be transmitted during the festival, often giving us less than 24 hours to turn around the finished programs."

Weir and his team recorded all of the material direct to SADiE (in 16-bit, 48kHz format) on location. Rough edits—mainly topping and tailing—were done on-site to produce exact timings. The programs were then finished and mastered on CRC's studio-based SADiE system the following morning, then couriered to BBC Broadcasting House for transmission at lunch time.

"We then went back out on location that evening for the next concert," recalls Weir. "It was very hard work, but a real challenge that could not have been completed within the required time without onsite editing and our SADiE portable."

Another CRC project involved the production of three CDs and associated radio programs for Collins Classics and BBC Radio 3. The repertoire consisted of Italian songs by Bellini, Verdi and Donizetti and featured tenor Dennis O'Neill and pianist Ingrid Surgenor. The sessions were recorded over nine days on location in a North London church.

"By recording direct to SADiE, at 20-bit and 44.1 kHz, we were able to complete all the editing on location with the artists," says Weir. "In the case of a short song, we could edit the track in the time it took for the artists to walk from the church to the vestry, which allowed immediate playback not just of session takes but of complete edited songs. This allowed us to involve the artists fully in the editing decisions and meant that they were completely happy with all the material as we went along and were not recording extra material 'just in case.'" ■

utes of a CD that you're really able to step back from what you've done."

### MULTITRACK AND SURROUND EDITING

Though multitrack editing has its place in classical music production, most of the editors *Mix* interviewed work only in stereo. "Multitrack editing, particularly editing tape-to-tape on 48-track recorders, tends to be the province of large orchestral works," says Sony's Wolff. The technique is generally used to allow the producer to put together a complete edited performance before it is mixed down from multitrack. Such multitrack preassemblies are particularly useful for big orchestral works, opera or any other large production. "Also, it's sometimes done with solo recordings, concerti and the like because the pro-

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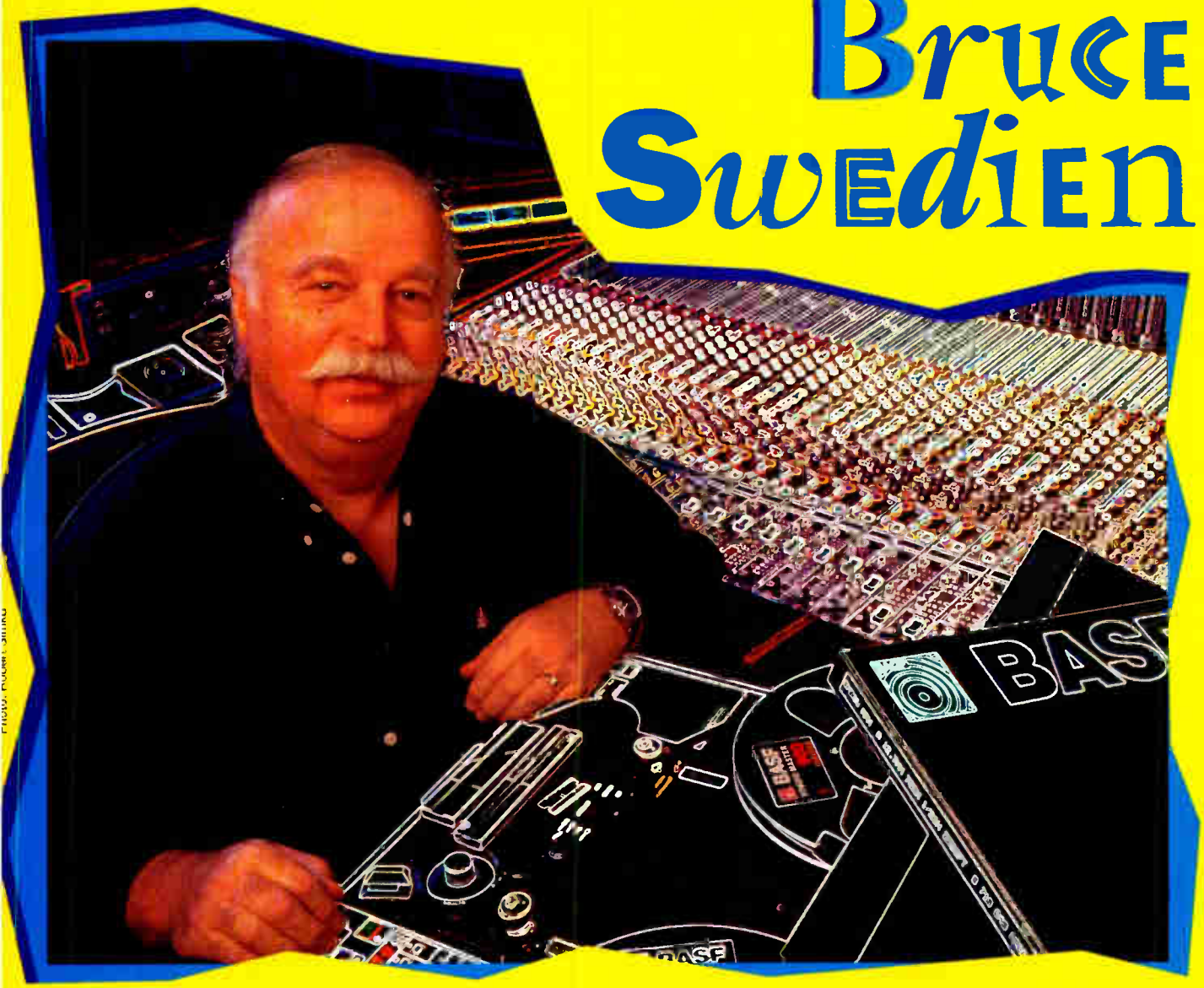
# Bruce Swedien




## on BASF tape

Five-time Grammy® winner Bruce Swedien's credits include recordings with Michael Jackson, Quincy Jones, Paul McCartney, Mick Jagger, Barbra Streisand, Natalie Cole, James Ingram, Duke Ellington, Oscar Peterson, Ernie Watts and The Chicago Symphony.

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ducer wants the freedom to be able to adjust the balance of the orchestra vs. the soloist in various spots," adds Wolff.

Though it is possible to choose different edit points for different tracks on the multitrack, it is difficult and time-consuming. One difficulty is that when the mic setup includes between two and eight microphones for the overall balance, supplemented by spot microphones, the signal gets picked up at the spot mic before it hits the main mic. "As a consequence, an edit that may work nicely for the main microphones may sound like a double-attack at the spots, so you may have to change the edit for the spot mic," explains Wolff.

Surround sound editing is relatively simple. Telarc's classical 5.1 surround sound productions are recorded using a minimal miking philosophy, with a pair of hall mics used to record surround information. "We load in the information as a 4- to 6-track sound file, and our editors edit across six tracks at a time," says Brenner. "Then each pair of tracks has to be checked separately to check that the edit still works. Because of the discrete nature of all the channels, you don't want something popping out in the rear channel."

## SELECTING A WORKSTATION

Though the interviewees represent a cross-section of the classical music editing community, they cannot be considered typical—each has his or her own working style and technique, and each has a preference when it comes to workstations.

In Wolff's case, his previous experience with Sonic Solutions led to his hiring at Sony. When Sony Classical Productions was formed in 1990, recordings were commonly committed to proprietary Sony 20-bit recorders. Sonic Solutions developed a complementary 20-bit editor, and Wolff's previous experience with Sonic recommended him for the job of mastering the new technology and managing the company's transition to disk-based editing.

Sony Music Studios is now one of the largest single users of Sonic Solutions, with 17 systems in the New York facility alone, and a total of between 35 and 40 systems worldwide, some of which are configured for multitrack editing. Wolff notes that the ability to perform 8- and 12-channel edits has applications for surround sound editing, as well as being useful for complicated multitrack editing sessions.

Telarc Records also selected Sonic Solutions when it moved from tape-to-tape to hard disk editing, though the company has since added a SADiE system. Telarc is currently using Sonic Solutions software revision 5.2. "We've been on it for at least a year," comments Brenner. "We don't usually embrace the new version immediately, though we do upgrade eventually—there are usually good reasons."

To inform her decision, Helen Moritz attended a three-day symposium on digital editing systems before deciding on a SADiE system for Recital Recordings. "I looked at Roland and AudioFile and Digidesign and Sonic Solutions," she recalls. "I had had some acquaintance with Sonic Solutions but was not taken with it. It seemed very cumbersome."

Aubort also selected SADiE for Elite Recordings. "I was looking for a disk editor, and the only thing that made sense was the SADiE system. SADiE's turnkey system was about $10,000, which made infinite sense to me, so we bought two systems and have been extremely happy with them ever since." Aubort notes that his partner, Joanna Nickrenz, took less than three weeks to be fully productive on the SADiE.

Squires Productions, which employs

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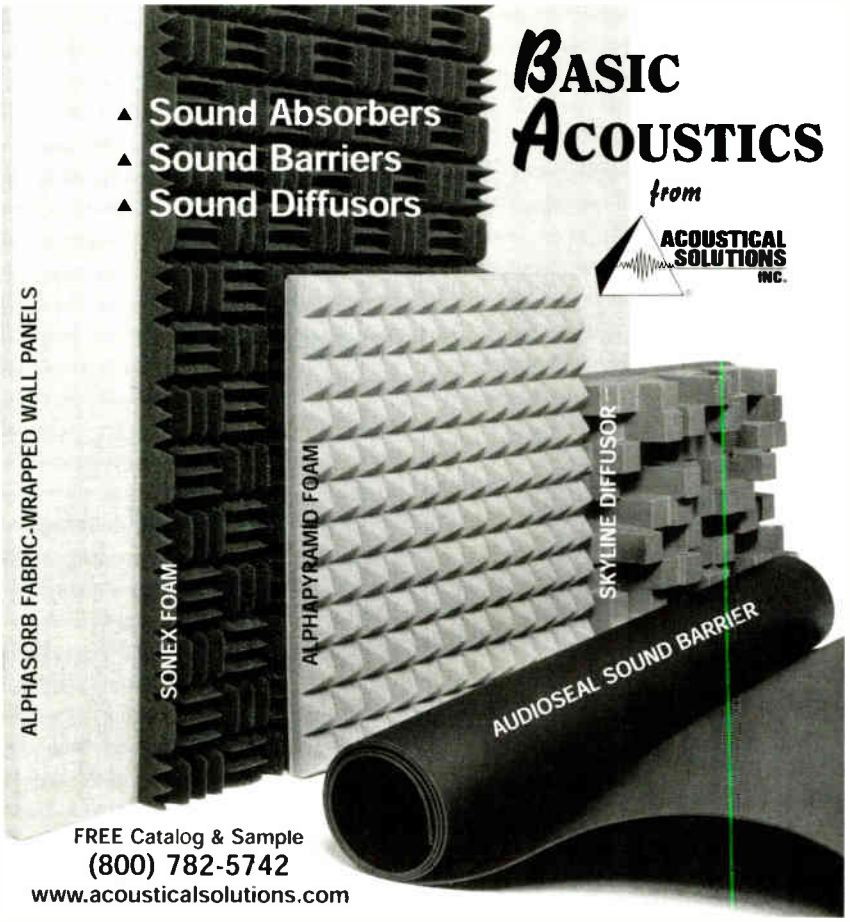


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three full-time editors in addition to Gregg Squires, has standardized on the Studer Dyaxis II. "We looked at all the other systems out there but have never found an interface that we're more happy with than the Studer," says Squires. "For classical music, we really feel strongly that it does the most for us the quickest." Though the Dyaxis II has been an orphan product since the demise of Studer Editech, Squires and team have managed to configure the Dyaxis for 24-bit editing. "If we get into a position where we have to move off the Studer platform, we'll go with Sonic Solutions," says Squires.

Da-Hong Seetoo's editing system is based on Digidesign's Sound Designer II software. "That particular software is very much ahead of its time in terms of editing classical music," says Seetoo. "It was probably one of the earliest programs out there that will handle a 24-bit format, it's a very small program, runs on the Macintosh platform and is very stable."

### THE JOY OF EDITING

Several of the interviewees praised particular features of their chosen editing system. For Aubort, who frequently records in Europe, portability is a significant benefit. "With a portable SADiE, it's actually very practical [to take equipment on location] because the whole thing fits in the overhead bin," he says. "All you have to take are some microphones and cables and you're in business on the other side."

Seetoo makes extensive use of the Quickkeys utility, which allows him to execute repetitive actions without using the mouse. "For editing, using a mouse can be very slow and tiring," he says. "[With Quickkeys] the whole process is very fast, almost like second nature." Seetoo is also a confirmed 24-bit recordist, and records direct to hard disk via Sound Designer II in 24-bit format. "My theory is that by recording 24-bit, in the editing all the truncation takes place at the 23rd or 24th bit," he says. Moritz shares his perspective and cites the SADiE system's 32-bit floating-point architecture as a valuable tool for preserving audio integrity while editing. "In terms of what I was seeking, I don't think SADiE has a peer," she says. "That 32-bit floating-point system was head and shoulders above everything else that was out there in 1994, except perhaps for the AudioFile. SADiE's 32-bit floating-point architecture meant to me that issues of truncation at every edit were taken to the furthest remove. It

—CONTINUED ON PAGE 226



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CIRCLE #032 ON PRODUCT INFO CARD

# Get Plugged-In

By Randy Alberts

**SOME OF THE HOT PRODUCTS THAT DEBUTED THIS YEAR**

Ask graphics designers to describe the evolution of their craft and they'll credit desktop computers, application software and the advent of the open plug-in architecture as epic milestones. Ask a digital audio engineer the same question and you'll likely hear the same answer.

Tape, splicing blocks and take-up reels will always be around, but mouse-driven audio environments are more the norm every day. The digital equivalents of outboard effects boxes requiring racks of valuable control room real-estate now reside on a chip, and pull-down plug-in menus get longer and longer with every CPU price and performance breakthrough.

Just 18 months ago, there were only 40 audio plug-ins available for a small handful of host applications, mostly Digidesign Pro Tools and Steinberg Cubase VST. Fast-forward beyond a couple of AES shows, and the VST-supported count is now up to 80 and climbing, there are more than 100 TDM-savvy plug-ins, and the past eight months alone have brought no fewer than 47 new audio plug-in releases supported by more than 30 digital audio recording and mastering applications. Add to this the fact that many programs are now adopting multiple plug-in architectures, such as BIAS Peak's addition of TDM and AudioSuite support and Emagic Logic's added support for VST plug-ins, and it's clear that native, host-based signal processing is here to stay.

Following is an alphabetical listing of those plug-ins released in 1998 (up until the AES convention in September), covering everything from basic audio tools to virtual subwoofers. Previously released software ported to new platforms, such as AnTares' Auto-Tune (now available in a DirectX version) and the Waves Renaissance Compressor, are not included, while we are presenting information on plug-in bundles upgraded with new tools and interfaces, such as Event Electronics' DSP•FX Virtual Pack and PurePitch from Wave Mechanics.

## PLUG-IN TO SOME NEW SOUNDS

One upgraded plug-in bundle is Hyperprism-TDM 2.1 ($499) from **Arboretum Systems** (www.arboretum.com), a Pro Tools suite of 22 effects modules. Added this year to the mix is a varispeed frequency shifter, vocoder, soft-knee compressor, limiter, parametric EQ, a new reverb, an updated Doppler effect and a talk box effect. Hyperprism's unique dual-axis parameter controller allows live, gestural control over effects settings, and each move can be recorded and edited within Pro Tools.



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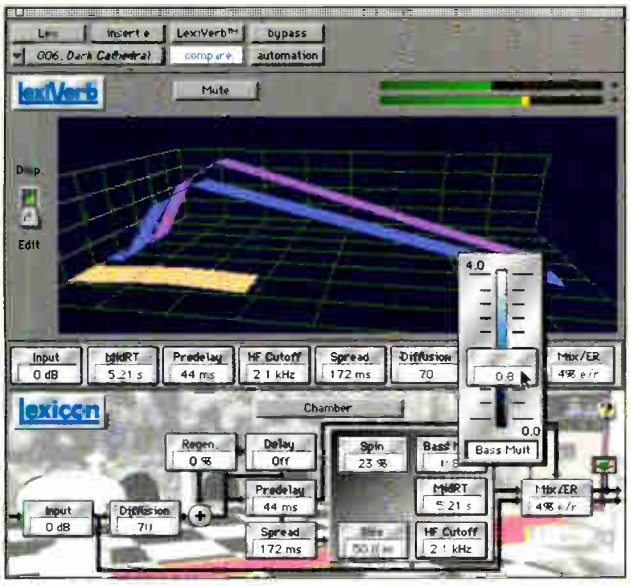
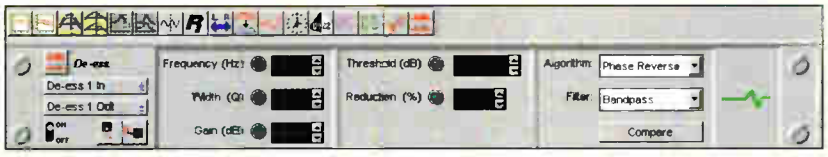



*The Lexicon LexiVerb TDM plug-in features 24-bit processing of four algorithms, with 100 presets.*

*Wave's Renaissance EQ offers controls and filter curves based on vintage analog designs.*




*The SADiE De-Esser is also a useful frequency-specific compressor and includes ducking and phase-reverse algorithms.*

*The TranceMitter is a freeware special-effects plug-in for Steinberg's VST or WaveLab.*

Cakewalk's (www.cakewalk.com) Audio FX 1 ($149) is the first in a new series of affordably priced, 32-bit, real-time effects processors. Included are compressor/gate, expander/gate and limiter modules, plus an integrated dynamics processor that incorporates all three DirectX-compatible processors into a single edit window.

CEDAR Audio (www.cedar-audio.com/cedar-audio) offers a variety of audio restoration tools for different platforms, including Windows and Macintosh, offering Declick, Decrackle and Dehiss2 software, all of which offer real-time restoration capabilities. CEDAR recently announced an enhanced version of the DeNoise audio restoration plug-in specifically designed for the new SADiE 24•96 System. The new version of DeNoise has been enhanced to improve transient response, allowing brighter, more dynamic restorations, with reduced risk of side effects on difficult passages. And just announced from CEDAR is the D/EQ Windows package, which works with CEDAR's 40-bit ProDSP boards to—simultaneously—mix and match up to 120 real-time EQs and dynamics processors across 16 channels of 24-bit audio.

FireWalkers ($298) from Creamware (www.creamware.com) is an extensive real-time DSP plug-in suite for the company's Masterport, tripleDAT and TDAT16 digital audio software environments. Parametric 8-band EQ, FFT frequency analyzer, chorus, flanger, stereo panner, modulation, pitch transposition, VU meter and signal generator modules are included. All numeric input is right-mouse-button-controllable, signal meters are scalable up to full-screen size, and the FFT display provides detailed audio views.

Also for Creamware's recording platforms is Osiris ($498), a sonic restoration plug-in that employs declick, decrackle, denoise, exciter and subharmonic bass enhancer tools for repairing old vinyl or tape recordings and premastering weak source material. Aptly named after the Egyptian god of resurrection, Osiris also pitch-corrects warped vinyl recordings in real time.

Don't happen to have a vintage '67 Fender Twin around? A 1963 Vox AC 30? No worries, so long as there's a Pro Tools TDM system in the room and a blindfold for the guitarist. The new Line 6 Amp Farm plug-in ($595) is distributed by Digidesign (www.digidesign.com) and uses the physical modeling algorithms found in Line 6's guitar amplifiers to emulate the Twin and the Vox, as well as a '59 Fender Bassman, '64 Fender Blackface Deluxe and the classic Marshall crunch of a '64 JTM 45, '68 Plexi and an '86 JCM 800.

Also new from Digidesign is the Maxim ($445) peak limiter and level maximizer plug-in for mastering and peak limiting applications on AudioSuite and Pro Tools TDM 4.1 and higher systems. By anticipating audio file peaks and intelligently reducing instead of clipping them, Maxim allows louder overall output levels while maintaining dynamic range. Familiar threshold, output ceiling, release time, gain reduction/attenuation and mix controls are included, as well as input/output meters and a color Histogram display for plotting input peak dB history during playback.

If "off-the-shelf" or "preset" trigger fits of creative claustrophobia, check out DSPider ($1,499) from DUY Research (www.duy.es, distributed by Cameo International, www.



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cameoworld.com). Similar to BIAS' SFX Machine's modular plug-in approach, DSPider allows Pro Tools TDM 4.1 and higher users to roll their own plug-ins from more than 40 linkable objects representing reverbs, equalizers, synth modules, compressors, 3D positioners, de-essers and more. Also in the recipe are filters, shifters, oscillators, delays, modulators and waveform shaper operators, all linked by a variety of onscreen drag-and-drop graphic controllers. DSPider's open architecture encourages third-party developers to create new plug-ins, too.

DSP•FX (formerly Power Technology) and **Event Electronics** (www.event1.com) have teamed to release the thoroughly redesigned DSP•FX Virtual Pack ($299), a suite of eight 32-bit native plug-ins for DirectX-compatible applications. Added to the reverb, multitap delay, multiband parametric EQ, chorus, analog tape flange, tremolo, pitch-shift and autopan plug-ins is multitimbral MIDI control that allows each unit to operate on its own MIDI channel. Also new is a live input mode for processing signals in real time without using the host application, song file-specific effects parameters and a healthy user interface facelift.

Working stand-alone or as a plug-in is **Gadget Labs'** (www.gadgetlabs.com) WaveWARM ($99) for DirectX-savvy systems. Designed to emulate vacuum tube amplifiers and add analog warmth to digital audio files, WaveWARM includes controls over gain, mix, dynamics and limiting and displays signal levels via virtual LEDs.

**Intelligent Devices** (www.intdevices.com) released four new native plug-ins for Mac and Windows Ensoniq PARIS 1.6 that operate on existing disk files or can be inserted on any channel for real-time processing. De-SERT ($275) learns the spectral signature of unwanted noise, such as stubborn 60Hz hum, then removes it. The Marshall Time Modulator ($175) is a plug-in version of its legendary namesake flanger and double tracker, and the Mangler ($175) does just that in dramatically altering audio with granular synthesis and dynamic waveshaping tools.

Also new from Intelligent is Fire•Ball ($175), a stereo FIR equalizer plug-in that adds real-time audible editing of complicated EQ curves to any application that supports Adobe Premiere plug-ins. EQ curve expansion/compression and hand-drawn EQ curves display before- and after-EQ audio spectrums. The PARIS Tourist Suitcase shell ($175) is stand-alone software that lets non-PARIS applications run PARIS native plug-ins, both on Windows 95 and MacOS systems.

**Lexicon** (www.lexicon.com) introduces LexiVerb, a reverb TDM plug-in for Pro Tools 4.0. LexiVerb can be used as either mono-to-stereo or stereo-to-stereo, and features 24-bit processing, offering four algorithms (chamber, plate, inverse and gate) with 100 presets. The intuitive interface displays algorithms as 3-D wire diagrams with pop-up faders to customize parameters; a macro editor allows group parameter control. Pro Tools 4.0 automation functions are also supported.

**Mark of the Unicorn** (www.motu.com) Digital Performer users will be interested in two new plug-ins added to a laundry list of built-in 32-bit MAS audio plug-ins. Version 2.3's upgrade brought with it PreAmp-1, a tube preamp simulator that models vacuum tube circuitry for processing signals with everything from slight coloration to full-blown tube saturation and distortion. Pre- and post-EQ gain, compressor controls and a great animated starburst graphic distortion display offer plenty of control.

Shipping with Digital Performer 2.4 is also the new Sonic Modulator plug-in for adding modulation effects like tremolo, vibrato, rotating Leslie speaker emulation, delays and filtering to any digital audio signal. Included are controls over pitch, amplitude, delay, filtering and more.

*Opcode's fusion:VOCODE, one of three cross-platform special-effects plug-ins, re-creates vintage (as well as new) vocoder sounds.*

Also new for '98, **Opcode** (www.opcode.com) released three special effect cross-platform plug-ins, as well as a limited-time offer on a VST bundle with all three ($295): Can you say phunky? fusion:VOCODE ($495 TDM, $149 for non-TDM systems) re-creates vintage and new vocoder sounds. Included is an onboard synth engine for creating carrier waves, a retro lo-fi operating mode, 5-band graphic equalizer and software controllers not possible with analog vocoder technology for creating some unique vocode voicings.

Just when pops, clicks and warped records had long been wiped out, along comes fusion:VINYL ($99) to bring 'em right back. Using a physical-modeling engine to add wear, dirt, static, hiss, rumble and warped vinyl sounds and scratches to audio files, VINYL turns any track into a well-worn 33, 45 or 78 rpm-sounding record. fusion:FILTER ($199.95) is a collection of classic filter and modulation modules with tempo-programmable LFOs, envelopes, variable filter poles, ring modulators and a drum machine-style editor for creating pulse sequences and rhythmic loops.

**SADiE** (www.sadie.com) has released several new plug-ins for the company's SADiE and Octavia digital audio workstations. Multi-Session CD-R ($595) writes the first audio session of any multisession CD in creating Blue Book or mixed-mode CDs and complements the SADiE V.3 PQ editor in preparing normal Red Book (session-at-once) and Orange Book (track-at-once) audio CDs. A new CD premastering plug-in, Mastering Limiter ($295), maximizes loudness without introducing digital clipping, and intelligently analyzes digital signals before applying relevant gain. A Hysteresis control is included for preventing the module from being inadvertently triggered by high-transient, low-level gain changes.

SADiE's Time Modulation (free with the SADiE system) is a Synchro Arts plug-in that speeds up or slows down recordings without altering pitch, especially useful for film sound and dialog needing accurate replay and synchronization at the original pitch. De-Esser ($245), though primarily designed to remove sibilance from vocals and dialog tracks, is also a frequency-savvy compressor that can attenuate any audio signal problem. Ducking and phase reverse algorithms are provided, and a Compare button plays back just the frequency being removed.

The XFX 2 Pack ($149) is the second set of plug-in bundles from **Sonic Foundry** (www.sonicfoundry.com) for DirectX-compatible platforms that includes discrete noise gate, graphic dynamics, multiband dynamics and paragraphic, parametric and graphic EQ plug-ins. The noise gate polices threshold; the graphic dynamics module provides graphical control over compression, limiting and expansion; and the multiband dynamics plug-in processes up to four concurrent bands, each


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CIRCLE #033 ON PRODUCT INFO CARD

with bypass, threshold, visual compression display and input/output metering. The parametric and graphic EQ plug-ins offer multithreading for taking advantage of Windows NT systems with dual processors.

Metric Halo Laboratories, maker of the SpectraFoo audio metering and analysis software system, is providing SpectraFoo technology to Sonic Solutions (www.sonic.com) users, with the first in a newly-announced line of HDSP plug-ins for SonicStudio. The SpectraFoo metering system is available in three different versions. SpectraFooSonic is based directly on Metric Halo's existing solution for lower-density audio (24 bit/48 kHz). SpectraFooHDSP features enhanced bandwidth and resolution. SpectraFooDVD will further enhance SpectraFooHDSP by adding special monitoring and metering tools optimized for surround processing. SpectraFooHDSP and SpectraFooDVD will be available exclusively on the Sonic platform, although SpectraFoo technology is also available as a TDM plug-in for Pro Tools and as a stand-alone application.

Catering to vintage electric guitar tones, the XFX 3 pack ($149) offers six more DirectX plug-ins including vibrato, amplitude modulation and an enhancer for smoothing overly distorted signals. Vibrato can be varied plus-or-minus two octaves, graphical distortion curves provide fine-tunable overdrive control, and the flange/wah plug-in can create vintage phaser, flange and auto-wah sounds with controllable resonance and center frequencies

We also saw some new plug-ins this year for the Soundscape (www.soundscape-digital.com) platform. Aphex Systems Ltd. (www.aphex.com), manufacturer of the Aural Exciter™ and other studio processors developed the Aural Exciter™ Type III and Big Bottom™ Pro DSP Plug-ins for the Soundscape SSHDR1-Plus digital audio workstation and the new Soundscape Mixtreme 16-channel PCI card. These real-time plug-ins for the Soundscape V2 Mixer are modeled on the top-of-the-line Aphex Model 104 Aural Exciter™ Type III and Big Bottom patented circuitry. Pricing (TBA at press time) is similar to the price of Aphex plug-ins for other DAW platforms.

Synchro Arts Ltd. (www.synchroarts.co.uk) offers its VocALign for its SSHDR1 workstations. VocALign automatically synchronizes the modulations of one audio signal to another by automatically micro-editing new or replacement audio signals and aligning the timings of its modulations. Applications include lip synching and foreign dialogue replacement for post-production or cleaning up double tracking or backing vocals in music recording. Also included is the TimMod feature, a highly efficient mono and stereo time compression/expansion algorithm. VocALign seamlessly integrates with the SSHDR1-Plus running Version 2 or higher software.

From TC Works (www.tcworks.de), TC Electronic's signal processing plug-in company, comes the TC Dynamizer ($799), delivering TC-quality dynamics processing for the Soundscape workstation and the Mixtreme card. The TC Dynamizer features integrated multiband expansion, compression and limiting, optimized for mastering applications. Several phases of mastering are combined into a single, easy to use interface, providing a multiband expander/compressor/limiter processing core, controlled by TC's graphical Target Curve Editor, which selects the overall processing characteristics. The TC Dynamizer also includes high-resolution level metering with clipping counters and peak

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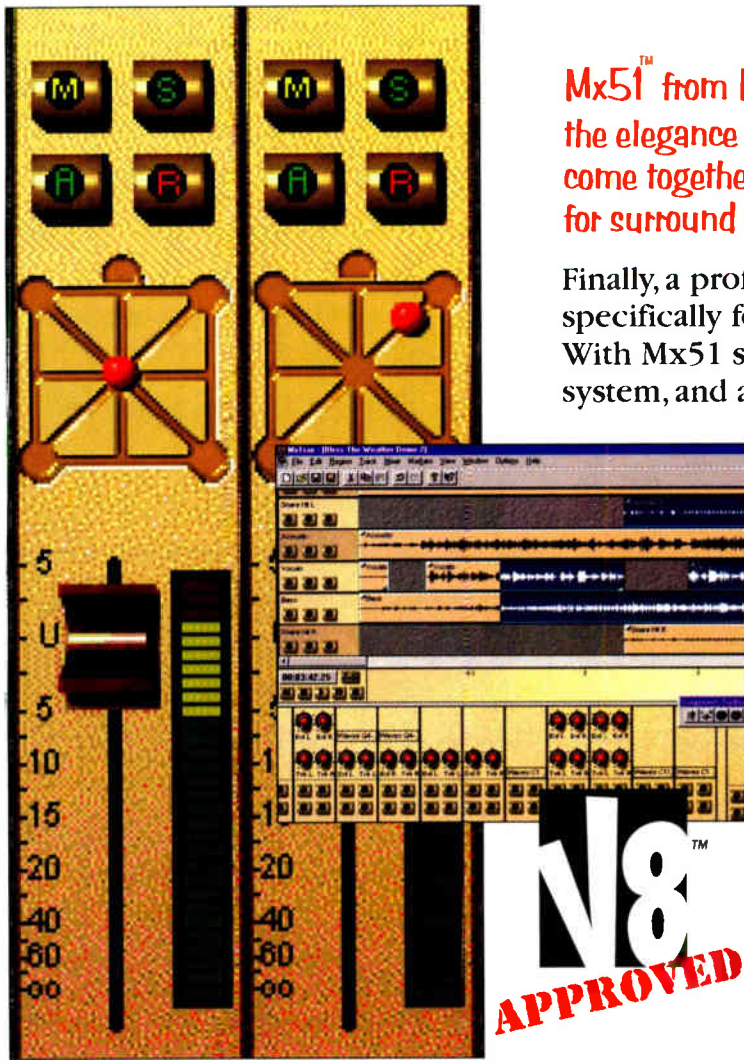
# Mx51™

# 5.1 SURROUND THE EASY WAY




**Mx51™ from Minnetonka Software; the elegance of MxTrax and the power of V8™ come together to deliver a revolutionary new tool for surround sound production.**

Finally, a professional audio workstation designed specifically for true multichannel format mixdown. With Mx51 software, a Digital Audio Labs V8 system, and a PC, surround mixes are a breeze:

- Individually pan each channel with Mx51's five way pan controls.
- View surround panning on all channels simultaneously.
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- Automatic 5.1 bussing on V8's mixer.
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**Plus get all the power of the standard MxTrax/V8 combination, including:**

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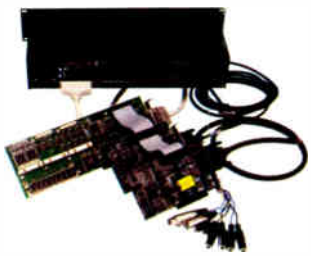
- LTC and VITC video sync*
- Optional realtime 3rd party effects from the V8 audio gearhead partners

Breakthrough tactile interface lets you *feel* surround panning as you *hear* it.



## Why the V8?

The V8 from Digital Audio Labs is a modular audio workstation platform for the PC. Systems can be configured with a choice of analog and digital I/O, MDM interfaces for ADAT and DA88, and realtime DSP options Contact Digital Audio Labs for information:

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*Some options require additional hardware.

Prices and specifications subject to change without notice.

CIRCLE #040 ON PRODUCT INFO CARD

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hold indicator, and a Look Ahead feature that searches for sudden level anomalies in the program material, to avoid creating any audible artifacts.

Like the legions of third-party VST tools, **Steinberg**'s (www.steinberg.net) own plug-in tribe is proliferating like a herd of procreation-crazed tribbles on a lonely space station. New additions to the family are the MultiComp ($399) multiband compressor and Quadra Fuzz (price TBA) distortion plug-ins. The MultiComp, for VST and DirectX, controls up to five independent frequency bands with frequency width and compression set via an easy-to-use graphical edit interface. Quadra Fuzz is based on a hardware multiband distortion box built by Craig Anderton that Spectral Design turned into this plug-in for Steinberg. Running on Cubase VST, WaveLab or DirectX host software, Quadra Fuzz divides signals into four independent frequency bands for independent frequency distortion and a new range of tonal control.

Hissing problems? The SPL Auto Dynamic De-Esser ($399) works with VST Windows, WaveLab and DirectX-compatible host platforms to reduce speech and vocal sibilance. By feeding a phase-inverted signal of detected narrow s-band frequencies back into the signal path, the De-Esser damps offending sibilance without altering original signal timbre or adding compressed lisp artifacts.

Q-Metric ($499) is a multiband digital equalizer that emulates warm analog EQ characteristics and avoids distortion by doubling 24-bit internal sampling rates when transfering high-frequency curves. Seven EQ bands are graphically displayed, including three fully-parametric mids with adjustable Q and variable high-/low-shelving with switchable slope. Q-Metric is available for Mac and PC VST, WaveLab and DirectX-compatible platforms.

FreeFilter ($399) for VST Mac/PC is a unique mastering plug-in with linear-phase 3-band graphic EQ and freely modeled filter curves that "learn" the frequency spectrum of any master mix and apply it to another audio source. Mixes can also morph between source and processed files in real time.

Also added to the Steinberg stable are several $399 VST plug-ins from Prosoniq. The Roomulator (reverb), Ambisone (3D audio positioning) and VoxCiter (vocal exciter) all came out toward the end of last year, and the new Dynasone mastering tool and Orange Vocoder were released in '98. Dynasone ($399) features 4-band dynamics processing, stereo high-frequency exciter, peak limiting and dynamics leveling, as well as a subharmonic synthesizer and media select switch for optimizing mastering to CD, tape or vinyl. The Orange Vocoder ($199) uses an 8-voice virtual analog synth engine and seven sampled sounds to follow in the footsteps of the EMS and other famous German vocoders. EQ, reverb and 4-pole lowpass filters are included, and either input audio sources or the built-in dual hard-synchable oscillators can be used as carrier signals.

On the freeware front is a new series of Windows plug-ins for VST and WaveLab, the first being TranceMitter for VST. Input levels control lowpass filter cutoff or resonance to create some drastically tasty techno sounds, and square, sawtooth and sine LFO waveforms handled the same way can rhythmically mutate filters. Also for filter freaks is Steinberg's D-Pole Multimode Filter ($199) plug-in from Waldorf. Yanked from the heart of the popular MicroWave II synth, the D-Pole provides control over low-band and high-pass notch filters and resonance up to either 12 or 24 dB per octave.

Free-D ($199) is a new 3D positional audio simulation plug-in for VST-com-

CIRCLE #036 ON PRODUCT INFO CARD



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## Digital EQ with Sliders plus FBX Feedback Exterminator, Compressor & Delay, ALL IN ONE!

**GRQ-3102**: 2U, dual channel *(two in / two out)*

# HANDS-ON DIGITAL EQ!

This is the family of digital EQs you've been waiting for! Sabine's new **GRAPHI-Q™** Series gives you hands-on, analog-style control of the industry's most advanced digital processing, all at one third the price of products with half the features.

How do we do it? Our 24-bit A/D and D/A gives the cleanest audio possible, and Analog Devices' new 32-bit floating point SHARC digital processor powers every Graphi-Q, allowing simultaneous use and independent control of these essential functions:

- **31-band Digital Graphic EQ, with +/- 6 or 12 dB range and High & Low Cut Filters**
- **FBX Feedback Exterminator: 12 Filters, all switchable to fully parametric. Industry standard automatic feedback control; works in setup *and* during the program. Super-accurate algorithm places filters on feedback, not on music.**
- **Digital Compressor (Full-featured Comp/Limiter with GRQ Remote)**
- **Digital Delay, with up to 1 second delay, adjustable in 20 microsecond increments**

**GRQ-3101**: 1U, single channel *(one in / two out)*

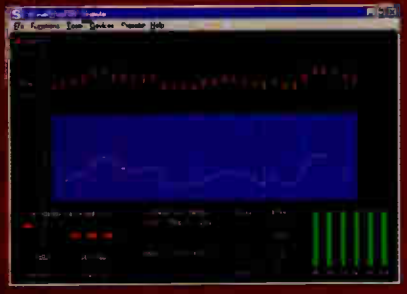
**Four models allow you to choose the Graphi-Q that's right for your application!**

# OR HANDS-OFF!

Do you need the industry standard in digital processing with no front panel controls? Sabine's new **GRAPHI-Q Slave** units provide all the signal processing you need, controllable via your PC computer, or remote contact-closure switching. You even get a front-panel serial port for convenient connection on site.

**GRQ-3101S**: 1U, Blank front panel slave, single channel *(one in / two out)*

**GRQ-3102S:** 1U, Blank front panel slave, dual channel *(two in / two out)*



*All four models include serial port and GRQ Remote software to control up to 8 units; plus contact switch connectors for remote scene changing.*

**GRQ Remote software gives you all the GRAPHI-Q features of the front-panel control units, plus:**

- View and edit response curves
- FBX filters switchable to fully-programmable parametric filters with graphic & tabular interface
- Graphic EQ filters: adjustable in 1/2 dB resolution on depths, .5 to 1 octave widths
- Full-featured compressor/limiter with editable gain structure graphic display
- Multi-layer password protection
- 70 user presets per GRQ file; fast transfer of files between computer & Graphi-Q
- Upgrade firmware & software via Flash RAM

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*FBX and FBX Feedback Exterminator are registered trademarks of Sabine, Inc., and are the brand names of its line of automatic feedback controllers. Covered by U.S. Patent No. 5,245,665, Australian Patent No. 653,736, German Patent No. 6911486.0, U.S. Patent No. 6486679, and Canadian Patent No. 2,065,524-2. Other patents pending.

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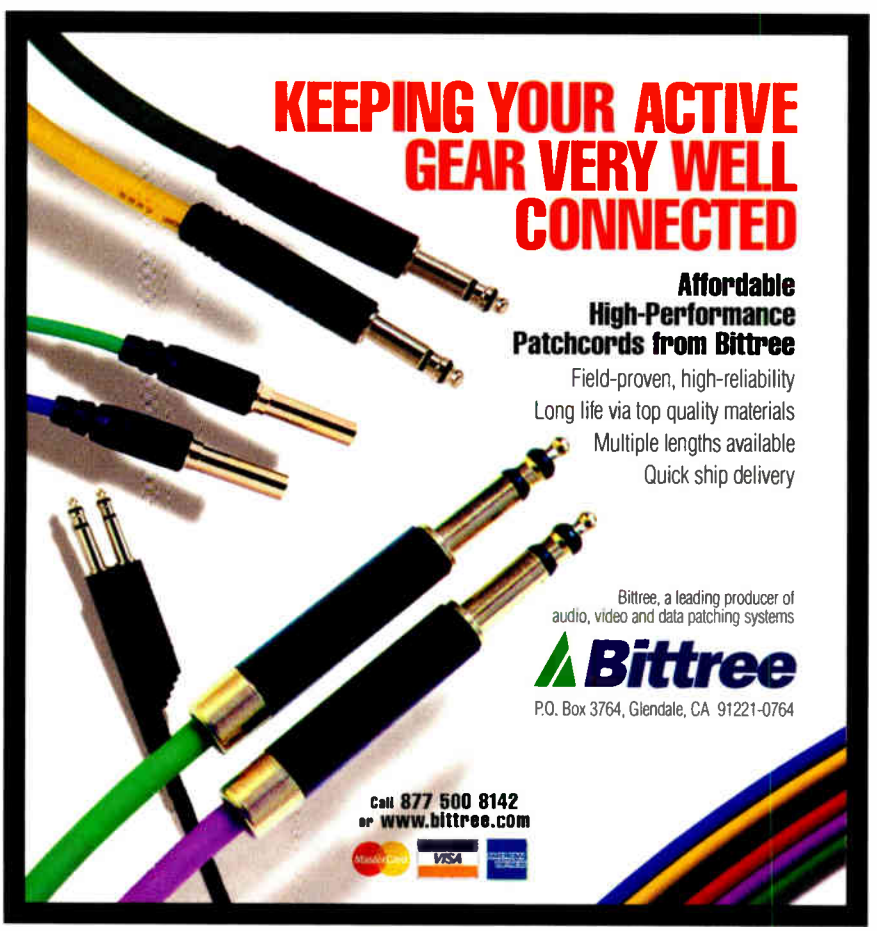


**CIRCLE #039 ON PRODUCT INFO CARD**


patible software that uses Apple's QuickDraw 3D technology to position and even automate the circling of audio material's distance and elevation in real time.

And finally, if 80 VST-savvy plug-ins just aren't enough to choose from, then use Pluggo ($74) to roll some more. This new technology from Cycling '74 (www.cycling74.com) allows Macintosh signal processing applications created in the MAX graphical programming environment using MSP, a set of audio object extensions for MAX, to work on a PowerPC as a VST plug-in. Pluggo, included free with MSP, is the shell program that enables signal patches created with MSP to work as a plug-in with VST.

Just as busy as Steinberg this year on the plug-in front was TC Works (www.tcelectronic.com). TC Native Essentials ($395), TC Native EQ Works ($449), TC Native Reverb ($549) and TC MasterX ($999) were released for a variety of DirectX-compatible environments, including Sonic Foundry Sound Forge, Cakewalk Pro and Steinberg's Cubase VST and WaveLab, as well as TC MasterX's support for Digidesign Pro Tools.

TC Native Essentials is an entry-level plug-in bundle with easy-to-use reverb, EQ and dynamics processing controls. The EQ plug-in features a virtual joystick interface for intuitive control, and TC's own SoftSat algorithms are used to generate warm compression and EQ. The TC Native EQ Works plug-in provides host-based DSP equalization and includes two separate plug-ins: TC Native EQ-P is a 10-band parametric EQ with seven fully-configurable bands and three additional bands controllable by an onscreen joystick. Stereo files can utilize split gain controls for discrete left and right channel access or to move the frequency spectrum around the stereo field; TC Native EQ-G allows users to create mouse-drawn curves to control this 28-band graphic equalizer.

TC Native Reverb, which ships with both DirectX- and Cubase VST Windows-specific plug-in versions, integrates aspects of reverb tail sound design into an intuitive graphical interface. System-optimizable algorithms ensure optimal compatibility with both high- and low-performance PCs (as low as 133 MHz). TC MasterX is TC Works' first multiband dynamics processing plug-in for Pro Tools TDM systems. Features include multiband expansion, compression and limiting, all optimized for mastering applications by integrating several mastering process phases into a single interface.



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- ...how much better your microphones would sound if they didn't have to drive all those mic splitters and cable runs.
- ...the confidence of having a limiter* on the microphone itself, providing up to 20dB of additional input dynamic range.
- ...the ability to simultaneously drive two independently trimmable balanced outputs per channel, plus 24 bit digital output on TDIF and TOSlink®.
- ...the power of having remote and local control of every function, including glitchless continuously variable gain.*
- ...the simplicity of one line for control and status on 128 channels via MIDI, RS-232 or RS-422.
- ...how quick set up would be if your preamps had an auto learn function.
- ...how easy scene changes would be if they were fully automated.

*Imagine*

## ...the Aphex 1788

**8 Channel Remote Controlled Mic Preamp**

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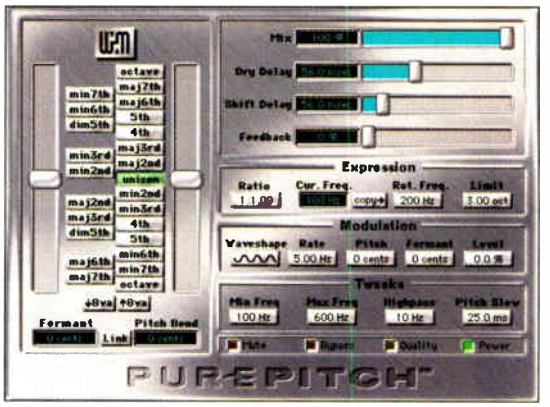
WaveShop ($29.95) from Terzoid Software (www.terzoid.com) contains four independent dynamics processors, including noise gate, compressor, peak limiter and gain leveler. Vocal and guitar presets can be edited and saved, and though specifically designed for use with Cakewalk Pro Audio, WaveShop works with any DirectX digital audio application.

Wave Mechanics (www.wavemechanics.com) was founded by the original designers of the Eventide H3000 and DSP4000 effects processors, and the company's PurePitch TDM plug-in bundle ($695) follows in its hardware predecessors' footprints. Two new plug-ins (free to registered users) have been added to PurePitch, which was released last year.

Re-creating a classic record engineer trick, PitchBlender makes stereo output from a mono source by altering left and right output channel pitch. Using multi-octave pitch-shift ranges, independent delays and a pair of LFOs to modulate pitch, level and panning, PitchBlender can do anything from subtle detunes to mind-bending auto-pan, pitch and amplitude modulation effects.




*Wave Mechanics' PurePitch is one of three plug-ins in the PurePitch TDM plug-in bundle; also included are PitchBlender and TimeBlender.*

TimeBlender models classic reverse pitch-shift and backward tape effects with a similar feedback and modulation structure as that used in PitchBlender that turns flat, one-dimensional mono signals into something entirely different.

Keeping in the surfing vernacular, Waves (www.waves.com) added four new products this year to its tidal wave of audio processing plug-ins.

EasyWaves ($150) is an entry-level package with AudioTrack (4-band parametric EQ, compressor, gate) and EZVerb, a sampling of presets from Waves' TrueVerb plug-in. BIAS Peak, Opcode Studio Vision Pro 3.5, Cubase VST, MOTU Digital Performer and other Macintosh applications supporting Adobe Premiere plug-ins support EasyWaves, as do Sonic Foundry Sound Forge 4.0, Cakewalk 6.0, VST, Syntrillium CoolEdit Pro and other DirectX-compatible environments.

The Waves DeEsser for Pro Tools 24 ($200) reduces vocal and dialog sibilance and unwanted high-frequency instrumental noises, such as fretted string squeaks. Bell or high-pass sidechain filters are available for isolating and attenuating specific frequenices, and tuned factory presets are included for male and female voices.

Following last year's release of the Renaissance Compressor, the simple interface and basic controls of the Renaissance EQ ($300) support Pro Tools TDM and Macintosh native processing environments, including Adobe Premiere and Steinberg VST. Renaissance EQ features easy-to-use, classic EQ controls and filter curves based on vintage analog designs for added warmth, resonant shelves and real-time EQ graphing.

Mixing for oomph-less playback systems? MaxxBass ($300) is a "virtual subwoofer" plug-in that creates the psychoacoustic effect of extended bass response from any speaker, big or small, by as much as two octaves. Desired bass below a speaker's low-frequency limit is added with a series of harmonics that enhance bass perception to the ear and can even replace the original bass frequencies all together. Platform support is extensive and includes Pro Tools, VST, Premiere, DirectX systems, MOTU Audio System and BIAS Peak.

DARTECH (www.dartpro.com, distributed by ZH Computer), makers of the DART Pro 32 (Digital Audio Restoration Technology) application for cleaning up audio sources and creating Red Book audio CDs, released two remastering plug-ins that incorporate DART Pro 32 features into DirectX-compatible audio programs. As the names imply, DART DeClick and DART DeHiss ($149 each, $209 for both) remove impulsive disturbances (read: clicks and pops) and high-frequency wide-band noise (a.k.a. hiss), respectively. ■

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

CIRCLE #041 ON PRODUCT INFO CARD




World Radio History

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ENGINEER MARK HOWARD'S JOURNEY FROM CANADA TO CALIFORNIA

# THE ROAD TO TEATRO

BY CHRIS MICHIE

**Producer/engineer Mark Howard has a unique history of constructing and operating "temporary" studios, chiefly for producer Daniel Lanois. This has led him, by a very circuitous route, to Teatro, a former movie theater on California's Pacific Coast Highway. Howard has converted the theater into a recording studio for himself and his partner Lanois.**

Today, Howard is a successful engineer, has his own studio, and is developing his career as a producer. He has made astute career choices, has lived and worked in several interesting corners of the North American continent, and his discography includes significant and successful recordings by high-profile artists. But Howard's story is not one of overnight success. Born in Manchester, England, he grew up in Hamilton, Ontario, a "steel city" near Niagara Falls. After playing drums as a teenager, Howard left school at 16 and started doing live sound. A job with a P.A. company led to several years of tour-

—CONTINUED ON PAGE 77

PHOTO: BOB LANOIS

*Part of Daniel Lanois' guitar collection. Guitar amplifier choices abound (3 Champs, 4 Deluxes, three AC-30s, etc.) and the comprehensive range of percussion instruments includes three drum kits.*



World Radio History

At the center of Teatro's console lineup is an 88-input Neve 8068 with 31102 EQs and Flying Faders. Three 10-input Neve BCM10s and a 12-input Melbourne serve as input panels, offering a choice of 1066, 1073 and 33114 EQ modules. An API 1604 console includes ten 560 EQs and six 550 EQs and three 10-input Neve Kelso consoles are also available. Monitors include Westlake BBSM12s with 18-inch subwoofers and Paradigm 3SE Mini monitors; surround speakers are AXYS Towers. Analog tape machines include a Studer A80 VU Mk IV 24-track (with Dolby A) and a Studer A80 ½-inch 2-track. Vintage outboard gear includes Teletronix, Summit, UREI, dbx and Tube Tech compressors. Outboard processing racks contain units from AMS, Eventide, Lexicon and Ensoniq; the studio also has a stereo EMT plate.

# MARK HOWARD ON SOME RECENT PROJECTS

**1998 has been a very good year** for engineer/producer Mark Howard. Bob Dylan's *Time Out of Mind*, produced by Daniel Lanois and recorded and mixed by Howard, picked up three 1997 Grammy Awards. The latest Willie Nelson album, produced by Lanois with Howard engineering, is named for the studio that Howard has set up in a former cinema in Ventura County, Calif. And when *Mix* visited Howard at Teatro Studio, he was preparing to produce Marianne Faithfull's next record, *Vagabond Ways*.

***Can you tell us something about the engineering techniques you used on Bob Dylan's*** **Time Out of Mind?**

I approached it as a '50s recording, using all old tube and ribbon microphones. I didn't use anything modern.

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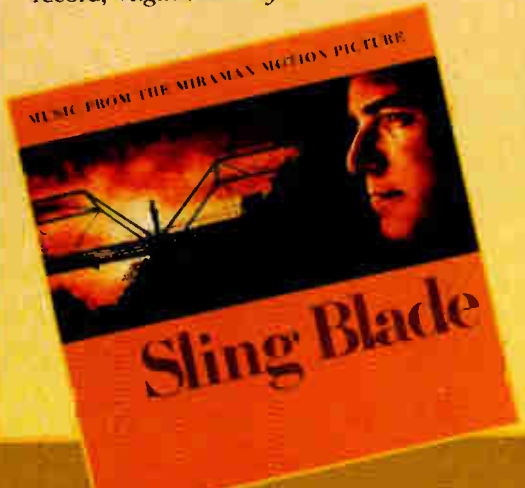

Mark Howard mixed Bob Dylan's and Willie Nelson's most recent albums at Teatro Studios, a converted cinema that he shares with producer Daniel Lanois.

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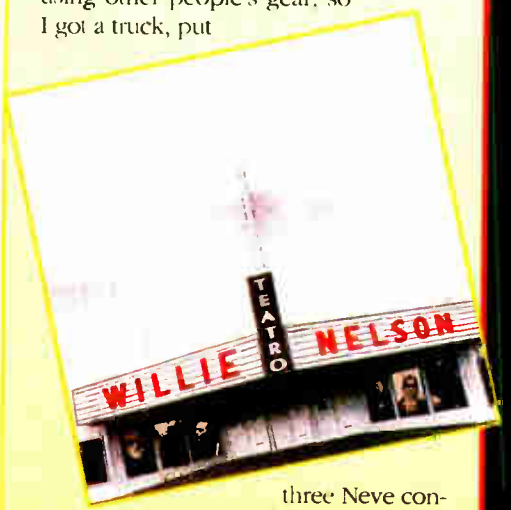
—FROM PAGE 75, MARK HOWARD PROJECTS

We started the record at Teatro, but then moved the project to Criteria Studios in Miami. We had such a great sound at Teatro that I didn't want to change the sound or compromise by using other people's gear, so I got a truck, put three Neve consoles in it—two BCM 10s and a Melbourne—all the microphones and a bunch of guitar amps and drove it from here to Miami. So I basically used all our microphones into all our preamps and then put it to tape and just used the Criteria console for monitoring.




There were two drummers a lot of the time, and I would just use a 47, or I'd use one microphone in between both of them, a C24, and point one capsule at one drummer and one at the other. And then a Coles mic in front of each of the kick drums. The miking techniques were pretty simple, no close-miking.

Bob sang through a C37A in the room with the band playing, and a lot of the sound from the record is from his microphone. Singing into a tube mic with compression on it, a lot of the leakage goes in there so you get that ambient sound going in there and you get a bit of a trashier quality than with a dry vocal. A lot of the sound of that record is due to the sound going into his microphone.

***I see from your credits that the only record you mixed but didn't record is the Scott Weiland record,*** **Twelve Bar Blues.** ***How did that come about?***

Scott had asked Daniel to mix a couple of tracks, and Daniel asked me if I was interested in giving him a hand. I said, "Sure, but he's got his own engineer, Tracy Chisholm, a really great guy. What am I going to do?" Dan says, "I dunno, just come along and do whatever you can do." So I invented a job for myself. I didn't want to be in the control room while the other engineer was there; it would just cause problems. So I put together my own setup in another room.

They were in the main Neve room at The Village, and I took over the lounge next door, took all the seats out and brought in a console and a rack of effects and DAT machines. We called it the Engine Room. I brought in all my effects, a Mackie console and said, "Bus me a couple of things and I'll treat them and send them back." They would pipe me all the drums and the bass and I'd treat and EQ them with these API graphics and compressors and then pipe them back. Or sometimes they would pipe me the whole track and then they'd balance my treated version with the vocal. I also did the vocal effects. It was a fun way of working.

***Your credit on Daniel Lanois' second album is pretty impressive, especially considering who it's coming from. And the credit for the one track you mixed on Emmylou Harris'*** **Wrecking Ball** ***is also very positive. Did you get any feedback from outsiders on your engineering during this period?***

My problem is that everybody knows that I work with Dan and nobody really wants to approach me because they think I'm locked in. Now I'm trying to build my own career as a producer. Sure, I get feedback from musicians who say they love the work, but it's been difficult along the way. I think now the record that I'm doing with Marianne is a starting point for my production career.

***I find it hard to believe that you have managed to build and troubleshoot so many temporary studios without extensive electronics knowledge. [See accompanying article for an account of Howard's peripatetic career.] But you say that you have a good relationship with gear—it always works for you. How do you explain that?***

It's a weird one. There's a really strange connection with people's energy and gear. I've seen gear work for me, and I'll leave the room and it won't work, and I'll come back in and it'll work. I think some people put out some kind of

—CONTINUED ON NEXT PAGE

**There's a really strange connection with people's energy and gear. I've seen gear work for me, and I'll leave the room and it won't work, and I'll come back in and it'll work. —*Mark Howard***

## MARK HOWARD
### *Selected Discography*

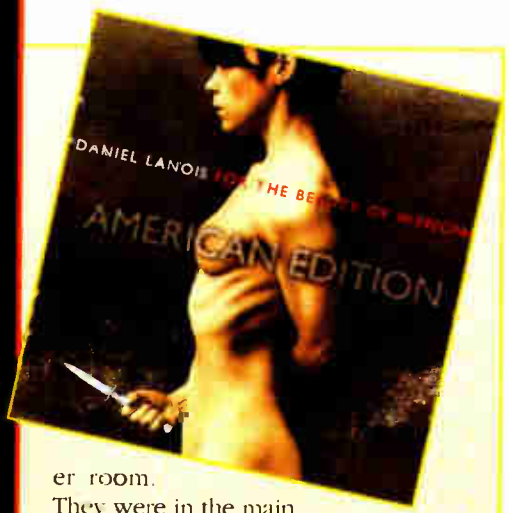
**Production Credits**

Marianne Faithfull: *Vagabond Ways*
The Really Useful Group *Music From The Miramax Motion Picture Sling Blade*
(Produced with Daniel Lanois): Island
Chris Whitley: *Terra Incognita* Sony/Work
Daryl Johnson: *Shake* Real World
Tragically Hip: *Day For Night* MCA

**Engineering Credits**

Willie Nelson: *Teatro* Virgin
Bob Dylan: *Time Out Of Mind* Columbia
Victoria Williams: *Musings of a Creek Dipper* Atlantic
Iggy Pop: *American Caesar* Virgin
Daniel Lanois: *For the Beauty of Wynona* Warner Brothers

Check out Howard's web site at **www.panix.com/~rmr**



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—FROM PAGE 76, MARK HOWARD PROJECTS

magnetic energy and some gear reacts to it in a certain way. I've had really good luck. I've put all of these studios together and I've never had to have a technician help me set it up—I've always done it myself. When it comes to repairs on samplers, sure I'll send it out. But with the multitrack machines it's pretty much troubleshooting by myself.

***What do you hope to achieve with your record label, Real Records?***

It's starting to be a record label. There's an artist on the *Sling Blade* soundtrack, Tim Gibbon, who had this amazing big voice, a kind of Tom Waits voice, a really big print. So I made a record with him and I'm trying to put it out on my own label. Because I have access to the studio, I can easily invite people in and make records. It's fun and there's no pressure. You can do whatever you want free of record company influence.

I'm not only producing records, but I'm very interested in visuals, too. I think this whole new DVD thing might create a whole new art form. I've been playing around with it a lot, working with Daniel's brother Bob Lanois. We've been coming up with these wild visuals for music. I think in the future when you buy a CD, you'll also be able to watch it. ■

—FROM PAGE 74, ROAD TO TEATRO

ing with such Canadian acts as Crowbar and legendary harmonica player King Biscuit Boy, and Howard gained a reputation as an in-demand live sound mixer.

A motorcycle accident on his Norton 750 ended Howard's career on the road. "Luckily, I didn't break anything, but I pulled my back out and couldn't do any more lifting," he explains. In 1986 he took a job at Grant Avenue Studio in Hamilton and started his studio career in time-honored fashion as a "tea boy." A quick study, and already an experienced audio troubleshooter, Howard soon graduated to engineering. "I was doing country records and syndicated radio shows," he says. "Quite complicated stuff, I thought at the time."

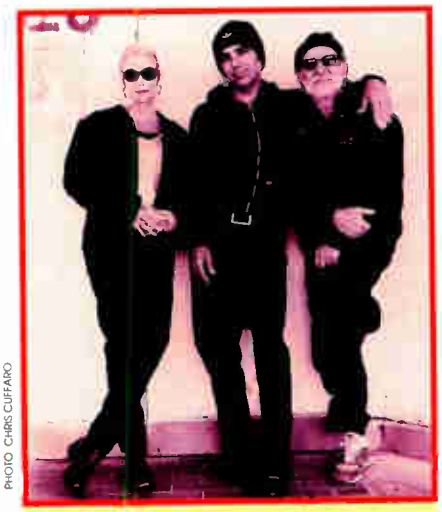

PHOTO: CHRIS CUFFARO

*Emmylou Harris, Daniel Lanois and Willie Nelson during sessions for Nelson's latest album, Teatro. Lanois (center) produced, Harris joined Nelson on vocals, and the sessions were recorded and mixed by Mark Howard.*

Howard's next break came when former Grant Avenue co-owner Daniel Lanois returned to work on his first solo record. "I met him, and the studio asked me to work on that session," recalls Howard. "He was nice, but he was always trying to stump me. He'd say, 'Well, let's put a mic on that amp,' and I'd say, 'It's already done, it's patched to channel 19.' I was always one step ahead of him, all the time. A couple of months later he called me up and said, 'Are you interested in coming to New Orleans to help me set up a studio there?' The deal was that if I left Grant Avenue I wasn't going to be

*A view of Teatro's main room, looking toward the cinema screen. There is a further section of fixed seats between the mixing consoles and the screen, and Howard has recorded groups set up on the stage under the screen.*

PHOTO: BOB LANOIS



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able to come back, so it was a big career move. It was only meant to be for six months."

### THEY CALL IT THE BIG EASY

As things turned out, the projected six months blossomed into a six-year sojourn in New Orleans and marked the beginnings of a continuing professional relationship with Lanois. But first, Howard had to build a studio. "I'd never set up a studio before in my life," he recalls. "Dan was there for two days and gave me some phone numbers. I had to find a location to make a record in, then get all the gear and everything together in one month. From scratch."

In addition to setting up the studio in a five-story apartment building on St. Charles Ave., Howard got deeply involved with creating a complete aesthetic environment for what became the Neville Brothers' *Yellow Moon* project. "We converted the whole control room into a swamp, with swamp moss hung all over," he recalls. "We had stuffed animals, Indian rugs hanging on the walls and tie-dye stuff everywhere."

When Bob Dylan decided to make a record with Lanois producing, Howard was assigned the task of setting up another studio, because the original building's lease had expired. Howard found a Victorian mansion on Soniat Street and spent a month preparing it for recording, building soundproofed rooms with glass doors and boarding up all the windows to prevent any leakage into the surrounding residential neighborhood. As things turned out, most of 1989's *Oh Mercy* was recorded in the control room.

### SO MANY HATS

"I wore so many hats in those days," Howard recalls, tracing his ascent from assistant and studio manager to engineer. "Malcolm Burn was the engineer on a lot of those sessions, but he's also a musician and he ends up playing, too. On "Man in a Long Black Coat" on the *Oh Mercy* record, I ended up doing that whole track because Malcolm was playing cricket sounds."

After Lanois' first solo record, *Acadie*, was recorded at Soniat Street, the studio moved again and got a new name—Kingsway. "It was a ratty old place, and the ceiling was falling down," says Howard. "I told Dan the place was messed up and would take months to get going. But he decided to take a chance and bought it. At that time a console became available in New York at the Record Plant, the big API console. It was full of 560A graphic EQs, 40 of them right across the console. They're really fantastic for drum sounds—you can get any kind of sound you want with those graphics."

Howard flew to New York to inspect the API console and bring it back to New Orleans. "I'd never taken a console apart in my life," he says. "At the time, I had just been to Pennsylvania to buy this 1947 Indian Chief motorcycle for Dan, and on the way back I got chicken pox—I don't know how I got it and I didn't know what I had—and I had to fly to New York two days later to take the console apart because it had to be out by a certain date. It looked like I had leprosy, so there I was dismantling the console and nobody would come by, so I did it all by myself. I took it apart, wrapped it all myself. Hired some movers, got it out of there, boxed all the modules, took it to New Orleans, put it in the big room, put it together, fired it up and it worked!"

As house engineer at Kingsway, Howard spent a couple more years working on Lanois' second solo record, *For the Beauty of Wynona*, and produced a record for local singer Marva Wright. When Lanois went out on tour, Howard went with him to mix the band's live sound. The tour ended up on the West Coast, and Lanois decided to go to Mexico to record tracks for his next album, so far unreleased. Again, Howard was assigned the task of finding a suitable site and setting up a recording system.

### DOWN BY THE SEA—OF CORTEZ

"I ended up taking a Studer A-80 in a road case and an Amek SR 6000 console—I had discovered the Amek while mixing live and I really loved the EQs on it; they sounded really warm. We rented a house in Ojai [Calif.] and did some recording so that I could troubleshoot the system, and then shipped it into Mexico.

"We rented this place on the Sea of Cortez, an amazing place. The house had been built into the mountain, all rock walls, so we set up the studio looking out over the sea. All the walls were uneven rock surfaces and the roof was a palapa roof, which is a grass roof, so the sound really soaked up well. The back was all open to the environment—birds, bugs, everything; it was kind of jungly back there—and it sounded fantastic."

Presciently, the housekeeper showed the visiting gringos how to deal with a scorpion bite. "If you saw a scorpion on



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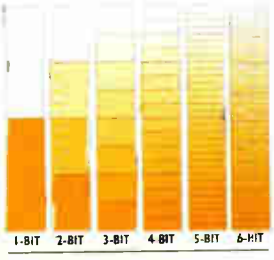


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the floor, you picked it up by its tail with kitchen tongs and put it in a jar of alcohol," recalls Howard. "As soon as you drop it in the alcohol, it spits its venom. That becomes an anti-venom, so if you get bit, you put a rag in there and put it on the bite. Sure enough, a scorpion crawled up the drummer's pant leg and bit him. His leg had this big lump, but we put the anti-venom on and five minutes later the swelling had gone down."

After about six months of recording in two temporary studios in Mexico, Howard and Lanois returned to the U.S. and set up in a house in Joshua Tree in Death Valley. "We'd work all day, and at sunset we'd drive out to the monument, put the speakers on the roof, lay out on a big rock and listen to our mixes in the middle of the desert. You could hear exactly what was working and what wasn't."

From there, Howard moved to San Francisco and rented a warehouse, in which he installed Lanois' ever-expanding inventory of recording equipment. "That was the start of our studio sharing trip," he says. Vocal tracks for Emmylou Harris' *Wrecking Ball* were recorded in the San Francisco studio, but the lease was expensive. When Lanois drove past an empty movie theater in Oxnard, a sleepy beach town in agricultural Ventura County, he again called on Howard to assess its suitability as a studio.

PHOTO: BOB LANOIS

*Teatro Studio's selection of studio instruments includes a Steinway grand piano, Wurlitzer and Yamaha CP70 electric pianos, four Hammonds, a Vox and a Lowrey, plus various electronic keyboards, including Yamaha DX7, DX100 and CS80 models. The extensive microphone selection includes vintage tube mics from AKG, Neumann and Sony. Ten RCA and Coles ribbon mics are available, as are 30 solid-state condenser and dynamic mics.*

## THE THEATER OF IMAGINATION

Despite a leaking roof and no air conditioning, Howard pronounced the site suitable and set to work on adapting the space to his needs. Today Howard and Lanois are partners in Teatro, their own private recording studio. The *Sling Blade* soundtrack, a joint production, was the first project recorded in Teatro, and the success of that and subsequent projects has spurred Howard to extend the original lease for another two years.

Entering from the street, one passes first through a lobby lined with a collage of Mexican movie posters. Behind

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the traditional padded cinema doors, the studio area evokes a successful musician's clubhouse and party room, rather than a professional recording environment. The floor is covered with large Indian rugs and the studio furniture includes several mohair couches. An eclectic assortment of 16mm films—subjects range from silent melodrama to road safety—run in loops on a screen that also reflects a light show worthy of the UFO Club or the Fillmore. But the casual-looking setup is in fact both deliberate and finely tuned.

"I don't think there's anything I would change," says Howard. "Equipment-wise, it's the ultimate. The consoles are discrete, there are no IC chips, you get really warm sound, and the way it's set up and the amount of space—I think it's been the best workspace I've ever worked in. At Peter Gabriel's Real World, his main control room is not as large as this, but the way he has his console set up in kind of a horseshoe is similar to the way I've done it. But he's gone high-tech, and we've gone kind of antique."

Occupying the center of the former audience seating area, the "control room" offers no acoustic isolation between the performers and recordist. A curved configuration of analog consoles, including several Neves and an API, is surrounded by various recording zones. Howard has rigged the various lighting and projection devices to a domestic handheld remote and can modify the mood or switch monitors without leaving his seat.

### NO TIME LOST SITTING AROUND

"Having a setup is pretty important," says Howard, pointing out that all of the instruments and amps in the room are already miked. "I treat this like a show: As soon as the artist walks in, it's like them going onstage—everything's got to work. They should be able to walk into the studio, with no time lost sitting around waiting for someone to get the kick sound. All of that stuff should be taken care of way before they even walk in."

Howard typically patches direct from the Neve BCM10 and Melbourne console preamps into the multitrack, using the Neve 8068 for monitoring and mixing—about half the console is dedicated to effects returns. Though he usually mixes direct to DAT, Howard edits on a ½-inch Studer (at 15 ips with dbx 157 noise reduction) and then copies the assembled master back to DAT. Most recently, Howard has been burning CDs on an Otari CD recorder for checking his mixes in the car or elsewhere.

Besides serving as Howard's production office, the building also houses Lanois' extensive guitar collection and a striking selection of vintage and modern motorcycles. "I've been riding bikes since I was 9 years old—dirt bikes and motocross racing," explains Howard. "I still ride Harley Davidsons, and I'm into antique bikes. Daniel is a fan, and I've helped him find a lot of his bikes. We had quite the collection of motorcycles when we were in New Orleans. We had ten Harleys—a 1947 Knucklehead, a '49 Panhead, and '60 and '65 Panheads. When we did the Dylan *Oh Mercy* record, he saw all the bikes and said 'Can't you get me one of those?' so I got him a 1966 Shovelhead, the first year of the Shovelhead. It's a really fantastic bike, and Dylan still says it's his favorite bike to this day. Like older recording equipment, old bikes just have a certain feel—it's amazing the difference." ■


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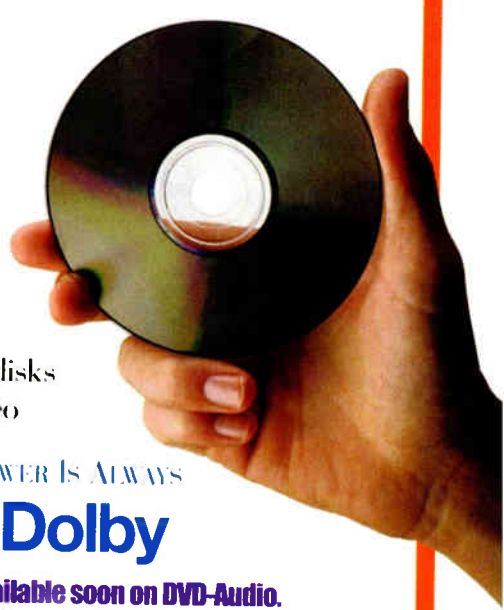

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# THE 1998 MONTREUX JAZZ FESTIVAL

## *Smokin' Sounds on the Shore of Lake Geneva*

*By Sarah Jones*

PHOTO © HANS WOLF IMAGE BANK

Jazz Festival photos by Phillipe Dutoit



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Buddy Guy on "Blues Summit" night in the Stravinski

Auditorium Stravinski with M

Jeff Beck on "Top UK" night in the Stravinski

## Montreux, Switzerland,

is a European paradise. Nicknamed "the pearl of the Swiss Riviera," this tiny resort village tucked in the mountains surrounding pristine Lake Geneva offers a sunny, Mediterranean microclimate, breathtaking vistas of the Swiss and French Alps, and a tranquil place to unwind. In the music world, however, Montreux conjures up a different image. For one thing, it was immortalized in Deep Purple's rock anthem "Smoke on the Water," which tells the story of the 1971 Montreux Casino fire during a Frank Zappa & the Mothers of Invention concert. But Montreux is perhaps best known for its annual international jazz festival. For a few weeks every summer, this usually serene town is alive with activity. Hundreds of thousands of music-lovers converge upon Montreux's state-of-the-art Auditorium Stravinski, lakeshore promenade and waterfront jazz bars to see and hear some of the world's greatest musicians.

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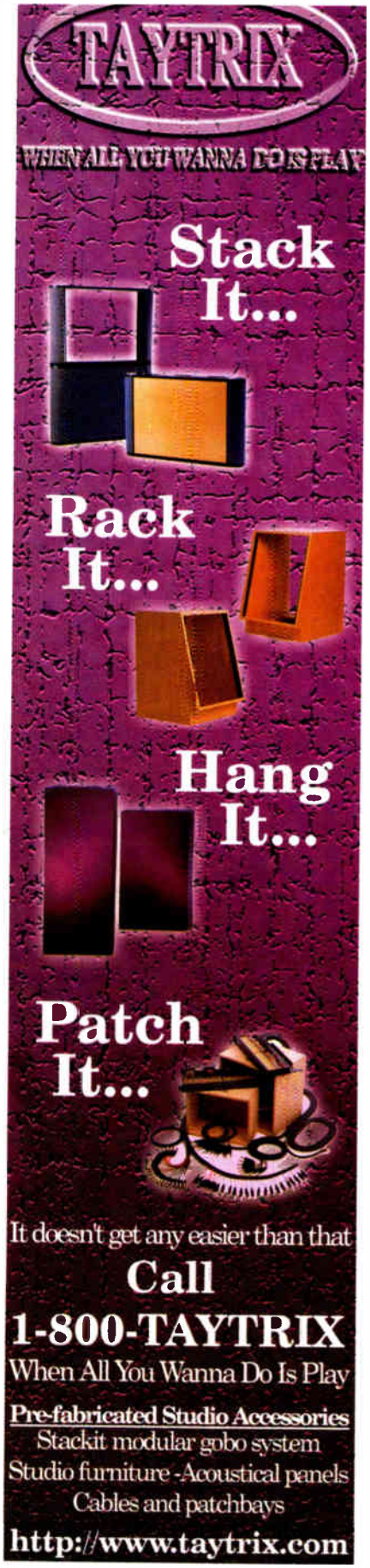

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Festival founder Claude Nobs (who directs Warner Bros. Switzerland in his spare time) organized the first festival in 1967; a three-day affair, it featured the Charles Lloyd Quartet with Keith Jarrett, Cecil McBee and Jack DeJohnette. Since then, the festival has showcased top-of-the-line performers from various genres of music and has grown into a weeks-long affair, with related special events taking place throughout the year: In August, Tokyo hosted the Montreux Jazz Festival in Japan; in September, three Montreux-organized concerts were held in Central Park. And the Detroit Montreux Jazz Festival (also held in September) is the largest free jazz festival in North America.

This year, from July 3-18, more than 2,000 musicians performed at Montreux, in hundreds of concerts held in three concert halls and various outdoor stages, lakeside jazz bars and three party boats. The blockbuster line-up was diverse, featuring such veteran performers as Bob Dylan, Santana, Buddy Guy, George Benson, Tower of Power, Bootsy Collins, Herbie Hancock and Earth, Wind & Fire; world music from Los Van Van, ¡Cubanismo!, Gilberto Gil, Candy Dulfer and King Sunny Ade; hip acts Björk and Morcheeba; and favorites Cassandra Wilson, Kenny Wayne Shepherd and Keb' Mo', to name a few.

### PLANNING THE EVENT

1998 marks the 32nd year of the festival, and 11 years of collaboration between founder Claude Nobs and official sponsor/sound system supplier Meyer Sound of Berkeley, Calif. This year is the first time all of the house P.A. systems are entirely self-powered, based largely around the MSL4, MSL6 and CQ/UPA monitors. In addition, Meyer has incorporated into the installation its groundbreaking new PSW-6, a self-powered, directional subwoofer. The PSW-6 exhibits a cardioid pattern over its entire frequency range, with symmetrical horizontal and vertical coverage patterns. Directionality is achieved with Meyer's "sound steering" technology, a combination of phase cancellation and critical geometry between multiple front and rear transducers. By maintaining a tight directional pattern, the PSW-6 cuts down on reverberant noise and allows for placement near walls without creating the usual boundary interference problems.

As for spec'ing the systems out, planning for next year's festival begins during this year's. Meyer's Mark Johnson, who coordinates design and installation of the various P.A. systems (as well as handling artist relations and other jobs) says he starts by polling the festival engineers, then works during the year to incorporate new products. "I remember when we initially designed the P.A.—it's almost a year-round job; as soon as the festival is over, we think about what changes we could make and how we're going to implement them for next year. When we started designing the P.A. for this year, the PSW-6s didn't exist. When they came into existence, I started thinking these would be great." So they were added to the mix.

Dan Keller of co-sponsor Shure Bros.' Artist Relations Europe group also assists in planning throughout the year. Early in the year, "we have a very vague idea of lineup and we overspec to the max," he says. "The festival planners get us a first tentative artist lineup somewhere around March, but it's never what ends up on the bill."

### OPTIMIZING THE HALLS

Of the three major venues, the Auditorium Stravinski is the largest and handles the major acts. Designed for classical performances, it is a live wood room that normally exhibits a six-second delay—not an ideal situation for amplified music. "A long time ago, when they first decided to move the festival here [from the rebuilt Casino], we went in to do some preliminary work and determined the reverb time would be problematic," says Johnson. "So we talked to the acoustician who designed the building and we came up with a treatment program, a combination of Fiberglas baffles and curtains around the circumference of the room. We went through a couple of iterations and hit on one that keeps the reverb time down to about a second-and-a-half or two seconds. Then they are pulled out after the festival." Johnson says the new cardioid subs also help control the energy in that hall, keeping sound directed toward the audience.

Downstairs from the Stravinski is the smaller Miles Davis Hall, which presented its own challenges in P.A. design, including a low ceiling and cramped quarters. "It's a very intimate room, so everything is literally backed up to the stage," says Johnson. "And the stage is just a temporary thing put in there so there's nothing underneath it, just a series of platforms. So the low frequencies would just rumble around that whole room. Since the subs were omni,


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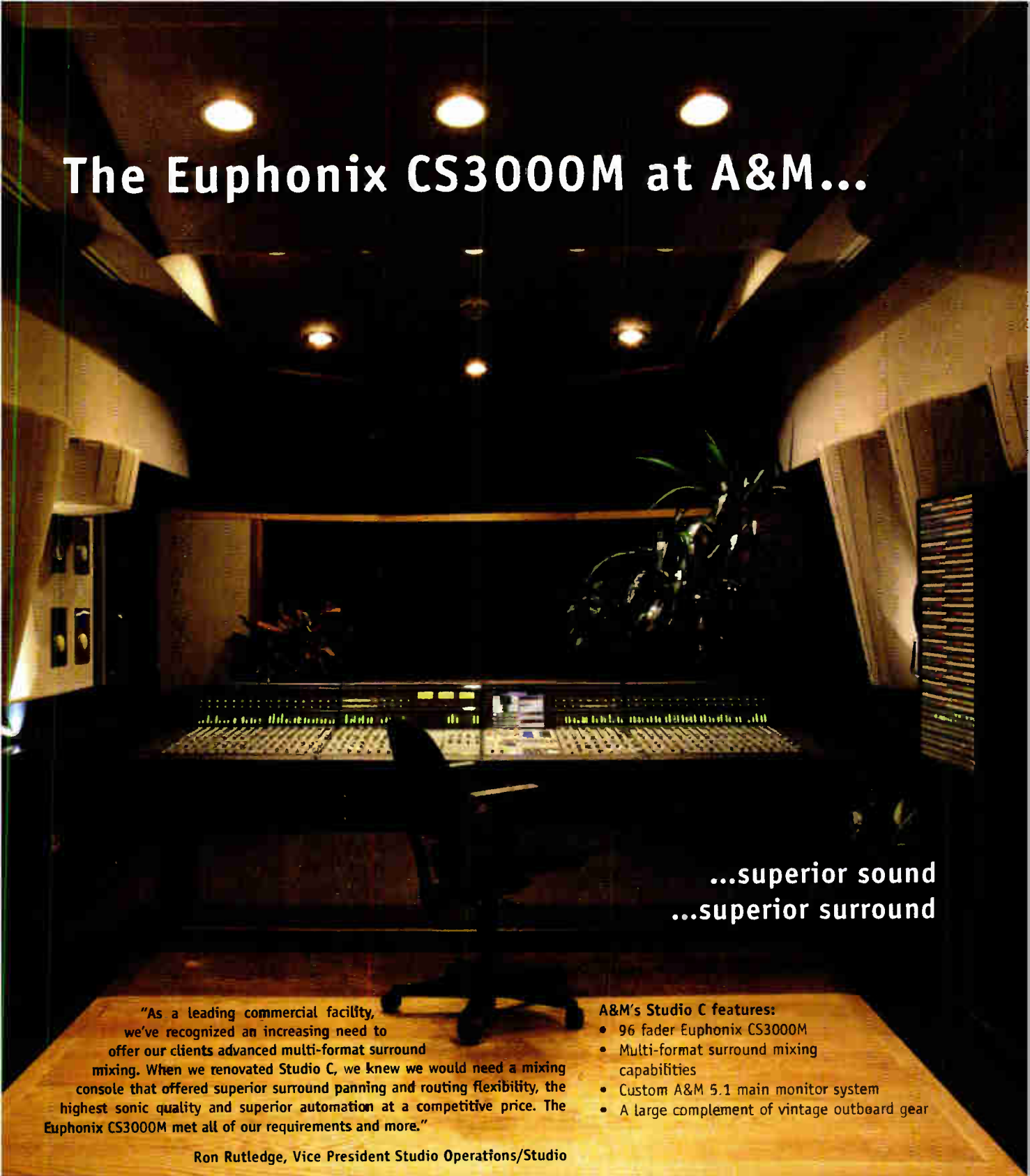

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you'd get terrible gain before feedback in the low frequencies, and it was always driving the monitor and house mixers crazy. So we wound up building baffles and things like that, but we don't have to do stuff like that now."

The third hall, the Montreux Jazz Cafe, was temporarily constructed for the festival, built into an open space below the Miles Davis Hall. Since the Cafe was to be a showcase for drum'n'bass, jungle and hip hop music, it had different P.A. requirements. "We wanted to make a system that was supporting a little bit more the kind of music that they were playing, which is techno/pop," says Johnson. "Last year it was MTS-4s, and they still wound up driving the low-frequency section pretty hard, so I used another speaker called a CQ as the main thing and then just hauled up subs for days. That room has a lot of low-frequency headroom in it, and you can hear it rumbling all over the building." In addition to the three main halls, various outdoor stages feature continuous performances throughout the day.

*Meyer's Dave Dennison optimized the halls with the SIM System II*

## MANAGING WIRELESS

All microphones and wireless UHF systems for the festival are provided by Shure Bros. (Evanston, Ill.). Keller says Shure's involvement with the Montreux Jazz Festival has grown as wireless technology has become more popular. In addition to providing 20 to 30 of every model of wired microphone that Shure makes (including the Beta and MS Series), the company supplied ten UHF systems in each hall, available with a choice of transmitters. In addition, six in-ear monitor systems were running in each room. Planning bandwidth allocation for all of these systems was tricky. "Every year we sit down with a computer program and scope out which frequencies are going to work on which hall to make sure that we don't have anything doubled up," says Keller. "Then every engineer

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that comes in, somebody in their band has got a wireless system. Nine out of ten times it tends to be Shure so we're okay, and we just ask them to either use our system or let us tune theirs to the frequency allotted to the hall.

"In the Jazz Cafe downstairs on the first floor, we had to give them VHF because we didn't have any more UHF bands. Not to mention you've got every third person walking around with a cell phone." Keller says that, apart from minor problems with harmonics, things ran pretty smoothly.

*Chuck Hall (L), FOH for Cassandra Wilson, and Dave Dennison, Meyer SIM engineer*

### HIGH-TECH HOSPITALITY

With concerts happening 20 out of 24 hours a day, including seven or eight main acts a night (not to mention the dozens of daily outdoor concerts), one of the main goals at Montreux '98 was moving acts in and out as seamlessly as possible, with minimal confusion for the visiting engineers. Staff FOH and monitor engineers stood by to assist with the house gear, which was selected based on familiarity and ease of use. In addition, dozens of drum sets, synthesizers and other instruments were available to facilitate backline setup. "Half the time people come in, they don't even unpack their kit," says Dan Keller. "We have prided ourselves on making it easy for people coming in."

The Stravinski FOH engineer, Ray Furze, who traveled from the UK to work the festival, says his priority is to make the visiting engineers happy. "I've done this many times from the other side, traveling with these bands that come in to the festivals, and it's very important to be welcomed and not be intimidated by the gear," he says. "The gear is pretty standard, really; there's nothing fancy. That's the other thing about festivals: There's no point in bringing in very fancy things that no one's ever seen before; you've got to bring in things that everybody uses." Accordingly, the console is a Yamaha PM4000, and effects gear includes a Lexicon PCM 70, and Yama-


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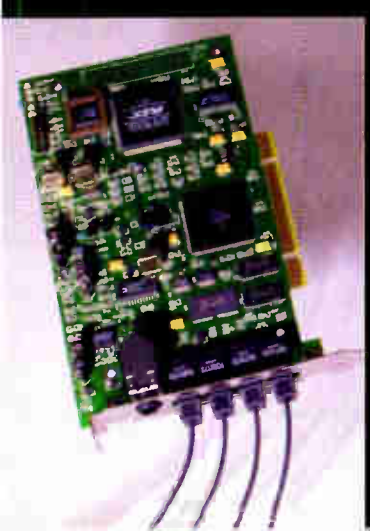

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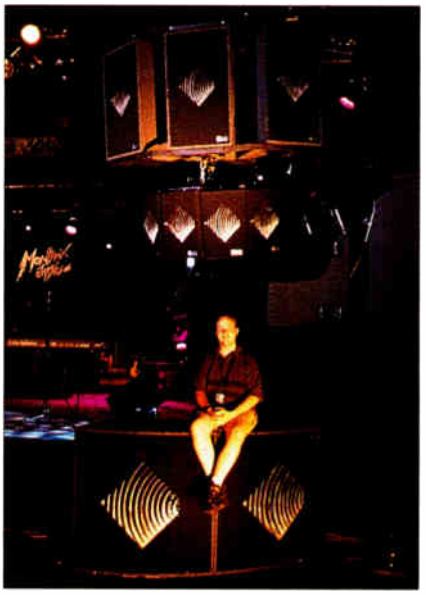

*James Bamlett of Meyer Sound Europe, dwarfed by PSW-6 cardioid subwoofers*

ha, dbx and Roland units. "Simplicity is the thing when you do something like this," continues Furze. "The pieces of equipment that are very successful are the ones that do things as simply as possible: [Yamaha] SPXs, Lexicons. Immediacy is very important in festival gear. You have very little time to muck about."

Furze says one of the best things about working at Montreux is the opportunity for him to work with a variety of engineers. "I've been able to sit and look at how the engineers are working all the time," he says. "And what has struck me is not the differences between the engineers, but the similarities. We've got engineers from all over the world here. And the similarities are amazing."

Johnson sums up the festival vibe: "Montreux Jazz Festival has a great reputation in the artist circles, performance circles, as being a great place to come and play, because the founder of the Montreux Jazz Festival, Claude Nobs, makes it a place that inspires creativity, makes it fun for people to come and play. A lot of people have been working here for a long time; it's sort of an extended family."

It's obvious that the entire staff at Montreux share a love for music and take pride in their work; that—combined with top-notch preparation and state-of-the art technology (and that view!)—helps foster those inspired performances that make the Montreux Jazz Festival a world-class event. ■

*Mix technical editor Sarah Jones has had worse assignments than this one.*


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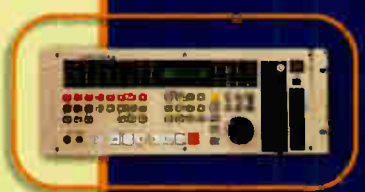

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# FIREWIRE UPDATE

## Report From the 1394 Developers Conference

BY MICHAEL CLAGETT

Firewire: Two years ago it was to be the hottest new technology in low-cost, high-speed digital audio delivery. Even the name sounded hot, conjuring up images of that speeding fuse in the opening sequence of *Mission Impossible*, or of a racing wildfire. Designed to support dozens, if not hundreds, of high-bandwidth audio streams, Firewire promised to be the transmission medium that would at last liberate us from those tangled rat's nests of point-to-point AES/EBU connections.

Indeed, Firewire—or IEEE 1394, as it's known in the digital standards world—promised the pro audio industry much more than simple multichannel audio. Its support for multiple data formats would enable audio, video, MIDI and control signals all to be sent over a single cable. It would distribute power as well as data, permitting hot-pluggable devices with simple rugged connectors. As a true full-fledged bus, it could broadcast from a single source to multiple receivers. And it was bidirectional, encouraging intelligent two-way conversations between the devices connected to it.

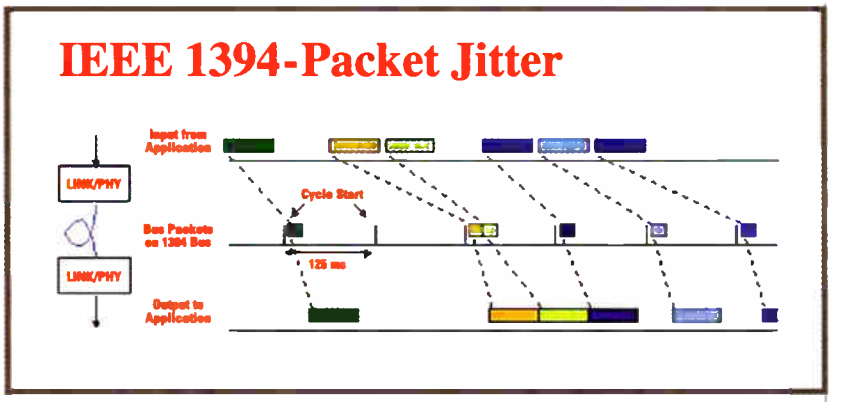
So what's happened? Has the fuse fizzled, the fire been extinguished? Where on earth *is* IEEE 1394 for pro audio? A recent visit to the 1394 Developers Conference in San Jose found at least part of the answer. The technology has been hibernating—or, even better, incubating—inside the safe warmth of the consumer electronics industry.

"Until now, 1394 activity has centered on the consumer side, in part because people want to recoup their investment with a mass market product," explains Mark Bridgewater of Digital Harmony, a company that licenses technology to guarantee that audio products using 1394 will adhere to a strict set of standard (i.e. interoperable) behaviors. This focus on consumer products also reflects some real technological issues, he adds, noting that the 1394 standard needs to outgrow some of its initial limitations before it can satisfy pro audio's more stringent distance and synchronization requirements.

### DISTANCE PROBLEM

The distance issue stems from the 4.5-meter limit that the original standard imposes on connections between any two adjacent 1394 nodes. This short distance permitted a very simple, low-cost clocking mechanism to be built into the standard, giving it native support for "isochronous" data transfers like audio and video that have very strict and regular timing requirements. Though the spec states that a signal can traverse up to 16 of these short hops, effectively extending the distance to about 70 meters,

***Packets are sent by the transmitting node in the first available timeslice after they are fully presented and are output by the receiving node as soon as possible after they are received. This can result in significant timing distortion.***



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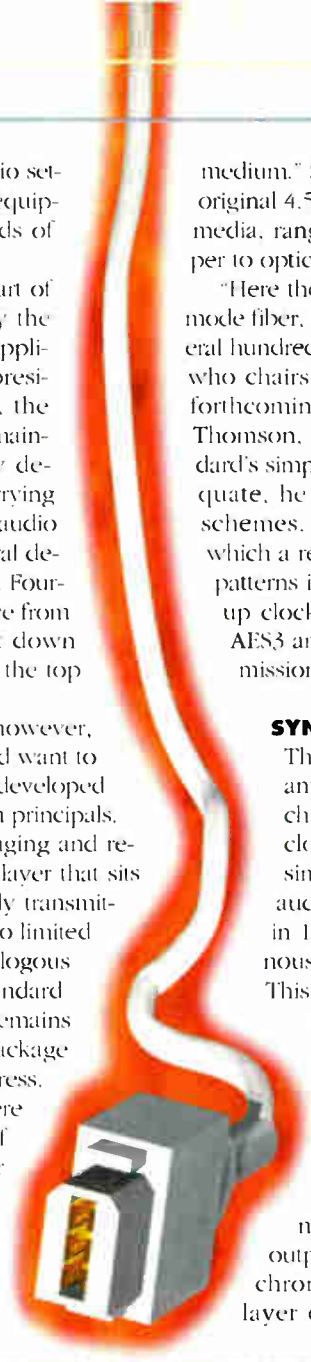
this still isn't very practical in most studio settings, where total distances between equipment can easily run into the hundreds of meters.

"The initial 4.5-meter cable that's part of the 1394 1995 standard was done by the computer industry for a very specific application," says Gary Hoffman, former president of the 1394 Trade Association, the manufacturers' group responsible for maintaining the standard. It was initially designed, he notes, with the idea of carrying high-bandwidth signals like video and audio between computers and such peripheral devices as disk drives and video monitors. Four-and-a-half meters was about the distance from the top of a standard computer rack down through a raised floor and back up to the top of another rack.

The standard's originators knew, however, that for future applications, users would want to extend the initial specification, so they developed it according to modern "layered" design principals. They placed the mechanism for packaging and retrieving data in a completely separate layer that sits above the mechanism used for actually transmitting it, with interaction between the two limited to a very standard protocol. This is analogous to a business person who submits a standard form to the shipping department but remains completely oblivious to whether the package is actually sent via UPS or Federal Express.

"The people who created [1394] were actually very thoughtful about a lot of these issues," says Hoffman, and for this reason 1394 can't really be seen as any one specific implementation. "It's a protocol," he says. "It's a way that, once you're given a medium, [you have a method for] moving bits on that medium." So people have been busy replacing the original 4.5-meter cabling scheme with a variety of media, ranging from Category 5 twisted-pair copper to optical fiber.

"Here the main distance spec is for 50mm multimode fiber, which is suitable for distances up to several hundreds of meters," says Colin Whitby-Stevens, who chairs the "distance" working group for the forthcoming update to 1394. His company, SGS Thomson, holds the patent on the original standard's simple clocking mechanism, which is inadequate, he says, for these new longer-distance schemes. It is being replaced by a method in which a receiving node "recovers" the clock from patterns in the incoming data. This more grown-up clocking method is similar to that used by AES3 and most other long-distance serial transmission specs.

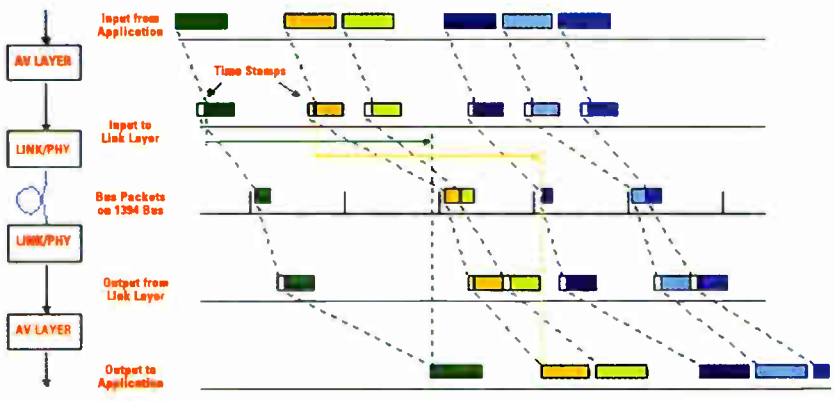


## SYNCHRONIZATION ISSUES

The new clocking mechanism won't do anything, however, to help solve the synchronization issue. It will still be the same clock rate that is currently used, and it's simply not accurate enough for some pro audio purposes. The "isochronous clock," in 1394-speak, is the rate at which isochronous data packets are sent along the wire. This happens once every 125 microseconds, or 8,000 times a second. Since this clock signal is delivered to every single 1394 node, it would be nice to use as a house sync signal. Yet it's not nearly accurate enough to clock a pro audio signal of 48,000 samples per second.

So, an additional mechanism is needed to ensure that each 1394 node is outputting all of its samples in a strictly synchronized fashion. And just as the lowest layer of the original specification is being swapped out to handle the distance problem, new layers are being added on top to address the synchronization issue. These go beyond the basic spec's scheme for simple packing and un-

## AV Layer-Removal of Packet Jitter




*The transmitting node adds a timestamp to each packet that reflects the presentation time plus a processing delay that has been negotiated with the receiver. The receiver outputs the packet at the specified time thereby preserving the relative timing of the packets. Every 125 microseconds the independent clocks of the transmitter and receiver are resynchronized.*

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packing of data and actually define the meaning of the data itself.

Yamaha Corp. has been a leader in this area with its mLan specification, a definition of how to send multiple sample-accurate AES3 signals, raw audio, MIDI and other control information over a single 1394 cable. The spec itself reduces clock jitter to an order of 40 nanoseconds. By using phase-locked loops at individual 1394 nodes, companies like PAVO have reduced clock jitter over an mLan network to less than one nanosecond.

The 1394 Trade Association recently adopted a portion of mLan as an official supplemental standard for handling 1394 audio and music control data. And the spec is currently under review by the AES and other international standards bodies for adoption there. Yet some in the AES are concerned that mLan is still too consumer-oriented and doesn't allow a fine enough degree of accuracy for some pro studio needs. They say that, though mLan timestamps may be suitable for ensuring that multiple 1394 nodes are in sync in their processing of individual signals, they may not be good enough to synchronize between the different types of signals traveling across a 1394 network.

Julian Dunn of Prism Sound has been active in the standards committees and is familiar with the issues that have been raised. "This is an example," he says, "of the difference between *sample-accurate* synchronization required for the interfacing of simultaneously sampled and potentially coherent signal sources and the *timecode-accurate* synchronization required for alignment of noncoherent audio, musical control signals or video."

## MULTIPLE PROTOCOLS

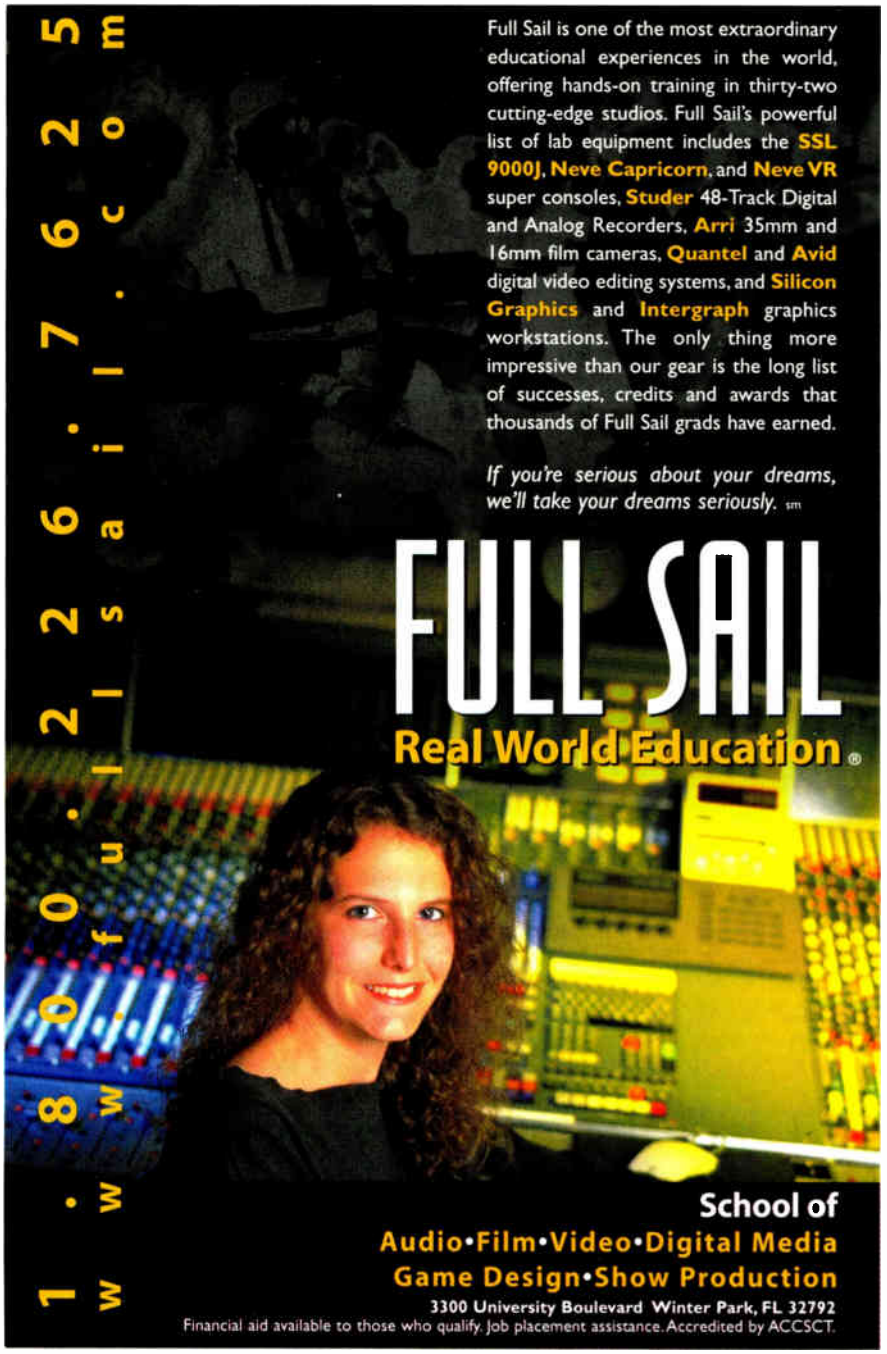
Bob Moses, who is chief engineer at PAVO and an active AES standards committee member, makes the point that mLan was never really intended to accommodate advanced pro audio applications. If there are advanced capabilities that studios need and they don't make it into the first consumer-oriented protocol, he says, there is nothing inherently flawed about 1394 that prevents acceptable levels of performance from being defined later. It all comes down, he says, to how much money you want to throw at the problem.

"By its very nature, 1394 supports multiple protocols at once," says Moses. "You can make a packet of whatever you want and send it somewhere. And so at one extreme the [mLan] way of doing things for consumer products can coexist with a completely different way of doing things for professional systems."

If 1394 hasn't yet made its way into an abundance of commercial products, he says, it's still very early in the technology's life. "Right now, you're asking people to do something that's undefined, that nobody knows how to do, that's very expensive. And companies with limited R&D budgets would rather go to 24-bit/96 this year instead, something else that's a little easier to bite off."

But 1394 is definitely coming to pro audio. It's inevitable, say its proponents, if for no other reason than that computers are going to be talking it and they are penetrating the studio world more every day. "The thing that really gets you with 1394," says Hoffman, "is it is really multimedia. It's audio and video and data—computer-type data, command and control, lots of it, all at the same time." So stay tuned, we'll continue to bring you the latest updates. ■

*Michael Clagett is a principal partner with Audio OBJECTives, a systems integrator specializing in networked media solutions. He can be reached at mclagett@netreach.net.*



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# MADJEF PRODUCTIONS

## JEFF TAYLOR'S BASEMENT OF BEATS

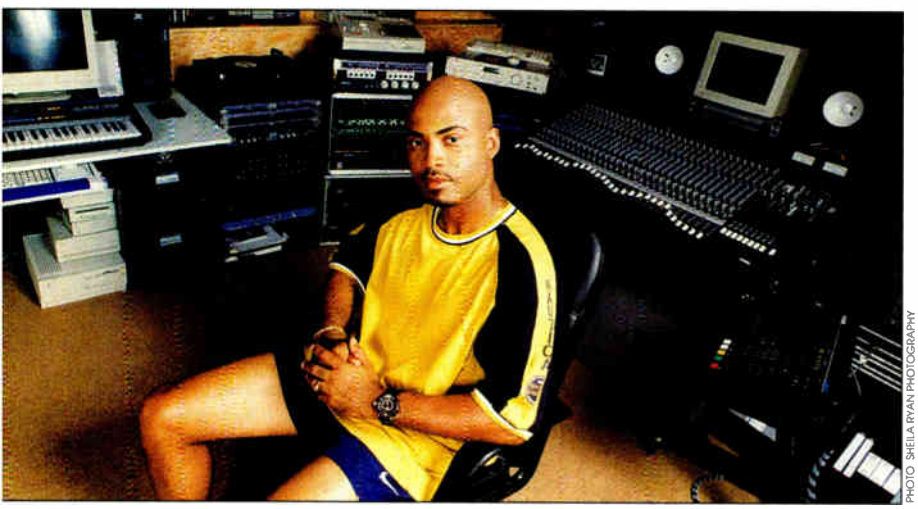

PHOTO: SHEILA RYAN PHOTOGRAPHY

On a late summer day at his home studio in Minneapolis, Jeff Taylor was tracking for a jazz album, mixing an R&B set, working on some commercials for Northwest Airlines and beginning work on "Black Butta 2," his second drum and grooves sampling CD for the EastWest label. And he'd just gotten back to town after mixing front-of-house for several live dates with Sounds Of Blackness on the East Coast and in Chicago. Sound like a busy guy? "I need an outlet for my energy," Taylor explains, "and having a full schedule is the only way for me to find balance. I want to be that busy. That's why they call me Madjef."

A guitarist and budding recordist, Taylor moved to Minneapolis from his native New York in 1988 and promptly "got busy," setting up a demo studio in his apartment. There he cut a lot of tracks with hopefuls who would submit their tapes to locally based superstar producers Jimmy Jam and Terry Lewis at their Flyte Tyme studios. "I recorded, mixed and played on a lot of those things," Taylor says, "so that brought me to Jimmy and Terry's attention. Then one day I got a call to go out and help on a Karyn White remix, and I never left. I folded my own studio and started working seven days a week at Flyte Tyme."

Taylor spent five years on staff at Flyte Tyme, engineering and programming for artists such as Michael Jackson, Janet Jackson, Patti Labelle, Ralph Tresvant, Solo and Mint Condition. "I was [engineer] Steve Hodge's assistant in my first couple of years," Taylor says, "and I learned a great deal from him. It was hands-on from day one—in the first week I was thrown in the studio with Boyz II Men—and I learned as I went. We'd have three studios going at once, and I'd be tracking in one room, programming drums in another and mixing in the main room. It was a breakneck pace and a crash course in getting records done. Jimmy and Terry are masters at knowing what it takes to get the vibe of a song."

Two years ago, Taylor built a house in the Minneapolis area, incorporating in the design a private studio in a sub-basement, consisting of a control room and a large iso booth. He equipped the room with 32 tracks of ADAT-XT with BRC, Pro Tools, Akai samplers and libraries, Yamaha and Roland modules, and outboard gear including Focusrite, Lexicon, Joemeek and Symetrix units. Asked about monitoring, Taylor replies, "I'm in love right now with these Mackie HR824s—there's not much better. I take them when I go to Flyte Tyme to mix, put them on the console there, and I'm pleased with what I get every time."

With the studio in place and many years' worth of projects and connections under his belt, Taylor decided to strike out on his own as a freelancer. He hasn't slowed down since—at his studio he's worked on projects for Mint Condition, Of Age, Angel Grant and Lil Buddy, as well as handled lots of soundtrack and multimedia work. When *Mix* spoke to Taylor, he was awaiting delivery of a Mackie digital 8-bus as a replacement for his Mackie 32•8. "I'm juggling six projects right now," he says. "The new Mackie will allow me to push buttons and switch between projects at the drop of a hat. That will cut my time in half on a lot of things."

Recently, Taylor cut a song with Sounds Of Blackness for Andrew Lloyd Weber, produced by Nigel Wright and arranged by Gary Hines. He tracked that one at home, but he continues to work at Flyte Tyme on a lot of his projects, as well as at local studios Oarfin and Burr Holland. "My room is a place for me to sit down and get my mind around the track and make sure that I've got all the elements," Taylor says. "I'm moving things around using Pro Tools and the ADATs to make sure the arrangement's where I want it to be. The beauty of the industry these days is that as long as you know what you're doing, it doesn't really matter where you are when you're getting stuff down; it's really just a matter of, 'Are my ears playing tricks on me or am I hearing this for what I want it to sound like when somebody else listens to it?' Years of experience will give you the confidence to record anyplace, anytime, knowing that you can always make it sound better when you mix it." ■

**BY ADAM BEYDA**



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BY TOM KENNY

POST·SCRIPT

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# THE LAST CHANCE

**by Larry Blake**

Nine times out of ten, when someone finds out that I'm from New Orleans, they start to say, "But you don't sound..." I don't let them finish the sentence, because I have a stock answer ready: "People from New Orleans don't sound like they're from the South. A classic New Orleans accent is like softened Brooklynese." If you have been here, you know what I'm talking about.

So when filmmakers come out from L.A. to make a movie in the Crescent City, you must understand my amazement at how far off-course the accents are. Half the actors will put on a stereotypical syrupy Southern accent, while the others will just concoct something out of thin air, like Kevin Costner did in *JFK*. The accent he tried to pass off for D.A. Jim Garrison was best described by a friend as "Southern surfer."

If Hollywood types have a hard time getting regional U.S. accents right, imagine how hard it must be for people in other countries to fit completely different languages into English-speaking mouths. This month's column is the second of three about my *post* post-production sound work for *Out of Sight*. I'll wrap it up in December with a discussion of the archival issues that we face when recording films on digital dubbers.

When I spent a week in Berlin poking my head in on the German mix of *Out of Sight*, it was the first time that I have ever seen a film I worked on being born again in a new language. Like most supervising sound editors and re-recording mixers in the States, the closest that I usually get is when I spend a day or so making the stereo music and effects (M&E) mixes. We do our best to make sure that they are completely filled with respect to room tone and sound effects that were under the original production track. The goal is to deliver an element that requires only the addition of new words.

One of the simpler ways to improve the quality of your eventual foreign-language mixes down the line is to keep a sharp eye on generation loss. Let's assume that your "master" is your 6-track dialog, music and sound effects stems, and from these you make your English-language printmasters. The first tip is to make sure that all of your music and effects mixes source directly back to these masters and are never fold-downs from other music and effects mixes. Let me explain.

I know of some facilities in Los Angeles that will make a 6-track M&E (for 5.1 digital foreign-language versions) and then use that mix to make the 4-track M&E for stereo optical foreigns. This is lazy mixing practice and *makes absolutely no sense.* Forget lazy; it's almost downright unethical, since one is taking up very expensive re-recording stage time to do what is in reality a transfer. Am I being clear here? This approach is disrespectful of the huge number of people whose only experience of the movie will be via the dubbed version. It's too easy and cynical for mixers to say that those audiences don't care. And as usual, the solution ain't all that complicated.

First of all, it's not rocket science to do a 6-track M&E and then run the console automation again and record the 4-track version in another pass. (In addition to level changes to help fit a loud 6-track mix to stereo optical, one predictable change would be to lower the stereo surrounds by 3 dB to fit into the mono surround track.) You have direct control over the music and effects stems separately, so that any moves that you made individually on them for the English stereo optical mix can be made again. You don't have this flexibility when folding down a "composite" 6-track M&E optimized for the dynamics of digital formats. This 4-track mix will take the same amount of stage time

—CONTINUED ON PAGE 104

PHOTOMONTAGE ALEX BUTKUS



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# "ANTZ!"

## SOUND DESIGN FROM A TINY POV

**by Tom Kenny**

In all the hoopla surrounding the fall competition between Dreamworks' *Antz* and Pixar/Disney's *A Bug's Life*, the one marketing scheme the former never capitalized on was Woody Allen as an action-adventure hero. Faster than a speeding dragonfly! More powerful than a hungry beetle! Able to leap grass blades in a single bound! With all the ever-lovable neuroses, to boot!

Allen stars as worker ant Z-4195, one in a billion, in love with Princess Bala, out-of-reach royalty voiced by Sharon Stone. *Antz* is a people movie, according to a quote by Dreamworks' Jeffrey Katzenberg, and to be sure, everything is meticulously animated to scale, from the picks used in the below-ground mines to the dramatic camera pull-back at the finale. The sound absolutely followed suit—but from an ant's perspective and with definite restrictions, including the dictate to not be cartoon-y.

*Richard Anderson, left, and Elliot Koretz of Weddington Productions always go the extra mile, or in this case, extra inch.*

PHOTO COURTESY OF DREAMWORKS

*Z-4195 breaks ant ritual and cuts loose with Princess Bolo in Dreamworks Pictures' Antz.*

"Our concept going in

—CONTINUED ON PAGE 110

# "VERY BAD THINGS"

## MOODY AND DARK, WITH HUMOR

**by Tom Kenny**

Dark comedy, done right, can be sound design heaven. Moody, fast-paced, funny, provocative, gruesome, emotional—audio themes that can be taken out of a literal context and explored as counterpoint to picture. Throw in some whooshes for scene transitions, add some claustrophobic soundscapes and maybe some lion growls, and the soundtrack moves well beyond see a dog, hear a dog.

*Very Bad Things* is dark to the *n*th degree. Starring Christian Slater (who else for dark comedy?), Daniel Stern and Cameron Diaz as the bride-to-be, and written and directed by first-timer Peter Berg, the PolyGram Filmed Entertainment film is a story of a bachelor party gone bad. A prostitute is killed, as is a security guard, and the ensuing cover-up by the five men at the party provides the basis for comic relief and increasingly insular paranoia.

*Right: Sound Dogs Inc. principals. (L to R) technical director Rob Nokes, supervising sound editor Robert Grieve, vice president John Switzer and supervising sound editor Greg King.*

*Below: The wedding party surrounds Cameron Diaz.*

PHOTO RANDY SHROPSHIRE

PHOTO ROBERT ZUCKERMAN

"It's a great forum for sound design," says supervising sound editor Greg King of Sound Dogs, an L.A. film sound facility run by King and Robert Grieve. "The film moves really quickly and constantly has these adrenaline charges. So the sound design was more moody and emotional to keep the tension and aggression and humor going. Because some of the violent parts are so graphic, we had to play against picture at times so that the audience doesn't get completely horrified and run out of the movie. Make it bizarre,

—CONTINUED ON PAGE 112

World Radio History

PHOTO: GREG HEISLER

# SPANK! MUSIC AND SOUND DESIGN

**PUTTING THE FUN BACK IN AD MUSIC**

**by Tom Kenny**

You have to maintain a sense of humor in the ad music business. Otherwise, you'll break down and run screaming for cover the first time a client calls at noon to messenger over an edited action-oriented spot, wanting full orchestra and asking to hear something by 4 when they bring the client over. "Oh, and if possible, could you also whip out a pumped-up urban track so they can get an idea of which works best." It's an important client, so you don't laugh until you hang up. Then you get to work.

That's not a far-fetched scenario. And variations on the theme happen all the time at commercial music facilities across the country. At Spank!, a Chicago ad music house with an increasingly national profile, the in-house sense of humor can help any of the three senior resident composers get through the four-hour pressure cooker, but it's the music chops that get them through the client preview—and keep the clients coming back.

Spank! was born about two years ago in the halls of Steve Shafer Music. Composers Shafer and Greg Allan had been working together since the early '90s, sharing a near encyclopedic knowledge of music over the past 30 years and an affinity for catchy, contemporary sounds, not to mention sharing album and song production duties on the side. ("Steve and I are a lot alike, except he has more theory knowledge, whereas I kind of grew up in bars," Allan says.) Shafer had been rooted in Chicago for years; Allan had a desire to reach out nationally. At the same time, composer Mat Morse, who had toured with Ray Charles, played in African ensembles and written for the London Symphony, had split from his partner, and the notion of bringing Morse in to add some diversity gave birth to Spank! The company recently added a junior writer, Gary Guzman.

"It's not like we collected and expanded Steve Shafer Music," Allan explains. "We just decided to become Spank!. Mat does the things we don't do, so there's a whole new diversity to the company. He does orchestration and comedy far better than we do, and those were the areas we were not strong in. Now when work comes in, it doesn't always have to go to the same composer because they are friends with the client. It's a matter of whoever can do the job best."

"Just yesterday was a perfect example," Morse interjects. "We had a newer client for a cereal spot. I had done sort of a cartoon-style orchestrated piece, and they wanted another take on it, more in a techno style. So rather than me do it, we have Greg go for it."

Musical diversity was certainly key to establishing a national profile, but other, more practical considerations also played a role. ISDN lines were installed, naturally, and the company hired reps in the Midwest, Southwest and West, penetrating Detroit, Minneapolis, St. Louis, Dallas and Los Angeles. But in L.A., arguably the most competitive market in the world, it became clear that talent was needed, as well. So in the spring of 1997, they inked an exclusive deal with Academy Award-winning sound designer Alan Howarth, who is able to pursue his feature film and special venue work, while declaring himself Spank-only for the ad market. Plans call for the addition of an L.A. composer or two in the near future.

*Top: The funky Synclavier-based sound design setup, hands by Mat Morse. Above: Steve Shafer at the Euphonix CS2000M.*

"All of the music houses say they do sound design," Allan says. "And I think probably about five percent of the music guys are actually sound designers, too. Well, we definitely didn't do it, so we thought, 'Why should we try to fake it?' Let's get somebody who does it for real, who can knock heads with Machine Head and Primal Scream and all these other houses. So Mat went out to L.A., met with a bunch of people, and who better than Alan? The guy was making the Tonka sounds when some of these other guys were playing with Tonka. Why not sign the best?"

Howarth is something of a pinch-hitting specialist in the film sound world, coming up with otherworldly effects and sound design for features such as all five *Star Trek* movies, *Poltergeist*, *Total Recall*, *The Hunt for Red October* (Oscar), *Bram Stoker's Dracula* (Oscar)



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*"Mrs Brown" Image courtesy Ecosse Films.*

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and *The Mask*, among many others. It didn't hurt that his axe is the Synclavier, which is what Spank! composers write on. (Morse has the seventh unit made, a polyphonic System 380). The company also purchased a Synclavier from George Duke for its studio on Seventh Street in Santa Monica.

"There's always this back and forth going on with Alan, and the communication is real strong," Allan says, explaining their working methods. "On a new Gatorade Frost job we just did, he came to Chicago and was in one room for three days. I was in the other room, and we would break in on each other and say, 'Is this music gonna fight you here? What do you think of this effect?' Then we spent the last two days on a cereal spot, and he had sent us a temp track of the sound design over ISDN, and we worked against that. Then we sent him the music back."

Spank! in Chicago comprises three control rooms and a live room, with two small iso booths; the facility was designed by John Storyk. Studio A, which is used on most tracking dates, features a Euphonix CS2000M, and the recording space includes a prized 9-foot Bosendorfer and a new Sonar set; each of the principals says there has been a significant return to using musicians on commercial spots. Studio A is also tielined to control room B, which features a pair of Yamaha 02Rs. Studio C has a Spirit by Soundcraft board. Monitoring systems include Dynaudio in A, Westlake BBSM-10s and Meyer HD-1s in B, and EAW near-fields in C. Synclavier/PostPro systems are common to all three main rooms, while a Pro Tools 16-track system is employed in the editing/dub room.

"The skinny on the Synclavier is this: Once you get past the massive learning curve and it becomes second nature, you never have to think about the machine again and you just write music," Morse says. "All the buttons and pages are right in front of you, and you don't have to page through millions of menus. It's all integrated and it works perfectly. All the stuff you buy 20 different boxes to do is all in one package here. You can model sounds on it instantly. You read about so many units that can theoretically do modeling, and I guess if you have hours or infinity to wait, they might work. But this business is 'hair on fire.'"

Certainly the pressure and demands on various styles so prevalent in the commercial music world translate well to other gigs. Shafer and Allan have picked up production work with local bands in their rare spare time, and an act they produced, Juster, had a song placed in five different movies. They also were in line to sell a song to a known R&B singer at the time we went to press. Morse, meanwhile, has branched into sitcom work, now beginning his second season scoring the show *Lateline*, starring Al Franken. ("After a typical ad music day, *Lateline* is like, 'Hey, I get a whole day to score!'" Morse says.) But their hearts remain in the ad music world, and once the L.A. office is staffed with writers, the plans are to bring their act to the East Coast.

"You used to hear the quote that one feeds the pocketbook and one feeds the soul," Morse says of the split between ad music work and long-form projects. "But you know, I did a little French piece the other day for a Yoplait spot, and I couldn't have had more fun. We had an orchestra in, an accordion, and it was beautiful. There's a whole lot of fun to be had in ad music." ■

*—FROM PAGE 100, SOUND FOR FILM*

and will sound better because it's one full generation better.

When making my M&E, I have always recorded an "M&E sweetener stem," which contains anything that has to be flown in and added to the music and effects stems to create a truly "filled" M&E: bits and pieces of the dialog stem, Foley cloth movement track, Foley premixes raised over what was needed for the domestic mix, and additional edited hard effects and room tones. By recording this sweetener, you make it easy to make additional M&Es either in the near future (when you go back to the top and do the 4-track M&E, right?) or in the far future, as in when the film is recut for airline versions and you have to provide a new M&E. Usually, an LCR mix will do fine for this sweetener "stem."

You can also keep an eye on generation losses by recording two first-generation 35mm SR-encoded M&Es (of each version) simultaneously. (This issue might change in the near future when digital dubbers become more widespread and standardized; more on this next month.) Otherwise, dubs will be made of your lone master in the middle of the night by some anonymous Greedo who does not share your passion for perfection. Give one first-generation 35mm SR-encoded M&E to your local U.S. distributor to put in a vault and tell them to send the other overseas with instructions to use that set for the foreign-language mixes, making dubs only as absolutely necessary. This technique worked like a charm for *Out of Sight*, as I had no small pleasure seeing my ace recordist in Berlin (Robert Jäger) tweaking, within an inch of their lives, pink noise and tones from my ace recordist in Los Angeles (Eric Flickinger). Right before Robert would roll during the printmaster, he would mutter "last chance" as he checked the start marks once again on the dubbers. Indeed, this was the last time anyone would have the chance to screw up our mix, or as was the case with Robert, get it absolutely right.

### FOUR PLUS TWO = ?

A buzz phrase in the world of M&Es is a "four plus two," which is to say a 6-track 35mm mag with 4-track M&E for stereo optical uses on tracks 1-4, original-language guide dialog on track 6, plus controversy elements on track 5. Controversy elements can include documentary material (speeches by well-known figures who may or may not be dubbed), lip smacks (some countries want them, some don't), foreign-language dialog that takes place in the original version, or questionable crowd material where there is a smattering of (too much?) English.

The idea is that this one piece of film can be used during foreign-language dubbing and mixing to reference the original dialog stem and, if needed, use the controversy elements. The only problem with this approach is that you are *de facto* limiting the use of controversy elements in mono (which might not cut it for a crowd scene); ditto for referencing the original dialog stem. (Although this is partly avoided by listening to the original mix as a whole, it would be clearer to be able to solo the original dialog stem only for the foreign-



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prints" are made at the end of the post-production process before the final mix is locked because by law theater owners have to see a film before they can bid on it. Thus, blind bid prints can contain anywhere from a scratch temp mix to an almost-final mix, as was the case on *Out of Sight*.)

Let me be clear that I was very impressed with the quality of Alexandra von Grote's translations, and her casting and direction of the actors, not to mention Stephanie Zenk's dead-accurate ADR editing. This is all the more impressive considering that German is, as a rule, more "wordy" than English, and to have the sentences start and stop in sync was quite impressive.

### DOWN AND DIRTY M&E'S

One of the more clear tips I learned from watching the German dialog being added to the M&E was that we really need to add "dirty fill" on top of whatever backgrounds we have cut. Even scenes that were shot on soundstages felt naked when stripped of production room tone. Mind you, I'm very careful to make sure that the backgrounds premix (and, later, the effects stem) for every scene contains something up the center. I know I've said this many times (in regard to both music and sound effects), but assigning a stereo pair only to the left and right speakers, with no sound going to the center, is just unnaturally wide when played back in the "discrete" 5.1 mode. Matrixed 4:2:4 playback will always spackle *something* into the center, so this is less of an issue in stereo optical.

But even when there is smooth background track filling up the center, I think it's crucial to put in a semblance of a real room. Many mixers have DATs and DTRS tapes of favorite room tones that they sprinkle in, but I think that we sound editors should be a bit less lazy about this point and should cut at least a pair of possible tones for every scene in a film. This should be ready for use in the final mix to help with ADR (and bused to the dialog stem, natch). Clearly, you don't want to have anything sounding loopy, or seem like, as a friend of mine once said about these moments, the audio equivalent of Fred and Barney passing the same house every other block while driving to work. Certainly, it would help to have room tone recorded at each location, although you have to be careful not to be too literal with this for obvious reasons. Your location might be much noisier than you want it to be, or...you know what I'm getting at.

Preparation is always important, and sometimes you have to be thinking of the foreign-language versions during *pre*-production, as was the case a few years ago on a film I worked on called *love jones*. In reel 1 we had two scenes of spoken-word poetry over a small jazz ensemble. Because it was shot live in a club, the vocal mic bled into the other instruments, putting a roadblock to the easy creation of an M&E. The simple solution was to do another, minus-vocal take right after the print take, which was then edited to match.

You also have to be very diligent about the presence of clear English in your background tracks. When I was cutting the prison backgrounds for *Out of Sight*, I knew that some words were poking through a little too much, and I had hoped to find the time to split them off into a separate premix that would eventually make its way to the group walla stem instead of the effects stem. I didn't get around to this, and when we were making the M&E, we had to transfer the effects stem into the workstation to fill around the problem areas. It would have been a far sight easier and more cost-effective to have done it during editing.

One thing I didn't forget to do was to checkerboard the dialog stem, which as usual was composed of two tracks, splitting the center dialog information evenly. This made it easier not only to extract production effects from the dialog by reducing the chance that they were covered by words, but it also facilitated the cutting of the non-curse-word airline version by making complete fill extensions available.

### PUT IT ON PAPER

When I asked what I could do to help them to do their job better (regardless of my presence at the mix), my German colleagues were all quick to state that we should always provide a memo that details our intention with the mix. In other words, the good news and bad news is that people who really care about creating dramatically correct foreign-language versions will reference the original mix often. If we were stuck with the background noise from production in a certain scene, and were happy to see it go away for the M&E, we should let them know that. If we don't want footsteps to be heard in a given scene, when it might be taken as

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an omission, this too should be noted. Since I hadn't made such a list, I had to "broom" many sound effects that Stephanie had cut, and I felt bad that I could have spared her the work. (Then again, she did catch a few production effects that we should have incorporated into the M&E.) You should also be clear on "signature" processing of voices that will need to be created; I've heard of some folks actually sending Lexicon 480L memory carts with the necessary settings.

I was saddened to hear that my colleagues in Germany as a rule will lower the fader on their Dolby Cinema Processors that control the monitoring in the room from a nominal 7 to 5.5 when doing the German versions of loud-ass American films. (This amounts to about a 6dB reduction.) To be clear, they line up the M&E mix at nominal 0 bus level, and thus by lowering the monitor they simulate the level at which said loud film will almost certainly be played back. So, they print the German dialog at a relatively louder level than the original English dialog (probably) was printed.

On the one hand, it would be proper to regard such procedures as heresy, since they result in changes from the intent of the original mix. However, I remain so pissed off at the ridiculously loud mixes that are coming out of Hollywood these days that I can't blame anyone for this, can you?

My jaunt to Berlin was the first of hopefully many trips overseas following up on films I work on. Let me know of your foreign-language dubbing experiences by writing to P.O. Box 24609, New Orleans, LA 70184; fax (504) 488-5139; or via the Internet: swelltone@aol.com. ■

*Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that he feels right at home when he visits the great cities of Europe.*

—FROM PAGE 101, "ANTZ!"

was *Braveheart* meets *The Flintstones*, in that it's a completely organic environment," says co-supervising sound editor Elliot Koretz of Weddington Productions, North Hollywood. "There is only one specific metallic sound in the entire movie. Other than that, it's all insect parts and dirt and wood."

"There's a door made out of an insect body. There's spears and picks



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they're digging with made out of insects. They drink out of insects' body parts," adds co-supervisor Richard Anderson, a principal at Weddington. "Well, the question becomes, what do you use for all that?"

For the digging scenes, with millions of worker ants in the caves, Anderson and Koretz put a cow bone on a handle, sharpened the end and went to the mountains to whack away at rock, dirt and wood. Earlier, at the home of Pacific Data Images, the show's animators in Palo Alto, Calif., the pair had knocked around on an overgrown root system of a big tree in a residential neighborhood. "It was a little disconcerting if people drove up and looked at us," Koretz laughs. Those elements were then layered in Pro Tools and cut with specifics to make group digging backgrounds. (John Cucci and Dan O'Connell of One Step Up handled the falling debris in Foley.)

Backgrounds, in general, had to be completely rethought, especially above ground. Birds, crickets and insects, the staples of normal films, represent potential predators to the ants. So nearly everything had to be treated to give a more otherworldly feel.

"Almost nothing in this film is a straight pull [from the house library]," Koretz explains. "Everything had to be layered and pitched and designed. We extensively used the Audio Suite function in Pro Tools to pitch sounds and time-compress. We also pitched elements with this shareware called SoundHack. Very little is a straight, normal sound. That was the challenge."

Insect wings were slowed down to give weight, then layered with helicopters and a bit of turbine whine, along with a stunt plane loop-de-loop. Wasps become wasps with a bit of four-engine propeller plane, buffeting wind and more added in. The magnifying glass becomes a parody of *Independence Day*, complete with science fiction death ray zap. Footsteps, to an ant at least, become a thundering earthquake.

Way back in February, in preparation for a one-reel screening at ShoWest, Anderson and Koretz were given the "shoe-to-shoe" scene to edit and mix. While walking near a picnic area, Princess Bala gets stuck on a wad of gum on the bottom of a shoe, and Z must rescue her in his finest Indiana Jones fashion. There are huge whooshes and wind effects, earth-rattling low end, and when the shoe steps on grass, Anderson says, to an ant it's like trees being crushed. "That scene sort of inspired me to slow things down," Anderson says, "not only to make them bigger, but to get back to the ants' point of view, where these giant shoes move in slow motion."

"We could really go to town on that sequence," Koretz says. "When we did the predubs, I thought it made *Jurassic Park* look like a wimp, particularly in this room, with its three-way speaker system. It was the biggest thing you ever heard." (It will be toned down somewhat in theaters, as it was decided that the score by Harry Grigson Williams and John Powell of Media Ventures would carry the second half of the scene.)

The film was the first feature to pass through Gregg Landaker's (effects) and Steve Maslow's (music and dialog) new room at Universal, featuring a 216-fader (with an additional 96 predub inputs) Harrison MPC console and three-way JBL 5000 Series Cinema System monitoring system. The film was recorded to mag. Dialog playback was from Timeline MMP16 digital dubbers. Music and any effects groups 16-tracks or less came directly off of Pro Tools. All other effects came off of 2-inch. ■

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—FROM PAGE 101, "VERY BAD THINGS"

make it strange, make it not literal.

"I guess the big scene in the movie is when the hooker gets killed in the hotel bathroom," he adds. "There's a lot of spinning camera and cutting back and forth with the other four guys in the hotel room, who are watching ultimate fighting. I grabbed a bunch of lion growls and roars and turned those into a washy word-sound design piece to tie the hotel room into the bathroom, so they become one location seamlessly, with the wrestler roars dissolving into what's happening in the bathroom.

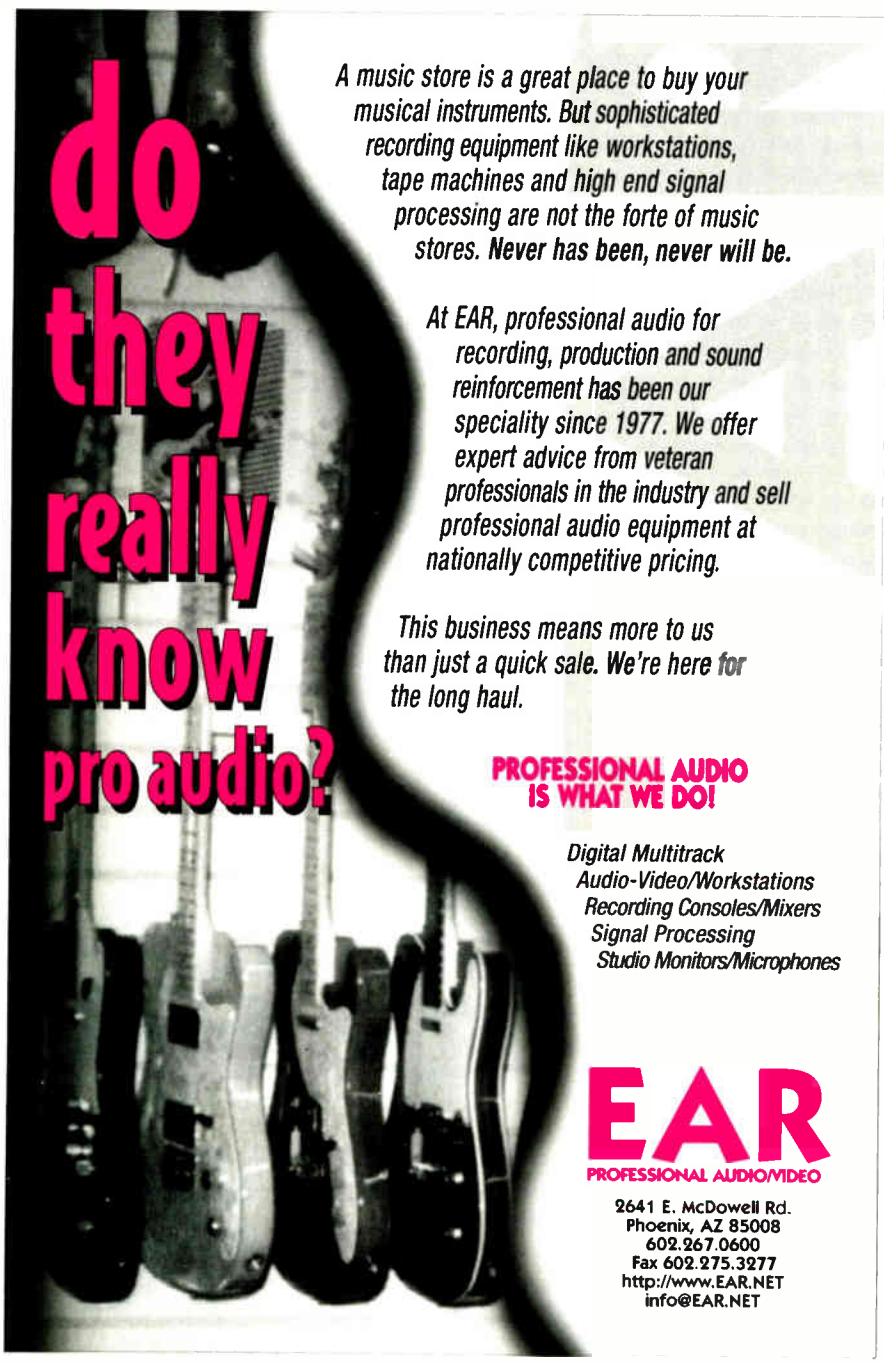
"The scene starts off with very literal Foley [done by John Sievert in Toronto] in the hotel room of the guys wrestling around, cutting to them having sex in the bathroom, with stuff like 'back-on-shower-door' slap. Then as the intensity grew and they started to get carried away, we began treating and processing the sounds, kind of like a song. I don't know if you ever listened to AC/DC, where they do the first couple of verses low-key, then comes the solo bridge, and after that you begin to hear extra guitar parts and extra vocals. The whole song builds in intensity and the singer starts screaming more and more, then the song ends. And at the end of the song, you're thinking, 'Shit, that was intense.' Same thing here."

The actual killing (or impaling) incorporated a number of organic and metallic sounds, including pig squeals, knife in ribs and the sound of an object dragged on a metal catwalk, fused and futzed with animal growls. Later, when the bodies are dismembered, a Saws-All was recorded, with bones and meat. We'll say no more, except that the sounds are so over-the-top outrageous and comic that it's not believable, and consequently the gory visuals are softened. But the humorous aspects of the movie are played straight, to keep the anxiety at a peak. Later, as the five men return to L.A., the film settles in, before building again to a paranoid, out of control ending.

King, who brought Sound Dogs with him from Toronto when he moved to L.A. in 1994, edits on Pro Tools|24 (with 160 megs of RAM and HUI controller) and designs in Sample Cell II, with extensive use of Waves plug-ins. He has a "standard old Roland MIDI controller" and a rack including Kurzweil K2000, Korg Wavestation and Eventide H3000, among other modules and processing devices. The facility runs digital video off Miro cards and is connected via a 10baseT Ethernet system, which will soon be replaced by a FibreChannel system that will hold the entire sound library on a central tower. That library can then be accessed through the facility's Web site (check it out at www.sound-dogs.com), which will allow picture editors to insert basic effects during dailies.

The film, mixed by Matthew Iadorola and Gary Gegan, was the first full-length feature to shake down the new AMS Neve DFC on Todd-AO's Bundy stage. Playback was from 2-inch 24-track, with Dolby SR, and predubbed to mag 6-track, SR. There were no temp mixes, and the crew had only five weeks from first seeing picture until predubs. There was no chance to hear Stewart Copeland's score until the mix stage, but by all accounts, the weaving of music and effects worked wonderfully, to the point that there are a few moments when effects "feel" like score.

"In spite of the short schedule, I thought it would be best for this film to be edited by a small crew," King concludes. "It would make the soundtrack far more cohesive and fluid. There were only five of us—myself on sound design and some ADR, Darren King editing dialog, Yann Delpuech on effects and sound design, Greg Brown on ADR, and my partner Bob Grieve doing polishing touches. I just had to lock myself in a dark room and beat my head against a wall until I came up with some good ideas." ■

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# More Bits...Please!

## MAXIMIZING SOUND QUALITY WITH HIGH-RESOLUTION AUDIO

By Bob Katz

"Faster, better, cheaper; pick only one of the three." Unfortunately, this adage is truer than ever in the age of digital audio recording: Occasionally you can get two out of three, but never all three at once. As computer power has become cheaper, more and more companies call themselves "manufacturers of recording hardware." And it's possible for a couple of individuals to "invent" a digital audio workstation in their basement out of a computer, an audio board, some mail order hard disks and a little software glue. There are many startup companies trying to sell you the latest DAW mousetrap, and with some flashy advertising, the world may beat a path to their door.



World Radio History

Is the analog tape recorder dead? Have the days of precision-engineered mechanical parts and quiet roller bearings bitten the dust? Can a $30,000 high-speed, widetrack analog tape recorder be equalled by the newest digital wonder consisting of computer, board and hard disk and costing less than $4,000? How much should that quality really cost, with 1998 computer technology? How can you avoid wasting $4,000 on the first digital Cuisinart?

This article looks at DAWs, digital tape recorders and digital mixers in a fashion you may have never considered. First, the DAW...

## THE DAW

It may slice and dice, but does it sound good? Before you buy the latest cheap box, don't forget that it takes a lot of talent and research-hours to produce good DSP software. The company producing this gear must have the right combination of skilled DSP engineers, user interface engineers, alpha test supervisors, beta test supervisors and a sufficient *beta tester user base* to give feedback—because every computer program has big bugs, lots of them. The trick is to turn them into little bugs before the program makes it to the street, where those bugs will bite you. One misplaced bug in DSP code can produce subtle—or severe—sonic aberrations.

Quality, features and reliability do not come cheap. Years of R&D really do cost. More realistically, instead of "a few thousand dollars," a robust workstation may require an investment from $8,000 to $20,000 and up, especially if you want sophisticated video synchronization features or *high-quality* noise reduction. Some manufacturers permit purchasing a system in incremental modules, so you may be able to get in on the ground floor of a quality system for less money.

Talk to users. It's a good start if users give a DAW high marks for sonic quality. But ultimately the equipment has to pass the test of your ears. Shortly, I'll tell you how to perform an easy, foolproof *listening test for sound bugs* that you can perform on almost any DAW. Digital is digital, right? What goes in is what comes out, right? Not necessarily. My article "The Secrets of Dither," in the October 1995 *Mix*, describes how mixing, equalization, gain changing and digital processing increase the wordlength of digital audio words.

Your DAW has to be able to handle these operations transparently in order not to alter sound. The first requirement for good sound is 24-bit data storage and processing. If your workstation only deals with 16-bit words, then all you should do is edit. Don't try anything else, unless you're actually looking for that "raw and grungy" quality. Do you want your music to lose stereo separation, depth and dimension, become colder, harder, edgier, drier and fuzzier? If these are not problems for you, then keep on bouncing and mixing away in 16 bits.

## THE SOURCE QUALITY RULE

This article is about getting "more bits" into our recordings, but there's a powerful opposite pressure to use an inferior-sounding, low-bit-rate (data compressed) delivery medium for home audio, radio and for the Internet. Personally, I wish lossy data compression could be outlawed; while that won't happen, let's at least keep lobbying for sound quality. One way to maintain quality is to follow this important rule: *Source recordings and masters should have higher resolution than the eventual release medium.* There's always a loss down the line, due to cumulative processing and lossy transmission techniques. For example, consider a lossy medium like the analog cassette. Dub to cassette from a high-quality source, like a CD, and it sounds much better than a copy from an inferior source, like the FM radio. In other words, the higher the audio quality you begin with, the better the final product, whether it's an audiophile CD, a multimedia CD-ROM or a talking Barbie doll.

Get ready for high-resolution release media, like DVD, by following this source quality rule. Prepare for DVD (and make better CDs in the process) by making your masters now with longer wordlength storage and processing, and if possible, high sample rates. The 96kHz/24-bit medium has even more analog-like qualities, greater warmth, depth, transparency and apparent sonic ease than 44.1 kHz. Perhaps it's due to the relaxed filtering requirements, perhaps it's due to the increased bandwidth—regardless, the proof is in the listening. Therefore, produce your master at the highest resolution, and at the end (the production master), use a single process to reduce the wordlength or sample rate. Multiple processes deteriorate quality more than a single reduction at the end.

For example, your multimedia CD-ROMs will

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sound much better if you work at 44.1 kHz/24 bits or higher, even if you must downsample to 11.05 kHz/8 bits at the end. Plus you've preserved your investment for the future. Your master will be ready for DVD-ROM, whose higher storage capacity will permit a higher-resolution delivery medium.

Our present "highest-resolution" release medium, the 16-bit compact disc, can sound better than what most of us are doing today. We're actually compromising the sound of our 16-bit CDs by starting with 16-bit recording. It's the reason why I've been a strong advocate of wide-track, high-speed analog tape and/or 24-bit/96kHz recording and mixing techniques. You can hear the difference; I've already produced three incredible-sounding CDs working at 96 kHz until the last step.

Working at 96 kHz/24-bit is prohibitively expensive for most of today's projects. The DAWs have half the mixing and filtering power, half the storage time, and outboard digital processors for 96 kHz have barely been invented. As a result, work time is more than doubled, and storage costs are quadrupled (due to the need for intermediate captures). I have no doubt that will change in the next few years. So at Digital Domain, most of the time we can't work at 96 kHz, but we still follow the *source quality rule* as much as is practical. Clients bringing in 20-bit mixes at 44.1 or 48 kHz, and especially ½-inch analog tapes, can get incredible results. The majority of mixes arrive on DAT, and we still get happy client faces and superb results by following the rule. When clients bring in 16-bit source DATs, we work with high-resolution techniques, some of them proprietary, to minimize the losses in depth, space, dynamics and transient clarity of the final 16-bit medium. The result: better-sounding CDs.

### DSD VS. LINEAR PCM
### 96 VS. 88.2

Sony's high-resolution Direct Stream Digital format is a one-bit (sigma delta modulation) system running at 64 x 44.1 kHz (2.882 MHz), which eats up storage at a little less than 3 MB/second/channel. The jury is still out on whether this system sounds as good or better than linear PCM at 96 kHz/24-bit, but regardless, Sony's whole purpose was to follow the *source quality rule*. The company feels that DSD is the first medium that will preserve the quality of its historic analog sources. DSD is controversial in several ways, including its incompatibility with current workstations and PCM hardware (although Sonic Solutions has a prototype editor). Furthermore, knowledgeable engineers question whether DSD's data rate will really produce 20- to 24-bit dynamic range in the 20 to 20k Hz bandwidth. Therefore, Sony needs to tell us more about the specifications of the format.

Sony says that DSD is easily convertible to 88.2 or 44.1 kHz, but not to 96 kHz. They also maintain that 96 kHz is not ideal for a music standard because of the need to release on 44.1 CD format. In support of that, an AES paper by Andrew Moorer of Sonic Solutions pointed out that it is really simple to convert from 88.2 to 44.1, but it requires a lot more complex DSP code to get from 96 to 44.1 without adding distortion. However, England's dCS has released a costly but practical sample rate converter with extremely low measured distortion, and the calculation precision to convert to and from any standard rate and wordlength. dCS preferred to conquer the engineering problem, and leave the argument over 96 vs. 88.2 kHz


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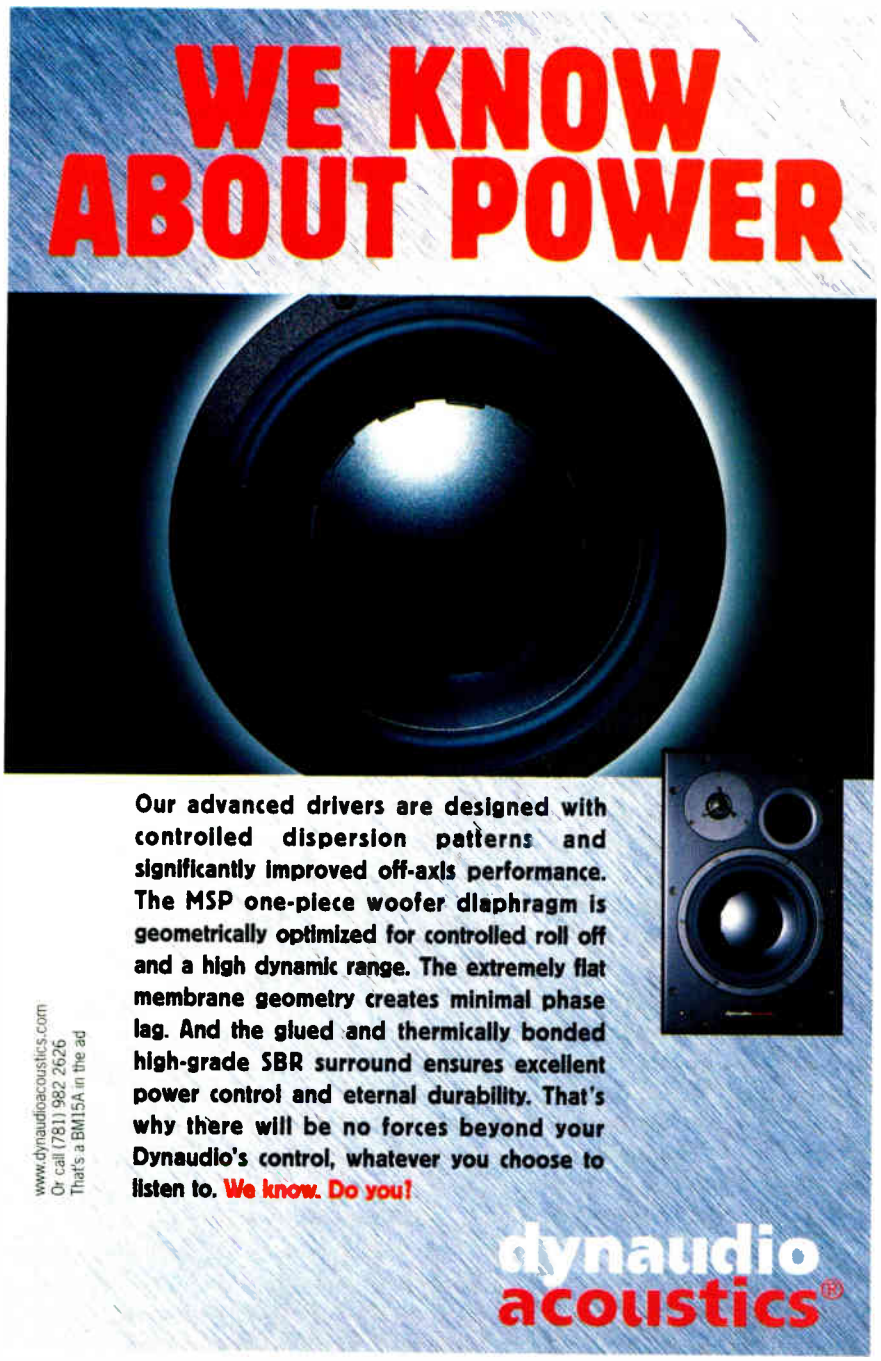
a question of politics or economics. Regardless of whether DSD, or linear 96/24, or 88.2/24 becomes the next standard, it's a win/win situation for fans of high-resolution recording.

### EXTENDING THE AES/EBU STANDARD

The ear is extremely sensitive to quantization distortion—the degradation can be heard as a "shrinkage" of the soundstage width. In my opinion, even 16-bit sources benefit from longer wordlength processing. I predict that in a few years studio storage and data transmission requirements will rise to 32 (linear) bits. Thirty-two bit will result in subtly better sound than 24-bit, especially with cumulative processing and capturing. Cumulative processing (such as multiple stages of digital EQ) results in gradual degradation of the least significant bits. Thus, moving the LSB down lower than the 24th bit will reduce audible degradation. How long does that wordlength have to be to result in audibly transparent sound processing? It's hard to say—perhaps 26 to 28 bits, but because storage is organized in 8-bit bytes, it must increase to 32 bits. Processing precision can easily increase to 48 or even 72 bits because of the 24-bit registers in DSP chips.

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One big obstacle to better sound is our need to chain external processors and perform capturing and further processing in our workstations. Even if manufacturers use internal double precision (48-bit) or triple precision (72-bit) arithmetic, the chain of processors must still communicate at only 24 bits, for that is the limit of the AES/EBU standard. Despite that, I welcome manufacturers who use higher precision in their internal chains, because all other things being equal, we'll have better sound. The ultimate solution is to extend the AES/EBU transmission standard to a longer wordlength, but in the meantime, try to avoid too many processors in the chain and reduce the practice of cumulative mix/capturing and reprocessing.

### FLOATING OR FIXED?

Don't get into a misinformed "bit war" confusing floating-point specs with their fixed-point equivalent. A 32-bit floating-point processor is roughly equivalent to a 24-bit fixed-point processor. When manufacturers speak of "32-bit buses" they are probably speaking of floating-point. However, both types of processors can perform double precision arithmetic, which extends the precision to 48 (fixed-point) bits. Double precision arithmetic (or doubled sample rate) in a mixer requires more silicon and more software to have the same apparent power—that is, the same quantity of filters and mixing channels. It'll be expensive, but ultimately less expensive than its high-end analog equivalent, a mixer with very high voltage power rails and extraordinary headroom (tubes, anyone?). What does a double precision digital mixer sound like? It sounds more like *analog*. The longer the processing wordlength, the warmer the sound; music sounds more natural, with a wider soundstage and depth.

### DETECTING THOSE BUGS

Proper use of those 24-bit words is equally important. Bugs that affect sound creep into almost every manufacturer's release product. In 1989, the latest software release of one DAW manufacturer (whose machine I no longer use) had just hit the market. I edited some classical music on this workstation. There was a subtle sonic difference between the source and the output, a degradation that we perceived as a sonic veil. Eventually, it was traced to a one-bit level shift at the zero point (crossover point, the lowest level of the waveform) on positive-going waves only. This embarrassing bug should


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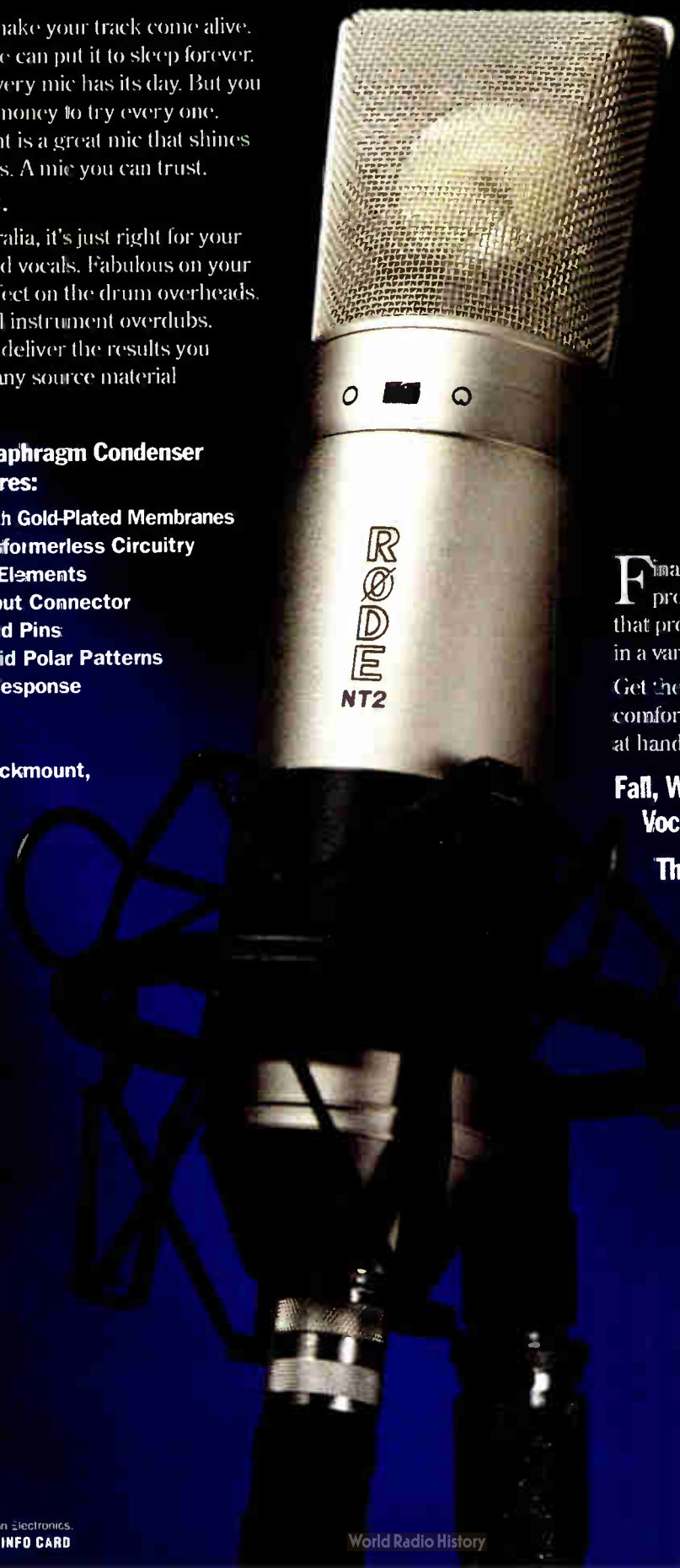


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have been caught by the testing department before the software left the company. Does your DAW manufacturer have a quality control department for sound, with a digital domain analyzer such as the Audio Precision? Do they test their DSP code from all angles? Incredible diligence is required to test for bugs. For example, a bug can slip into equalizer code that does not affect sound unless the particular equalizer is engaged. It's impossible to test all permutations and switches in a program before it's released, but the manufacturer should check the major ones.

### A BITSCOPE YOU CAN BUILD YOURSELF

The first defense against bugs is eternal vigilance. Listening carefully is hard to do—continuous listening is fatiguing, and it's not foolproof. That's why visual aids are a great help, even for the most golden of ears. In the old days, the phase meter was a ubiquitous visual aid (and should still be a required component in every studio); our studio also uses a product we call the "digital bitscope," which is easy and inexpensive to put together. It's not a substitute for a $20,000 digital audio analyzer, but it can't be beat for day-to-day checking on your digital patching, and it instantly verifies the activity of your digital audio equipment.

You can put it together yourself (see sidebar, "Digital Detective"). If you're not a do-it-yourselfer, Digital Domain manufactures a low-cost box that can be converted to a bitscope with the addition of a 2-channel oscilloscope. Our bitscope is always online in the mastering studio. It tells us what our dithering processors are putting out, it reveals whether those 20-bit A/D converters are putting out 20-bit words, and it exposes faults in patching and digital audio equipment.

### SOME SIMPLE SOUND TESTS YOU CAN PERFORM ON A DAW

With the output of my workstation patched to the bitscope, I can watch a 16- or 20-bit source expand to 24 bits when the gain changes, during crossfades, or if any equalizer is changed from the 0dB position. A neutral console path is a good indication of data integrity in the DAW. After the bitscope, your next defense is to perform some basic tests, for linearity, and for perfect clones (perfect digital copies). Any workstation that cannot make a perfect clone should be junked. You can perform two important tests just using your ears. The first test is the fade-to-noise test, described previously in my "Dither" article.

The next test is easier and almost foolproof—the *null test*, also known as the *perfect clone test*: Any workstation that can mix should be able to combine two files and invert polarity (phase). A successful null test proves that the digital input section, output section and processing section of your workstation are neutral to sound. Start with a piece of music in a file on your hard disk. Feed the music-out of the system and back in, and re-record while you are playing back. (If the DAW cannot simultaneously record while playing back, it's probably not worth buying anyway.) Bring the new "captured" sound into an EDL (edit decision list, or playlist), and line it up with the original sound, down to absolute sample accuracy. Then reverse the polarity of one of the two files, play and mix them together at unity gain. You should hear ab-

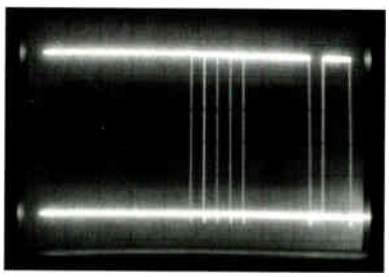
## DIGITAL DETECTIVE: THE BITSCOPE

Are you a Sherlock Holmes of the audio world? You can use an ordinary oscilloscope (20 MHz or better) to see the bit activity of your digital processors, consoles and workstations. These photos illustrate some typical bitscope displays.

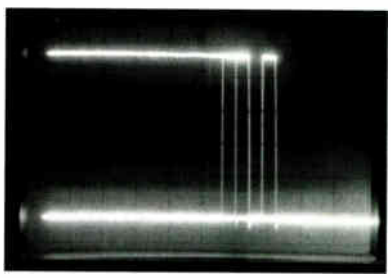
Every digital audio recorder, processor or console extracts serial data and word clock from the AES/EBU or S/PDIF line. Pick a "neutral" machine or processor that you can patch into your digital audio system at the end of your processing or monitoring chain, so you can analyze what all your processors are doing to the signal. All you have to do is connect the vertical input of your oscilloscope to data, and its trigger or time base to word clock (44.1 or 48 kHz), to see which bits and how many bits are being used at all times. If you're not used to digging into audio equipment, then give the job to someone who is. Opening any manufacturer's gear may void the warranty.

Crystal Semiconductor's ubiquitous CS8412 digital receiver IC is used in many processors. You'll find data on pin 26, and word clock on pin 11 of this 28-pin chip. Attach the shield of the scope lines to ground. I suggest soldering a 75-ohm build out (isolation) resistor from the chip's

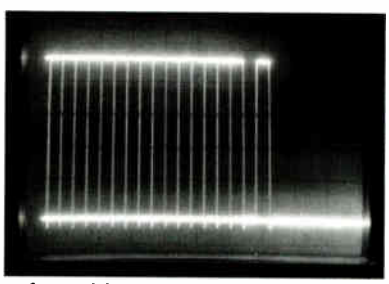
—CONTINUED ON PAGE 121



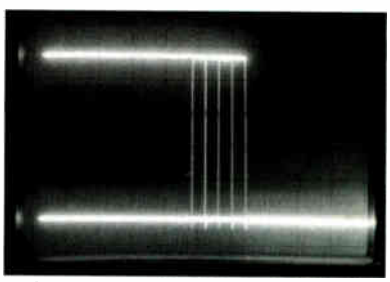
*"Defective" digital processor in BYPASS. Source is a 16-bit sinewave at -70 dBFS. The additional bits could be DC offset or what?*



*The same defective dithering processor idling (with no input signal). Note two-three bits worth of dither and the same missing 17th bit and toggling 18th bit.*



*Defective dithering processor set for 16-bit output. Source is a 16-bit full-scale sinewave. Note the missing bit in the 17th position and the extra 18th bit is toggling*



*Dithering Processor in idle (no input signal) showing 4 bits toggling (high order dither with noise-shaping).*



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solutely *no sound*. If you do hear sound, then your workstation is not able to produce perfect clones. The null test is almost 100% foolproof; a mad scientist might create a system with a perfectly complementary linear distortion on its input and output and which nulls the two distortions out...but the truth will out before too long.

If the workstation is 24-bit capable, and your D/A converter is not, you may not hear the result of an imperfect null in the lower 8 bits. Use the bitscope to examine the null; it will reveal spurious or continuous activity in all the bits and tell you if something funny is happening in the DAW. Even if your DAC is 16 bits, you can hear the activity in the lower 8 bits by placing a redithering processor in front of your DAC.

Use the powerful null test to see whether your digital processors are truly bypassed even if they say Bypass. Several well-known digital processors produce extra bit activity even when they say Bypass; this activity can also be seen on the bitscope. Use the null test to see if your digital console produces a perfect clone when set to unity gain and with all processors out (you'll be surprised at the result). Use the null test on your console's equalizers; prove they are out of the circuit when set to 0dB gain. Use the null test to examine the quantization distortion produced by your DAW when you drop gain .1 dB, capture and then raise the gain .1 dB. The new file, while theoretically at unity gain, is *not a clone* of the original file. Use the null test to see if your DAW can produce true 24-bit clones. You can "manufacture" a legitimate 24-bit file for your test, even if you do not have a 24-bit A/D. Just start with a 16-bit or 20-bit source file, drop the gain a tiny amount and capture the result to a 24-bit file. All 24 of the new bits will be significant, the product of a gain multiplication that is chopped off at the 24th bit. You'll see the new lower bit activity on the bitscope.

### DIGITAL CONSOLES: CHEAP, BUT GOOD?

Let's discuss the use of digital consoles with digital recorders. Digital consoles suffer from the same potential word-length and truncation problems as DAWs. Truncation without redithering is always bad, but depending on where you truncate, the result can be sonically benign, or very nasty. For example, truncating a 20-bit A/D to 16 bits is relatively benign because most mic preamps are noisy enough to provide some dithering action. But using a DSP

*—FROM PAGE 120, DIGITAL DETECTIVE*

pins to the scope lines, to protect the signals from accidental shorts. Use good, short co-ax cables (I've used three feet with no problems).

Even if you're not the do-it-yourself type, you can still be a digital detective. Digital Domain will add scope outputs to its FCN 1 Format Converter or VSP/P Digital Audio Control Center for a small fee. For further information, contact Digital Domain at 407/831-0233 or email bobkatz@digido.com.

The bitscope will tell you when certain things are *wrong* (e.g., missing bits, or extra bits), but it can't guarantee that everything is *right*. Harmonic distortion will not show on the bitscope. The bitscope will tell you if an A/D is putting out 20-bit words, which is helpful information, but it will not tell you if all those bits are significant. Therefore, use the bitscope as a visual aid, a first line of defense against digital audio problems.

The 8412 chip can be configured for many modes. The most common mode presents one channel's worth of data on wordclock "up," and the other channel on wordclock "down." Crystal uses a 64-bit "slot," so you'll see up to 24 bits worth of one channel, followed by 8 bits of "silence," then the other channel (another 32-bit half slot). Counting bits is easy if you adjust your scope's timebase to show one audio channel, and 2.5 bits per division, which gives a convenient count of 5 bits every two divisions, and spreads 24 bits across the whole screen. The format is 2's complement, with the MSB at left, and LSB at right. When the MSB is low, the audio signal is positive, when high, it's negative, so the MSB will be toggling all the time, unless the signal is pure DC. A toggling bit will appear to have both high and low values; this just means that the eye's persistence of vision is showing both values.

Note: The scope pictures are a little over-exposed, so the top vertical line is fatter and brighter than the actual scope display. —*Bob Katz*

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to drop gain only 0.1 dB in a console and then truncating the output to 16 bits is very damaging, shrinking soundstage and producing harsher sound. Be aware of these facts when using digital consoles with digital recorders. Always use dither to reduce the console's long wordlength to the recorder's wordlength. If your digital console does not have dithering options, you'll be better off with a very high-end analog console. That's one of the things that separates the higher-priced digital consoles from the cheap ones. Cheap digital consoles do cost—you pay in reduced sound quality.

There's an engineer on the leading edge, who had been working with 20-bit recording and a digital console, but reverted to a purist-quality analog console when he upgraded his converters to 24 bits. He found he got better-sounding results mixing live sources in analog and then feeding the 24-bit A/D than by starting with A/D's and feeding a digital console. It takes a very special digital console to preserve 24-bit quality; it's also difficult and expensive to design an A/D converter that retains high resolution inside the polluting environment of a digital console.

Here's how to make a better-sounding mix with a digital console. When recording to multitrack, dither every track to 16 bits if using ADAT or Tascam format. Or to 20 bits if using the ADAT type II format. Better yet, bypass the console, and connect the A/D converter directly to the ADAT, using the A/D converter's built-in dither when appropriate. This reminds me of "the old days" where we patched around the analog console to get more transparent sound. If your work involves little or no submixing and bouncing, you will end up with an excellent-sounding tape. If you work in 20/24 bits, avoid sending a 16-bit DAT to the mastering house, because a lot of your quality will be wasted. If possible, send a 24-bit mixdown to give the mastering engineer more "meat" to work with. Let the mastering house work on the long wordlength, apply their processing and finally, the world's best dither for your 16-bit CD master. That's what the mastering experts do every day.

CIRCLE #081 ON PRODUCT INFO CARD

### THE MISSING LINK: AFFORDABLE 24-BIT FILE INTERCHANGE

Now, after much work (and money), you have advanced to 24-bit storage and transmission. But you need to get that 24-bit data to the mastering house, where the mastering engineers can work miracles with your sound. That's the missing link in the audio industry—an affordable, universal 24-bit interchange medium. There are many new technologies competing for long wordlength data interchange. Which one will catch on? Frankly, I'm pessimistic. No single company has set the standard or tried to be the leader. This means the mastering house must rent machines they do not have on hand. No studio can afford to have every possible 24-bit format.

### CONCLUSION

DAWs, digital tape recorders and digital consoles affect sound. Use these tools properly and your music will sound better. Mastering houses thrive on high-resolution sources. Consider the choices and send the best source you can for mastering. And manufacturers—give us more bits and please: Make them compatible!

---

*The co-owner of Digital Domain (www.digido.com), a CD mastering house in Orlando, Fla., Bob Katz recorded and mastered last year's Grammy-winning album in the Latin Jazz category, Paquito D'Rivera's* Portraits of Cuba.


World Radio History

# FOR LEGENDARY STAGE PERFORMANCE AKG'S C535EB MICROPHONE DELIVERS

## AKG Brings Two Great Performers Together With The C535EB Microphone And k.d. lang.

k.d. lang, singer and winner of three Grammys and seven Juno Awards, relies on the clean, open characteristics of the AKG C535EB microphone. With an integral four-position switch, the C535EB tailors output levels and bass roll-off, making it perfect for both live performance and in the recording studio. So for the legendary condenser sound that AKG delivers, test drive your own C535EB microphone today.

"I feel the AKG's C535EB gives the audience the truest quality of my vocal performances. I wouldn't perform without it."

## LEGENDARY SOUND QUALITY BY

AKG

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AKG Acoustics G.m.b.H. Vienna/Austria, http://www.akg-acoustics.com

H A Harman International Company

CIRCLE #082 ON PRODUCT INFO CARD
World Radio History

# PREVIEW

### QUESTED THREE-WAY MONITOR, SUBWOOFER

Quested Monitoring Systems (distributed by Audio Independence, Middleton, WI) has introduced the UD1, a three-way passive monitor and the QSB118, an 18-inch subwoofer designed to complement the HQ210 active system. The UD1 features two 8-inch woofers, a 3-inch mid driver and a 28mm soft dome tweeter. Each driver is housed in its own chamber, for minimal IM distortion, and the passive crossover features polypropylene capacitors. Multiple binding post connectors allow for bi- or tri-amplification, and the speaker cabinets include integral stands. Price of the UD1 is $3,120; the QSB118 is $3,680.

**Circle 327 on Product Info Card**

### TC ELECTRONIC FINALIZER EXPRESS

The Finalizer Express Studio Mastering Processor from TC Electronic (Westlake Village, CA) is a lower-cost version of the company's Finalizer Plus digital processor, and is easier to use. Featuring 24-bit A/D and D/A converters, the Finalizer Express offers a complete set of multiband dynamics processing tools through a simple user interface. I/Os include AES/EBU, S/PDIF, optical, MIDI and analog; the unit also includes a PCMCIA card slot and will interface with TC's Master Fader digital fader. Additional features include multiple simultaneous digital outputs, 16- and 20-bit dithering and spectral balance controls, soft limiting, look ahead delay, MTC controllable autofade with record feature and LED metering. Price is $1,599.

**Circle 328 on Product Info Card**

### EV'S VARIPLEX THREE-WAY SPEAKER

Electro-Voice's (Buchanan, MI) Variplex™ is a THX®-approved tri-amped (also available with internal passive crossovers) loudspeaker for behind-screen cinema applications. The 18-inch-deep Variplex includes an 800-watt, dual 15-inch LF section and a unique mid-bass horn with two high-power 8-inch drivers. The HF section includes EV's DH2T 2-inch compression driver. Mid-bass and HF sections employ EV's patented Vari Intense® asymmetrical (variable angle) horn technology for uniform coverage and reduced reflections from ceilings and walls. Used with the new D1138 monitor/digital crossover from THX, Variplex is approved for room depths up to 80 feet. For other applications, the EV DX34A digital processor has presets optimized for the Variplex.

**Circle 329 on Product Info Card**

### AUDIO TECHNOLOGIES ALL-TUBE COMPRESSOR

Audio Technologies (Sea Girt, NJ) offers the Tubelink All-Tube Compressor/Limiter ($2,495) and the TMA2 All-Tube Microphone Preamplifier ($1,495). The dual channel Tubelink features a push-pull design with Class AB circuitry, a variable Mu gain reduction section and transformer-balanced I/Os. Additional features include variable threshold and release controls, illuminated VU meters (switchable between input and gain reduction) and stereo link and bypass switches. The dual-channel TMA2 features circuitry similar to that of the Tubelink (less the gain reduction section) and Reichenbach input transformers. Each channel has a stepped input gain control, a trim control and switches for polarity reverse and 48V phantom power.

**Circle 330 on Product Info Card**

### SOUND ACOUSTICS D/A BOX

Sound Acoustics (Lisle, IL) debuts the D/A Box, a modular absorber/diffuser designed for use as a gobo and/or wall treatment. Measuring three feet square by eight inches deep, each D/A Box has alternating strips of absorbent foam and angled wooden slats. Units may be set up with the slats in either horizontal or vertical orientation and may be stacked to form walls. An I-Lite Box replaces foam and slats with a ¼-inch Plexiglas panel set at an 8-degree angle within the frame. Both D/A Box and I-Lite Box are priced at $175; any two panels may be purchased for $299.

**Circle 331 on Product Info Card**



World Radio History

# PREVIEW

### SUNFIRE LABS POWERED SUBWOOFER

Bob Carver's Sunfire Laboratories (Snohomish, WA) makes its debut with the True Subwoofer Professional, a self-powered subwoofer in an 11-inch cube cabinet. Featuring two 8-inch drivers, mounted on opposite sides of the cabinet, the unit produces up to 112 dB SPL from 25 to 100 Hz. Powered by its own 2,700-watt amplifier, the unit accepts stereo inputs and offers "daisy chain" outputs for slaving additional units. Input level, crossover frequency (35 to 100 Hz) and phase relative to input are continuously variable. Weighing 48 lbs, the unit features a high-impact rubberized finish, metal corner protectors and "rollover bars" to protect the woofers. Price: $1,499.

**Circle 332 on Product Info Card**

### A-T 7000 SERIES UHF SYSTEMS

Audio-Technica's (Stow, OH) 7000 Series UHF wireless systems offer 100 PLL-synthesized channels in the 700MHz band and true diversity operation. The ATW-7375 UniPak™ Transmitter System ($975) includes the ATW-R73 true diversity receiver and ATW-T75 bodypack transmitter, compatible with lavalier and headworn mics. The $995 ATW-7376 handheld dynamic mic system includes the ATW-R73 receiver and the ATW-T76 mic with an Audio-Technica Hi-Energy® dynamic element with internal shock mounting. The half-rack ATW-R73 receiver has balanced (XLR) and unbalanced ¼-inch outputs, ground-lift switch, adjustable volume and squelch and RF/AF/A-B front panel indicators.

**Circle 333 on Product Info Card**

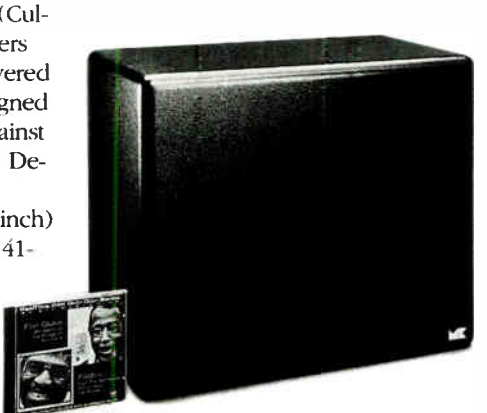
### ROLLS SONIC EXCITERS

Rolls Corporation (Salt Lake City, UT) offers the RP261 Dual Sonic Exciter, a 2-channel rackmount unit using the Spectrum Correction Encoding (SCE) process to enhance finished mixes. Front panel controls for each channel affect "Bottom" and "Definition." A stereo version, the RP262, includes LED bar graphs and an adjustable 18dB/octave subwoofer output. I/Os are XLR, RCA and TRS. Price for each unit is $200

**Circle 334 on Product Info Card**

### M&K POWERED SUBWOOFER

Miller & Kreisel (Culver City, CA) offers the MX-700 powered subwoofer, designed to be located against a wall or corner. Despite its modest (14.5x17.5x12.2-inch) dimensions, the 41-pound system offers flat response to below 20 Hz. The unit contains two rear-facing and mag-shielded 8-inch long-throw drivers matched to a 200-watt amp with electronic protection and an adjustable roll-off filter. A Bypass switch eliminates the internal roll-off for use with Dolby Digital and THX systems, and there is a two-position phase switch. Price: $1,395.



**Circle 335 on Product Info Card**

### GENELEC 1038AC CENTER-CHANNEL SPEAKER

Genelec USA (Natick, MA) debuts the 1038AC Active Center-Channel speaker, an active three-way, 640-watt, tri-amplified monitor speaker designed for mounting horizontally above or below a projection TV or screen. The 1038AC includes dual 10-inch woofers, 5-inch mid and 1-inch metal dome tweeter, powered by a dedicated remote amp and crossover system providing a total of 400 watts for bass and 120 watts each for the MF/HF drivers.

The compact (36x14x22-inch) system incorporates Genelec's proprietary Directivity Control Waveguide Technology™ for a stable soundstage throughout the listening area and improved dialog intelligibility. System frequency response is 35 to 20k Hz (+2.5dB); maximum output is 120 dB SPL @ 1 meter. Additional features include protection circuitry and full magnetic shielding. Price is $7,499.

**Circle 336 on Product Info Card**

### ALESIS Q20 MULTI-EFFECTS

Alesis (Santa Monica, CA) is shipping the Q20 professional 20-bit master effects processor, which replaces the Q2 multi-effects proces-

World Radio History

# PREVIEW

sor. The Q20 has 300 programs (100 presets and 200 user spaces), and runs up to eight effects at a time—in series, in parallel or fed back into themselves. Effects include hall, room and plate reverb, graphic and parametric EQ, flanging, chorus, pitch shift, delay, rotary speaker simulation, overdrive, auto panning with Doppler effect and stereo sampling. New features of the Q20 include balanced XLR I/Os, 20-bit digital converters, internal power supply and S/PDIF digital I/O. Price is $999.

Circle 337 on Product Info Card

### WAVE DISTRIBUTION ADAT DACS

The AD24 and DA24 24-bit 8-channel analog/digital and digital/analog converters from Wave Distribution (Ringwood, NJ) are specially designed for use with ADAT recorders and ADAT-compatible PCI soundcards and digital consoles. Manufactured in Switzerland by MusicNet, the units feature a 117dB dynamic range and support 44.1 and 48kHz sampling rates. I/Os on both units include individual XLR and 8-channel Lightpipe connectors; balanced XLR I/Os are +4 and -10 dB switchable. Also featured are Word Clock I/O, dual LED front panel monitoring and de-emphasis support for Red Book CD. The units are half-rack size and may be mounted in a single rackspace. The AD24 price is $749; the DA24 is $549.

Circle 338 on Product Info Card

### ESOTERIC SOUND MONITOR SWITCHER

Esoteric Sound (Downers Grove, IL) offers the Super Connector, a rackmount switcher for monitoring up to four main sources and up to five stereo recorders (a pair of front-panel stereo TRS connectors link to the External selector position). Any live or recorded source may be monitored while taping, and two external equalizers may be inserted independently. All 34 rear panel RCA connectors are gold-plated, and a stereo/mono switch simplifies mono dubbing or monitoring. Price is $299.

Circle 339 on Product Info Card

## HOT OFF THE SHELF

Now available: **firmware V. 2.4 for the Sabine POWER-Q**, combining the functions of nine products into one easy-to-use 2U package. The new firmware is also included in all POWER-Qs and POWER-Q Slaves. Call 904/418-2000 or visit www.sabineinc.com...**Fresh Music's "Fresh Produce" six-CD library** of sound effects and production elements, includes ambiences, effects, stingers, logos, tags, pulses, beats, drones, impacts and more. For a free demo disc of Fresh's buyout library of over 50 CDs, call 800/545-0688 or visit www.freshmusic.com...**The Real Drums CD-ROM for the Akai** MPC2000 contains dozens of full kits ranging in size from 2 MB to 18 MB along with congas, timbales, shakers and other assorted Latin and "ethnic" sounds, as well as orchestral percussion. The CD-ROM is $149 plus $5 shipping and handling. Call 850/877-9438 or e-mail to stratus_CD@mindspring.com...**Vol. 12 in River City Sound's "Specialty Series"** of buyout production music is Useful Stuff 1, with 57 tracks of themes, moods and elements in :60 and :30 versions. Call 800/755-8729 or visit www.rivercitysound.com...**Platt Luggage's Guardsman™ ATA cases** are available in aluminum as well as polyethylene. Cases are tested to ATA 300 specs, and can be ordered with custom interiors, in standard or custom sizes, with and without wheels. Call 800/997-5288 for a catalog...**Electro-Voice ArraySHOW™ software** for optimizing multiple loudspeaker array performance, is available free from the "Download" area at www.electrovoice.com...**Promusic adds "Broadcast Plus,"** a 75-disc collection to its production music library of more than 2,000 CDs. Also, Promusic's "Elements" is a buyout CD with more than 200 production elements, music beds and sound design treatments. Call 800/322-7879 or visit www.promusicinc.com...**The Interactive Music Handbook by Jodi Summers** is a comprehensive guide to Enhanced CD production, Internet music distribution and related business topics. The $19.95, 296-page paperback includes technical primers, Q&As with leading industry practitioners, analysis of case studies, and helpful guidance on design issues and legal requirements. Visit Allworth Press at www.allworth.com...Four new titles to **The Music Bakery's production music library**: Think Positive, Dramatic Atmospheres, Acoustic Inspiration and Orchestral Scores. All Music Bakery libraries are searchable using MusicSearch software, and customers may order custom CDs. For a free demo call 800/229-0313 or visit www.musicbakery.com...**EDAC's weatherproof connectors** for the 2- to 15-amp current range include 1/2/3/5/9-pole connectors. Call 416/754-3322 or visit www.edac.net...**Syntaur Productions CD-ROM samples for Ensoniq ASR and EPS** samplers include Supersoniq and Let There Be Phat! Prices are $169.99 per CD; the samples are also available on Zip disks. Call 800/334-1288...**Telect's Umbilical Cable Harness Audio Patch Panels** handle both analog and digital signals in the same panel. Front and rear panels are connected by an umbilical cable to ease maintenance/reconfiguration. Call 800/551-4567 or visit www.telect.com. ■

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And because GENELEC has twenty years of active monitor design and manufacturing, you can be sure what you hear represents the audio truth – the good news as well as the bad. And that's precisely where one of several GENELEC Surround Sound Active Monitor Systems can save your...

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CIRCLE #084 ON PRODUCT INFO CARD

world radio history

# Finally, A Powerful 24-Bit Digital EQ That Thinks It's Analog

Protēa

The Ashly Protea Series programmable 24-bit digital graphic equalizer/system processors are the finest, easiest to use and most affordable digital equalizers on the market. True 24-bit resolution from input to output provides you with unparalleled audio processing power. The 4.24G "mother" unit may be used as a four-channel stand-alone EQ that not only saves you rack space but also allows you control of up to twelve more channels of EQ. Complementing the 4.24G are the 4.24RD Full Function Remote Control with Display, the 4.24GS Four-Channel Slave, and the 2.24GS Two-Channel Slave. Each channel gives you 1/3-octave graphic EQ, a compressor/limiter which may be assigned pre or post in the signal chain, high pass and low pass filters, and time delay for aligning your system. Applications include monitor systems, front of house PA, commercial sound installations requiring fixed and tamper-proof EQ, recording and broadcast studios, surround-sound equalization digital audio workstations and computer recording.

## PROTEA 4.24G: DIGITAL EQUALIZATION MOTHER UNIT

Full control of the 4.24G is accomplished from the front panel in an intuitive and straight-forward layout. It's like using your old analog equalizer, only with features and benefits unavailable until now. Housed in an all-steel 2RU package, the 4.24G has all the audio processing tools needed for flawless equalization and sound control. In addition to 28 bands of 1/3-octave EQ are a programmable compressor/limiter for speaker protection and programmable delay of up to 341ms for time alignment of speaker clusters, arrays or monitor speakers. Individual, programmable 24dB/octave High- and Low-pass Filters allow you to zero in and fine tune the audio spectrum you need to work in. A large 240x64 fluorescent backlit display keeps you constantly informed of every parameter, function and utility.

- 24-bit A/D/A Audio Resolution
- 24-bit Digital Signal Processing
- Four 28-Band 1/3-octave Channels of EQ
- Intuitive User Interface
- Compressor Programmable for Pre or Post Signal Chain Position
- Move Multiple Faders Simultaneously
- Linkable Channels
- Constant Q/Reciprocal Filter Design
- ±15dB Boost and Cut
- 128 Preset Locations
- RS232 Computer Interface
- Full MIDI Implementation
- Password Protection of System Operation
- Input and Output Level Metering
- Programmable LCD View Angle and Auto-Off
- Channel Mute Control
- Instant "Flat" Control
- Master Level Control
- Programmable Scene Setups
- Instant Parameter Copy From Channel to Channel

## PROTEA 4.24RD: FULL-FUNCTION REMOTE CONTROL WITH DISPLAY

The 4.24RD is a full-function remote controller used to facilitate changes to the 4.24G, 4.24GS, and 2.24GS via two standard mic cables. Cable length can be up to 1000 feet. The control buttons and display are exact replicas of the front panel features of the 4.24G, allowing you to program either the mother unit or slaves from a remote location. When multiples of the processing units are used in a system, up to sixteen channels of processing may be controlled by the remote. A meter display lets you monitor your compressor output level and gain reduction, allowing quick and easy adjustments. The best live sound application for the remote is to EQ individual monitors on-location without having to return to the processor repeatedly to make adjustments. For a fixed installation using the 4.24GS or 2.24GS slaves, the 4.24RD remote may be temporarily used to set up all EQ curves and processing parameters. Removing the 4.24RD after setup ensures complete tamperproof operation.

World Radio History

ASHLY

Protēa

# DIGITAL EQUALIZATION SYSTEM

## PROTEA 4.24GS:
## 4-CHANNEL DIGITAL EQUALIZATION SLAVE UNIT

The 4.24GS is housed in an all-steel, 2RU chassis, and has four independent channels of 28-band Graphic EQ with Limiter, High- and Low-pass Filter, and Time Alignment Delay functions. The front panel displays currently assigned individual channel numbers, signal present and signal clip using 7 segment and discrete led indicators. A power switch is located on the front panel. Connections on the rear panel include: balanced XLR and 1/4" Ins and Outs for each channel, RS232, MIDI In, Out/Thru and Ashly's exclusive digital remote control protocol via two standard XLR connectors. Control of the 4.24GS is from the 4.24RD, 4.24G, or a PC using Ashly's exclusive Protea System Software.

- 24-bit A/D/A Audio Resolution
- 24-bit Digital Signal Processing
- 1/3-octave Graphic EQ
- RS232 Computer Interface
- Compressor Programmable for Pre or Post Signal Chain Position
- Expand Your System to 16 Channels of EQ
- Truly Tamperproof Equalization Settings
- Linkable Channels
- Constant Q/Reciprocal Filter Design
- Active Balanced Inputs and Outputs
- ±15dB Boost and Cut
- +6/-∞ Master Gain Control
- 128 Preset Locations
- Full MIDI Implementation
- Signal Present and Clip Indicators

## PROTEA 2.24GS:
## 2-CHANNEL DIGITAL EQUALIZATION SLAVE UNIT

The 2.24GS is housed in an all-steel, 1RU chassis, and has two independent channels of 28-band graphic EQ with Limiter, High- and Low-pass Filter and Time Alignment Delay functions. The front panel displays currently assigned individual channel numbers, signal present and signal clip using 7 segment and discrete LED indicators. A power switch is located on the front panel. Connections on the rear panel include: balanced XLR and 1/4" Ins and Outs for each channel, RS232, MIDI In, Out/Thru and Ashly's exclusive digital remote control protocol via two standard XLR connectors. Control of the 4.24GS is from the 4.24RD, 4.24G, or a PC using Ashly's exclusive Protea System Software.

- 24-bit A/D/A Audio Resolution
- 24-bit Digital Signal Processing
- 1/3-octave Graphic EQ
- RS232 Computer Interface
- Compressor Programmable for Pre or Post Signal Chain Position
- Expand Your Systems EQ
- Truly Tamperproof Equalization Settings
- Linkable Channels
- Constant Q/Reciprocal Filter Design
- Active Balanced Inputs and Outputs
- ±15dB Boost and Cut
- +6/-∞ Master Gain Control
- 128 Preset Locations
- Full MIDI Implementation
- Signal Present and Clip Indicators

## PROTEA SYSTEM SOFTWARE

Ashly provides a custom software interface for the Windows™ 95 or 98 environment. Protea System Software is designed to mimic the look and feel of the mother unit's keyboard/display, while utilizing the added benefits and portability of a PC. Interface is through one RS232 serial port. The software is flexible enough to set up as little as a two-channel slave unit for a permanent installation, or as much as a full 16-channel stereo system for live performance. To download a free version of the software, visit our website (http://www.ashly.com) and follow the link to the Protea section, then click on the *Download Protea System Software* line.

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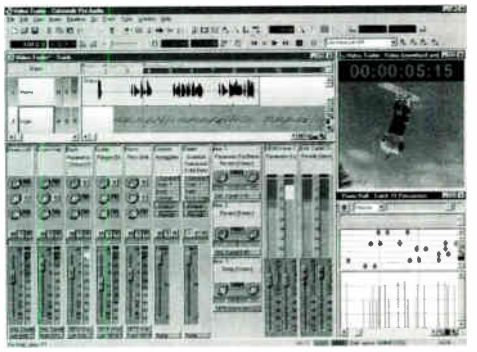
# SOFTWARE AND HARDWARE FOR AUDIO PRODUCTION



### CAKEWALK PRO AUDIO 8

Cakewalk's (Cambridge, MA) Version 8 Cakewalk Pro Audio digital audio/MIDI software for Windows 95/98/NT features 24-bit/96kHz support, real-time MIDI plug-ins, integrated video support with sample-accurate sync of video to audio, an enhanced 32-bit engine for improved audio streaming, and vector-based mixing, allowing users to edit audio nondestructively by drawing automation data directly onto audio clips. In addition, a Deluxe version—which includes Cakewalk's Musician's Toolbox III—is also available. Estimated street price of Cakewalk Pro Audio 8 is $299; the Deluxe version is $399.

Circle 340 on Product Info Card

### DIGIDESIGN PROJECT II

New from Digidesign (Palo Alto, CA), Project II is a 24-bit, cross-platform PCI computer interface card designed to work with leading digital audio sequencer applications as well as Digidesign I/O audio interfaces such as the 882|20, 888|24 and the ADAT Bridge. Project II features Digidesign's Direct I/O technology, which allows digital audio sequencers to communicate directly with an audio interface, without the intervention of the Sound Manager on the Macintosh or the Multimedia Engine on Windows; as a result, computer processing power can be used by the sequencer, while Direct I/O handles the audio. The card supports recording/playback of up to 32 tracks of audio and can be upgraded to a Pro Tools 24 system. List price is $795.

Circle 341 on Product Info Card

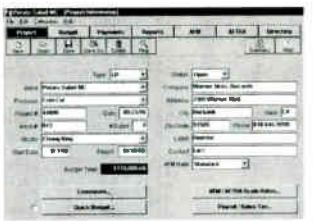
### CEDAR DE-HISSER PLUG-IN

CEDAR Audio USA (Portland, ME) upgraded the DHX de-hisser to incorporate an improved noise reduction algorithm. The new algorithm, V. 1.02, removes noise more effectively in the presence of high amplitude transients and artificially enhanced dynamic ranges. Current owners of DHX units may have the software upgrade installed free by CEDAR Audio USA or a local dealer.

Circle 342 on Product Info Card

### EWARE SOUNDBUSINESS

Soundbusiness by Eware (New York City) is a comprehensive cross-platform database system created by music industry professionals for managing recording production by creating, editing and tracking recording budgets, payments and union session reports. The package tracks project status and warns when project or individual cost categories are nearing or exceeding set budgets, and it creates Summary and Detailed Budget and Actuals reports. Soundbusiness also generates, prints and stores AFM and AFTRA Session Reports from within the Soundbusiness system. In addition, a powerful onboard directory exports talent information to session and budget reports, and automatically links payments and purchase orders to vendor tax ID numbers, addresses, etc. Soundbusiness files can be imported directly into the Soundbusiness Special Edition, an expanded application designed for complete record production management, which offers additional functions specifically designed from an A&R administrator's perspective of album recording costs management.



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## UPGRADES AND UPDATES

New from Metric Halo is the **first Sonic Solutions HDSP-compatible plug-in**, the SpectraFooHDSP real-time FFT-based audio analysis tool. Visit www.mhlabs.com...Steinberg (www.steinberg.net) announced that Opcode **Vision DSP now supports the VST plug-in format** and Steinberg's ASIO (Audio Stream In Out) software API...Sonic Foundry (www.sonicfoundry.com) announced **six new loop libraries** ($59 each) **for ACID**: Street Beats, Signals I and Signals II Analog Synth Dance Loops, Funky xtreams I and II and Syntonic Generator... **JBL reduced the price of Smaart-Pro**. The acoustical measurement/system optimization tool dropped from $795 to $495; check out www.jblpro.com...Clover Systems (www.cloversystems.com) introduced the QA-101 CD Analyzer, a **CD/CD-ROM tester for $3,333**. The stand-alone system provides a quantitative measure of disc performance, including error pit rates and pit geometry; a PC version is also available...Seer Systems (www.seersystems.com) released **V. 1.5 of Reality**, featuring expanded voice card support and enhanced Internet broadcast features...BitHeadz Inc. (www.bitheadz.com) released **V. 1.1 of its Retro AS-1 software synthesizer for the Macintosh**. New features in the free upgrade include five new filters, four new oscillators, interface enhancements and improved synth engine performance... New from ETF is **V. 4.0 of the ETF audio/acoustical measurement and optimization software**. Enhancements include gated frequency response measurements, harmonic distortion measurements, RT60 measurements for large and small rooms, and microphone and sound card calibration features. Visit www.etfacoustic.com... Gefen Systems (www.gefen.com) **introduces M&E Pro Version 3.3**, featuring a Sound Effects Editor, QuickFetch feature and an Add Notes field. ■

World Radio History

# HARRISON DIGITAL ENGINE

## *ANALOG/DIGITAL/HYBRID MIXING CONSOLE*

For months before AES, visitors to the Harrison Web site were greeted with the following message: "On September 26th, the world of audio mixing will change forever." These are bold words to be sure, but the unveiling of Harrison's digital.engine™ at the 105th AES convention in September may have marked a fundamental change in the way consoles are designed for years to come.

Essentially the digital signal processing core of a digital Harrison SeriesTwelve or MPC console, the digital.engine was developed to integrate with existing SeriesTwelve and MPC control surfaces, allowing these mixers to operate as digital, analog or hybrid consoles. Hybrid productions are commonplace in a world filled with inputs coming from a variety of sources, whether analog (2-inch multitrack, sprocketed film, tube signal processing, mic preamps, etc.) or digital (DASH or MDM tape, workstations, samplers, MO dubbers, etc.), and a console that can change its character from session to session is a sensible and practical development. Why digitize a signal from a mic preamp, only to return to the analog domain for compression and EQ? By offering the ability to handle both digital and analog inputs simultaneously, the digital.engine's hybrid console design avoids unnecessary A/D and D/A conversions on analog tracks, while allowing digital material to stay within the digital domain. Additionally, the digital.engine offers an expandable, scalable solution that can grow to serve user needs.

### UNDER THE HOOD

The digital.engine is made up of three sub-systems: the DSP Core, Control Computer and Satellite I/O. The Core is based on rackmount units—each capable of handling 144 channels of full processing—which are bridgeable for up to 576 channels. Within the Core, an extensive I/O matrix allows up to 1,344 inputs and 1,344 outputs to be routed to/from any channel at any time. The digital.engine Core's 40-bit floating point SHARC-based internal signal processing easily handles 24-bit I/O at sample rates from 44.1 to 96 kHz, so input truncation is not an issue. Standard outputs include 72 main output buses, 32 mix/re-assign buses and 32 aux buses. Multiformat monitoring facilities (L/R, LCRS, 5.1, 7.1 and IMAX) ease surround production.

"Speed was the criterion here," says Harrison president Bill Owens on the console design. The console processing latency time is said to be in the sub-millisecond range, even in the worst-case scenario, with lots of active dynamics processing. But perhaps best of all, the ample processing in the Core is *not* allocatable: Every channel has full access to DSP, full EQ, dynamics, etc., at all times. There is no need to worry that using too much dynamics or EQ will "steal" from available mix channels or buses. And speaking of DSP, the EQ is based on that of the SeriesTwelve but adds other variations, such as Little Dipper emulations. One of the strengths of digital processing is its ability to create surgically precise, ultra-narrow bandwidth filters, and Little Dipper-style notching is a welcome touch.

The Control Computer communicates between the MPC or SeriesTwelve and the digital.engine via high-speed serial communications, sending automation signals and controller data. When absolutely fail-safe operation is necessary—such as broadcast applications or live recording sessions—a second Control Computer can provide seamless online backup.

Rackmount Satellite I/Os offer interfacing with any number of sources—MADI, AES/EBU (with onboard sample rate conversion, if necessary), Tascam TDIF digital, ADAT Lightpipe, 24-bit A/D and D/A converters and analog mic preamps. The Satellite I/O communicates to the Core via MADI and passes word clock and system serial data, eliminating the need for separate sync and control signal cable runs.

The digital.engine is currently in beta testing. Initial deliveries should begin next year, with pricing expected to be comparable to that of a high-end analog console. And while the digital.engine was designed to operate with Harrison's SeriesTwelve and MPC consoles as host controller, don't be too surprised if other mixers also end up as digital.engine controllers in the near future. But whatever controller is used, the real advantage to the digital.engine is best summed up by Harrison president Owens: "It used to be that studios would roll their analog board out and roll a digital board in. Now you can roll the digital in and leave the analog in. It's the best of both worlds."

Harrison/GLW, 7104 Crossroad Blvd. Ste. 118, Brentwood, TN 37027; 615/370-9001; fax 615/370-4906. Web site: www.glw.com. ■

**BY GEORGE PETERSEN**



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# YAMAHA 01V

## DIGITAL MIXING CONSOLE

How many times have you bought into a new technology early on, only to find that a new and improved version of the product becomes available shortly thereafter? This all-too-common occurrence is particularly annoying if the improved product costs less than the original. So, imagine my horror when I first glanced at the promotional brochure for the Yamaha 01V digital mixer: It appeared to have most of the same features as my 03D, and even some extras, at just over half the price! But after perusing the somewhat misleading promotional literature more carefully, and

comparing these two products side by side for a while, I discovered that they are closely related yet distinctly different animals. Whew!

The 01V replaces the ProMix 01 in Yamaha's digital mixer lineup and offers considerably more mixing power, including multichannel digital connectivity and a more powerful DSP—at about the same price. In fact, a superficial examination might lead one to the conclusion that the 01V is more like an 03D without dynamic automation and surround mixing capabilities; but that view fails to take into account other important differences. I won't dwell too long on those differences, but anyone who is trying to determine which mixer would best meet their needs will benefit by being aware of them.

The most obvious difference between the 01V and the 03D is the former's lack of onboard dynamic automation. However, almost all of the 01V's mix functions may be automated via MIDI messages, allowing for remote dynamic automation via a MIDI sequencer. The 01V does have mix scene automation, which stores a "snapshot" of most of the mixer's current settings—analog pots and switches, and some internal settings, are not recorded—in a mix scene memory, and up to 99 scene memories can be stored in the onboard Scene Library. Mix scenes may be recalled by pushing a button, or remotely via MIDI program change messages, and crossfades between scenes from 1 to 25 seconds long may be programmed for individual faders using the Fade Time function. A Recall Undo function allows A/B scene comparisons, and individual channels may be designated as Safe, thereby remaining unchanged during scene changes. Scene memories, like all of the various library memories, may be backed up to an external MIDI device via Bulk Dumps. So, if your requirements don't include automated mixdowns, or you have a MIDI sequencer-based studio, onboard automation may be a waste of money. Likewise, if you won't be doing surround mixes, you'd probably prefer not to pay for that option.

But those are not the only important differences between the 01V and the 03D: The 01V also has a considerably smaller display with less-user-friendly menus, and has no serial mouse port, no user-defined buttons, fewer EQs and dynamics processors, fewer fader and mute groups, no channel library, and a lot less I/O flexibility; e.g., no analog channel inserts, dedicated analog aux sends or dedicated AES/EBU digital I/O. Ironically, the 01V *does* have four more XLR mic inputs than any of Yamaha's other digital mixers, which may provide a clue to its designer's intentions. Many 03Ds and 02Rs are used in applications that do not require dynamic automation, and in which a few extra mic inputs could come in handy. I'm thinking specifically about sound reinforcement in small clubs and theaters, small-scale remote recording, live rigs and even some broadcast studios. The 01V also has twice as many Scene Memories as the 03D, as well as dedicated solo buttons and a dedicated EQ section, which the 03D does not.

The 01V uses the same 32-bit DSP as the 03D and 02R, with an internal dynamic range of 192 dB. Its internal sample rate is fixed at 44.1 kHz, but it can be synchronized to an external source, over a range of 44.1 kHz (-10%) to 48 kHz (+6%). Digital output is 24-bit, with internal dither adjustable from 23 to 16 bits in single-bit increments. Conversion tasks are handled by the latest crystal 20-bit/128-times oversampling delta-sigma A/Ds, and 20-bit/8-times oversampling D/As, with 18-bit D/As on the four "Omni" outputs. The typical dynamic range from channel input to stereo out is given as 105 dB. The two onboard effects processors and the EQ operate at 32-bit and 44-bit resolution, respectively. All of these factors contribute to the 01V's ultra-clean performance and give it a sound previously available only on much more expensive mixers.

The 01V is ideally suited for recording and mixing with a single MDM (modular digital multitrack), for use with hard disk recorders and for sound reinforcement applications where no more than 12 mics are likely to be needed. You

**BY BARRY CLEVELAND**



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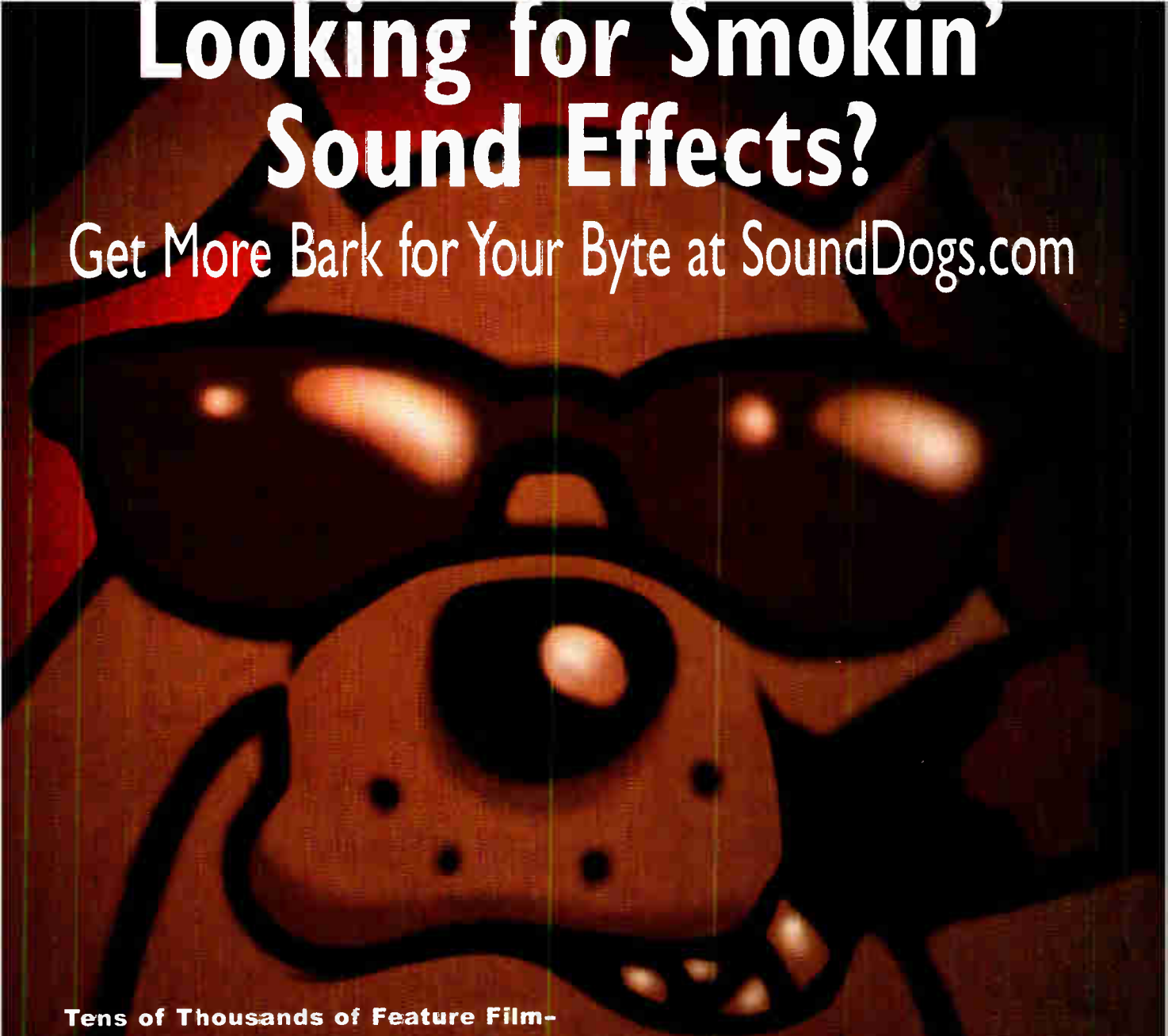

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won't be able to patch your favorite outboard compressors and/or EQs into channel inserts, but you'll have plenty of inputs and outputs, and the onboard EQ and dynamics processors can easily handle most tasks. However, if you really want to be able to patch in that killer compressor and/or use lots of outboard effects processors, or you are planning on upgrading to 16 digital tracks in the near future, you may find that the 01V will not easily accommodate your needs.

On this last point, Yamaha recommends that you simply buy a second 01V (of course!), which brings us to one of the 01V's coolest features: Cascade. If you want to cascade two or more 03Ds or 02Rs, you have to use a special cascade card. The 02R has four card slots so there's no problem there, but the 03D has only one, so if you use it to cascade two 03Ds, how are you supposed to connect your MDMs to them? The 01V solves this problem by using the To Host port (used to connect the mixer directly to a personal computer without a MIDI interface) instead of a cascade card. Very clever! And speaking of MIDI, the 01V's MIDI implementation is extensive: Mix scenes can be recalled via program change messages, mix parameters can be controlled via control change and SysEx messages, and remote recorders and other devices can be controlled and edited using MMC messages and User Defined MIDI controllers.

## CONTROL SURFACE

The 01V has a sort of "space age" looking control surface. Its top panel is finished in a metallic silver sparkle with very linear black graphics, and its display, EQ/Pan section and main meters are mounted on a raised and smoothly contoured black panel. Its control layout is essentially an amalgam of those found on Yamaha's other digital mixers; like them, it is arranged very logically and ergonomically. The 01V has 15 "quick response" 60mm motorized faders. There are individual faders for channels 1-12, and single stereo faders for channels 13/14, 15/16 and the stereo master out. Channels 1-12 also have analog trim pots and switchable 26dB pads, while the stereo-linked channels share a common trim pot that boosts/cuts the right and left sides simultaneously. Input sensitivity for all analog channels is adjustable over a -60 to +10dB range.

As is the case with most digital mixers, all of the 01V's faders except the master fader operate in layers. The first layer assigns the faders to the 16 analog inputs, while the second layer assigns them to the eight digital inputs on channels 17-24. Pushing the Effect 1 button configures them as 24 effects sends to that processor, while pushing, say, the Aux 1 button configures them as aux 1 sends, etc. Odd/even adjacent channels, the four aux sends and the four Omni outputs can be configured in stereo pairs (channels 13/14 and 15/16 are always paired), and there are three fader and three mute groups to which they may be assigned.

The 01V is 19 inches wide and comes with an adapter for rack mounting. All of its analog inputs, the 2-track I/O and the headphone jack are located on the upper section of its front panel, making them more easily accessible from the front. But things can get messy quickly if lots of cables are connected, particularly if the mixer is upright. Also, the two small switches that direct phantom power to inputs 1-6 and 7-12 are located on the rear panel, making them inaccessible from the front of a rack. The 01V's analog outputs are located on the rear panel, along with the S/PDIF


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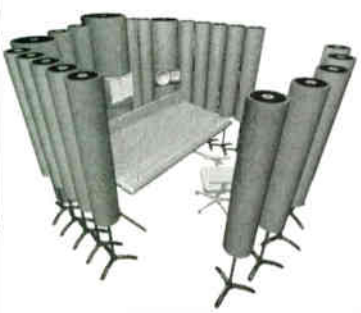

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digital I/O MIDI jacks, the To Host 8-pin DIN port and a slot for the option cards. The power switch is also located on the rear panel, next to the non-removable power cord.

A 320x80-pixel display is the centerpiece of the 01V's control surface. Its size is a cost-saving compromise between the 240x64 LCD found on the ProMix 01, and the brighter and more detailed 320x240 LCDs found on the 03D and the 02R. If I were not already familiar with the 03D/02R displays, I would probably find the 01V's LCD perfectly adequate—and perhaps it is—but in some situations its smaller size makes it less user-friendly. For example, the Hall reverbs in both the 01V and the 03D have identical adjustable parameters, but on the 03D's larger display they are logically arranged on a single page, while on the 01V the parameters are arranged in a nearly random order; and they extend onto a second page, which can only be accessed by scrolling to the bottom of the page and pressing the down arrow key. The same is true of the View screen, which displays critical channel information—e.g., channel fader, aux send and effects send levels, EQ and dynamics curves, panning, routing assignments, etc.—at a glance. Now that glance requires going to another page, and since the 01V has the Channel Copy page on the same menu, you actually have to cycle through three pages to see everything.

Directly to the right of the LCD are the EQ/Pan section and the main output meters, and on the left are the Fader Mode section and the various other main select and configure buttons. Along the bottom are the channel strips, consisting of the faders and their Select, Solo and On buttons. The buttons and data encoders for the internal effects are to the right of the channel buttons, and the jog/shuttle wheel, the parameter decrease/increase buttons, and the Cursor and Enter buttons are located in the right bottom corner.

## CONFIGURATION

The 01V is basically a 16x4x2 mixer that may be configured in several different ways—including as a purely digital 8x8x2. Input channels 1-12 accept balanced mic/line level signals via either XLR connectors or phone jacks. The phone jacks, which take priority over the XLRs, also accept unbalanced phone plugs. Phantom power may be sent to two banks of XLRs—channels 1-6 and/or 7-12—but not to individual channels. Input channels 13 and 14 are configured as a stereo pair and controlled by a single fader. These channels function essentially like the Stereo In on the 03D and the 02R, accepting balanced or unbalanced analog signals via two phone jacks, or digital signals via the S/PDIF coaxial input. Similarly, channels 15 and 16 have phone jacks, but signals from the Two-Track In phono inputs may be routed to them instead.

Input channels 17-24 have no analog I/O and can only be accessed by adding one of the three optional mini YGDAI (Yamaha General Digital Audio Interface) digital I/O cards, which are not the same as those used in the 03D and 02R mixers. These channels are considerably more limited than the "full-feature" channels, as they have only a 2-band parametric EQ (which cannot be stored in the EQ library), no dynamics processing, and can only be assigned to the first two of the four aux sends. The good news is that the Option I/O digital inputs can be collectively or individually traded with channels 1-8, using the 01V's ingenious Swap feature.

The output situation is a little bit trickier. Signal input on channels 1-16 may be routed to the main stereo bus out, the monitor outs, direct channel outs, the four aux outs, the four bus outs, the two internal effects sends and the eight digital/four analog Option I/O buses. Channels 17-24 are slightly less flexible, as their signals cannot be routed to aux outs 3 and 4, or the direct channel outs. Bear in mind, however, that the aux outs, the bus outs and the direct channel outs exist only in potential—or virtually—and that even though you may route signals to them internally, there are no dedicated output jacks that actually correspond to them. In order for a signal to emerge physically from one of those "outputs," it must be assigned to one of the four Omni outs. This represents a step down from even the ProMix 01, which at least had two dedicated aux send jacks, and big steps down from the 03D's four and the 02R's six. The practical limitations of such an arrangement should be obvious. And by the way, there are no dedicated aux returns on any of the Yamaha digital mixers, which means that if you use the aux sends to feed outboard effects devices, you will have to use input channels for effects returns.

There are three mini YGDAI cards available, and a fourth card which provides four XLR analog outputs. A fifth card providing eight additional analog in-



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puts should be available by the time that you read this. The MY8-AT card facilitates eight channels of ADAT optical I/O, and can be used with a single ADAT recorder or any hard disk recorder that accepts Lightpipe optical connections. The MY8-TD facilitates eight channels of TDIF (Tascam Digital Audio Interface) I/O using a D-sub 25-pin connector. The MY8-AE card also uses a D-sub 25-pin connector, but in this case it must be used in conjunction with a breakout box, which in turn provides eight channels of AES/EBU digital I/O via four stereo XLR inputs and four XLR stereo outputs. This card is used to connect the 01V to a Digidesign 888 Audio Interface for use with Pro Tools, or to any system using the AES/EBU format. The MY4-DA card provides four channels of digital-to-analog conversion and outputs signals on four XLR connectors.

### EQ, DYNAMICS & DELAYS

Advertisements for the 01V boast that it has a dedicated EQ section "just like the 02R," but that is not precisely true. The 01V does have dedicated EQ controls, but only for boost/cut and frequency; you have to use the data entry wheel, or some even less convenient controller, to adjust the Q. In practice, however, once the Q parameter has been assigned to the data entry wheel it remains there, making it in effect the third knob.

Control issues aside, the 01V's EQ operates at a surgically accurate 44-bit resolution and sounds extraordinarily warm, clear and musical. Full 4-band parametric EQ processors are available on channel inputs 1-16, the internal effects returns, the aux sends and the stereo out, while a simplified 2-band EQ processor is available on channels 17-24. The onboard EQ Library contains 40 factory presets and 40 user slots, but settings for the 2-band EQs cannot be stored there. A preference can be chosen that automatically calls up the EQ screen for a selected channel when any of the EQ controls are moved. But speaking of EQ screens, the 01V's EQ Library screen is considerably less detailed than the 03D's. For example, on the latter there are two graphic curve displays, one for the current curve and one for the selected (but not yet engaged) curve. This allows a visual comparison while scrolling through presets, which can be very useful.

The 01V has 22 onboard dynamics processors, assigned to channels 1-16, the four aux sends and main stereo out. Each can function as a compressor, limiter, gate, ducker, expander or hard/soft compander, and they may be configured

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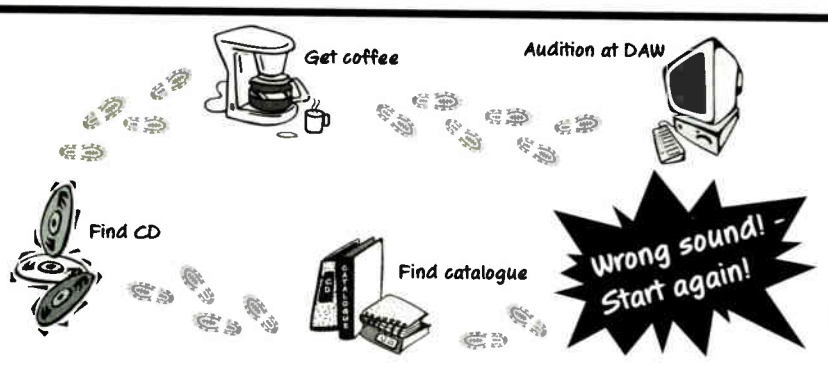
as pairs. Processing may be triggered internally by the signal being processed, or keyed from one of the 16 full-feature input channels. The Dynamics Library has the same features, and the same limitations, as the EQ Library. Like its EQ, the 01V's dynamics processors are extremely clean and precise with practically no coloration, for better or worse. To my ear they work better for processing individual channels, but lack the sensitivity to be ideal for use as a "master" processor on the main stereo outputs.

Input channels 1-16 also feature dedicated channel delays, with delay variable between 0 and 250 ms. The wet/dry mix and feedback gain are adjustable, but the delayed signal cannot be panned. There are also delays available at the stereo output and the Omni outputs, which may be specified in milliseconds, meters or samples. The maximum delay time in samples is fixed at 13,229, while the maximum delay time in milliseconds and meters is governed by the sample rate (e.g., 300 ms or 102.2 meters at 44.1 kHz). The Omni and main stereo output signals may be delayed up to 300 ms, with control over the wet/dry mix.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### ONBOARD EFFECTS

The 01V's two onboard effects processors are similar to those found on the 03D and the 02R, and like them, they use the same DSP as Yamaha's ProR3 and REV500 processors. Like the 02R, but unlike the 03D, the outputs of one effects processor may be routed to the inputs of the other. Another difference between the 01V and the 03D is that the 01V uses individual non-motorized rotary encoders to set the effects return levels, whereas the 03D uses a single motorized fader that is toggled between effects one and two. What would have been really great is to have dedicated returns for *outboard* effects!

There are 42 types of effects to choose from (if you count combinations such as "DELAY>REV" as individual effects), and they are significantly different from the 34 types found on the 03D. For example, delay time and modulation frequency may be set using note and tempo/tap-tempo values on the 01V, but not on the 03D; and the 01V has a ring modulator, while the 03D does not. On the other hand, many of the 03D's effects (particularly the delays, pitch shifters and modulation effects) are more sophisticated than those on the 01V and have a broader range of editable parameters. The factory presets in the Effects Library are also significantly different. For example, the 01V has considerably fewer types of reverb, while it has more multi-effects. There are 57 user slots available in the 01V's effects library in addition to the 42 presets.

### CONCLUSIONS

The Yamaha 01V is a great-sounding digital mixer, loaded with lots of great features, available at a very reasonable price. That said, numerous compromises were made in order to keep the price at $1,999 (cards sold separately), and those compromises will affect you more or less, depending on what you do and how you work. I *love* my 03D, and for me the differences are significant enough to warrant the additional cost. But if you do not need all of the 03D's features, or you simply cannot afford one, you should consider the 01V very seriously before buying *any* other "affordable" digital mixer.

Yamaha Corp. of America, 6600 Orangethorpe Avenue, Buena Park, CA 90620; 714/522-9011; fax 714/739-2680; Web site: www.yamaha.com. ■

*When not playing guitar, Barry Cleveland is the editor of the* Mix Master Directory, Recording Industry Sourcebook *and* Electronic Musician's Personal Studio Buyer's Guide.



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# TANNOY REVEAL

## TWO-WAY REFERENCE MONITORS

In 1926, a London engineer named Guy R. Fountain founded a company in order to manufacture electrolytic rectifiers for radio receivers. Fountain called his company Tannoy because the rectifier designs utilized two metals: *tan*talum and a lead alloy. By 1930, Tannoy was producing loudspeakers and going head to head with huge companies like Western Electric and Marconi for a share of the burgeoning public address market.

Tannoy produced its first discrete two-way loudspeaker system in 1933, and by the late 1940s was making reference monitors for recording studios. Tannoy monitors employed a unique "dual concentric" design, consisting of a horn-loaded compression driver mounted concentrically on a direct radiator bass unit, using a single magnet. It was convincingly argued that this arrangement reduces the phase errors and wave cancellations associated with traditional two-way systems, and many discerning users agreed, simultaneously validating the dual concentric design and establishing Tannoy as a major player in the studio monitor field. However, the components used in dual concentric speakers are costly, so Tannoy's less expensive monitors have typically employed more conventional two-way arrangements. Presumably, then, Tannoy's non-dual-concentric monitors *do* suffer from phase errors and wave cancellations; but hey, whaddaya gonna do? At four bills a pair, these little Tannoys sound pretty darned good.

The Reveal's 1-inch soft dome tweeter and 6.5-inch long-throw woofer are independently mounted on a massive 1¾-inch-thick MDF baffle. The baffle serves as the cabinet's front panel, and its beveled edges and red satin finish give the monitors a distinctive and even elegant appearance. The back and sides

—CONTINUED ON PAGE 144

BY BARRY CLEVELAND

## Lab Analysis: Tannoy Reveal Monitors

**by John Schaffer**

### PHYSICAL CHARACTERISTICS

The Reveal cabinet is a rear-ported, bass reflex design, constructed of ¾-inch particleboard covered with black satin vinyl. Construction method is miter-folded, wrapping around the sides, top and bottom. The rear cap has a ⅜-inch lip, while the other cap, the baffle, is robust 1-inch thick MDF with a cherry paint finish. The outer portion of the baffle is curved, tapering toward the rear of the cabinet, more drastically at the top and bottom. This, along with the elliptical outer shape of the drivers, gives reason to why there is no grille on this speaker. The tweeter is recessed, but the woofer is not. The plastic port tube is 2-inch diameter, and the cabinet is stuffed with polyfill.

The 6-inch woofer features a plastic injection-molded frame, which is vented right below the spider landing. The paper curvilinear cone has a poly look treatment and a roll butyl rubber surround. An inverted paper dust cap with the same treatment covers the overhung, 1-inch aluminum bobbin voice coil. The flat, large-excursion spider helps eliminate the third harmonic that is associated with cupped spiders. The magnetically shielded, conventional motor structure includes a bucking magnet, as well as a shielding can.

As with the woofer, the treated-cloth, soft dome tweeter has a magnetically shielded, conventional motor structure with a bucking magnet and shielding can. Behind the dome is a damped chamber, helping to reduce reflections and cavity resonance. The underhung, ferrofluid-cooled coil is wound on an aluminum bobbin. One peculiar feature on the tweeter is the steep horn loading on the plastic faceplate. As seen in the off-axis response graph, this provides well-controlled directivity. The elliptical shape of both the woofer frame and tweeter faceplate minimizes the distance between the two devices. This helps reduce comb filtering in the crossover region.

The crossover features five-way, gold-plated binding posts mounted on a recessed terminal cup. The crossover topology appears to be sec-

—CONTINUED ON PAGE 143



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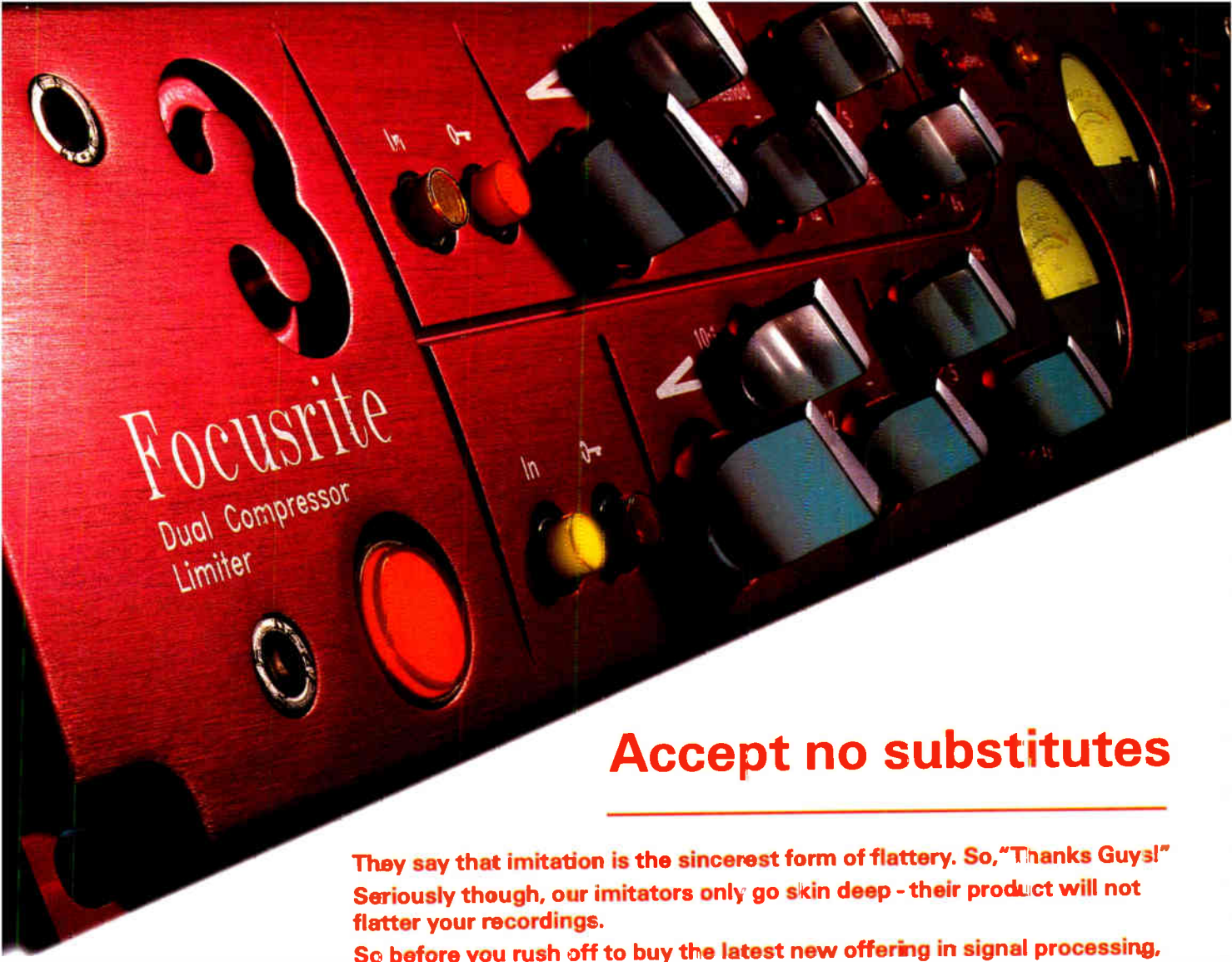


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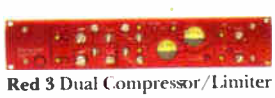

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World Radio History

—FROM PAGE 140, LAB ANALYSIS: TANNOY REVEAL MONITORS

ond order on the woofer and third order on the tweeter.

## ACOUSTIC CHARACTERISTICS

Like most other speakers from the UK, the frequency response of the Reveal, taken at one watt and one meter, is polite. After a presence peak at around 1 kHz, the response begins to roll off nicely, going down about 2 dB to 13 kHz. After 13 kHz, the response rolls off more drastically, around -3 dB, over the portion of the last audio octave. Due to the unusual horn loading and curved baffle, the Reveal has extremely well-behaved tonal balance, unlike most tweeters that tend to roller-coaster once the listener is off-axis.

The Reveal also exhibits a nice transient response. The slight offset of the woofer and tweeter provide time alignment for the system. Throughout its settling time, the decay produces few ripples.

Due to many features in both transducers, the distortion of the system is low. Distortion measurements were taken at around 90 dB at one meter. Reveal's THD is held under 1%, and in the tweeter's passband it remains at around 0.2%. The second-order harmonic dominates the third in the woofer region below 500 Hz, creating a warmth that most listeners find pleasant. Only in the region of cone cry (600 to 1,200 Hz) does the distortion become noticeable. The spectral contamination, also taken at one meter, is respectable, around 50 dB down from the input frequencies. ■

*John Schaffer is a test engineer associated with Menlo Scientific, an independent acoustical test lab based in Berkeley, Calif. For more on testing methodology, refer to the Feb. '98 issue of* Mix *or visit www.mixonline.com.*

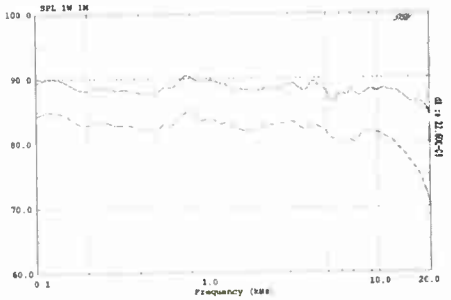



*Fig. 1: On-axis and 30° off-axis frequency response. Smooth response on-axis and smooth, well-behaved off-axis response.*

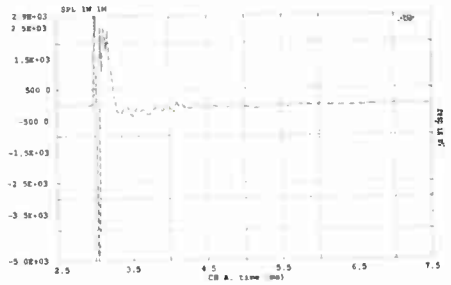



*Fig. 2: Impulse response test shows good time alignment between woofer and tweeter, fast settling time with only a slight overshoot.*

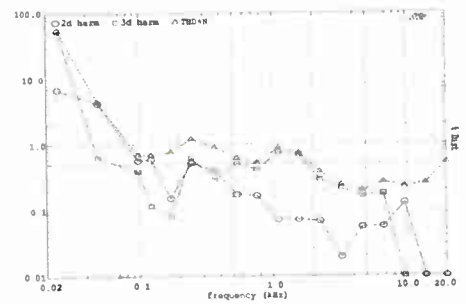



*Fig. 3: Distortion measurements (THD+N = Δ trace; 2nd Harmonic = ○ trace; 3rd Harmonic = □ trace). The tweeter remains around 0.2% for most of passband.*

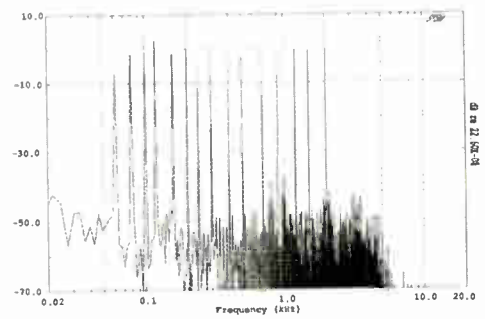
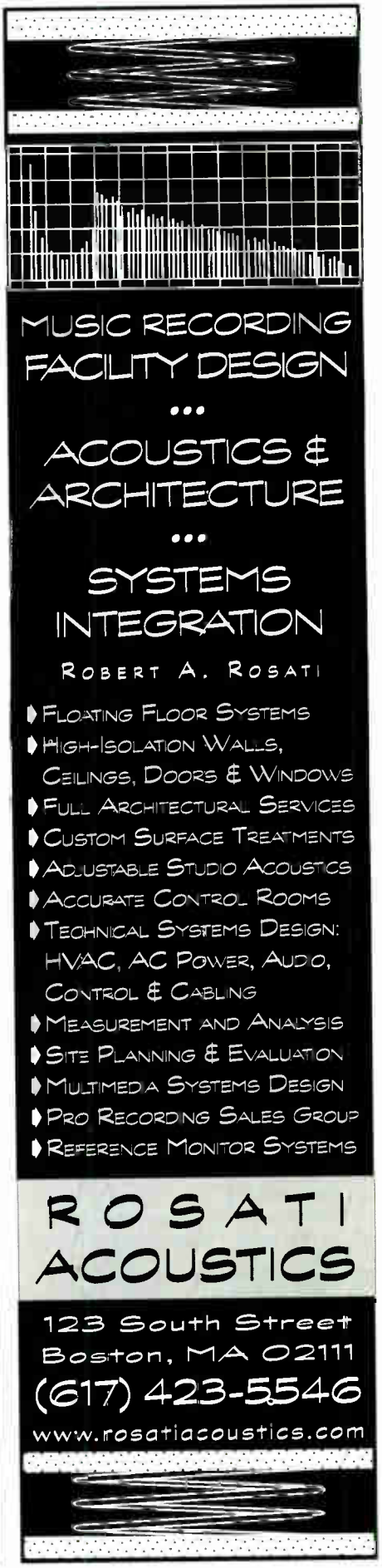



*Fig. 4: Spectral contamination test compares series of input signals (tall spikes) to speaker output. Clarity is decent, especially in woofer passband, with self-noise about 50 dB below input signals.*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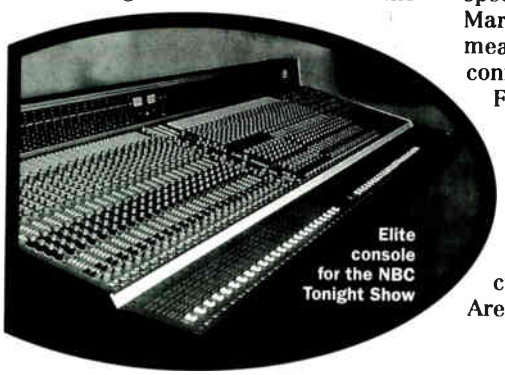


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—FROM PAGE 140, TANNOY REVEAL MONITORS

of the cabinet are made of ¾-inch high-density particleboard, and finished in gray suedette vinyl, nicely complementing the red satin front. A small, round port (which also serves as a dandy carrying handle), and a gold-plated five-way binding post are located on the back panel. Despite the hefty baffle, the cabinet measures only 13⅜x8¼x10¼ inches, and weighs a little over 15 pounds. Both drivers are shielded, allowing the Reveals to be used next to computers and video monitors. Each Reveal is said to comfortably handle more than 100 watts RMS power into 8 ohms, with distortion given as less than 0.8%. Frequency response is given as 65 to 20k Hz ("measured in an anechoic chamber"), with a hard-wired crossover at 3 kHz.

### WHAT'S THE DEAL?

The Reveals are priced about the same as several other small monitors currently competing for a share of the home/project studio market, and I was fortunate enough to be able to listen to them in the company of three of those competing products, all powered by the same amplifier. The program material consisted of several CDs, ranging from orchestral to electronic to rock. Without getting into point-by-point comparisons of specific products, I will just say that overall the Reveals held their own, even against a popular monitor with a much larger woofer. They also easily blew away a certain, shall we say, "classic" small monitor. After listening to the Reveals in that almost clinical setting, I took them home and set them up in my own personal/project studio.

For my home studio listening tests I chose five very different CDs, including two that had been mixed in my studio. First was *Version 2.0* by Garbage, a mega-compressed pop monster packed with sounds occupying every nook and cranny of the audible frequency range. It tested the Reveals' frequency response, and challenged their ability to handle a dense mix without breaking up or becoming muddy. In contrast, drummer Bill Bruford's *If Summer Had Its Ghosts* is essentially an acoustic jazz trio album, featuring performances that are rich in tonal and harmonic color and a production style that is uncluttered and open. It tested the Reveals' ability to reproduce natural instrument sounds faithfully, and to convey space. *Live-Evil* by Miles Davis is a CD of a live recording from 1971; it tested the Reveals' ability to identify and highlight technical flaws. The CDs that were mixed in my studio, one electro-



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acoustic world beat and the other of a small orchestra, enabled me to hear how familiar material mixed on much more expensive monitors translated.

**PERFORMANCE**

I found that to obtain optimal results with the Reveals, it was necessary to do some experimenting with placement. They worked best when mounted on stands away from the wall, with plenty of room for the rear port to project the lower frequencies. They are not hyper-directional, and they maintain reasonable imaging even when one is listening to them several feet off-axis. However, I invariably had the best results while listening relatively close in, say five feet away, in a conventional triangle arrangement. That was particularly true when listening for subtle stereo relationships and effects, and for sonic imperfections.

Once the Reveals were properly positioned, I found that generally they performed quite well. They were a little thin on the bottom end, but one can't realistically expect ultra-low bass response from monitors this size, particularly at this price. That said, they did deliver a lot of punch for their size, and what bass frequencies *were* there were handled smoothly and efficiently. The mids were generally well-balanced and focused, yet the lower mids sounded slightly "boxy" on some of the denser mixes. The high end was crisp and bright without being harsh, though some details (apparent on more sophisticated monitors) were less than clear, and the overall character of the sound was not particularly spacious or transparent. Sound quality and balance remained fairly consistent at all monitoring levels, and I was able to listen to the Reveals for several hours at a time without becoming fatigued, even while listening at relatively high levels. In short, the Reveals sounded very good, particularly given their low cost, but they lacked some of the qualities usually associated with professional-quality reference monitors. Then again, you usually get what you pay for, and these monitors deliver a lot of sound in return for a very modest investment. Check 'em out!

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*Barry Cleveland is the editor of the* Mix Master Directory *and the* Recording Industry Sourcebook.

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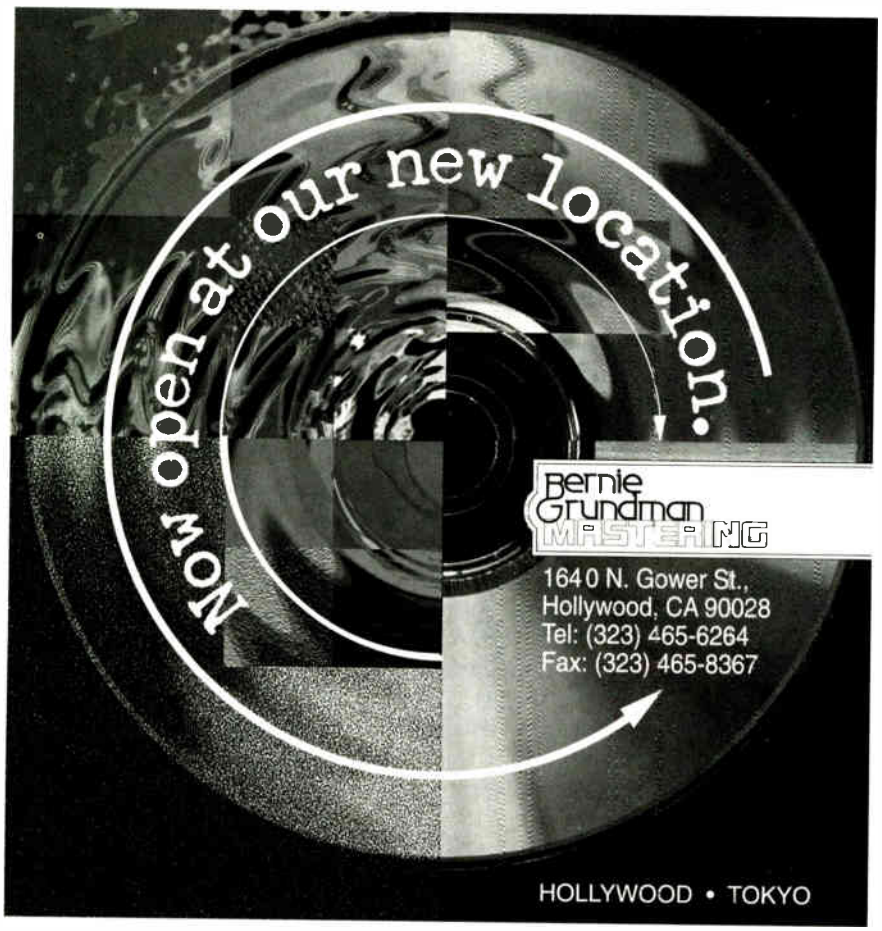

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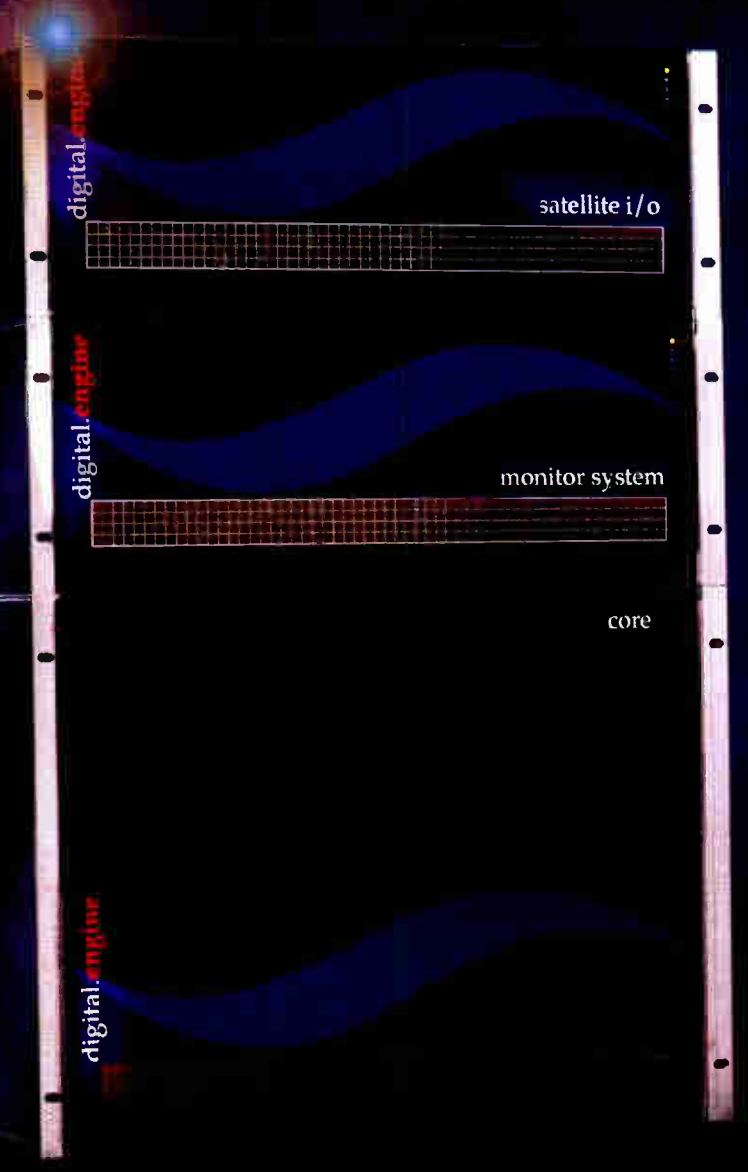


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**Headquarters**
7101 Crossroad Blvd • Suite 115
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CIRCLE #101 ON PRODUCT INFO CARD
World Radio History

# SADiE 24•96

## HIGH RESOLUTION DIGITAL AUDIO WORKSTATION

SADiE Inc., (formerly Studio Audio Digital Equipment Inc.) may be a relatively minor player in the U.S. DAW market, but the SADiE 24•96 could change that. In the UK, SADiE is already a best-seller—the BBC owns in excess of 500 SADiEs, mainly used in network radio. The total figure for units shipped worldwide is now more than 3,000. Of these, at least a third are being used for CD mastering and yet more have found their way into the niche market of film synching for nonlinear editing.

The success of the SADiE Classic, the company's entry-level PC-hosted DAW, has been due to a concentration on some key areas; SADiE has kept the cost competitive, has fitted the tool to the job, provided excellent backup and support and, most important, has listened to users. This does not mean that SADiE has simply trawled "wish lists" for the lowest common denominator—if every user's crazy idea (I also plead guilty) is thrown into a product, catastrophe theory kicks in, with dire consequences for reliability and ease of use.

The SADiE product range has recently been swelled by the introduction of the flagship Octavia workstation, the PORTiA random-access component video recorder and now the SADiE 24•96.

### HARDWARE

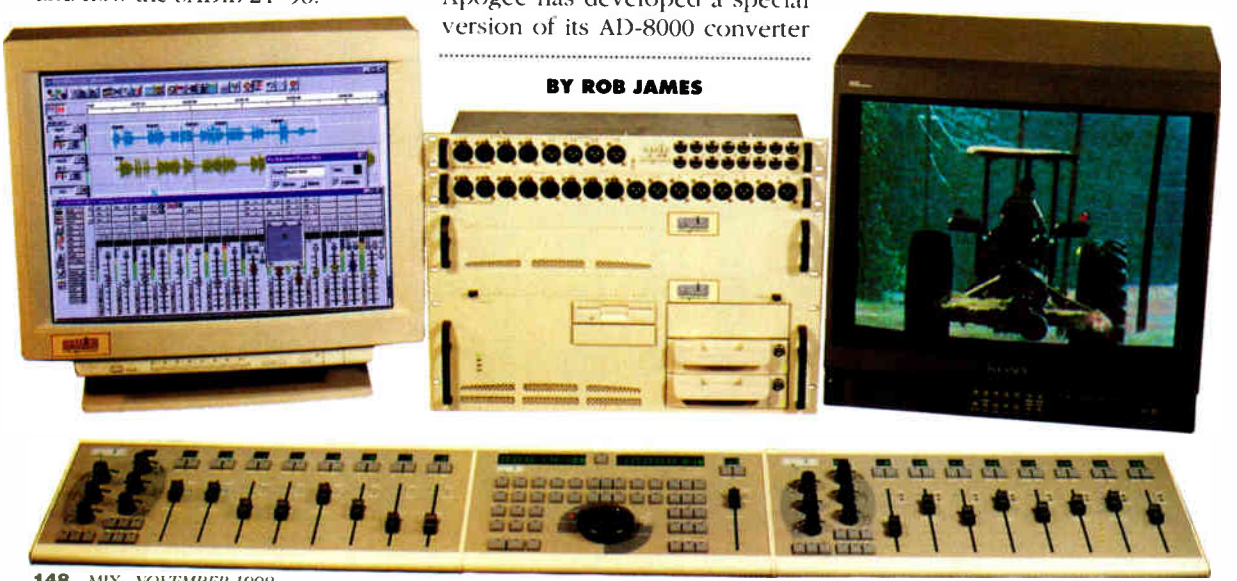
It is relatively easy to specify a SADiE system for a particular application without getting burned in the wallet by surprise extras—which is not the case with many other PC- or Mac-based DAWs. SADiE has its own SCSI bus, so all the PC has to cope with is updating screens. The basic turnkey system hardware consists of a rackmount mainframe that contains the PC, proprietary processor cards and removable disk caddy. A separate rackmount "BOB 800" break out box offers eight unbalanced analog I/Os and eight channels (four stereo pairs) of AES/EBU I/O plus reference in. A plain vanilla PC case is a lousy environment for audio—cooling can be a problem, and PC cases are hard to fit into studios. SADiE's purpose-designed rackmounting unit has to be the way to go. The built-in A/D and D/A converters are all 20-bit. Machine control on the 24•96 is standard and particularly comprehensive. And in addition to the usual SMPTE timecode generate, chase and MIDI there are four 9-pin (Sony P-2 protocol) connections.

To upgrade the I/O to the next level, the BOB 800B breakout box equips the system with fully balanced analog inputs and outputs on XLRs. If you want to go further, Apogee has developed a special version of its AD-8000 converter (reviewed in the Sept. 1998 *Mix*) that provides eight channels of 24-bit A/D and D/A conversion, as well as ADAT and TDIF connectivity, plus a super high-stability clock. There is nothing to prevent the use of "sky's the limit" converters if the application requires.

If real knobs, moving faders and a jog wheel are important, a system may be specified with two dedicated hardware controllers and an editing and fader panel first seen on Octavia, SADiE's flagship 24-track DAW. I'm a big fan of the mouse for editing, but I must admit the panels do increase productivity. The fader panel is essential for mixing. I really like the uncluttered feel, more like a big-gun digital console than a do-everything budget mixer.

Available plug-ins include a graphic EQ that gives a graphic display to a four-band parametric equalizer with additional high and lowpass filters. The sound is clean and surgical, as are the EQs. A Mastering Limiter may be used to make your mix sound louder than anyone else's. Hi Dither 96 is a true 96kHz noise-shaped dither. SADiE can also supply an Exabyte drive for DDP masters, now the preferred format for all major pressing plants. Apogee has produced a SADiE plug-in version of its UV22

BY ROB JAMES





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process, and CEDAR offers a De-Noise plug-in.

The 24•96 has been designed with expandability in mind. Up to three cards can be added into the rackmount unit to create a 32-in/32-out system. The software and hardware are fully capable of running at high-density sample rates. Both 96kHz/24-bit and 192kHz/24-bit audio editing and processing are standard. It is worth thinking long and hard about how many tracks with physical outputs you might need—the extra processor cards are available at a deep discount when purchased with a complete system. The PORTiA card adds good-quality, component, random-access digital video and, like SADiE, has its own SCSI bus for storage so there is no effect on audio performance. PORTiA is completely controlled from within the SADiE software. An ATM networking option, SASCiA, enables real-time networking of any of Studio Audio's DAWs.

### INSTALLATION AND SOFTWARE

The system arrives with all the required cables to connect the units together. All you need to supply are I/O cables in whatever flavors are appropriate for your installation. I would like to have seen the hardware controllers powered by the "mainframe" rather than by a separate power supply. All the units arrive calibrated, and the accuracy on mine was good. Software is supplied installed and ready to go.

The current V. 3.5 software provides a consistent, common interface for all SADiE and Octavia DAWs. According to SADiE, the code has been optimized to squeeze every last ounce of performance out of the systems' processors, extracting maximum power from each of the hardware platforms. All software upgrades to date have been free of charge. Hardware upgrades and plug-ins are, of course, priced separately.

### PERFORMANCE

A single 24•96 card can replay more than 30 tracks of 16-bit/48k audio with enough DSP power in reserve for 16 bands of EQ. Or you can swap more processing for playback tracks (for instance, ten tracks, with 36 bands of EQ and nine dynamics processors). This trade-off is made possible by the way in which the software dynamically reallocates DSP.

For a real-life example, I loaded an EDL with 29 streams of 16-bit, 44.1k audio into 28 mixer strips (some mono, some stereo and some group masters) with 14 bands of EQ. Most of the list had between 16 and 24 streams of audio playing back, and there were areas in which 17 tracks were crossfading simultaneously in real time over three seconds' duration. In this case, a single SADiE 24•96 card was actually replaying 34 tracks of audio.

With a large number of units in use in the mastering field, SADiE is well up to speed when it comes to high-bit-rate, high-sample-rate recording. The 24•96 can edit eight simultaneous tracks of 24-bit, 96kHz playback or four simultaneous tracks of 24-bit 192kHz. If EQ is required you get fewer tracks, but this is a seriously impressive performance for an entry-level DAW. With no agreed standard interface as yet for high-sampling-rate audio, the 24•96 uses multiple standard AES/EBU interfaces for the purpose. SADiE directly handles audio recorded on the Genex GX8000 recorder, which is capable of 96kHz, 24-bit recording. Just connect the SCSI bus, log the disk and edit. I'm no mastering engineer but occasionally need to compile the pick of the sound effects I record for other projects onto CD-R. As you might expect from the number of systems in mastering houses, SADiE is well up to the job.

Assembling tracks is a cinch. The software allows naming and editing while recording, so tracks can be easily identified by name as soon as they are recorded. Once the tracks are edited into clips in the right order, SADiE will produce all the required offsets for PQ coding automatically. I used a Yamaha 400T drive to write the disk without problems. I even managed to export the text EDL to my effects database. I also like the idea of being able to produce DDP masters on Exabyte if I ever get around to producing sound FX in commercial quantities. All these features are included in the standard software.

Although the SADiE Classic never made significant inroads in sound for picture editorial work, I believe the 24•96 will change that. And at a U.S. base price of $9,995, the machine has the right blend of features at the right price. The eight analog outputs on the standard turnkey system are more than adequate for the monitoring requirements, and the mixer has enough building blocks to allow for the manipulation of sound effects. There is adequate DSP power onboard to cover all this if used sensibly. Like its siblings, the 24•96 uses the industry standard .WAV file format and its derivatives such as Broadcast WAV (BWF). The use of this industry-standard

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file format should mean compatibility with an increasing number of other manufacturers' products. The 24•96 already has direct access to Lightworks sound and picture media packs, and SADiE was slated to announce similar audio support for Avid media at last month's AES convention in San Francisco.

All this will be particularly important if the 24•96 is used for feature film tracklaying as this area rapidly moves into digital using digital dubbers to replay the output of DAWs.

I tracklayed and mixed a 30-second commercial, short but complex, and was anxious to see how the 24•96 (my system also had the optional PORTiA random-access video recorder) would stand up in this role. Once you've experienced the luxury of random-access instant pictures, Betacam (or even worse, VHS) is a remarkably unattractive alternative.

The autoconform read my CMX list and controlled the Tascam DA60 MkII DAT the first time. The DA60 is a good test of 9-pin control; a number of other DAWs have problems with it. Once completed, I background-loaded some effects from CD while tidying up the conform. This and other background functions should be great time-savers. For tracklaying, the 24•96 makes life easy with one exception. There was no region editing. This is one of those features where you don't realize how much you use it until you don't have it. However, the latest software release, V. 3.6, adds region editing, and it looks like a good implementation.

The segment-based automation really came into its own in this kind of work. I found I could deal with one iteration of a repeating effect then simply copy and paste complete with all the EQ and fader moves. All this happens in real time, so when it comes to mixing, you can run out of DSP if you get too ambitious. But you can always bounce the odd item with processing applied to work around it. The good part is SADiE always lets you know what is going on. The recently introduced surround mixing has added a comprehensive array of extra mixer components and busing arrangements to give fully automated control over surround panning, width and divergence in all the major formats. As with all previous software upgrades, the addition of surround capabilities is free. It is pretty impressive to be able to do a fully automated 5.1 surround mix on an entry-level DAW.

I would like to have seen a scrolling track display; moving the cursor is fine for tracklaying but a pain for mixing to picture. But, despite its low entry cost, the 24•96 is ideal for tracklaying and fairly complex mixing. This is a serious piece of gear capable of producing excellent results in various high-end applications. The hardware may be new, but the software is robust and well-proven on the company's other products.

For anybody looking for a DAW for mastering, radio production or synching dailies, the SADiE 24•96 has to be high on the short list. Now that SADiE is pursuing the sound-for-picture area with determination, the SADiE 24•96 should rank high on the "must audition" list for audio post-production applications.

SADiE Inc., 1808 W. End Ave., Ste. 1119, Nashville, TN 37203; 615/327-1140; fax 615/327-1699. Web site: www.sadie.com. ■

*Rob James formerly was a film dubbing mixer for BBC TV, where he received two BAFTA Awards and managed the post-production sound department. He regularly writes for British audio magazines and occasionally lectures to film students at the Royal College of Art and the National Film and Television School.*


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# SONORUS STUDI/O

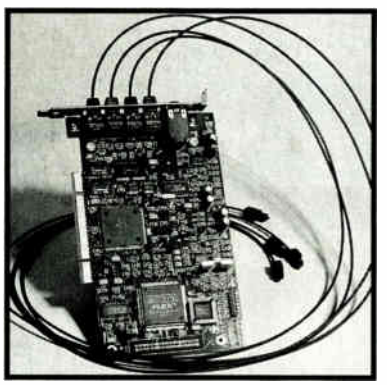
## PCI-BASED 16-CHANNEL SOUND CARD

There's no doubt that the Alesis ADAT caused a revolution in affordable digital multitracking, and tape-based production offers many advantages over using a workstation, such as low-cost media, inexpensive data backup and a truly universal exchange format where tracks can easily be sent nearly anywhere on the globe. However, computer-based systems provide their own strengths, such as ease of editing, simplified looping and near-instantaneous sync to MIDI or tape sources. And the combination of a tape-based MDM with a digital audio workstation offers the best of both worlds.

STUDI/O™ from Sonorus is a 16-channel digital audio interface for PCI-based PCs and PowerMacs. This $849 package is quite complete: The card is equipped with two (24-bit capable) 8-channel Alesis ADAT optical interfaces and an 18-bit ¼-inch TRS stereo analog monitor/headphone output and comes with four 6-foot TosLink optical Lightpipe cables. (Note: For mastering applications, one or both ADAT interfaces can be software-configured for optical S/PDIF optical I/O, with or without sample rate conversion.) STUDI/O also ships with a floppy disk of compatible Windows 95 and ASIO Mac drivers for programs such as Steinberg Cubase Audio VST (PC and Mac), IQS SAW Pro/Plus 32 (PC), Cakewalk Pro Audio 7.0, Emagic Logic Audio (PC and Mac), Metric Halo Spectrafoo (Mac), Opcode Vision DSP (Mac), SEK'D Samplitude 4.0 and 24/96, Sonic Foundry Acid (PC) and Syntrillium Cool Edit Pro (PC). Compatible drivers for other programs were in the works around press time, so check with Sonorus if your fave isn't listed. And if you're interested in checking out something new, the CD-ROM included with STUDI/O has demo versions of nine music and audio editing programs.

Besides adding the CPU of choice (a 200MHz Pentium/Pentium Pro on the PC side, or 180MHz 604e PowerMac or better is recommended), some software and a couple ADATs, the only remaining STUDI/O option is a plug-in sync backplate adapter ($150), which provides ADAT 9-pin sync, MIDI Time Code input and word clock I/O.

The STUDI/O software includes a series of menus that offer quick, flexible system setup: For example, from the settings screen, the card's optical I/Os (or headphone output) can be configured to act as one 16-channel soundcard, two 8-channel cards, eight 2-channel devices or as 16 mono soundcards! Other screens provide control of clocking, format, the onboard sample rate converter, phase reversing (for interfacing with original "blackface" ADATs), routing, metering and monitor mixing (routed to the headphone/monitor out).



The depth of control offered in STUDI/O's routing, mixing and metering screens is impressive. The routing tab allows routing any input to any output using a simple, visual matrix. Besides level and pan, the monitor mixer even includes mute and solo functions, and the on-screen peak meters allow a choice of input, output or master displays (along with instantaneous reset, peak hold or infinite peak displays with adjustable decay) and selectable 30 to 144dB meter range. One nice touch is that setups can be saved as user presets (snapshots), for quick system reconfiguration.

Installation requires little more than plugging the STUDI/O card into a PCI slot, copying a driver from a floppy disk, and connecting the card to your ADAT system. I tested STUDI/O with Windows 95 on a 180MHz Pentium Pro PC with both SEK'D Samplitude 4.0 and Syntrillium Cool Edit Pro, interfaced to 20-bit ADAT M20s (V.1.1) and 16-bit ADAT XTs. Running Samplitude and Cool Edit Pro with STUDI/O was a seamless, plug-and-go operation, although the manual could use some more detailed sections about the actual ADAT-to-STUDI/O (and vice-versa) audio track transfer process.

The STUDI/O card offers full Lightpipe support up to 24 bits. And as the card uses the ADAT's converters—rather than converters crammed onto a PC card—the sound quality is very good. Of course, users who simply want to record directly to disk can use any converters with Lightpipe output, such as Sonorus' new 8-channel, 24-bit AUDI/O AD/24 ($799) and AUDI/O DA/24 ($599) converter sets, or other outboard converters, such as Apogee's TEC Award-winning AD-8000 or Mytek's new 8X96 series. In fact at AES last month, Mytek was showing a complete 24/96 workstation based on the latter and a STUDI/O card.

Without the $150 sync backplate add-on for sample-accurate sync, the card alone is limited to MIDI Time Code sync; this was fine for most situations, although I expect that most pro users will opt for this inexpensive option. Also, while I felt the TRS analog output was adequate for monitoring, few pros would actually mix on it. But at $849, the Sonorus Studio I/O is an affordable, flexible solution that is priced right and brings the advantages of ADAT recording to a new level.

Sonorus Inc., 111 East 12th St., Second Floor, New York, NY 10003; 212/253-7700; fax 212/253-7701; Web site: www.sonorus.com. ■

**BY GEORGE PETERSEN**



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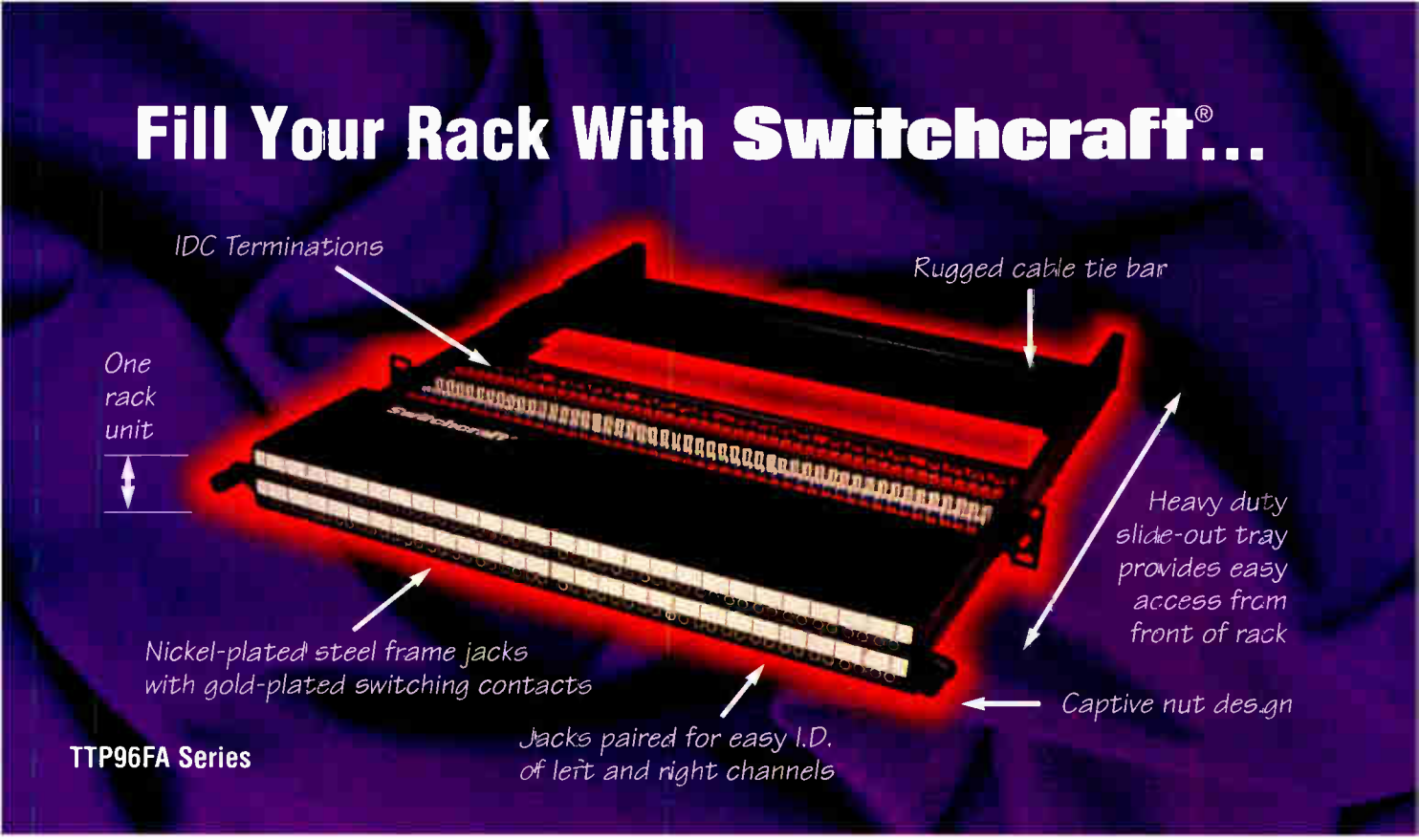


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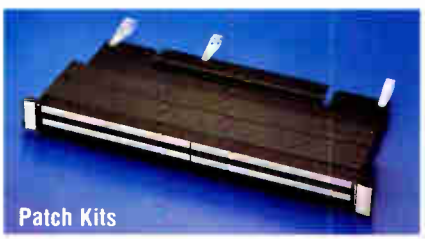


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# CREST X-EIGHT HS

## 8-BUS SOUND REINFORCEMENT CONSOLE

Crest's new X-Eight console combines a comprehensive feature set in a rugged package, at a price that puts Crest quality within reach of a wider audience. Introduced at last year's AES show, the X-Eight comes in three frame sizes, accommodating 24, 32 or 40 mono inputs, with the largest frame size being only six feet wide. List prices are $11,000, $13,000 and $15,000, respectively.

### COMPREHENSIVE FEATURE SET

The X-Eight has all the features expected of a budget console, plus more. The construction is based on the 4-channel module design that has become an industry standard for reduced-cost mixers. Each mic input supports LCR mixing and features individually-switched phantom power, pad, phase and a 12dB/octave highpass filter that sweeps up to 400 Hz. Mono inputs offer separate mic and line inputs, a direct output and dual ¼-inch send and return jacks. The 4-band EQ has two midrange sections (bandwidth of about two octaves) that sweep over four octaves with generous overlap. The HF control shelves at 12 kHz, and the lows cut or boost at 100 Hz. Large solo switches are conveniently located at the bottom of each strip and feature selectable "last cue" interlock. A modest 13-meter VU bridge shows group, mix and solo bus signals.

Standard on each console are four stereo line level return channels with XLR, ¼-inch and RCA jacks and the same 4-band EQ found on the mono inputs. All frame sizes are offered with two alternate configurations of group and master sections. While the RT version has tape returns, the HS has twelve sections of five-band output EQ, a feature not found in many consoles in this price range. This output EQ, normally assigned to the eight groups and four matrix outs, can also be individually switched to the eight auxes and the 3-channel main mix. The latter can be set up for true LCR panning, or as stereo plus mono. Further, the group faders on the HS model can be individually swapped with the aux masters, a useful feature for stage monitor applications. In addition to the group and mix inserts found on the RT, the HS features dual insert jacks for the auxes. The last two pairs of aux sends can be switched for stereo "level-and-pan" operation, facilitating headphone or in-ear mixes.

In addition to the four matrix and three main mix outputs, there is an alternate L/R output and a second mono output labeled "hearing assist." The solo bus is also routed to a pair of XLRs for local monitors. All outputs are on XLR connectors. A pink noise source and the talkback mic may be individually assigned to any output. Talkback is either latched or momentary, depending on how long the switch is held.

Internal jumpers allow customizing the console to particular needs. For example, each input's aux sends can be set pre-EQ or pre-mute. Similar jumpers in the master section switch the mix source for the monitor, mono or "hearing assist" outputs to pre-fade and disable phantom power for the talkback mic.

### AT THE PORTLAND BLUES FESTIVAL

I tried out a 32-channel X-Eight HS at the Portland Blues Festival, where I used it at the "B Stage" to mix FOH for two dozen bands over four days. Because the X-Eight uses the same XLR effects and dual insert jack connections as a larger console, patching in my usual big-console effects and insert rack was a breeze. The console's gray finish kept it cool in the sun, and I found that the bright five-segment LED signal meters and illuminated solo and

BY MARK FRINK



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## Know your limits using the new L2 Ultramaximizer™ precision peak limiter in a convenient 19-inch rackmount box!

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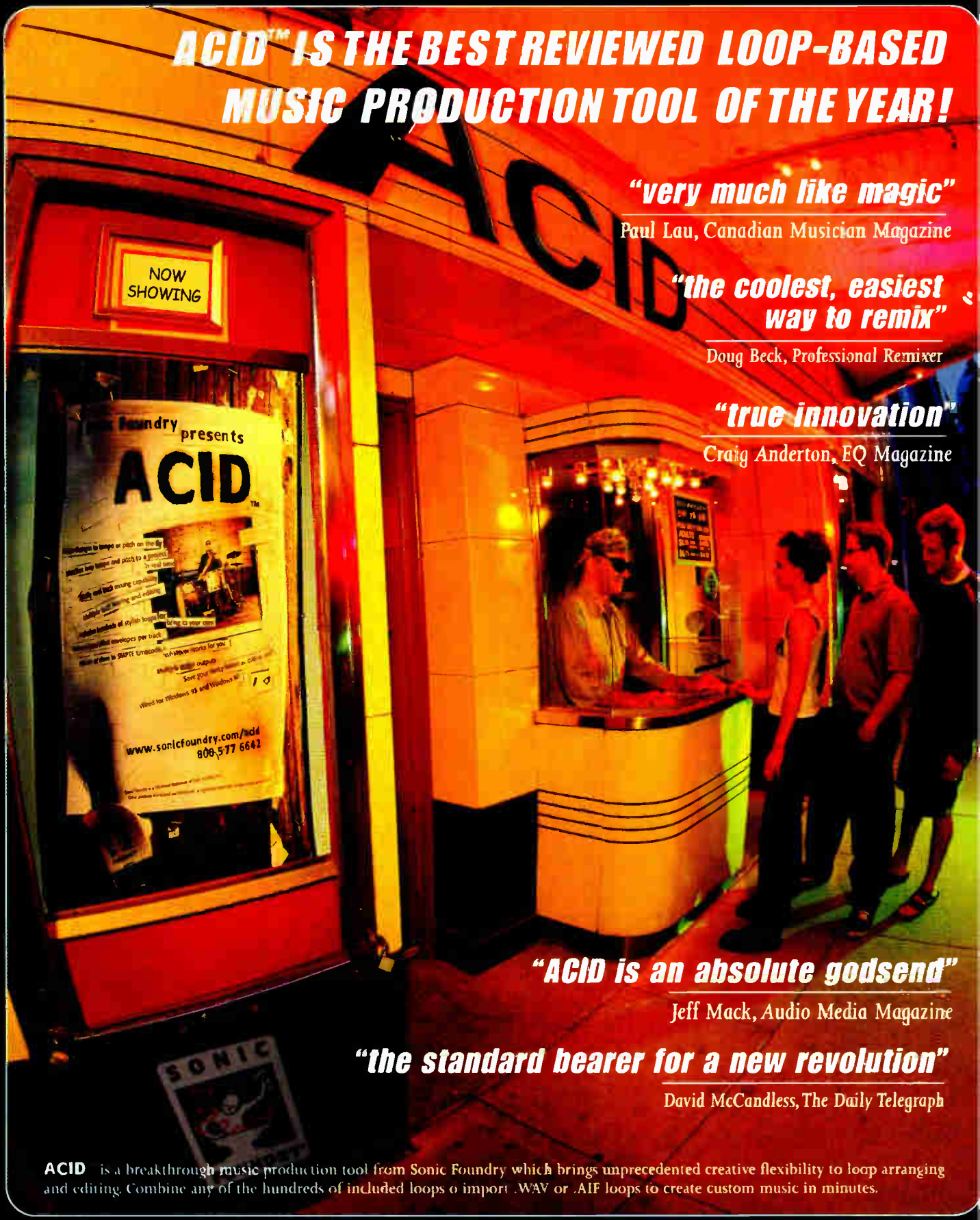


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mute switches on every channel made the console easy to use in both daylight and moonglow. XLR connectors on the back of the meter bridge power gooseneck lamps.

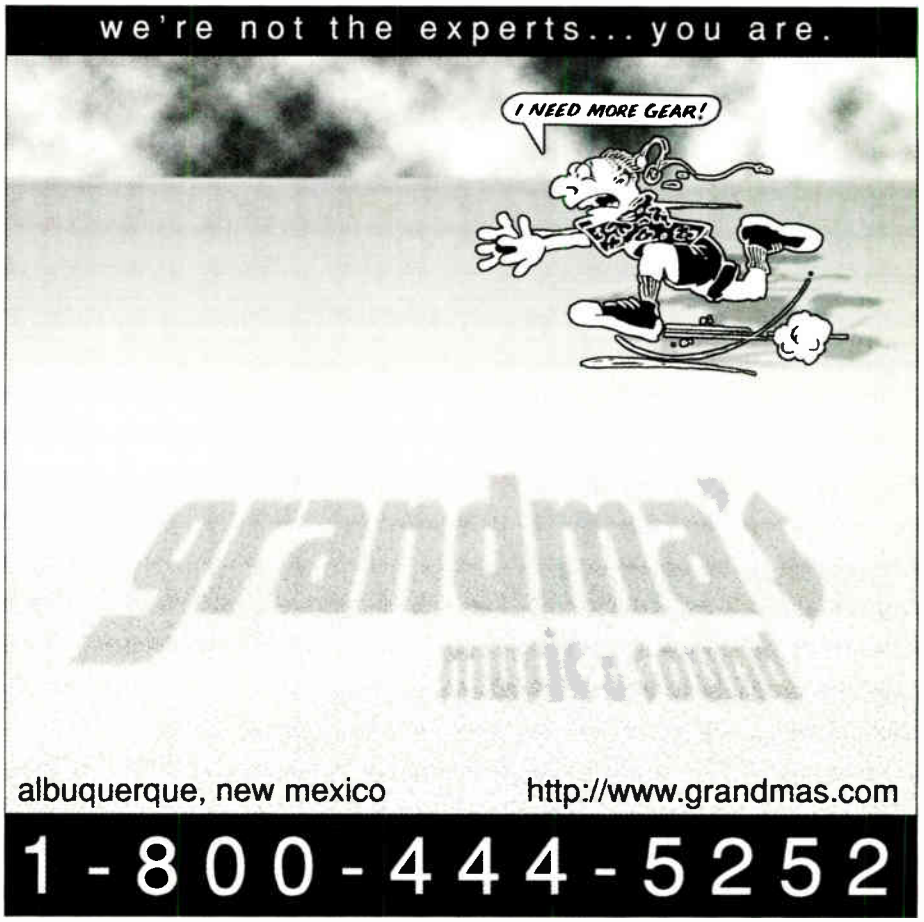
In typical festival fashion, I inserted compressors on subgroups for keys and horns, and gated or compressed individual drum and vocal channels. Dedicated effects for drums, keys, horns and vocals were returned on the stereo inputs, which left all 32 channels open for a festival spread that allowed each band's inputs to drop into pre-assigned channels. I used the four matrix outputs to feed delay towers situated at midfield, and sent the eight subgroup outputs to a video truck. The alternate stereo mix was fed to the radio station, and the extra "hearing assist" output was assigned to the TV news camera.

The comprehensive mute system on the X-Eight is reasonably intuitive, and I figured it out without referring to the manual. In addition to eight traditional static mute scenes (directly recalled by a row of eight master mute switches), 128 MIDI-controllable mute scenes can be run separately—or in addition to—the static masters. The console also accepts and sends change commands that can be used with outboard MIDI devices. Individual channel mutes can be locked in "safe" mode so they can only be switched manually. Scenes can be written and edited "blind" without affecting the current scene. The red mute switches are accompanied by a bi-color LED that indicates safety and scene status.

At the Portland Blues Festival, the X-Eight performed beautifully and sounded like a desk costing twice as much. Few consoles succeed as well as the X-Eight in combining low cost, rugged quality and a well-thought-out, flexible design. Purchases in this price range are too often made without taking sonic quality and durability into consideration. (I find the lack of VCAs on consoles in this price range to be a hidden benefit.) Those looking for large-console quality in a small package would do well to consider the X-Eight.

Crest Audio, 100 Eisenhower Dr. Paramus, NJ 07652; 201/909-8700; fax 201/909-8744. Web site: www.crest-audio.com. ■

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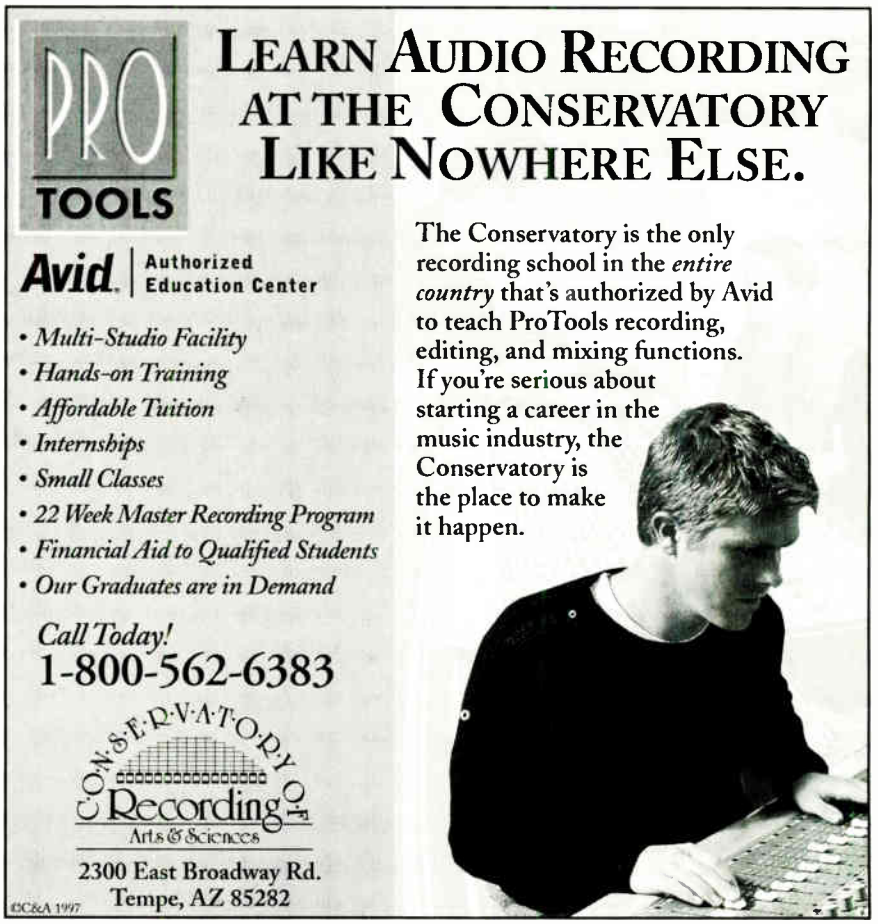


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# MACKIE HUI

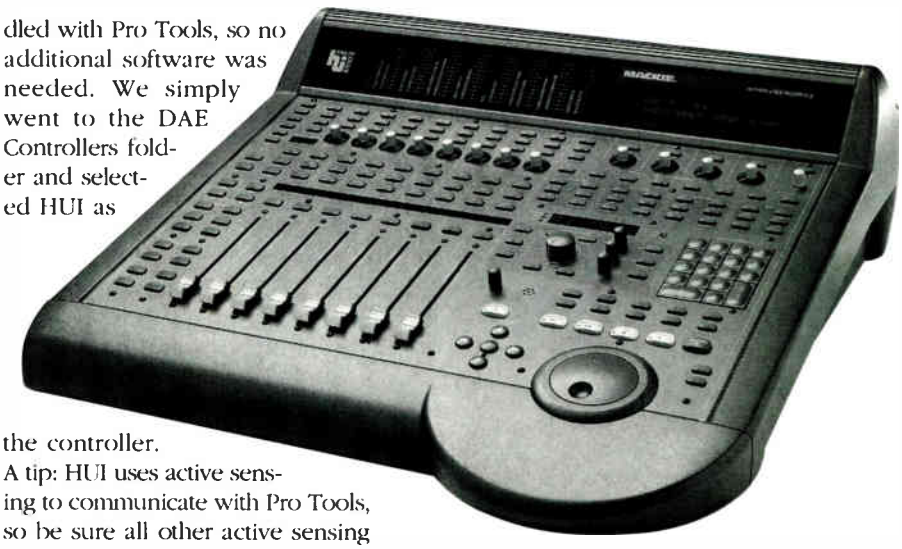
## HUMAN USER INTERFACE FOR DIGITAL AUDIO WORKSTATIONS

Digital audio workstations are capable of handling nearly any audio production task, whether recording, signal processing, editing or mixing. And although the keyboard and mouse are suitable for word processor use, this combination is poorly suited as a DAW interface. One possible solution from mixer specialists Mackie Designs is HUI (Human User Interface), a hardware controller designed specifically as a DAW control surface, providing standard controls (faders, pots, transport buttons, etc.) to DAW software.

HUI was designed in cooperation with Digidesign, yet it was intended as a controller for a variety of DAWs. However, it currently works only with Pro Tools (either Pro Tools 16 or Pro Tools|24 running version 4.1 or higher). Mackie wasn't ready to utter the names of any other DAW manufacturers planning HUI drivers. We tested HUI with Pro Tools|24, Version 4.2.

The HUI is well-built, with typical Mackie craftsmanship. While it is smaller than a full-blown mixing console, its 6.5x20.6x22.5-inch (HxWxD) footprint does require a fair amount of real estate. It appears quite roadworthy, even having handy cut-outs near its top to grip when picking it up. The various sections are clearly laid out, and it is no more difficult to get around on than your typical automated console. Standard features include eight stereo meters, eight touch-sensitive faders with associated channel strips, a 10-key pad, an easy-to-read timecode display and a plethora of dedicated buttons that mirror Pro Tools' functions. Power is supplied via a removable IEC cable on the unit's rear.

As for getting HUI up and running, the entire setup process—opening the box, to plugging the unit into our Opcode Studio 4 and getting HUI talking with Pro Tools—took only about 30 minutes. The HUI drivers come bundled with Pro Tools, so no additional software was needed. We simply went to the DAE Controllers folder and selected HUI as the controller.



A tip: HUI uses active sensing to communicate with Pro Tools, so be sure all other active sensing gear is turned off or you will have a communications problem.

Next, we hooked up HUI's audio section. HUI has three stereo inputs and three stereo outputs (all balanced ¼-inch with a S/N rating of >92 dB). The inputs are assignable, in stereo pairs, to any of the outputs. There is a volume control for each stereo output on HUI's face and a large master volume wheel that controls the overall mix of all three inputs. All Monitor knobs have a center detent for unity gain at 0 dB. Simply plug the stereo output of your Pro Tools audio interface into an input on HUI, plug your amp or powered speakers into the assigned output and you're ready to rock 'n' roll. When you need to do more, connect sources into the other two inputs and hook Pro Tools' inputs into a pair of HUI's outputs. In this way, HUI's audio section acts as a mini-mixer allowing you to avoid a large console when all you need are a few inputs and outputs; this is perfect for many jobs where you're just cutting audio to picture and your source material is coming entirely from CD and DAT.

HUI's mixer arsenal also includes two microphone inputs with trim controls, phantom power, XLR inputs, and balanced ¼-inch outputs; they are the same high-quality mic preamps used on Mackie's 8-bus boards. The balanced outputs are handy for plugging directly into your DAW; use them in tandem with HUI's dim, mute and talkback buttons and you've got a simple—yet elegant—system for voice-over jobs (or overdubbing sessions) when you're recording directly to Pro Tools.

While we thought the audio section was slick, one small problem appeared: Talkback only dims the outputs that it is assigned to. The result is outputs sending to the main control room monitors aren't dimmed automatically when you press the Talkback button—unless you have talkback assigned to these outputs, but then you get feedback. If your mains are up loud, when using talkback you're going to have to shout to be heard. There is a dedicated Dim button assignable to any output; however, pressing it while you press the Talkback button to dim the outputs your mains are on is awkward. Talkback needs to have a way to dim or mute these outputs that is accessible via the Talkback button but separate from the talkback assign. We wish for this in HUI's next incarnation.

Mackie likes to portray HUI as

**BY MICHAEL DENTEN AND ERIK HAWKINS**



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## TIPS ON THE USED CONSOLE MARKET

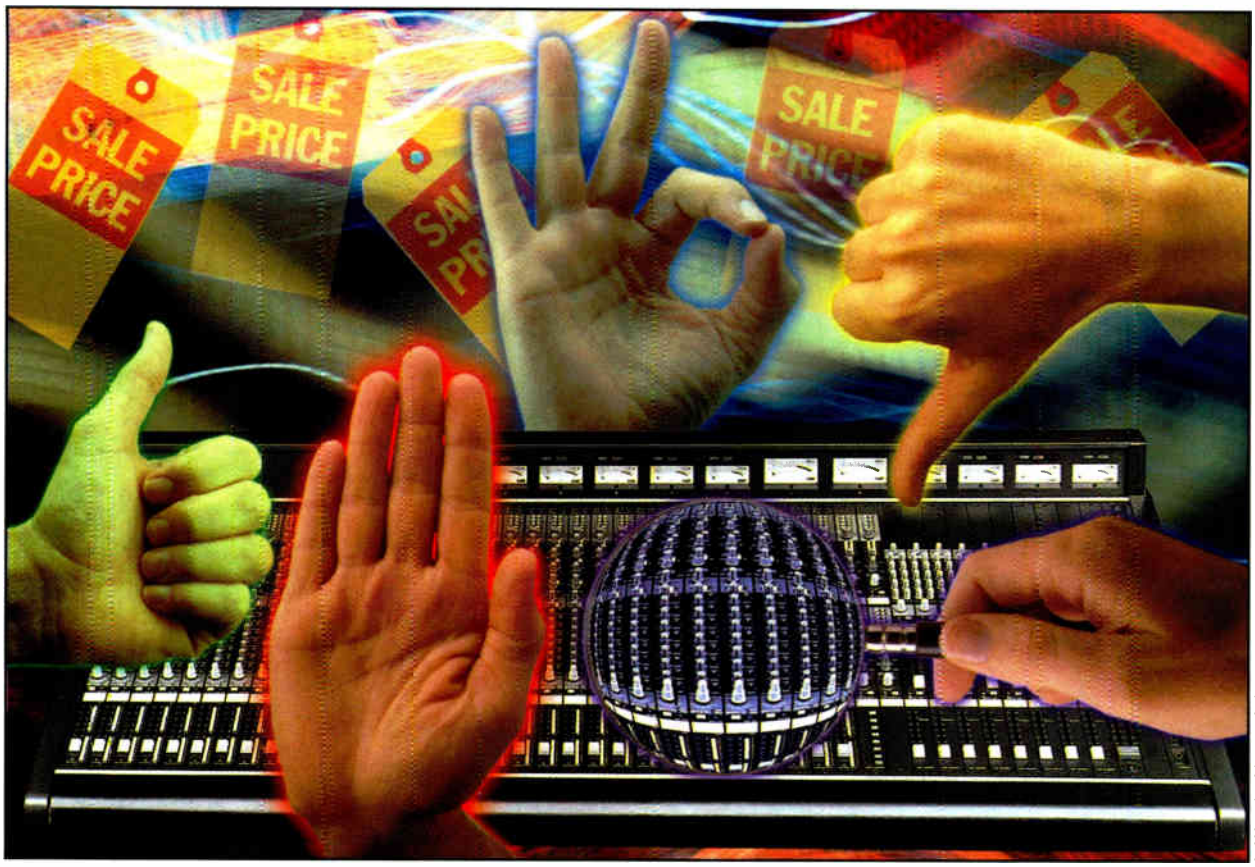


PHOTO ILLUSTRATION: MIKA CHISAKI

Like the auto manufacturers, console makers generally prefer that the customer buys a new product at close to retail price rather than a "pre-owned" model at a significant discount. Though many manufacturers are no doubt proud of the fact that their older consoles are still operating faultlessly in the field, it's a double-edged sword. After all, how can you sell a customer a new car or a new console if the old one is still running perfectly?

Fortunately for console makers, mixing consoles do have a limited useful life, and the ever-expanding technical requirements of modern music and sporting events call for features and performance capabilities unavailable in older models. But not every potential buyer wants, or needs, a brand-new console, and there exists a large and active market for used (or, to continue with automobile euphemisms, "previously owned") ones. There are bargains for the alert and patient shopper, and there are pitfalls and expensive lemons to be avoided. Here are some opinions and buying tips for those entering the netherworld of the used console market.

### CLASSIC MODELS

When buying a used console, it is generally considered sensible to stick to the reliable, low-maintenance models. Consoles that have stood the test of time and remain popular years after their introduction include the Ramsa WR-S840 and Midas XL-340, both of which still command a healthy price. Whenever I run into an old Gamble HC40, I'm reminded that new is not necessarily better. Hand-built consoles of a previous era may lack VCA controls, but I remain unconvinced that a VCA is necessarily a good audio feature. When drawing up a short list of used consoles to buy, think carefully about the needs of the operators and try to get all the features that are needed. A console that is familiar to the "typical" operator will get more use, and presumably earn a better return on rentals. Only time will tell what the next "big thing" is in live sound. While the jury is out on new digital console technologies,

BY MARK FRINK

—CONTINUED ON PAGE 174



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# ANDREA BOCELLI AND ORCHESTRA

## *At Madison Square Garden*

PHOTOGRAPHY FROM THE LENS OF GEORGE KALINSKY, MAJOR LEAGUE GRAPHICS

A hot young Italian tenor, backed by an 85-piece symphony orchestra, is booked into New York's Madison Square Garden for the penultimate date of his tour. The program will consist of operatic arias.

If that sounds like recipe for aural disaster, think again. When Andrea Bocelli performed his sold-out show at the big town's big room with the Pittsburgh Symphony this summer, the sound was exceptionally clear, detailed and nearly free of artifacts.

The reasons that the nascent heartthrob Bocelli and orchestra were able to sound so good in a gigantic concrete room are complex. One key is sound designer Alexander Yuill-Thornton II, better known as Thorny, who for the past two decades has, through his Solstice Company, made his reputation as the man to call when you have a critical audio event to stage.

The Solstice Classical sound system that Thorny designed and used for Bocelli's shows is a time-tested setup. Configured from standard Meyer Sound components, the system now includes the new Meyer PSW-6 directional subwoofers, which proved crucial for controlling and refining the sound in the cavernous Garden. Thorny also uses JBL's Smaart-Pro, a PC-based spectrum analysis and transfer function measurement program that gives the sound designer the ability to accurately compare the signal coming out of the mixing console with the live sound in the hall. Among other functions, Smaart-Pro provides the data necessary to isolate the sonic anomalies and instabilities that are common in large arenas; it also measures the effectiveness of compensating equalization.

PHOTO: ERIC RUDOLPH

*Alexander "Thorny" Yuill-Thornton II*

Thorny has made a career of ensuring the intelligibility and musicality of the reinforced sound for most of Luciano Pavarotti's large-venue American events, including the Three Tenors shows, and other large-scale performances, such as the Three Sopranos concerts. He has also masterminded the high intelligibility for the stadium-filling Promise Keepers events.

But Thorny, it must be noted, does not mix sound.

"Early on, I realized that I couldn't remember musical cues and that my timing is awful," he says the day after the New York Andrea Bocelli show. "I decided the world would be a better place if I didn't mix. So I'm never in competition with the person who is running the board."

### INTELLIGIBILITY IS KING

In Thorny's world, intelligibility is the main point. "In the kind of events I do people come to hear: everything else is secondary. I've learned this to a great degree from the Christian events I've done over the years, where every single word that is spoken or sung is very important and must be heard clearly. From this, and from the classical events, we've developed a general approach that enables us to make systems intelligible by identifying problems we can solve with acoustical treatment and measurement tools like the JBL Smaart-Pro, so the shows will be intelligible and musically

**BY ERIC RUDOLPH**

*—CONTINUED ON PAGE 168*

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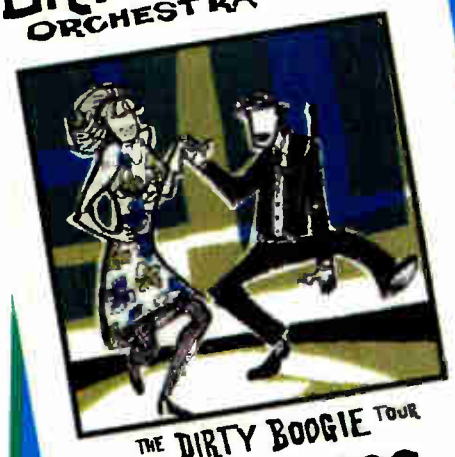
# THE BRIAN SETZER ORCHESTRA

Out on a seven-week theater tour to promote their new *The Dirty Boogie* CD, the Brian Setzer Orchestra has been playing to sold-out houses.



*"I don't dramatically EQ anything," says FOH engineer Mark Allison. "If you look at the EQ on my board it's pretty much flat. The only dramatic EQ is for the cymbals, hi-hat and kick drum. I don't use a ton of reverb and effects and all this other stuff. I want the instrument to sound like it does when the person is playing it, only louder and properly mixed for the environment."*



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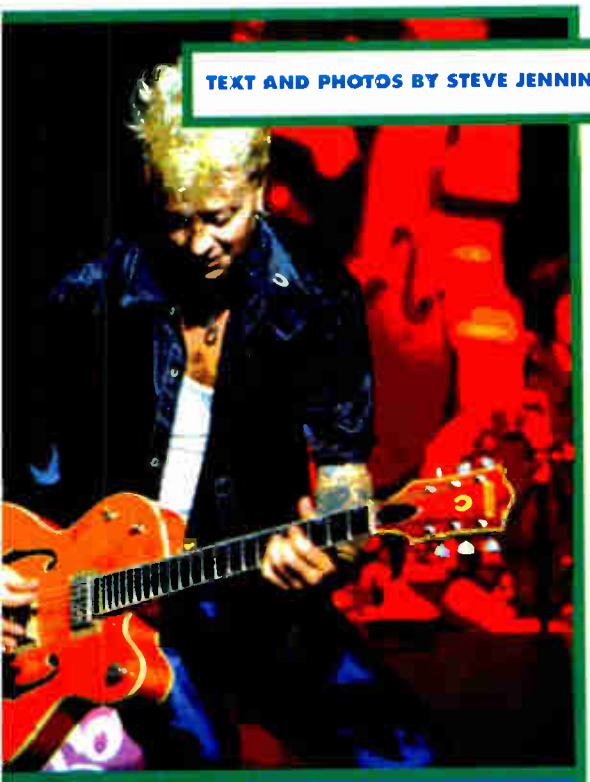
ALL ACCESS

# BAUHAUS

**After a 15-year absence, Bauhaus is back on tour. Originally intended as only a few select shows, the tour instantly sold out and has been expanded into a full 27-city tour in the U.S., followed by shows in Japan and Europe. *Mix* caught the show at the Warfield Theatre in San Francisco.**

TEXT AND PHOTOS BY STEVE JENNINGS



Setzer sings through a Shure SM58 mic. "He's always consistent and has impeccable tone," says Allison. Allison is also pleased with the Audio Technica ATM 35s he's using on the kick drum. "The clips are unbelievable," he says. "The ATM 35s never fall off."

Drum tech/stage manager Bobby Gilcken has been with Setzer for more than 11 years. The drum kit, built for the Brian Setzer Orchestra by DW Drums, is a re-creation of a 1950s kit with all calfskin heads. "Miking and tuning are completely different from anything I've ever done before," Gilcken says. "The kick drum has no dampening; it's very live, very boomy and all the punch comes from the slap of the bass drum. We kind of reverse the roles of the stand-up bass and the drums. The drum kit provides the low, boomy thud and the upright bass is providing the real slap hard kick you're looking for."

L to R: David J. (bass/vocals), Kevin Haskins (drums), Peter Murphy (vocals/guitar) and Daniel Ash (guitar/sax/vocals).

Vocal microphones are Audix OM-6s; lead singer Peter Murphy uses a Samson wireless rig with an OM-6 capsule. "I really like the OM-6 for these guys because of its rejection of feedback," says FOH engineer Chris Raughley. "You can get the mic really loud without it feeding back in monitors." Daniel Ash (guitar, sax and vocals) uses an OM-5, chosen because its tight coverage pattern minimizes pickup from his guitar. Twelve Industrial Sound (Los Angeles, Calif.) monitor wedges are positioned under the grating in front of the stage. Raughley uses the Eventide H-3000 on the vocals. "It fattens them up, gives you better harmony sound," he says. "I like the dbx 120 on the kick drum and sometimes the bass guitar; it gives you more low end without it wanting to take off and feed back." Raughley also favors the Yamaha SPX-90 and Rev-5: "They work really well on drums."

Raughley has also mixed for Bauhaus spin-off Love & Rockets since 1995. Industrial Sound is providing 24 EAW-850s plus 16 proprietary subwoofer cabinets. The stacking configuration changes, depending on the balcony coverage. "The design really works," says Raughley. "The low end is nice and tight in the theater-size venues we're playing in."

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—FROM PAGE 165, ANDREA BOCELLI

pleasing as well.

"I think we generally exceed people's expectations because they have seen other types of shows in these big venues which are muddled and not intelligible; they pay their money and then can't hear what they came to hear," explains Thorny. But, he notes, "That's usually not a disaster because, as with most pop shows, the audience has come for other reasons in addition to hearing the music."

For what would be Boccelli's first American dates, Thorny developed a gear list and contacted sound company Pro Media, which soon after merged with another company, Ultra Sound. "The selection of the system supplier is crucial," he emphasizes. "The vendor needs, of course, the proper gear. But just as important, they need to have good people and a commitment to excellence.

"I've known Don Pearson of UltraSound and Drew Serb of Pro Media for years, and so I knew that their gear is in as good shape as anyone's. Of equal importance, I knew that their people's commitment to quality was paramount."

### DIRECTIONAL SUBWOOFERS

The combined vendors provided everything but the directional subwoofers. "The PSW-6's are so new they are not generally available, so I made arrangements with Spectrum Sound of Nashville to obtain them. And I am very happy I did that. They consist of two 18s and two 15s in front, and two 15s in back. The cones in back redirect the energy that would normally spill around the back of the box around to the front, so that behind the box the sound level is about 20 dB down."

The all-Meyer P.A. at Madison Square Garden consisted of a main center array of two PSW-6 subs mounted atop four MSL-5s with main downfill provided by three UPA-1s. Side arrays (left and right) consisted of four MSL-3s in a rigid array per side, with the side downfill (left and right) again provided by three UPA-1s in a rigid array. Center front fill for the audience section nearest the stage came from two UPA-1s, flanked by single UM-1s for middle front fills (left and right) and outer front fills (left and right). Onstage monitors were UM-1s.

Such an extensive setup means that Thorny works a long day. "I start out early on a show day, long before there

PHOTO: GEORGE KANATOUS

*Co-anchor Jodi Applegate belts it out with Dolly, while Al Roeker, left, Katie Couric, rear left and Matt Lauer, right, keep time from the wings.*

## LIVE PERFORMANCE ON "THE TODAY SHOW"

### MUSIC IN THE MORNING

Each Friday at 1:15 a.m., a small but energetic audio crew from ProMix begins load-in at the back of 30 Rockefeller Plaza, between 48th and 49th streets. Soundcheck begins at 5:30 a.m. The venue is the street. The gig is *The Today Show*. The acts, since the segment premiere on the first weekend of June, have included Hootie & The Blowfish, Shania Twain, Gloria Estefan, LeAnn Rimes and, this year's opener, The Artist, who apparently went way beyond the call of duty and rocked for an extra hour out on the street for a crowd of 3,000.

The format is pretty simple. A ten-second bumper airs at 8:15, and the band can either go with a taped teaser from the soundcheck or come out live (many choose the latter). Between 8:30 and 8:40, the band takes the stage, and Katie Couric and/or Matt Lauer come out of the building for a short interview, wireless mics in tow. The band performs a song, cut to a commercial, another interview, another song, then off the air. Sounds simple, but for the audio crew, the logistics are every bit as complicated as any arena one-off. It helps that with very few exceptions, ProMix sends the same crew each week: Paul Morini, chief wrangler; Patrick Healy, systems tech; Yens McVoy, systems tech and FOH mix; and Jack Babin, A1 and monitor mix. The NBC crew includes Billy Chin, the network's A1 upstairs in the booth; and Alex Samaglia, head on-air mixer, backed up by David Levins.

"For the 2,000 to 3,000 people who show up every Friday morning, some of them as early as 2 a.m., we really are the show—the techs and crew," says Morini. "The P.A. system is set up in what I call the bullpen, facing out to the street to hit the audience, which is surrounding the stage and tech area. It's become a huge tourist attraction."

While ProMix has pretty much standardized on a Meyer system for the P.A., the company caters to individual band riders for mics, in-ear monitors or wireless systems. "The audience system can get pretty complicated," Marino says, "because we split everything. All the talent mics, whether in the studio or outside, go downstairs to the NBC desk and are then split upstairs to our front-of-house desk, which is a Crest VX52. Then they call out through the PL cues to Yens whenever Katie or someone else is on mic, and Yens punches it up and brings it through the outside mix. The talent may come flying outside arbitrarily. Or Al Roeker may come out to meet the audience and do his weather report from the street, so it's pretty hairy making sure you don't get feedback from all that."

Meyer UPAs on poles provide the main coverage, with powered CQ1s and CQ2s for the band mix. The band

—CONTINUED ON PAGE 174



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is an orchestra or audience," he says. "I use the JBL Smaart-Pro to make measurements of the system and adjust the equalization to optimize the system's response to the venue. I'll feed music—pink noise, white noise, it doesn't matter—through the system. Of course, things change as you add elements. With a stage full of 35 open mics the response of the system changes because we run the levels very close to feedback, and that audio energy gets back into the mics. Part of what I do is keep control of that returned energy. I can't eliminate it but I can EQ the additional gain out of the system."

Of course, some halls change dramatically with the presence of an audience. "We played a shed the other day that was highly reverberant without the audience," Thorny recalls. "Once the audience came in, the acoustic treatment of the ceiling acted with the bodies to almost completely eliminate reverberation. Madison Square Garden changes, but not so much in its actual response as it does in one's perception. When the Garden is full, you suddenly can hear reflections that were masked by others when the room was empty."

## LISTEN FOR THE UNEXPECTED

Once the show begins, Thorny's job is to "make minor adjustments and listen for the unexpected. There were some instability points at the Garden after the show started because, to obtain the levels he was looking for, the mixer was operating the system very close to feedback. I had earlier used JBL Smaart Pro to find the most problematic frequencies, and during the show I used that knowledge and current measurements to restabilize the system. I did that by carefully tweaking the EQ knobs with my pinkies, parking filters where needed to change the gain so we were not so close to feedback. By the end of first half, it settled down; the second half was largely a matter of being there in case of problems."

Thorny does not suggest that it was a cake walk. "The Garden is a tough room. Based on my one previous experience there with Pavarotti about ten years ago, I knew there were a few situations to look out for. Round rooms do some predictable things in terms of focusing audio energy. In the recent renovation of the Garden, they added VIP boxes, which broke up a lot of the cylindrical walls near the ceiling. These new VIP boxes fortunately don't have plate glass windows to serve as additional reflectors. Still, there are some parts of the wall left exposed which our system, for lack of a better word, was going to blast right into, reflecting sound energy back into the room."

To mitigate the reverberation from those upper-level walls, Thorny ordered about 300 feet of black velour drapes. "The wall space is a retro-reflector, so I was doubly concerned. There is a ceiling above these vertical walls that is horizontal, so the energy that comes in goes back out no matter the angle of entry. So we draped the area to absorb the extreme highs and high-mids. The drapes can't do much at the low end, but they did get rid of the specular things that are a problem with a point source system, which the Solstice system is." The heavy velour drapes were hung slightly away from the wall "so we would get two passes through the fabric before the reflected energy enters room," Thorny explains.

The Garden's ceiling, suspended by gigantic cables, also called for acoustical treatment. "Because of the ceiling's

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construction, any energy that hit it would be sprayed out over a very wide area. Keeping that from happening would help keep the confusion factor down. So I put in eyebrows of drapery above the main center array of speakers and the side systems to intercept energy from the top of the speakers before it could hit the ceiling. That's about all the acoustic treatment I felt I could get away with, because producers are always concerned with costs, as they should be."

Feedback was also an important concern. "We've got close to 40 mics onstage," Thorny explains, "all running at very high gain levels because we're area-miking. With subs, which up until now have always been omnidirectional, they spill back onto the stage and create lots of problems. In the past, we had to separate the subs and do things such as isolate them on an aux, which means they were never quite balanced right and you only had a couple of instruments in them. The result is, of course, that you lost the low end of those that are not routed through the subs.

"With the directional PSW-6s, which we're using in a high-center downstage cluster, the orchestra is at an angle of 30 to 40 degrees behind the box, well into the zone where the sub energy is under good control. As a result, our frequencies of instability were not in the subs. In fact, I could not get the subwoofers to feed back. That is a freedom I have never enjoyed before!"

This freedom allowed more instruments to be run through the subs for a fuller, more powerful and more accurate representation of the orchestra. "We were able to put in the celli; before it was iffy because there are so many celli mics, and they're close to the lip of the stage. Now it doesn't matter! You can put the harp, which has some nice low tones, through the subs. The PSW-6s have given me a tool to reproduce the orchestra in a much more balanced way than in the past."

## OPERA SINGERS AND MICS

A constant danger in working with opera singers and sound systems is the potential for the powerful singers to overload the microphones, resulting in clipping. Plus, Andrea Bocelli works about six to eight inches from the mic. "Opera singers who work close to the mics do not do it because we've told them to do so," Thorny says. "Given the choice I would start every opera singer as far away from the mic as possible. But opera singers have a great need to hear themselves. Every consonant is consciously formed; nothing is spontaneous. In opera houses, they use the reflective surfaces of the halls. When you take them out of the opera house and into the arena, all of them need something to help them hear.

"Most opera singers learn to work with sound systems pretty quickly. Some can just use what they hear from the edges of the system without any monitors, and others need a lot of foldback. Additionally, most tenors who've had sopranos singing duets in their ears all these years lose some hearing as they get older. So the need for monitors increases as that happens. However, they all learn very quickly that the closer they get to the mic the louder the monitors get, so they end up controlling their own monitor volume that way.

"Proximity to the mic is a much more subtle issue," he continues. "When they get close, you start hearing a lot of mechanical sounds you wouldn't hear otherwise, such as breath noises. Also you don't get as much chest sound as you would if the mic was farther away. As with any classical instrument, with opera singers the sound doesn't just come out of the opening; it comes out of a lot of places. So you emphasize the mouth as opposed to the whole sound when you've got a singer working that closely."

## THESE MICS ARE HISTORY

At the Garden, all of the stage mics were Schoeps MK series. Bocelli used two MK-41s in what has become the usual opera singer configuration: a special 1.2-meter tube connects the capsule to the CMC 5/6 preamp, so the profile of the mic near the singer's face is tiny. "I use these mics because historically they are what has been used for recording opera singers, something I learned from Jimmy Lock and John Pellowe, longtime classical recordists with Decca," explains Thorny. "In addition to their historical use, however, they have an open, natural sound, and based on our experience they are highly reliable."

Other key elements of the Solstice Classical system, as represented at the Garden, included: a Yamaha PM-4000 console; Meyer LD1-A line driver/crossovers; M-5, M-3 and M-1 processors along with various Crest amplifiers for the speaker systems. (Though most current Meyer speaker models are self-powered, in the Solstice system only the PSW-6 subwoofers have their own amps.) Lexicon 480L and LARC units

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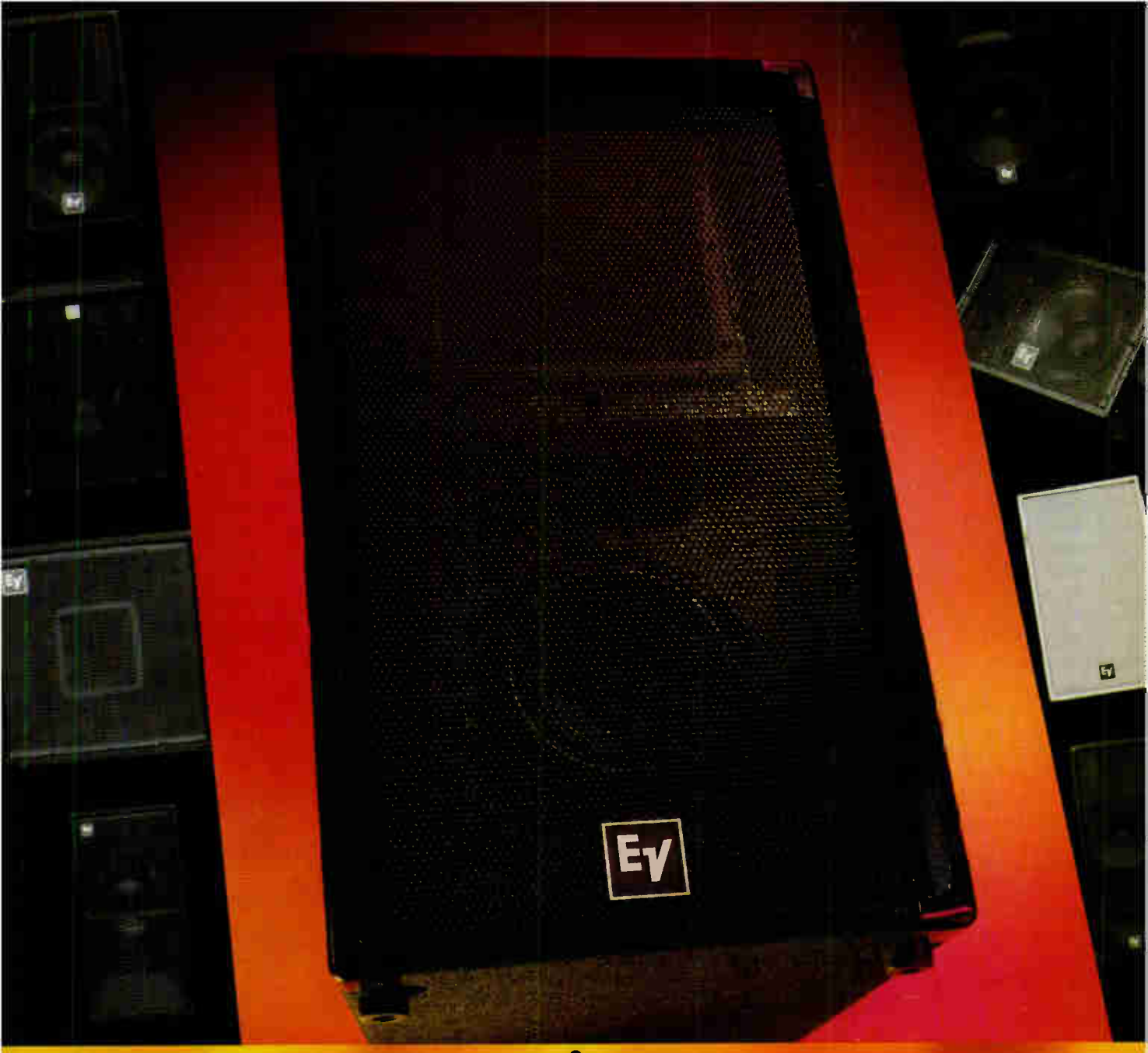

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supply artificial reverb, and Thorny's hands-on precision equalization and delay management was done with eight Meyer CP-10 equalizers and two BSS TC-804 delay units.

### THE PRAGMATIC APPROACH

Perched directly behind Thorny and his JBL Smaart-Pro station was a single, slender B&K microphone. This mic routed the room sound to two laptop PCs running the JBL Smaart-Pro.

"Some people who use transfer function measurements say you need to have mics all over the place. I know this system well enough and I felt that mic position was a safe one. It uses the obstacles of the board and JBL Smaart Pro station in front of it to avoid reflections from the floor. Also, I'm a pragmatist; the name of the game is to get in and get out. And with a center cluster system it is easier to make your measurements with one mic than if it was a left-right setup.

"The idea is that what the mixer sends out should be well-represented at the measuring microphone," explains Sam Berkow, president of SIA Software Co. and SIA Acoustics and, with Thorny, a co-developer of the JBL Smaart-Pro measuring program. "In the simplest terms, Smaart-Pro displays a real-time FFT-based transfer function between the signal coming from the mixing console and the sound as reproduced in the hall. This allows the user to measure the frequency response of the system using program material." (For more details on Smaart-Pro, see the April 1998 *Mix*.)

Thorny is clearly happy with this new tool in his arsenal but is also looking forward to the next technical developments that will help him bring classical music to a mass audience in a way that does justice to the music. "For me, classical concerts are a challenge because many of those in attendance have a clear idea of what an orchestra should sound like. My job is to create a system that allows the audience to forget they are listening to amplified sound and simply enjoy the music and artists they came to hear. The approach we currently use is not exactly like it was last year, and I expect it won't be the same next year. What keeps me interested is the ongoing effort to create the perfect system." ■

*Eric Rudolph is a freelance writer based in New York City.*

*—FROM PAGE 164, USED CONSOLES*

older consoles from established manufacturers represent solid value in the short run.

### ONE OWNER, LOW MILES!

What should one look for in a used console? A reputable, trustworthy seller is a good place to start. To a large extent, you will have to take the seller's word on the console's condition and service history. An older console might be better value than a newer model if it was used only in "low-impact" applications and was regularly serviced. A console that has only been used for Sunday church services by a little old pastor from Pasadena will generally be a better risk than a newer console that has spent its summers bouncing on bobtails to and from rodeos. An original road case with no gouges or scratches is a reliable sign that the previous owner took extra care.

A preliminary inspection may also be most revealing, particularly if it is scheduled on short notice. Look for a clean console inside and out. Anyone can sweep off the front of a console with a clean brush and detail the knobs with Fantastik. It is often more telling to pull several modules and look for dirt and dust in the belly pan, which will give an indication of how often the desk received a full tear-down, if ever. It is not unreasonable to get a qualified third party to inspect the console and recommend a fair price.

Headphone jacks and pots are the most frequently used and, consequently, are the first to go. On monitor desks in particular, the control room and/or "wedge" outputs take heavy use. Since many engineers mix from a "zero dB" row of faders, mic preamp gain pots are adjusted frequently and over a wide

PHOTO: GEORGE KANATOUS

*The ProMix crew (that's Paul Morini at far left) surrounds the Crest VX52 before Dolly takes the stage.*

*—FROM PAGE 168, THE TODAY SHOW*

goes through the UPAs and CQs; lapel mics and the TV show go only through the UPAs. The on-air SSL console at NBC feeds the FOH board, provides a world feed (for remotes from exotic locations) and sends a mix-minus feed for the outside audience, along with the band feed, which is split to NBC Studio 1A before being split to the monitor and FOH desk. (The monitor board is a Yamaha PM4000, with about a dozen mixes, plus sidefills.)

"Because talent will run from the studio to the street, the audience speakers are matrixed out with this Ashly VX RD-8 remote control, so we can mute and lower individual speakers as the talent gets close to a monitor," Morini explains. "We have 16 wireless systems out there at any one time, including wireless for the talent. But it's on-air, and feedback can be the death of you. If you squeak on-air, you're probably not going back there next week. We have all these mics all over the place in a really tight area, plus shotguns for audience pickup! But for all that, there is absolutely no feedback. We like keeping the gig."

*—Tom Kenny*



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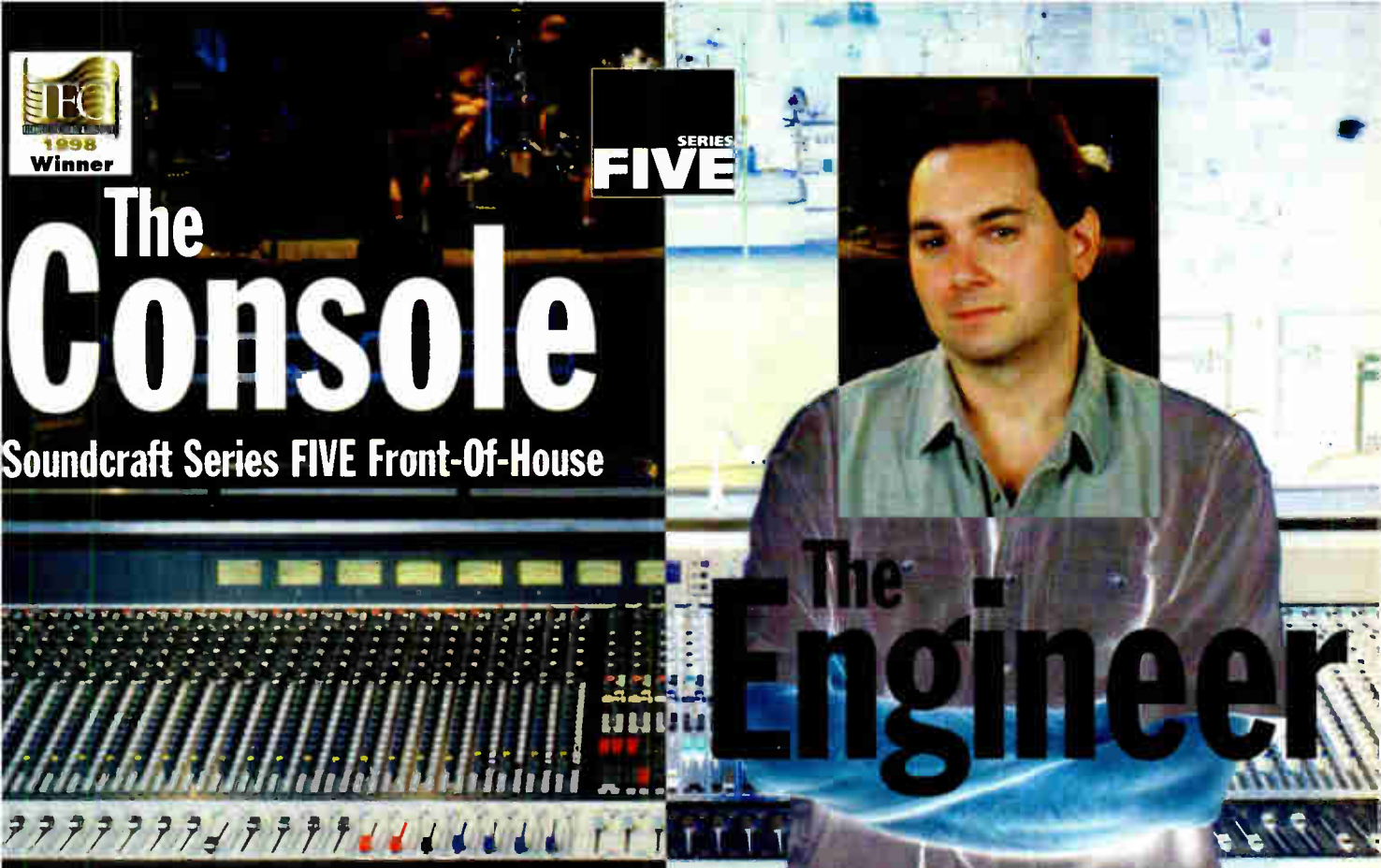

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*– Roger Williams III: Systems Engineer*

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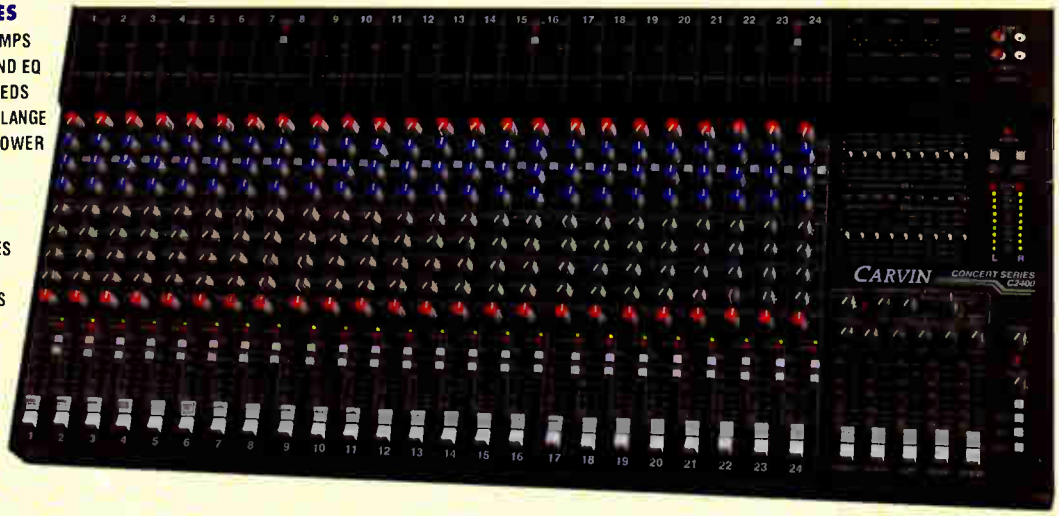


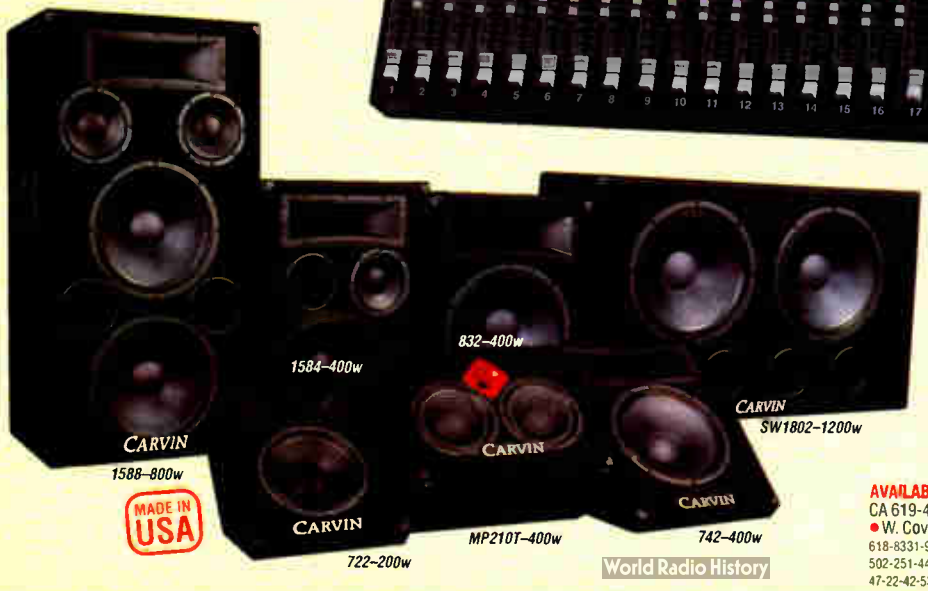


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range; when gain pots deteriorate, the entire strip becomes dangerous to use. To listen for dead spots and dirt, gently and slowly turn each pot. Canny owners will have moved troublesome channels down to the far end of the console, where they are used least—check these first. Bent shafts and dirt around the nuts holding the pot shafts under the knobs are signs of lax maintenance. Consoles that see a lot of outdoor work, especially at fairgrounds, can be expected to have more problems—carefully check the faders of any desk that has been used outdoors. Some owners clean faders with inappropriate solvents that can cause the resistors to deteriorate or leave residue.

When buying a used console, you can reasonably expect to have to carry out some maintenance chores that would be unnecessary if the console were new. For example, you should include in your budget the cost of replacing some bulbs, pots, switches, knobs and caps. It may even make sense to replace or upgrade some of the more critical components, such as the summing amps for the mix bus. On the plus side, most used consoles are sold because they don't meet the needs of the owners anymore, not because they are broken.

### MOTIVATED SELLERS

When deciding on how much to offer for a used console, it is worth examining the seller's motivation. Though the practical lifespan of most sound reinforcement consoles is just less than a decade, they are usually "written off the books" (depreciated to a zero-dollar value) long before that. Consoles are typically depreciated over five years, but many touring companies can make a console pay for itself much more quickly if tours are frequent and profitable.

Like sound companies, musical groups and production companies will sell equipment when the associated project reaches the end of its life cycle. For example, theatrical productions will often liquidate their entire inventory at the end of a run. Similarly, it is sometimes cheaper for a band to buy a console for a tour and sell it at the end than it would be to rent the console for the same period.

Cash flow is often a significant factor in the decision to turn over old or excess inventory. Because touring is seasonal, sound reinforcement companies will typically pick up new consoles at the start of the busy season and then sell off when business slackens. As a result, there is often a proliferation of used consoles available in winter, just as manufacturers are preparing to ship new models to replace them. Prices fluctuate seasonally—miss the market by a few months and you may have to wait through the next business cycle for comparable prices.

The motivated seller of a used console may be able to offer the potential buyer some valuable incentives. For example, it is not unreasonable to ask to "test drive" the console before buying it; any serious seller can easily guard against abuse by charging a rental fee and applying it toward an eventual purchase. Not to be ignored is the possibility that the current owner may be prepared to carry the financing.

### WHO'S BUYING?

Another factor to consider when shopping for a used console is the makeup of the buyers' market. Used-console buyers will include large and small sound rental companies, sound contractors, clubs, bands, places of worship and independent operators. Each of these groups will have slightly different requirements.

In general, sound reinforcement companies choose their console inventory to match the needs of the largest number of clients. For some companies, owning a particular manufacturer's model can make the difference between getting the gig and seeing it go to a competitor. However, since console preferences can vary widely from year to year, touring companies don't usually attempt to keep all possible choices in stock. If a client's rider lists a particularly exotic console, it may make more sense to rent one rather buying it outright and risk having it idle in inventory. (With a healthy market for large-console rehires, several rental houses cater specifically to this demand.) On the other hand, if the tour is sufficiently profitable, it may be possible to amortize the cost of a "new" console over the length of the initial run and then warehouse it in the hope that the same client will return next season. For these and other reasons, a larger company may be able to pay top prices for desirable models.

Many touring acts prefer to carry either FOH or monitor consoles (or both), even if they don't normally carry an entire P.A. system. A used console can provide a relatively secure way to minimize the uncertainties and unwelcome surprises that come from using different local production facilities at every gig on a budget tour. A familiar and exclusive console can provide the consistency that allows artists to walk onstage without a soundcheck on occasion, enabling bands and managers to tackle a challenging itinerary with confidence. Depending on a band's financial stability and experience, their production manager may be willing to bid aggressively for a suitable console.

### PRICING TO BUY

As in any commodity market, price is determined by supply and demand, so how much a used console is worth will depend on a number of factors. For example, some sellers wait until a worsening financial situation forces a sale at below market value. Other sellers may have no incentive to sell at a discount and can hold out for top dollar. As with any large purchase, a little homework can pay huge dividends. Listings in the Orion pro sound "Blue Book" provide one benchmark for used-gear prices, though Blue Book console prices appear to be biased in favor of the buyer. Owners and managers at larger sound companies can quote the value of popular console models, often off the cuff and with better accuracy, since they are in the market and may even have something they'd consider selling. Another point to remember is that relatively few live sound consoles are sold at anything near list price when new. Manufacturers' rebates, "spiffs," and flexible pricing and payment terms can bring the real cost of a new console close to dealer cost.

Knowing what you want and actively looking among several sources are good hedges against paying too much. Since the market is fairly small, it may take several months to find the right console at the right price. Patience, persistence and the ability to write a check when the opportunity presents itself are key to successful shopping.

At last month's AES convention, there were plenty of consoles on the floor. And the big sound reinforcement companies no doubt wrote a few checks, as they should. They have the big acts. They need the absolute state of the art. But, for the rest of the world, there are alternatives to plunking down a season's worth of profits for a single console. For certain applications, a 200,000-mile Mercedes may be just the ticket. ■

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

World Radio History

# New Sound Reinforcement Products

### TONE PLUG TEST TONE GENERATOR

The Tone Plug audio test tone generator from GTC Industries (Naperville, IL) offers an 11-function test unit housed in a familiar 3-pin XLR connector. A button on the connector shell selects among five sine wave test tones (100, 250, 400, 1k and 10k Hz) and five special function test signals. The latter include subwoofer and crossover test tones, a multifrequency pulse for setting delays and reverbs, an amplitude sweep for adjusting dynamics processors and a sweep tone. An LED signals mic cable and connector faults. The phantom-powered Tone Plug is priced at $49.95. A companion device, the Noise Plug, is a pink noise generator.

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### QUINCO TRAQTAPE

Quinco Inc. (Boise, ID) offers TraqTape, a hand-tearable cloth tape designed to keep instrument and control cables neat and tidy. Easily positioned and removed, TraqTape is edge-coated with a cured resin adhesive; because of its center adhesive-free band, TraqTape leaves none of the gummy adhesive residue on cables that can make teardowns messy and laborious. Available in 4 and 6-inch widths on 20-yard rolls, TraqTape may be ordered in matte black or vivid yellow (other sizes and colors pending).

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### ACE G-5 TOURING SYSTEM

Audio Composite Engineering (Escondido, CA) debuts the G-5 Touring System, a modular loudspeaker system including both full-range and subwoofer cabinets. Each full-range module includes four 14-inch neodymium woofers, two compression driver/waveguide combinations and four UHF devices. The subwoofer module has four 18-inch woofers. Lightweight and durable, the cabinets are constructed from carbon fiber, Nomex® honeycomb and other composite materials. The carbon fiber exterior is weather- and UV-resistant, and the cabinets include integral TrakStak™ rigging hardware.

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### TOA DACSYS II V2.3

TOA Electronics (South San Francisco, CA) upgrades the control software for its DACsys II digital signal processor, with the control of over 20 signal processing functions from a PC. The 32-bit Version 2.3 is Windows 95-compatible and offers expanded EQ facilities, adding 96 filter Qs for parametric and all-pass filters, 51 for low- and high-pass filters and eight for notch filters. Other new V2.3 features include saving multiple signal-flow configurations with click-and-drag copying, real-time monitoring of input, output and compression levels, and an input-to-output routing function. Files created under earlier DACsys II software are upwardly compatible, and current users can upgrade for free.

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### QSC POWERLIGHT 9.0 PFC

The PowerLight 9.0 PFC from QSC (Costa Mesa, CA) was designed to provide the highest power density available in a pro power amp: 1,800 W/channel into 8 ohms, 3,200 W/ch into 4 ohms and 4,500 W/ch into 2 ohms. QSC's Power Factor Correction (PFC) technology lowers peak AC current requirements by as much as 40%, reducing strain on the AC power supply and eliminating the effects of voltage sag. Line and load regulators ensure maximum peak power, regardless of AC voltage drops, and the amp operates at any AC voltage. Additional features include soft start and standby mode, a data port for performance monitoring and variable-speed fans. Price: $6,998.

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### D.A.S. POWERED TWO-WAY SPEAKER

D.A.S. Audio (Old Lyme, CT) has introduced the DS-15A self-powered loudspeaker system, a bi-amplified, two-way system with 150-watt and 50-watt amps for the low- and high-frequency drivers (crossover is 2 kHz). Protection circuits ensure against signal overload and unstable voltage. The HF compression driver has a 2-inch diaphragm with a 1-inch exit and the DS-15A's maximum SPL is 121 dB. Dimensions are 26.8x17.4x14.2-inches. Price: $979.

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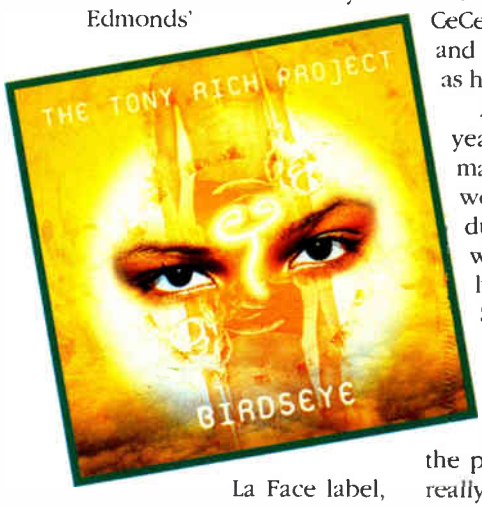
World Radio History

# TONY RICH HITS THE "BIRDSEYE"

## NO SOPHOMORE JINX HERE

**by Blair Jackson**

One of the surprise hits of 1996 was an ultra-smooth pop/R&B confection called *Words*, the debut by Atlanta-based singer/songwriter/multi-instrumentalist/producer Tony Rich. With its pleasing acoustic textures, soaring melodies, heartfelt lead vocals and bright harmonies, Rich's CD was a refreshing throwback to an era when songs and sincerity, rather than grooves and attitude, were king. The album was nominated for four Grammys (and won the Best R&B Album category) and spawned the mega-hit "Nobody Knows." Now Rich has released his second album for L.A. Reid and Kenny Edmonds' La Face label, titled *Birdseye*, and it is sure to establish its creator further as a major force in the world of soulful balladry. The Detroit native has cited Prince and Stevie Wonder as major influences on his songwriting and production styles, and he shares with those artists that rare ability to do almost anything he puts his mind to musically, whether it's playing all the instruments—including drums—on a given track, or layering eight parts of harmony vocals himself. He is also developing into a formidable producer, having helmed discs by the likes of Pebbles, CeCe Wynans, Aaron Neville and Michael Bolton, as well as his own records.




*Birdseye* was nearly a year-and-a-half in the making (though Rich worked on other projects during that time) and was cut mainly at Rich's home and at Lacoco Studios in Atlanta, an SSL-Studer facility that has served as the creative nexus for La Face productions for the past several years. "It's really an engineer's dream working with Tony," says John Frye, who recorded both of Rich's albums and has been a LaFace mainstay for the past eight years. "He's got it so much together on his own that when he makes a record, he's written and sequenced it at home and he always knows pretty much where he wants to go with every song so the actual recording is relatively easy.

"He does most of his sequencing and drums and triggers all of his keyboards through the MPC 3000," he continues. "His records start out pretty sequenced, but then take off from there. At a later date, he'll often add live bass and drums and percussion and various guitars—acoustics, electrics. Before we'd even get together for the first time on a song, he usually had about 50 percent of the backgrounds done and even some of the lead vocals. He's quite a good engineer on his own and has a studio at home."

"I love technology, but I always maintain a respect for acoustic instruments because I want my music to sound real," comments Rich, who tracked some of his album at home using Tascam DA-88s. "My latest thing is that I'm getting into Pro Tools and digging that; checking it out and seeing where it can go. But to me the technology has got to serve the music

—CONTINUED ON PAGE 192



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# A NEW DAY FOR WAYLON JENNINGS

**by Barbara Schultz**

Miles Copeland's Ark21 label bagged a giant when it signed country legend Waylon Jennings: He's an artist with a huge voice, tremendous talent and a larger-than-life history. Some highlights: His first record was produced by Buddy Holly, and he toured as Holly's bass player in the last days before the plane crash. His first Top 5 hit, "Only Daddy That'll Walk the Line" (1968) was rapidly followed by his first Grammy, for his version of "MacArthur Park." In '75, he was the Country Music Association's male vocalist of the year. And in 1976, the *Wanted: The Outlaws* album, which Jennings recorded with Willie Nelson, Tompall Glaser and Jessi Colter (Jennings' wife), became the first Platinum album to come out of Nashville.

PHOTO: FRANK OCKENFELS III

The statement made by the *Outlaws* LP was almost inadvertent; the album was assembled mainly from live recordings and unissued material, and none of the participants necessarily considered it their most important work. But the arrangements had a raw, rockin' appeal that broke the country/rock barrier from Nashville out. With its electric sound and artist-driven production, *Wanted: The Outlaws* managed to subvert the Nashville establishment and enlarge

*—CONTINUED ON PAGE 185*

# HERBIE HANCOCK & FRIENDS CELEBRATE GERSHWIN

**by Gary Eskow**

The music of George Gershwin has been celebrated throughout 1998, the centennial of his birth. In October, Verve Records released *Gershwin's World*, Herbie Hancock's tribute to Gershwin's work and the milieu in which he flourished. *Mix* spoke with *Gershwin's World* producer Robert Sadin—a gifted composer, arranger and performer himself—about how the project was conceived and brought to life. We later caught up with Hancock in Memphis, where he was preparing for a show.

PHOTO: JIMMY KATZ

***Left to Right: Robert Sadin, Herbie Hancock and Kathleen Battle***

"This year witnessed a lot of reissues of Gershwin music," says Sadin, "but Herbie and I talked about doing something different. We decided that including works by some of the composers who influenced him, as well as recording some important Gershwin pieces with a remarkable cast of musicians, would help flesh out the picture, make it more whole."

Compositions from W.C.

*—CONTINUED ON PAGE 193*

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# GLADYS KNIGHT & THE PIPS' "MIDNIGHT TRAIN TO GEORGIA"

**by Blair Jackson**

The great soul vocal group Gladys Knight & The Pips first rose to national prominence in the fall of 1967, when their version of "I Heard It Through the Grapevine" became a Number 2 smash for Motown's Soul label, followed quickly by the hit "The End of Our Road." This was no overnight sensation, however: the group had already been together in one form or another for 15 years!

Born in Atlanta in 1944, Gladys Knight got her start singing at the Mount Mariah Baptist Church in that city and even toured the South as part of the Morris Brown Choir before she was 5. At 7, she won a $2,000 prize on the popular *Ted Mack Amateur Hour* TV program. A year later, at her older brother Merald's birthday party, Gladys formed a singing group with Merald, her sister Brenda and cousins William and Eleanor Guest, taking their name from another

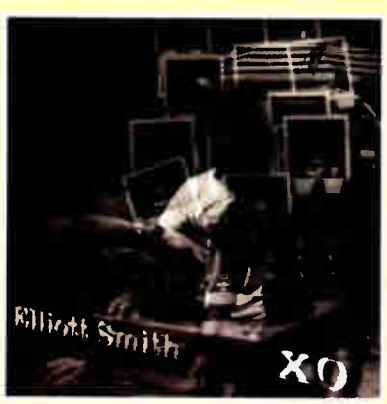
PHOTO: JIMM BRITT/MICHAEL OCHS ARCHIVES/VENICE, CA

*Gladys Knight & The Pips, mid-'70s*

the nickname of another cousin, James "Pip" Woods. In the late '50s, The Pips toured with soul sensations such as Sam Cooke and Jackie Wilson, and they recorded sides for Brunswick (without much success). Brenda and Eleanor left the group in 1959 and were replaced by another cousin, Edward Patten, and, for three years, Langston George. In 1961, The Pips scored their first hit (for Vee-Jay) with Johnny Otis' "Every Beat of My Heart," but then went through a relatively fallow period until "Grapevine" put Gladys Knight & The Pips on the map. Throughout the late '60s and early '70s, the group regularly landed tunes on the

## Cool Spins

***The Mix Staff Pick Their Current Favorites***




Elliott Smith: *XO* (DreamWorks)

His fourth solo release and major label debut finds moody popster Elliott Smith stretching out while working a feel similar to his earlier endeavors. In the past, acoustic guitar predominated. This time, thanks to a larger budget, the production is much bigger, incorporating a broader palette of instruments (including strings and horns) in a more polished package. There are indulgences—some moments, for instance, have sounds so reminiscent of The Beatles that it's distracting. But, fortunately, Smith seems aware that his material is at its best in relatively unadorned settings; generally, he's kept things fairly restrained. He chose to record again with producer/engineers he's worked with in more humble incarnations, and, in fact, Smith plays the majority of instruments on the new record himself. And the essential ingredient—his voice—is as luminous, supple and evocative as ever. Smith sings from a quiet place, and on *XO*, the beauty of his intimately observed songs really creeps up on you.

Produced, recorded and mixed by Tom Rothrock, Rob Schnapf and Elliott Smith. Additional engineering: Larry Crane. Assistant engineers: Doug Boehm, Alan Sanderson, Richard Barron. Studios: Sunset Sound (L.A.), Sound Factory (L.A.), Ocean Way (L.A.), Sonora (L.A.), Jackpot! (Portland, OR). Mastering: Stephen Marcussen/Precision Mastering (L.A.). —*Adam Beyda*

Maxwell: *Embrya* (Columbia)

Maxwell's second album, *Embrya*, may have

—CONTINUED ON PAGE 199

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pop and R&B charts, including "It Should Have Been Me," "The Nitty Gritty," "Friendship Train," "If I Were Your Woman," "I Don't Want to Do Wrong," "Make Me the Woman That You Go Home to" and "Neither One of Us (Wants to Be the First to Say Goodbye)."

Despite the success of "Neither One of Us," the group had been dissatisfied with Motown's accounting procedures and lack of promotion for some time, and in early 1973 they bolted the stable and moved to Neil Bogart's Buddah Records, the one-time bubblegum pop powerhouse. It turned out to be a good move: The first album they cut for Buddah, *Imagination*, became Gladys Knight & The Pips' best seller, and it yielded their biggest hit single, "Midnight Train to Georgia," which was penned by Jimmy Weatherly, who also wrote "Neither One of Us."

Actually, "Midnight Train to Georgia" began its life as a song called "Midnight Plane to Houston"; indeed, it still appears under that title for publishing purposes. As Jimmy Weatherly explained to Fred Bronson in *The Billboard Book of Number One Hits*, "[The song] was based on a conversation I had with somebody about taking a midnight plane to Houston. I wrote it as kind of a country song. Then we sent the song to a guy named Sammy Limbo in Atlanta, and he wanted to cut it on Cissy Houston. He asked if I minded if he changed the title to 'Midnight Train to Georgia,' and I said, 'No, just don't change the rest of the song.'" Shortly after that, Weatherly's publisher sent the tune to Gladys Knight.

The basic tracks for Knight's "Midnight Train" and four other tracks on *Imagination* were cut at Venture Sound in Somerville, New Jersey, with producer/arranger Tony Camillo at the helm and a young engineer named Ed Stasium handling the technical end of the sessions. The studio had been built in Camillo's basement the previous summer, so it was still essentially a new facility when the Knight project came to Camillo.

"The studio was a shell when I arrived and I helped put it together," says Stasium, who was a 23-year-old working for Ampeg/Altec in Linden, N.J., when he started hanging out with Camillo and his then-partner, engineer Tony Bongiovi. "That's how I learned to do what I do. My band did some demos on a 12-track Scully at Media Sound when Bob Margouleff and Malcolm Cecil were still there. Tony Bongiovi had been on staff at Media Sound when [Venture Sound] started being put to-


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gether, and Tony Camillo was doing a lot of independent arranging. So I started going down there and saying, 'What can I do?' So I did woodwork and helped put in the floor and ran wires and did the patchbay." The studio's main room was fairly large, measuring about 30x40 feet with a 20-foot ceiling. The walls were wood, broken up by colorful Fiberglas panels, and the ceiling was covered in acoustic tile. Additionally, there was a drum booth Stasium describes as "totally dead."

Much of the equipment in the control room was purchased from a Philadelphia studio that was going out of business including an Ampex MM1000 16-track and a custom Langevin console. "The console was actually a 12-in and 4-out 4-track console, but Tony Bongiovi and one of his buddies modified it to be a 16-input console; then we made a little monitor section that was separate from the console. There wasn't much to it: a 2-band EQ that had no midrange; just top and bottom. But those Langevin preamps now go for an exorbitant amount of money. It sounded good, and the records we made on it sounded good."

The studio had a decent collection of mics, Stasium says, including a number of Neumann 87s, Sennheiser 421s, RCA 77s, Altec "salt-shakers" and various other models. During its first year or so, the studio had no reverbs at all, but it did boast a fine-sounding chamber.

"I helped build the echo chamber in a cinderblock closet," Stasium recalls. "I can still smell the Fiberglas epoxy. It was August 1972 and it was hot, hot, hot. There was no air conditioning in the place, and here we were brushing on this epoxy, getting dizzy and sick as hell. But that's what we used on 'Midnight Train to Georgia' and all that early stuff. There was no plate there at that time. We had a stereo 440 and a 4-track 440 and a mono 440 and Tony [B.] taught me the trick of sending a delay to the chamber. So if I recall, I'd send the signal through a mono machine, and we had a shitty little Sears Roebuck speaker or something in there, and a couple of a microphones, and then I'd bring [the signal] back in stereo. Later we got a plate that Holland, Dozier, Holland had gotten from Motown."

In the early days of Venture, Stasium assisted however he could—aligning machines, marking tapes, etc.—and worked on his budding engineering chops recording local bands at off-hours. Then, one-day, he went into Media Sound, where "Kool & The Gang were in doing a session and Tony [B.] went out for a sandwich and said, 'Here Eddie, you do the vocals!' and didn't come back for two-and-a-half hours! Tony did that with a lot of people: Bobby Clearmountain, Harvey Goldberg, Ron St. Germain—'Here, you do this.' 'Cause Tony was always on the move, making some kind of deal somewhere." When Bongiovi left Venture shortly after this, Stasium stepped into the void.

Though the studio was 50 miles from Manhattan, "Tony [C.] had a good enough reputation that people would come out and record there," Stasium says. "The studio guys would come down, and Tony used to cook these fabulous Italian dinners and we'd hang out. We'd do tracking in like two days and then a week later we might have the horn section come out one day, then the string section come out another day. It was pretty relaxed."

**We did Gladys Knight's vocal in one take. No comping. No 24 tracks of putting in one syllable at a time. This is a vocalist who can sing her butt off.**

***—Ed Stasium***

It helped, too, that a number of Motown players had relocated nearby after Motown moved West, and they became regulars at Venture: most notably drummer Andrew Smith and bassist Bob Babbitt, who are the rhythmic anchors on "Midnight Train to Georgia." At least they are on the finished version. Stasium says the song was cut three times—at first using a different rhythm section—before Gladys Knight (who was not at the sessions, but was sent tapes for approval) was satisfied with the feel of the song. "Gladys wanted to get more of an Al Green thing on it, which you can hear a little in the jabbing horn lines and the sparseness of the instrumentation," Stasium says.

The band on the song ended up consisting of Smith, Babbitt, guitarist Jeff Miranov, Barry Miles on acoustic piano and Tony Camillo on Hammond organ, Wurlitzer and percussion. The arrangement was completely written by Camillo: "He wrote every fill, every cymbal crash, every note that Babbitt played on bass," Stasium says. "The overdubs were probably done in one leisurely afternoon, and then a week or so later I think we did the strings and horns and ate more Italian food. Randy Brecker and Alan Rubin played trumpets, Michael Brecker was on sax. Lou Delgado was on woodwinds, Dave Taylor and Meco Monardo on trombones. Then there was a small string section which we double-tracked."

Once the instrumental bed was completed, the project moved to Detroit and "a place called Artie Fields'," Stasium says. "First Tony went out there on his own and then he gave me a call: 'I don't like the way this engineer works, so come on out here and help me!' I was so excited. It was my first trip. I had never even been on an airplane before.

"I think we did Gladys' vocal in one take. It was ridiculous—I had no idea what I was doing. I'd been doing it for about a year. I knew what an 87 was and what an LA2A was. So I got that together, and all of a sudden Gladys is like, 'Okay, I'm singing it now.' And that was the take: *BOOM*. It's basically one take and then she went back in and punched in one line, and that was it. No comping. No 24 tracks of putting in one syllable at a time. No Pro Tools. This was a vocalist who can sing her butt off. Put her in a room and she sings."

After Knight was gone, "Tony and The Pips came up with the background arrangement completely. We worked on it a long time to get it right, and then we double-tracked it. That was quite a few hours."

The track was mixed at Venture Sound, and here is where Stasium was allowed to get creative. "Tony had put all the instruments on from the beginning of the song and the stuff was just packed on there—the Hammond organ and piano were on from the top, the guitar, the horns were in the first verse. So we took a lot of things out and made it sparser and then brought the different instruments in as it went along. I think that really made the song more powerful."

Within a couple of months, the album and single came out, "and I remember hearing it for the first time on WABC," Stasium says. "What a great feeling! And I totally flipped out when it hit Number One." It was Stasium's first Number One, and it became his first



World Radio History

Gold record, too (though he didn't get the actual Gold disc until many years later). He stayed with Venture until 1975, then took a staff position at Le Studio Morin Heights in Quebec, and followed that with a stint as chief engineer at Bongiovi's new studio, The Power Station. Since the late '70s, he's been independent, working with the likes of Mick Jagger, The Ramones, Living Colour, Smithereens, Talking Heads and many others.

"Midnight Train to Georgia" marked the beginning of a new Golden Era for Gladys Knight & The Pips. They sold millions of records in the mid '70s, and though that was their commercial peak, they've managed to score a number of hits through the years, including "Landlord" in 1980, "Save the Overtime (For Me)" and "You're Number One (In My Book)" in 1983 and "Love Overboard" in 1987. The act's durability is a testament to the tenacity of Knight and the Pips, and to the strong bonds of family. Forty-six years and still groovin': Amazing! ■

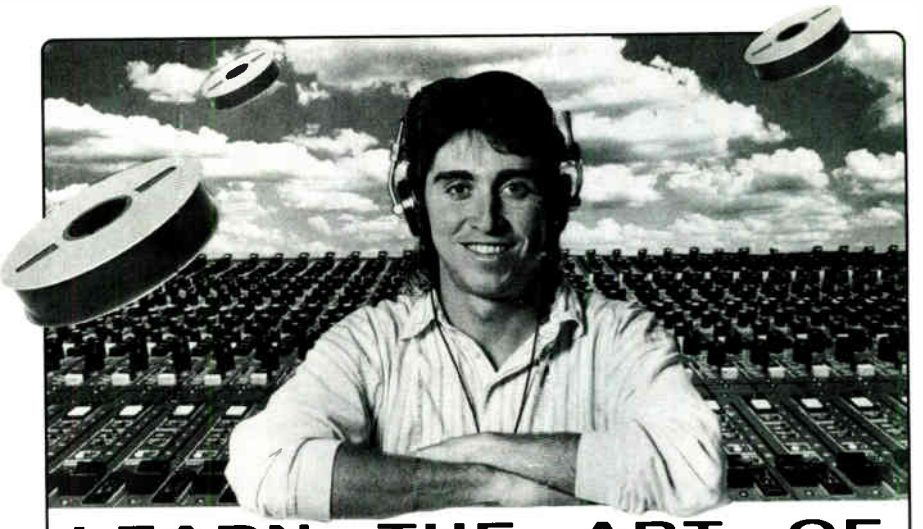
*—FROM PAGE 181, WAYLON JENNINGS*

country's following at the same time.

Jennings' successes have been many: a couple of Grammys, 13 Gold albums, one Platinum and two double-Platinum LPs and a greatest hits collection that went quadruple-Platinum. But he is definitely one of those artists who feels pride in having succeeded in spite of the music industry.

Jennings' long love/hate relationship with Nashville is one of the larger themes of the 1996 autobiography, *Waylon*, which he wrote with guitarist/producer/writer Lenny Kaye. This book digs deep into Jennings' family relationships, professional successes and mistakes, and his many years of drug abuse. "A lot of it your mind wants to cut off, you know?" Jennings says, "but that book is the truth."

Today, Jennings still lives in Nashville, and this past summer he released his first album for Ark21, *Closing in on the Fire*, which was recorded at Treasure Isle Studios with producer Gregg Brown (Travis Tritt, Tanya Tucker) and engineer Peter Coleman. The record includes guest appearances by Sting, Sheryl Crow, Travis Tritt, Mark Knopfler and another country legend, '50s hitmaker Carl Smith, so you can gather that the sounds vary quite a bit. This kind of crossover and variety isn't as surprising now as it might have been back when

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Jennings started breaking the rules, but his music and his opinions sound as hot-blooded now as they did in the '70s.

***How did you end up signing with Ark21? What was it about the label that appealed to you?***

I have a certain way I like to do things. Mainly, I like to be left alone. I think the artist is the one who does the record, and I think the record company and the merchandisers, they sell the records. And Miles was in sync with me. I said I just want to have a good time. I don't worry about any type of thing as far as cutting a record that fits the radio now. I don't want my records on that kind of radio. I never was a big single-seller anyway. I was a big album seller. There's 5 million people somewhere that bought one of my albums, so maybe something'll happen.

***How did you get started on this album project, and how did you choose the material?***

I wrote a lot of it, and we went into a studio called Treasure Isle, which has a real great atmosphere. That's what I look for in a studio; they're all really good, and they got the best mics and what have you, but what I look at is a good atmosphere when you're sitting around waiting for things to get started. When we got in there, we had about 20 songs, maybe more, and some of them kind of eliminated themselves as we went along.

***Tell me about your producer, Gregg Brown.***

Gregg comes from the modern-day way of doing things. But, like I told him, I don't want anything that even resembles that. He had to learn not to be fixing things 20 times. I like to go on past it, come on back to it. But Gregg is real-

## RECORDING WAYLON JENNINGS' VOICE

Waylon Jennings' new album, *Closing in on the Fire*, was recorded in the large tracking room at Nashville's Treasure Isle studios. Engineer Peter Coleman says Treasure Isle, which is equipped with a Trident 80-C console and Augspurger monitoring, is one of his favorite Nashville facilities. "Throughout my career, I've had the habit of latching on to certain studios, because I like the atmosphere there," he says. "Treasure Isle, for me, is very homey, and it's got a huge tracking room, so it's great for recording large drums."

Apparently, it's also a good room for recording large voices. Here's what Coleman has to say about capturing Waylon Jennings' vocal.

"There's three booths at Treasure Isle, ranging from a relatively large booth down to the other extreme, which is about 6 foot by 8 foot. Waylon liked the bigger booth. The mic we used on his vocal was a [Neumann] U87 tube mic that's modified by Craig Cameron, who's a mic wizard that lives here. [At Treasure Isle], we've got four of those microphones. They all sound exceptionally good, and they all sound extremely different, so usually we put all four of them up, and we'll have the artist we're working with sing a little bit into each mic, put it on tape, listen back and pick the one that we all think sounds the best.

"All of Waylon's vocals went through my mic pre. I own a very old Telefunken V76M that I think is just about the best-sounding mic pre I've ever heard. The tube mic pre's, to me, have a much larger frequency response. They just go down further in the low end, and they just keep going up in the high end—way beyond anything we can even hear. It's just like a mini Loudness button. It tends to make things sound expanded. Also, I always use UREI 1176 compressors on vocals—the old black-face ones. The older the better.

"I had Waylon stand really close to the mic because I always put people that close. He's obviously been in situations where people like him way back, off the mic, but I don't do that. There's so much low end off his voice, so I guess low end becomes a matter of personal taste. I love it, and I just wanted to maximize that. If you listen to Waylon's CD, on a lot of those tracks, you can almost feel his heart thumping through his vocal."

*—Barbara Schultz*



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ly good. He grew up on my music, and I guess it's something he always wanted to do, so I said, well let's just go in and see what happens. That's the way I usually do it.

***Are you normally involved in technical decisions on a session?***

We had a great engineer, Peter Coleman (see sidebar, p. 186). He's from England—we call him a British hillbilly—and he don't need any help in that department.

***What do you like about the way he works?***

He knows what he's doing, and he knows how to get the best sound out of your voice, what the best mic placement is. He had me a lot closer in than I was normally used to, but it gave us a lot more control in the mixing. And he's very aware of everything that goes on. I swear, he could hear a cricket if it was in the room right in the middle of a big band. And he had his work cut out for him, too, because we had these two drummers from Memphis, and they play loud.

***How were you guys set up?***

The drums were out in the open in the room, and I was in a booth. Rhythm guitar was in a booth, and acoustical-type things were in booths, but the electric and the drums were all out in the open.

***What kind of microphone did he use on your voice?***

I don't really know the name. But when a mic don't work very good I give it a new name, anyway—usually pretty dirty: "This blankety blank blank don't work!" I've renamed several microphones.

***Did it take getting used to, singing so close to the mic?***

Yeah, because you have a tendency to want to back up—afraid it's going to pop—but I've recorded so long, I know little tricks to keep from popping the mic. And you have to put your hat on backwards if you're wearing a baseball cap. That was the main thing I had to get used to.

***How long did you spend working on this record?***

We probably spent about a week with the band, and then we'd do any things I needed to re-do in the vocal department, and then the rest of it was the mixing, which we didn't spend a long time on.

***Did you sit in on the mixing?***

As much as I could. I wound up in Arizona, and they would Fed-Ex me the tapes every day, because I had to have the last say. I'm the one who's got to live with it.

***Nashville engineer Randy Kling mentioned to one of the other editors here that you're one of the few artists he ever worked with who participates in the whole process—from recording through mastering.***

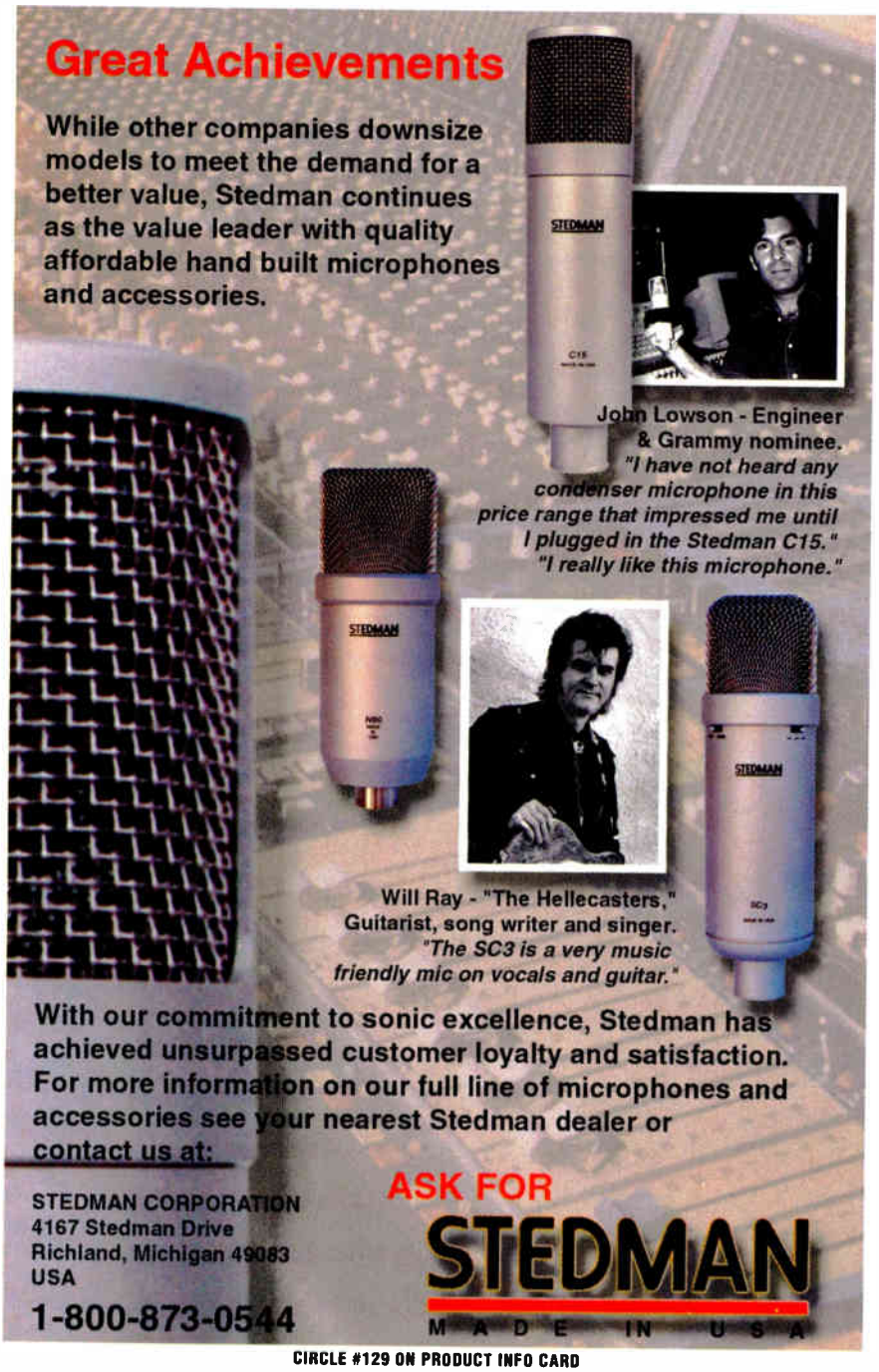
You know, I don't want to make out like I know so much. It's just something I enjoy. One time I engineered, produced, did everything on one of my records, and then I realized you can't do that. You need help. But I did it because I wanted to see if I could; I thought I should know something about what's going on, and I learned grass roots in that area. The technology is changing every day, though, and now you've got like the cockpit of a 747 when you're in there with all the computers.

***I read your autobiography recently.***

Did you? What are you doing reading nasty books? I had a lot of fun doing that, though. Lenny Kaye is one of the most wonderful people.

***In the book, your feelings about what it was like trying to make it in Nashville when you were coming up are pretty clear. How do you feel about Nashville these days?***

If I was coming here today, and they brought me into an office and told me, "Okay, you got four years and that's

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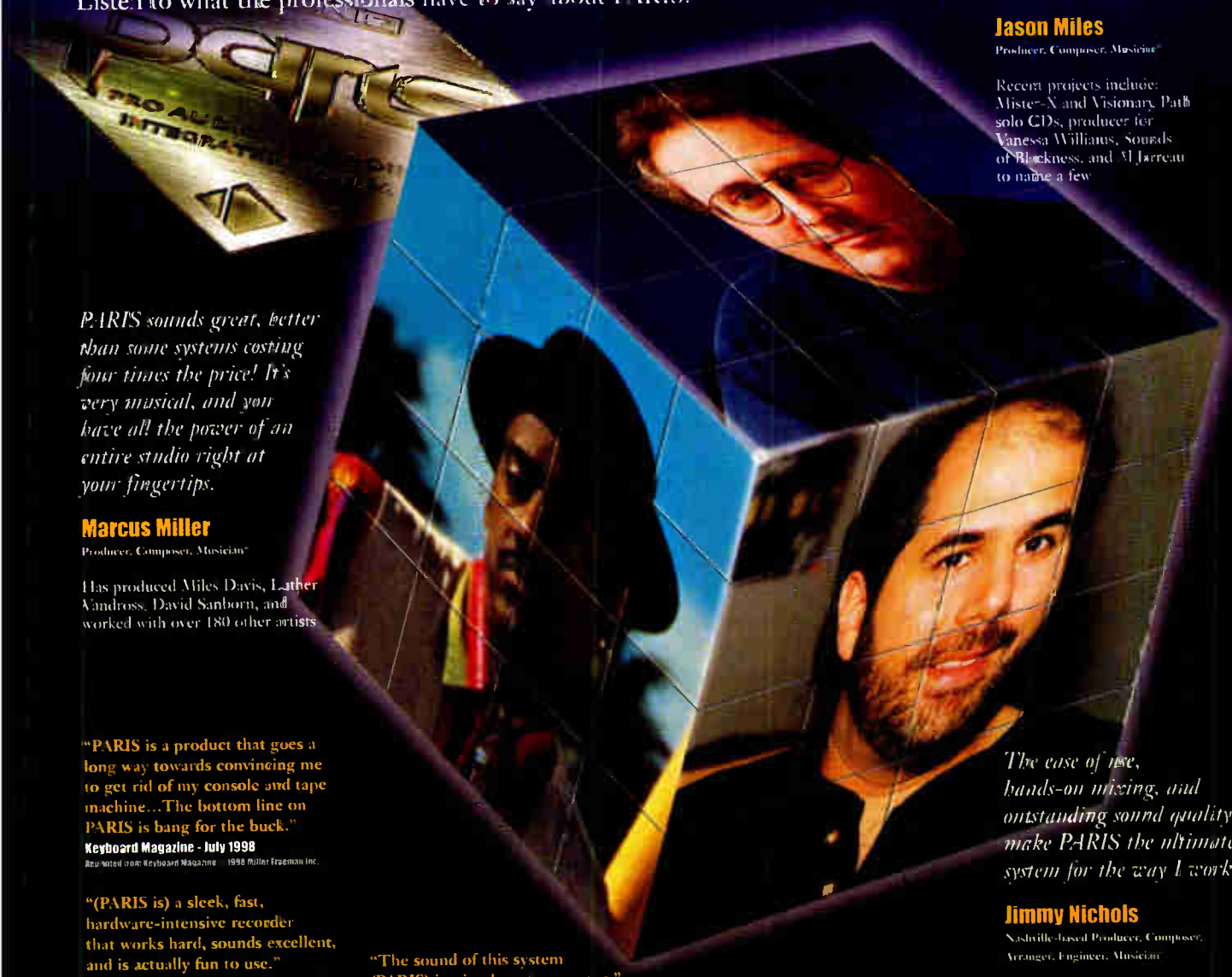

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about it, and you're out of here," I don't know how I'd deal with that. Or if they came in and just put my voice on a track and then told me to go home, that whatever they did to it I'd have to live with it.

***You feel like that's what happens to young artists now?***

I know that's what happens to them. They even tell them what kind of hat to wear. I tell you, I've always had trouble with somebody going to college for four years, getting a degree in marketing and then telling me they know more about my music than I do.

But they go in and they work their jobs and they produce their records and they go to the watering hole and they brag on each other. That's what it's about. I've been around some of these sessions, and I can never believe what's going on. The artists are scared to death, too, because they're only as good as their last record with these producers, and it has nothing to do with talent. It has nothing to do with the artistic or creative control of the artists. They have no control, and that's sad. Some of these guys are great little singers, and if they would be left alone they could be great writers and great artists, but they have to do what the big guys say.

***Why do you stay in Nashville?***

I'm not part of this. What I'm doing now is I'm cutting records and having fun with it. When it ceases to be fun, then I'll go where I want to. I have a home here and a home in Arizona. I don't have to have music or the business in my life, because I'm very happy. I've had a good run at it. And like I said in the book, the road is for young men or drug addicts.

***Or both.***

Yeah, it's a little rough. It's a hard road. And I like every once in a while to do shows, but I just have no pressure on me, and I'm not going to get into that song and dance.

***Tell me about how you write. Do you have a certain place to work?***

Yeah. The people at my house, I drive them crazy because it's the prettiest room in the house, the living room. That's where I keep everything, and it looks awful.

***Do you set aside a certain amount of time to work, or do you just write when it comes to you?***

I just write when it comes to me. I don't have any structure. I wrote "Are You Sure Hank Done It This Way?" in a car on an envelope as I was driving from my house—which is about three miles, red lights and all—to the studio and recorded it right then. A week or two later, I looked at the piece of paper that I wrote it on, and you couldn't even read one word, but I knew what it said when I looked at it in the studio.

Or sometimes I have songs, my little jewels, that I've had around for years. One song I've always liked and I've had around for 20 years is called "It Rains Just the Same in Missouri." I've never recorded it, but I do know some day I'm going to.

***Why haven't you recorded it?***

I'm the only one who likes it. [Laughs]

***Do you record demos as you work, or do you just write on paper?***

I put it on paper, and I usually know what the music is as I'm going. And when I finally get it together, I'll mess with it for a while and get all the kinks out, and then I'll put it down somewhere. My son has a studio in the back. He records rock 'n' roll and industrial rock. He's very talented. He plays several instruments, and he knows how to engineer. He knows all the equipment, all the mics and what they'll do. They learn a lot more nowadays, and he's computer-literate.

He's got a little vocal booth, too. It's just a little demo studio, but he's usually pretty busy. He does most of the


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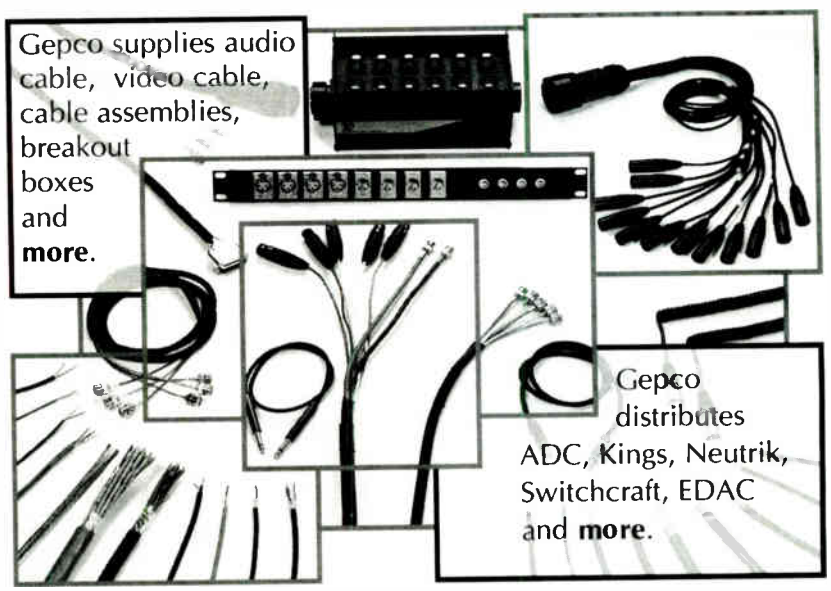


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music on his tracks. He works with two other guys, and they're definitely into the modern things—Nine Inch Nails and Metallica.

***What do you think of that stuff?***

I love it. I really do. You know, we did Lollapalooza, and he was onstage with me and sang a couple of songs. The reason I was on is that Metallica—James Hetfield—they wanted me. Best audience I ever played to. They were happy, they were jumping up and down. They were having their fun, and if they liked what you did, they really let you know it.

***What do you look for in a song to cover?***

That I relate—something that says something or you can feel it. "Closing In on the Fire," that's a nasty old song. It's so good. I've been wanting to record it for a long time. Tony Joe White [who wrote the song] is one of my best friends.

***How do you develop your arrangements?***

A lot of them, I just say 'Play.' If you've got an idea, we'll know if it's right or wrong. I usually have some idea of an arrangement, and I used to be more controlling about it, but I've learned that some of the musicians just always get told what to do and no one really lets them really stretch out. I let them stretch out.

***From the credits it looks like you didn't play any guitar on this record.***

No, I didn't.

***How come?***

I had a doctor in Atlanta operated on my hands and they're still not...He said I had carpal tunnel, but all he wanted was the money. I didn't have carpal tunnel, and it has caused a problem with my hands, and I'm trying to work my way back into it.

***Do your doctors expect you to recover?***

Well, I don't know. Some say I can, some say I can't.

***What do you say?***

I think I'll be able to play a little. They wanted me to sue him, but I think I just want to find him in an alley and operate on his face.

***Tell me about the guest artists on your album. How did you end up working with some of those people?***

Sting was in town—I think that was through Miles—and he played bass. I had met Sheryl Crow awhile ago. She's just the sweetest thing, and I think she is one of the most talented little gals in the world. The way she did that double-voice thing on the bridge [on the song "She's Too Good for Me"], that knocked me out. And then, of course, there's that twerp, Travis Tritt. [Laughs] He's my little buddy, and that was planned from the minute I picked that song.

***In your book, you say you really like his singing.***

He's got a great voice, and he's an artist at what he does. I really believe that. You know, all of these new singers in country music, 80 percent of them are imitating Merle Haggard and don't know it. And Merle Haggard was imitating Lefty Frizzell and didn't know it. But Travis Tritt is not imitating anybody. He sounds like Travis Tritt.

***Carl Smith sings on the record, too.***

Carl Smith still is one of my heroes. He always was. You know, he sings so great, I had to go in there and do my vocal over because he sounded better than me.

He's so funny, too. See, he retired years ago [in 1977] and has a little horse farm out there in Franklin. He just gave it up, and now all he does is chase his wife from room to room. They're the greatest couple. They're some of our best friends, Jessi's and mine.

So, one day I said, Carl I got this song I want you to sing on. He says, "I don't sing no more, now you leave me alone." That's the way he is. But I said, "No, no, no, now wait a minute. Here's the part you're doing." I just ignored him. "I'm not gonna sing," he says. "Don't be handing me that thing!" But comes time to record and he's learned the part. Carl is great, and I really enjoyed working with him.

***Tell me what else you want people to know about the new record.***

Well, I think every home ought to have one...I'm sorry I guess I'm not being serious. It's hard to be serious. The last time I was serious was 1956. ■

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*—FROM PAGE 180, TONY RICH*

first and foremost. I've got this music in my head, and I'll use whatever I need to get it down on tape.

"I like to experiment with different vocal and instrumental parts. Sometimes I'll take a song where I've got a main vocal line and then I just sing along to it and pretend to be these different background singers and I end up coming up with all these parts—it's almost like becoming a different character for each part. Great background parts can take a song to another level, so that's something I like to concentrate on."

"I think the most background vocals we had on any song was maybe eight—not extremely thick," Frye adds.



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"What was most interesting for me was doing the lead vocals because instead of going into an iso booth or something, he would be in the control room right next to me at the board with a microphone. Typically we used a [Neumann] 87 or an [AKG] C-12, and for a mic pre, a John Hardy or a Focusrite, typically into a Summit TLA-100 compressor to catch some peaks, to Studer A-80 multitrack. I also used the Avalon compressor and EQ. Vocally, we never did the traditional route of doing many lead vocals and then comping. We did very little comping. He'd get it right the first couple of times and when he'd say, 'That's the one,' he was always right. Obviously, he's a great singer."

Rich did use a few outside musicians and singers on the album, but he notes, "I use musicians because I want to, not because I have to. Like on the song 'Blue Butterfly' [on *Birdseye*], I played all the instruments and then at the last minute I decided to call in Peter Moore, who plays nylon-stringed classical guitar for me, to play the melody line on the acoustic guitar. I have some players who I really respect a lot and who can add another dimension to what I'm doing." Besides Moore, Rich's stable of players included bassist LaMarquis Johnson, a guitarist known simply as E. and percussionist Cedric Anderson. Frye notes that some of the drums were tracked at Doppler Studios in Atlanta, which he says is "one of the city's great live rooms."

Both of Rich's albums were mixed by Jon Gass—a veteran who has worked on many of Babyface's projects—on Lacoco's SSL 4000 Series with G-Plus automation. "He's certainly put his magic on all those mixes," comments Frye. "He's one of the best engineers I've had the pleasure to work with."

Rich agrees: "Jon is very clear in the way he works, and he's easy to communicate with. I've learned a lot about placement on the mix end working with Jon Gass. I was more instrumental in the mix this time. I'd do rough mixes and send them to Jon and then he'd work on those. Because sometimes you make a record and you have a vision of how it's going to sound and then the mix comes out totally different than you intended. So it's been important for me to learn about mixing so I can get it to sound the way I want to."

Although he toured quite a bit behind *Words*, opening dates for Sting, Mariah Carey and Tina Turner, Rich says he has no desire to spend his life on the road, preferring to make his statements in the studio, as both an artist and producer. He loves wearing both hats, and so far all of his work has shown a Midas touch. Rich believes its because he listens to his heart instead of following trends.

"I'm not influenced by today," he says. "I don't listen to the radio. So when an artist comes to work with me they know they're not going to get a record that sounds like everything else that's out there. I like to think I bring freshness to my productions because I deal with the basics. My thing is, 'Hey, turn down those keyboards! Let's hear the vocals better! Let's listen to it low instead of loud,'" he says with a laugh. "I bring a different attitude. I'm not trying to hype anybody up to do something they don't want to, or something that I want them to do.

"People keep telling me that what I do is different, but I'm just doing what I do, you know? People in the industry want to label myself and Maxwell and Erykah Badu and D'Angelo as some kind of 'alternative R&B,' whatever that means. But I don't sound like Maxwell and D'Angelo. Erykah Badu might sound a little like D'Angelo, but doesn't she also remind you a little of Billie Holiday with a hip-hop beat? I don't know—I hate labels. One of the things I learned from Prince is to just be yourself and do what you feel and write what you want. I don't look at myself in the mirror and say, 'Okay, I'm a black man, so I've gotta do R&B.' They say Michael Bolton is a pop guy, but I'm sorry, he's R&B. There are fine white boys doing rap. In the end, music is music and you can do what you want." ■

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*—FROM PAGE 181, HERBIE HANCOCK*

Handy, Duke Ellington, James P. Johnson and Maurice Ravel were recorded by a stellar cast, including Stevie Wonder, Wayne Shorter, Joni Mitchell, Chick Corea, soprano Kathleen Battle, and the Orpheus Chamber Orchestra.

The project involved some detailed plotting by Sadin and Hancock, who first met at the Kennedy Center for the Arts several years ago, after a concert for which Sadin had written some arrangements. "After we discussed the idea in general terms," Sadin says, "I put down a treatment, a broader philosophical plan of what we were trying to do. This included possible repertoire and suggested forces. Herbie was interested, and we decided to pursue the idea."

In the summer of '97, while Sadin

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PHOTO: JIMMY KATZ

***Herbie Hancock (L) and Chick Corea***

was in Holland attending a series of Philips Classics meetings, he hooked up with Hancock, who was performing at the Vienna Jazz Festival. "I took a plane down from Amsterdam, met Herbie at his hotel at about 5 p.m., and cabbed back to my hotel at 6 a.m.," Sadin recalls. The Gershwin project was in motion.

An early decision involved arranging the material in a way that would lock down critical aspects of the music yet leave ample run for the improvisatory skills of the players. "An interesting example would be the way we handled 'Gershwin's Lullaby,'" Sadin says. "This work was originally composed for strings alone, but we restructured it to allow Herbie to freely embellish and solo on top of the Gershwin material. He had a score and improvised on top of the Orpheus Orchestra. There were no significant changes in the form of this, the most structured of the works we recorded."

"Someone to Watch Over Me," a duet between Hancock and bass player extraordinaire Ron Carter, fell on the other end of the spectrum. "Herbie worked hard reharmonizing the changes to this piece [a bonus track on the Japanese release only] and adding an intro. He wrote out the chart and gave it to Ron, who just came in and played it down at sight."

Sadin, a scholar as well as artist—he taught at Princeton University for seven years—notes that the score to *Porgy & Bess* includes a brief polyrhythmic interlude. Notations on the score indicate that Gershwin intended to evoke the sounds of African drums at this point. Using this concept as a jumping off point, Sadin brought in a group of five percussionists—four West Africans and a Brazilian. "I wanted to evoke the mood of what African-American music must have sounded like to Gershwin in the 1920s," Sadin says. "Jazz and blues are too familiar—they've been too processed at this point. These great percussionists, sitting on a groove, evoke that spirit."

The bulk of recording was done in New York, but Sadin and Hancock flew to L.A. to track Stevie Wonder, Joni Mitchell and Wayne Shorter at Ocean Way Studios, which has a Sony 3348 digital recorder (the recording medium of choice for the entire record). Joni Mitchell is not generally thought of as a chanteuse specializing in the works of Tin Pan Alley greats, but Sadin believes she magically captured the spirit of "The Man I Love" and "Summertime." "People are going to be surprised in a wonderful way when they hear her work on this album—she was really special," Sadin says. "The right key for her was determined in rehearsal, and the band nailed it."

Stevie Wonder contributed harmonica parts to "Summertime" and W.C. Handy's "St. Louis Blues," and sang on the latter, as well. "Herbie and I had worked out a harmonica plan for 'St. Louis Blues,'" Sadin comments. "Then Stevie came in and put in his two cents—two million dollars' worth would be more appropriate—to the session. We were all looking for a beat for the track, when Stevie started to rap on his thighs. Drummer Terri Lyne Carrington picked up the pattern, and then the bass player joined in. Herbie had devised a bass line for the harmonic structure of the piece as we'd worked it out, and that line worked perfectly with the groove Stevie had suggested, so we were off to the races. At every turn, Stevie had ideas



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about the flavors and nuances of the piece—where it should turn, how it could grow—and they were perfect."

Hancock was joined by Chick Corea on a duet performance of J.P. Johnson's "Blueberry Rhyme," and by Kathleen Battle and the Orpheus Orchestra and Cyro Baptista on a vocalese treatment of Gershwin's Prelude #2 for piano. The second movement of Ravel's Piano Concerto in G (the post-impressionist master and Gershwin were mutual fans), as well as "Gershwin's Lullaby" were recorded by Hancock and the Orpheus Chamber Orchestra at Sony's West 54th Street soundstage. Sony's Director of Audio Operations, David Smith, was critical to the success of the sessions, according to Sadin: "David supervised the hanging of a set of wooden acoustical clouds, which were dropped from the ceiling to provide a more natural resonant environment—we didn't want to rely on reverb units. Rob Eaton, Pat Metheny's engineer of choice, was behind the board. Rob worked with the Sony classical music specialists to get the most resonance out the room."

With the exception of the orchestral cuts, most of the New York work was recorded at Right Track, with Eaton engineering. "We chose Right Track for a number of reasons," Sadin says. "They have great technical support—we worked there for 15 days and had no down time. Plus, they have old Neve mic pre's on every channel, which was very important to me. It's a superb place to work."

Overdubs on "Honeyman," and "My Man's Gone Now," selections from *Porgy & Bess*, were recorded at Masters at Work Studios. This last track began with Sadin programming some percussion loops in MOTU's Performer using an Akai S3000 sampler. Come tracking time, Cyro Baptista played along with and then replaced most of the loops. Dave Darlington, an engineer and co-owner of the studio, worked with Sadin for two days on these tracks. "We spent this time blending live and sampled percussion parts. Dave is extraordinary. His sense of timing, of when to go from the live tracks to the sampled ones, and make them lock up naturally, is fantastic."

All mixing on *Gershwin's World* was done at Sony with Bruce Swedien, who has worked extensively with Hancock in the past. Swedien supplemented Sony's setup with racks of his own gear, some of his own cabling, his own half-inch Studer analog tape deck and his Westlake monitors. Sadin notes that the judicious use of an EMT 250 plate reverb was one of the keys to the success of the mix. "No one beats Bruce in his concern for sonic details and warmth," he says. "We mixed with very little or no compression. Everything went to analog half-inch except Kathleen Battle's work and the two orchestral pieces, which we mixed to the Sony 9000 magneto optical because of the low noise floor."

All in all, the album stands as an extraordinary blending of Gershwin's timeless compositions with a cast of contemporary musical giants; bits of yesterday and today. "We tried to construct the music in a way where Gershwin is the foundation," Hancock says. "But this is my record, and it was necessary for me to have my musical personality represented fully. I had the freedom to express Gershwin—the way I felt about those pieces at the moment I played them—throughout the album. Jazz is about constant change, and a good performance reflects how you feel at the time.

"Gershwin had a wonderful, modern harmonic sense—that's obvious," he continues. "He's been a major force in both popular music and jazz for so many years that his contribution is built into the fiber of both. These genres have captivated me for most of my life." ■

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—FROM PAGE 182, COOL SPINS

registered disappointing sales compared to his double-Platinum 1996 debut, *Maxwell's Urban Hang Suite*, but in every other respect it is a successful follow-up. (*Maxwell—MTV Unplugged*, a convincing demonstration of Maxwell's in-performance abilities, is a 35-minute EP.) Like the first studio album, *Embrya* is a suite of songs featuring Maxwell's multi-tracked vocals against a constantly shifting backdrop of sophisticated arrangements. Maxwell and his arrangers revive the familiar motifs of the soul orchestra—liquid bass, wakka-wakka guitar, horn stabs, string pads, burbling synthesizers—and weave a detailed sonic tapestry that rewards repeated listenings. Relaxed but purposeful, Maxwell glides his gorgeous falsetto around the sonic landscape, equally at home in Norman Whitfield/Barry White territory and more modern surroundings reminiscent of Bryan Ferry's cool and limpid modes. Like Ferry, Maxwell has a tendency to draw short phrases and song fragments out into musically static themes, and *Embrya* lacks memorable melodies, but the instrumental and vocal arrangements are a delight.

Producer: Musze (except three tracks produced with Stuart Mathewman). Mixers: Mike Pela with Musze (except three tracks co-mixed with Stuart Mathewman and one track mixed and engineered by Glenn Marchese with Musze). Studios: Musze NYC, Sony Music Studios (NYC), Cottonbelly Studios (NYC), Hit Factory (NYC). —*Chris Michie*

**Los Super Seven: *Los Super Seven* (RCA)**

Two years ago, Ry Cooder's *Buena Vista Social Club* CD brought acoustic-based Cuban folk music to a huge worldwide audience. *Los Super Seven* is good enough to do the same thing for Mexican folk music. The group is an all-star band of sorts, consisting of Los Lobos' guitarists/singers David Hidalgo and Cesar Rosas, *conjunto* accordion legend Flaco Jimenez, versatile singer-guitarist Joe Ely, the Texas Tornados' Freddy Fender, *Tejano* singer Ruben Ramos and up-and-coming Austin singer Rick Trevino, all supported by a handful of other great players from the Tex-Mex musical community. Most of the songs are traditional folk tunes, with a sprinkling from other sources, including one each by Rosas and Hidalgo (with Lobos mate Louie Perez) and the lone song entirely in English, Woody Guthrie's "Plane Wreck at Los Gatos (Deportee)," sung by Ely. The playing and singing is outstanding throughout the unfailingly lyrical and wide-ranging material.

Producer: Steve Berlin (of Los Lobos). Engineer: Dave McNair. Studios: Cedar Creek Recording (Austin, TX), Sunset Sound Factory (L.A.; mix only). Mastering: Doug Sax/The Mastering Lab (L.A.). —*Blair Jackson*

**Dave Alvin: *Blackjack David* (Hightone)**

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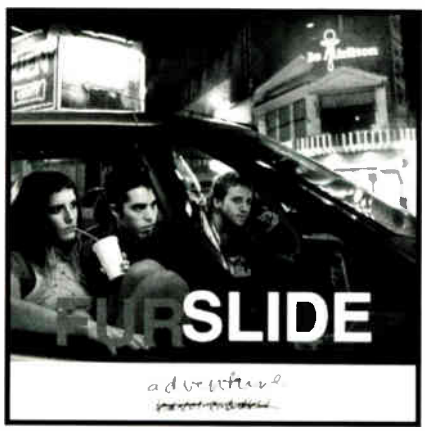
about how he answers when people ask what genre category his music goes in. He says, "I play folk music." Then, the story goes, when half the people have run away screaming, he says, "There's two kinds of folk music: quiet folk music and loud folk music. I play them both." The loud folk music is, of course, the type of roots rock he played with The Blasters. His more quiet side came out on the luminous and critically hailed *King of California* album. *Blackjack David* showcases both kinds, and the result couldn't be more satisfying. With his dark, intricately textured version of the title track, wrenching and poetic story songs like "California Snow" and blues rockers like "Laurel Lynn," Alvin shows what folk music can be. Producer/musician Greg Leisz and Alvin's band, the Guilty Men, help play complex arrangements of strings, keyboards, drums and the occasional clarinet that shine around Alvin's deep, stirring voice.

Producer: Greg Leisz. Engineer: Paul duGre. Recording Studios: Media Vortex, Paul & Mike's (both in Burbank). Mixing Studio: Bernie Becker's (South Van Nuys). Mastering Engineer: Joe Gastwirt/Oceanview Digital Mastering (L.A.). —*Barbara Schultz*

**Furslide: *Adventure* (Meanwhile.../Virgin)**

Jennifer Turner may have received her greatest exposure as the lead guitarist on Natalie Merchant's hit album, *Tiger Lily*, but this debut by her three-piece band Furslide bears little resemblance to Merchant's tuneful and occasionally precious pop. Turner's vision, as expressed through her lyrics and her guitar playing, is much darker and edgier, though her vocal style actually does recall Merchant occasionally. Produced by Nellee Hooper, who has worked with such groundbreaking artists as U2, Massive Attack, Madonna, Björk, Garbage and Smashing Pumpkins, the album is an eclectic melange that moves with impressive fluidity from loud, thrashing rock to dreamy, string-laden songscapes. The plethora of guitar textures—'60s-psychedelic one moment, '90s-jagged the next—reminds me a bit of Smashing Pumpkins, and Turner works with musical dynamics in a way that recalls the Pumpkins' Billy Corgan. But Furslide has developed an original (if slightly schizophrenic) sound, and certainly there's no shortage of good ideas here.




Producer: Nellee Hooper. Engineer: Pete Lewis. Studios: Metropolis (London), Olympic (London), Abbey Road (London). Mastering: Howie Weinberg/Masterdisk (NYC).
—*Blair Jackson*

**Smith & Mighty: *DJ Kicks* (STUD!O K7)**

The Bristol, UK, production duo Rob Smith and Ray Mighty have contributed a sprawling installment to the DJ Kicks series released by label STUD!O K7. Smith & Mighty are said to be progenitors of the Bristol "Freestyle" sound—a blend of drum and bass, hip hop, trip hop and reggae—which has made the likes of Portishead and Massive Attack famous. Due to a falling out with a UK label in the early '90s, the group's work was largely unavailable, but their reworking of Burt Bacharach and Hal David's "Walk On By" garnered attention in dance clubs. This 24-track CD showcases the duo's deft mixing aesthetic, stretching and playing with all aspects of the Bristol scene: full-on-stoned, reverberant dub with toasting; crackly and skittering jungle; beats and scratches from the 'hood (or in this case, from the government housing blocks); almost frighteningly smooth-n-hip diva-driven grooves. Easy listening for the next generation.

Recorded at Rob Smith's home studio (Bristol, UK). Mastering: Chillout Studios (Berlin, Germany) —*Anne Eickelberg*

**Royal Crown Revue: *The Contender* (Warner Bros.)**

Each of the most popular bands in the retro neo-swing movement brings something different to the table. The RCR's greatest strength is the generally high quality of their original songs and the integrity of their horn arrangements, which have been beautifully captured here. These guys have chops and attitude, and though there is certainly an element of whimsy involved in this project, they're not playing it for laughs or for camp value exactly. I like their choice of covers, too: Their swinging version of "Stormy Weather" is a nice, different take on an over-covered standard; the '50s tune "Morning Light" lets the band tackle a latin/calypso feel, and Dizzy Gillespie's "Salt Peanuts" shows off the band's boppin' side. A fun workout by a fine bunch o' mugs.

Producer: Ted Templeman. Recorded and mixed by Jeff Hendrickson and Lee Herschberg. Additional engineering: Rod Michaels, Jason Mauza. Studios: Royaltone (North Hollywood), One on One (North Hollywood). Mastering: George Marino/Sterling Sound (NYC).—*Blair Jackson* ■

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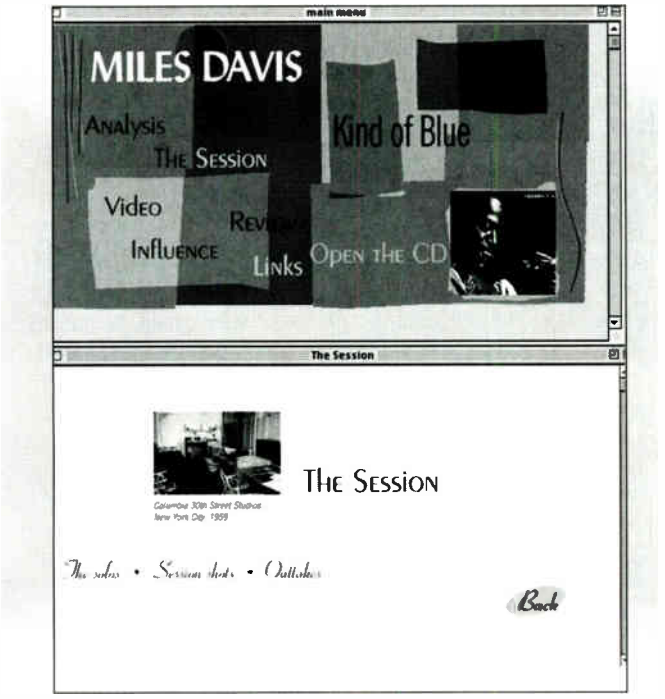
# MEDIA & MASTERING NEWS




*Sony Music's ConnecteD web site features multimedia content for a number of CDs, including Miles Davis' Kind of Blue.*

**SONY GETS MILES CONNECTED**

Integrating the World Wide Web with the audio CD, Sony Music has added Miles Davis to the list of artists with multimedia content available on its ConnecteD Web site (www.sonymusic.com/thelab/ConnecteD). Based around the free Macromedia Shockwave player and an accompanying CD Control plug-in, the ConnecteD site allows users to listen to a standard CD-Audio disc in a CD-ROM drive while experiencing synchronized playback and linking of multimedia content residing on the site's server. In addition to Davis' classic *Kind of Blue* album from 1959 (arguably one of the most influential jazz albums of all time), the site also features material for *Whatever and Ever Amen* by Ben Folds Five, *Blizzard of Oz* by Ozzy Osbourne and *Inspired by Bach* by Yo Yo Ma.

The *Kind of Blue* material includes a synchronized transcription of Davis' solo on "So What," photos of sidemen (John Coltrane, Cannonball Adderley, Bill Evans, Wynton Kelly, Paul Chambers and Jimmy Cobb) that link to their solos on the CD, Davis' comments on the sidemen and the making of the album, and previously unreleased photos from the sessions, as well as reviews and historical essays. The site also features a video clip of Miles performing "So What" for a 1959 CBS television special.

According to Sony, the ConnecteD approach allows content to be developed retroactively to work with any CDs already released on the market, and for content to be revised at any time without any changes to the audio CD itself. That makes the ConnecteD approach an intriguing alternative to the long-stalled Enhanced CD concept, which requires a pre-release development effort, which is not only potentially costly but also can delay shipment of the CD. The Web-centric approach will allow anyone who has a browser, the downloadable Shockwave plug-in and a CD-ROM drive to access the multimedia material, though they will be running up connect-time charges if they are not on an unlimited use Internet plan.

**BY PHILIP DE LANCIE**

**SURROUND HOUSEHOLDS TOP 31 MILLION**

Dolby Laboratories announced its latest figures for penetration of surround sound playback systems into the homes of consumers. "More than 31 million consumer products with Dolby Surround decoding have now been shipped worldwide," says marketing VP David Watts. "In addition, more than 600,000 receivers and outboard decoders with 5.1-channel Dolby Digital have been shipped in the short time that they have been available." Based on these figures, Watts estimates a total population of about 100 million people that can listen to programs either in the matrixed Dolby Surround format or in Dolby Digital (AC3), which has been adopted as a standard audio format for both DVD and DTV.

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10% of the weekly Billboard Top 200 chart. The company says the releases, listed in the latest HDCD directory, have sold more than 60 million copies in the first two years of availability. Prominent among new releases in the catalog are current albums from Paula Cole, Natalie Merchant, B-52's, John Lee Hooker, Garth Brooks, Neil Young, Mark Knopfler and the Grateful Dead. Pacific Microsonics also reports that over 100 HDCD-equipped CD player products are now available.

## MASTERING NOTES

**Time Capsule Mastering** has moved into the old Bernie Grundman Mastering site in Hollywood, CA, as Grundman shifts to a new facility. The four-room Time Capsule space is based around fiber-linked Sonic Solutions workstations, with Genelec monitoring and additional signal processing by Avalon, Manley and Weiss...At **CMS Mastering** in Pasadena, CA, engineer **Robert Vosgien** worked on the Phunk Junkeez, The Flys and Dreamhouse, all for Trauma Records. Vosgien also mastered the Kottonmouth Kings for Capitol and Mary Cutrufello for Mercury...**Oceanview Digital Mastering** in Los Angeles was the site of mastering sessions for Hootie & The Blowfish, Willie Nelson, Dionne Warwick, Robbie Robertson and Mickey Hart...**David Glaser** of **Airshow Mastering** (Boulder, CO) mastered albums for John Gorka, the Nashville Bluegrass Band and Lee Nestor. Glaser also worked with Dean Everson of New Age label Soundings of the Planet on projects including Scott Huckaby and Tom Barabas. Meanwhile **Charlie Pilzer**, working out of Airshow's original Springfield, VA, room, worked on Smithsonian/Folkways projects including "Southern Banjo Sounds," "Africans in America" and Dock Boggs...The Latin lineup mastering at Hackensack, NJ's **Trutone Inc.** included Tito Puente, Joe King, Tony Vega, Raul Paz, Miles Pena and Marcos. In a dance/R&B groove, meanwhile, were projects from J.T. Taylor and Debra Michaels. Trutone also reports that the single "Can't We Try" by Rockell is climbing *Billboard*'s Hot 100 chart...Toronto's **Lacquer Channel** is working on a "best of" compilation for Holly Cole, as well as mastering projects for Hagood Hardy, Leonard Fisher's Groove Club Kids, Captain Tractor and LL Cool J. ■



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# COAST TO

## L.A. GRAPEVINE

**by Maureen Droney**

NRG Recording Services in North Hollywood has opened a third room, the Gothic Revival-themed Studio C, complete with a "raven black" 72-channel SSL 9000 J Series console. With acoustic design by George Newburn of Studio 440 and interior styling by Grace Gehman (who also designed NRG's Moroccan-motif Studio B), Studio C is set up as a mix suite, complementing NRG's existing rooms, both of which feature large tracking spaces.

The prevailing impression upon entering the five-year-old NRG complex has always been one of spaciousness—high ceilings and open areas with plenty of lounges and lots of secure parking. It's the kind of place bands feel comfortable settling in to: Groups like 311, Sugar Ray, Hootie & The Blowfish, No Doubt, Tracy Chapman and Ice Cube have all been in for long-term projects, and the trend continues, with Korn locking out Studio B for five months this year to record their Number One album *Follow the Leader*.

That comfortable atmosphere originates with owner Jay Baum-

—CONTINUED ON PAGE 207

*The new Studio C at Sear Sound, with custom console*

PHOTO: MAUREEN DRONEY

*Studio owner Jay Baumgardner (L) and manager Kit Rebhun at the SSL 9000 J in NRG's new Studio C, the Raven Room.*

## NY METRO REPORT

**by Gary Eskow**

Walter Sear has been around the block, as musician (tuba player with the Philadelphia Orchestra), synthesizer pioneer (Simon & Garfunkel's *Bookends* was recorded at his studio in the '60s, and Sear says his Moog performances on the album were the first in pop music) and studio owner. At a stage in life when many professionals are off smelling the roses, Sear—who puts in about 70 hours a week at Sear Sound, his midtown recording studio—has just built a new room. Why?

"I was blackmailed by my landlord!" he says. His ten-year lease was expiring, and the building owner had two floors he was unable to rent. So, the deal came down to Sear taking on both floors or giving up his space entirely. "I wasn't anxious to build another room, but I'm glad I did. It turned out quite nicely," he says.

*Mix* stopped in at Sear Sound recently to see the breathtaking new 4,800-square-foot live room, which Sear calls his graduation exercise—"I needed to find out if I've learned anything in the last 50 years!" The first thing one notices upon entering the live space—after basking in the sunlight wafting in through the reinforced windows liberally sprinkled throughout the space—is the lack of obvious acoustical

—CONTINUED ON PAGE 208



World Radio History

# COAST

## NASHVILLE SKYLINE

**by Dan Daley**

Nashville has the world's densest population of studios; the local business (historically, highly insulated from the coasts) has been shielded in large part from major changes in the industry, such as the emergence of project studios, until very recently. But in the past five years those changes, now fully developed, have hit harder and with more focus in Nashville than anywhere else. Always characterized by its cliquish nature, the Nashville studio community became downright fractious as the economic pressures of the mid-1990s increased.

NAPRS, the Nashville Association of Professional Recording Services, was founded nearly three years ago, and most would agree that its primary accomplishment to date has been its very existence. The seed for NAPRS was born in the local industry's equivalent of Concord and Lexington: a historic and hastily assembled meeting of studio owners and managers at Georgetown Masters in 1995 to vent concerns about the noise impact of a proposed heliport in the heart of Music Row. The organization's first administration, led by Castle Recording owner Josef Nuyens, was propelled by that same sort of populist dy-

—CONTINUED ON PAGE 210

PHOTO DAVID GOHSON

*With A&M recording artist Barry White (R) at the SSL 9000 J in Studio B at Record One (Los Angeles) were assistant engineer Greg Collins (L) and producer/engineer Jack Perry, during sessions for White's upcoming album.*

*Nashville's Studio III recently completed renovations and installed a 56-input Euphonix CS2000. The studio is also equipped with Otari 24-track analog and Mitsubishi 32-track digital tape machines.*

## SESSIONS & STUDIO NEWS

### SOUTHERN CALIFORNIA

Laughter Train recorded their new one for Will Records at Billy Cobb Recording (Moorpark). Producing and contributing guitar work was Stone Temple Pilot Dean DeLeo. Tracy Chisholm engineered...At Paramount Recording in Hollywood, Head Set (formerly Don Knotts Overdrive) tracked and mixed their Centipede Records debut with producer Jim Goodwin. Deborah Cox was also in, mixing new tracks with producer Montell Jordan and engineer Anne Catalino...Producer/engineer Ulrich Wild tracked Static-X for the Warner Bros. debut at Grandmaster Recorders (Hollywood). Michael "Elvis" Baskette assisted...At Skip Saylor Recording (L.A.), Marilyn Manson mixed a new Nothing

—CONTINUED ON PAGE 212

World Radio History

Space at the complex has been maximized. A new entrance/reception area and lounge have been added, making the previously existing lounge a private one for Studio A, and all the recording spaces are now accessible from both control rooms. With an eye to flexibility and the future, Vincent has taken what was Studio B's large tracking room and created a designed-for-5.1 control room, one of the first in L.A. built with large speakers specifically placed for surround sessions. "You need a lot more space to do a 5.1 control room properly," explains Vincent. "So, basically, we've turned the rooms around. We took the soundproofed shell and basically gutted it—what was the tracking room is now our control room, and we've made a mastering room out of the control room."

The new 5.1 room was acoustically designed by Carl Yanchar, using his custom Wave:Space 5.1 large monitor system. "Carl built rooms for Quad," Vincent says. "He knows how to deal with the problems inherent in multiple speaker placement."

Front Page has also upgraded to a Euphonix 3000, which features moving fader automation, 96 mono or stereo input faders, 20 aux sends and dynamics on every channel, along with Euphonix's trademark SnapShot Recall of level, dynamics, EQ, sends and electronic routing. Like its CS2000 forebear at Front Page, the console is fitted with the surround cube and the TT007 machine controller/synchronizer that controls up to three serial machines and also talks to Lynx synchronizers for parallel machines.

"I jumped into Euphonix early," Vincent says, "and it was a good decision. The consoles sound amazing, and they work great." A lot of people concur. Rich Nevens of Euphonix informs us that there are now over 100 Euphonix consoles installed in Los Angeles: L.A. "Babyface" Reid owns four, Hans Zimmer has four, Glen Ballard has two, with other converts including Bruce Springsteen, David Lynch, Maurice White and George Duke.

"People have been wary of what they see as a learning curve," Nevens comments, "but the way most people use them is to set up templates for how they want the board to operate—that way they don't have to start from scratch and it becomes very easy. The new 3.2 version software allows you to start with a default setup, and you can get to work almost immediately."

The Euphonix's demonstrated capacity for post-production work led Vincent to make other accommodations to that market, and a Sharp high-resolution projection video system with a 12-foot screen is a very cool feature of the new Studio B. Convenient for both lock-to-picture sessions and for projecting Pro Tools screens, it's also a great way to watch your favorite television show—this is a *very* nice picture!

Along with options for flexibility, Vincent has been giving a lot of thought to recording formats. "I will probably end up with one 24-track analog and one 24-track hard disk system in each room. Since I'm a Euphonix fan, I have high hopes for their hard disk system. I looked at the RADAR II and it's quite impressive, but it won't be 96k/24-bit, and for me it's worth waiting a few months to get another few years out of the format—these days, that's no small thing for a studio owner.

***Jars of Clay mixed a new song for Essential/ Silvertone in Studio B at The Village Recorder (West L.A.) with producer Mark Hudson (seated).***

"I've tried to cover a lot of bases here," Vincent says. "I can't predict the future; all I can do is make educated decisions. We're set up for 5.1 records, and for high-end video and low-end film. If film goes the way records have, then it's possible that everyone won't be using huge soundstages in the future. Some people will say, '80 percent of our market is home theater; let's mix in a room that sounds more like that reality.' Well, we've got that room here at Front Page. It's also a room that's great for stereo or 5.1 record mixing. I just want to let people know we're here, and that we're an option."

**On the way out of Front Page we poked our heads in the door of Bobby Bee's Sonic Solutions mastering suite** ("The name is actually Digital Audio Dynamics," he says, "but everybody calls it DAD Mastering"), where he was finishing up work on the soundtrack for the Jackie Chan/Chris Tucker film *Rush Hour*. Bee has found himself with a growing business lately, with projects ranging from Lalo Shiffren to Nate Dogg. "I started out in radio," he says, "where I spent 12 years of my life playing hit records for 18 hours a day. I think that helped me develop a sense of what things should sound like. I was mastering my own productions, and people heard what I was doing and asked me to master their projects—it just turned into a business."

Besides his Sonic system, Bee is a proponent of Exact speakers. "Each pair is handmade," he explains, "and they go down to 32 Hz, completely uncompressed—you get a very exact replication of what you have on tape. The designer of Exact speakers matches each pair of drivers, spending however long it takes to do it. So you don't want to blow one, because it's not like with an NS-10, where you just pull a driver off the shelf and drop it in place."

For clients who aren't familiar with the Exacts, DAD is also set up with Tannoys with Manley crossovers and Augspurger mains with JBL drivers. "We keep busy, and we have fun here," Bee says. "I have a sign that says, 'Check your sunglasses and egos at the door'—we're here to work." ■

*Fax your L.A. news to 818/346-3061 or e-mail nismdk@aol.com.*

*—FROM PAGE 204, NY METRO REPORT*

treatment. "We spend our lives as musicians training and performing in real rooms," Sear explains, "but studios force us to do our best work in artificial environments. I wanted to create an open space that would encourage artists to relax and do their best work."

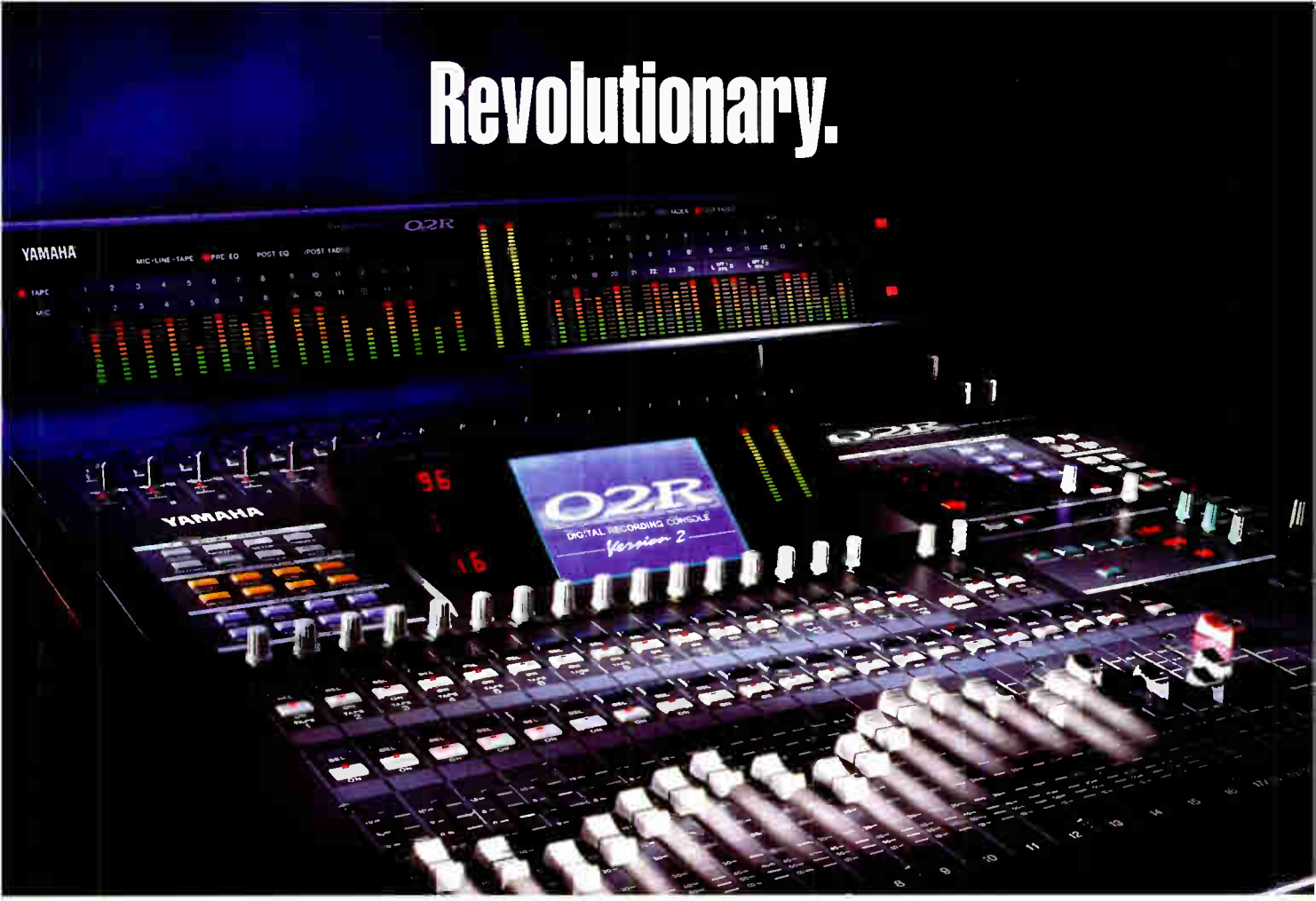
Supplemental lighting is provided by chandeliers, and the waffled acoustical ceiling, coupled with the ruby red drapes that adorn the windows, add to the ballroom effect. Two isolation booths for guitars and soloists, plus a piano room, round out the space.

Sear has been involved with the evolution of digital standards since the topic was first bandied about at AES meetings, and despite his fondness for vintage gear, he's no opponent of new technology. In fact, Sear worked intimately with Bob Moog when he was developing his synthesizer technology, and a vintage Moog sits in a project room on the sixth floor, not far from the Studer J-37 1-inch, 4-track machine that



World Radio History

# Revolutionary.

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CIRCLE #148 ON PRODUCT INFO CARD

the Beatles cut *Sgt. Pepper's* on. Sear Sound bought a Studer Dyaxis workstation years ago, and clients continue to cut sound digitally on a regular basis.

Sear is still convinced, however, that analog recording remains far superior to any current digital format, and his new room is built around an Ampex 300 machine that he has converted from its original 2-track, ¼-inch format to function as a 2-track, ½-inch machine. Several vintage Studer C-37s dot the control room, as well. They sit alongside Panasonic SV3800 DAT and Studer D740 CD recorders.

The console is a story unto itself. In the early 1970s, Sear custom-built a 16-channel vacuum tube console. "Everyone was building transistor consoles at the time, but they sounded terrible!" he remembers. "I've always been out of sync with whatever trends were current. That includes my years building tubas. I updated a design that had been classic for a long time and built over 2,000 instruments, which sounded quite good."

Twelve channels of his vacuum tube console have migrated onto the left side of a Sony 3036 frame, which Sear bought from a Scientology temple on the West Coast. "We took the Sony frame because I like the routing, and added GML automation and A80 custom-wound transformers. I like transformers the way I like vacuum tubes—they always sounded better until about five years ago, when solid-state technology got to the point where it sounded acceptable."

The console, designed and built by the staff of Sear Sound, has 24 buses and a pair of broadcast buses. The signal path was stripped out and replaced with custom-built Avalon Class A M3 microphone preamps and Avalon Model E3 EQs. "My friend Win Murrow at Avalon agreed to build all of the mic pre's and EQs," Sear says. "The equalization goes all the way up to 32 kHz, and believe me, there's a lot of information coming to our ears well above the 20kHz range that most digital technology limits us to."

The trend in New York City studio construction clearly favors all-digital rooms, but Sear is putting his faith (and a good deal of cash) on the line, based on his conviction that quality analog rooms are a must. "Everything is built around style these days," he says. "All of the studios in town are putting in SSL 9000s and going fully digital wherever they can. But the sound isn't there! Maybe someday, but not now.

"I played with the Philadelphia Orchestra," Sear continues, "and I know what a great string section sounds like. As long as digital recordings cut off at 20 k or so, you'll never get me to buy a CD! The strings get thinner and thinner as they go into the upper registers. Put any CD next to a vinyl recording of the same material, and you'll hear it for yourself!" Sear says that the custom console in the new room "stays flat to 59 kHz, and it goes all the way up to 500 kHz, still capturing information." When it's pointed out that no mic can capture that data, nor can speakers re-create it, Sear replies, "True, but it's there, and it comes through as a color that's present in the live sound as well, one that's harshly eliminated by the current generation of digital recorders." ■

*E-mail your New York news to New York editor Gary Eskow at scribeny@aol.com.*

*—FROM PAGE 205, NASHVILLE SKYLINE*

namism. But organizing a group of people who are, by nature, social and business mavericks took its toll; Nuyens resigned as the organization's president in the fall of 1997, citing, among other reasons, the fact that running such an organization was becoming a full-time job.

Membership had dropped an estimated 25% as the realities of running a trade organization became apparent. NAPRS's current administration reflects this stage in its evolution. The group has been led by Fred Bogert, owner of Studio C Productions, since last December, and he is the conciliatory successor to the firebrands that started it. In a conversation, Bogert, who comes from the Northeast but who spent 20 years in Florida before coming to Nashville, acknowledges that the organization he took over was "adrift and out of focus"; but, he stresses, "it never had developed a sense of negativity or hostility. A lot of people had their own conceptions about what NAPRS should be, but it never devolved into actual camps of Hatfields and McCoys. People were simply drifting away back to their studios for personal survival. Josef did a great job of getting NAPRS going. What we need to do now is give the organization an infrastructure, a focus, deal with the mundane day-to-day aspects of running a working organization. Things like getting a fax machine." He's not being facetious; NAPRS's membership suffered from administrative lapses, including basic procedures such as getting dues notices out.

"NAPRS is a valuable forum for a lot of things," Bogert says, "like co-op insurance buying and how to deal with an aging installed base of PD machines. Mundane stuff, but necessary stuff. At the same time, it has to focus on people. I know that sounds vague, but it's not. There are other organizations in town, like AES, that focus mainly on technical agendas. We can work with them and bring a more neighborhood sort of feel to the community."

NAPRS co-sponsored—with SPARS and the MPGA—a 5.1 surround mixing seminar in August in Nashville. Bogert has also given the organization's three vice presidents specific administrative mandates, such as developing events to increase Nashville's profile, including accompanying the Chamber of Commerce to trade shows. "We're making NAPRS information-oriented," says Bogert. "One thing we noticed in the first year of the organization was that everyone was coming up with great ideas, but few of those ideas were getting accomplished. That's where the need for infrastructure becomes very apparent."

Bogert's tone stems in part from an awareness of the inherently fragile nature of the NAPRS coalition. Studio owners are difficult to organize, and economic pressures can understandably exacerbate the normal levels of competitive paranoia. Nashville is not called a rumor mill for nothing. However, Bogert adds, it's not necessarily more so than anywhere else. "In fact, compared to other places, this place is paradise."

New Rooms: At a time when many Nashville studios had been feeling the pinch of a slow summer and other economic pressures, two facilities expanded. In late August, three of the four new studios at Sound Kitchen were up and running. Laid out by L.A. designer Chris Huston, who did the first two rooms at the suburban Franklin facility, two new mixing rooms sport SSL G Plus desks, and a mid-sized tracking room has a vintage (1983) 48-input Neve 8108. A larger tracking room with six large iso booths was scheduled to open last month. The facility's two original rooms have Neve VR boards; all of the facility's Neves are loaded with Flying Faders automation, and the SSLs have Ultimation.

The same week, Hank Williams completed an across-the-street shuttle, moving his Mastermix mastering facility from one side of Division Street to the other. The new building has two mastering suites, a DVD authoring suite, DVD production suite and a mastering production and editing suite. Acoustics were done by Russ Berger of Dallas. Look for more info on both of these facilities in upcoming issues. ■

*Send Nashville news to Dan Daley at danwriter@aol.com or fax 615/646-0102.*



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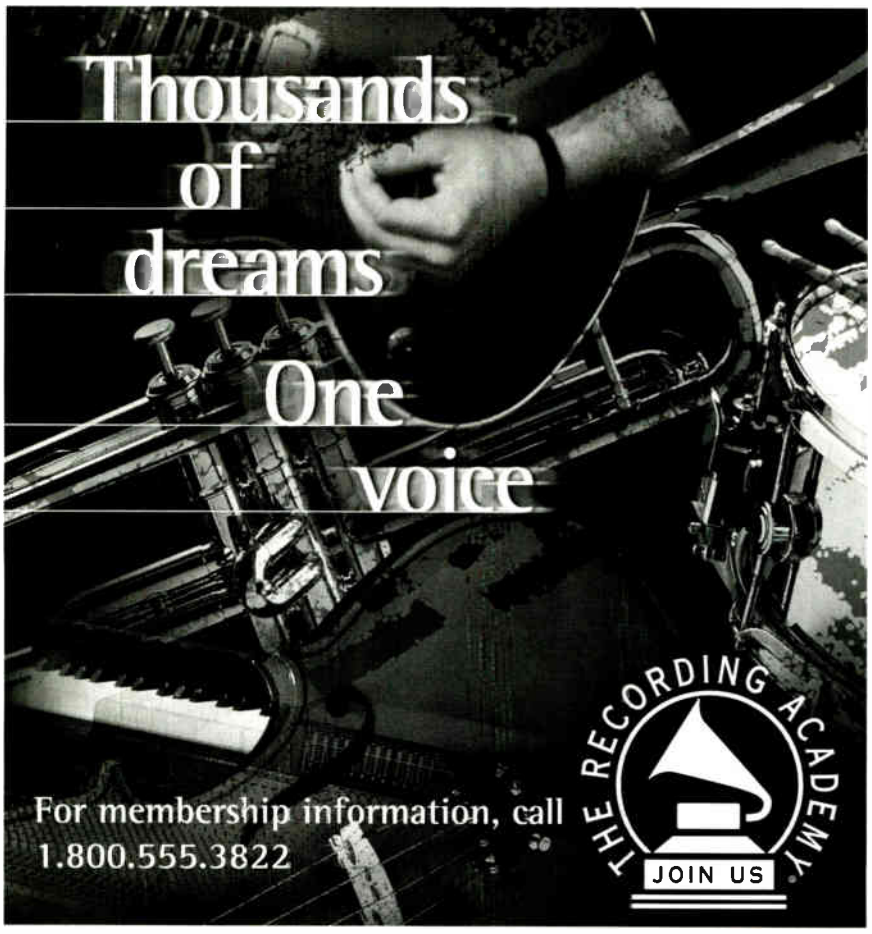


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*—FROM PAGE 205, SESSIONS & STUDIO NEWS*

Records release with producer **Michael Beinhorn**, engineer **Sean Beavan** and assistant **Ian Blanch**. Loud Records artist **Tash** was in mixing with producer **Young Lord**. **Rick Clifford** engineered, and **Daniel Romero** assisted...**Frank Black** returned to **Sound City** (Van Nuys) to track new material with **The Catholics**, engineered by **Billy Bowers** and assisted by **Nick Rasklinecz**. **Old Pike** recorded for Sony with producer/engineer **Jim Scott** and assistant **Mike Terry**...At **Sony Music** in Santa Monica, **Ben Folds** worked on a new solo project with engineer **Troy Gonzalez** and guest vocalist **William Shatner** (!). **The Yellowjackets** were also in, overdubbing and mixing their upcoming GRP release with engineer **Rich Breen**... Warner Bros. artists **Cafe Tacuba** mixed a single at **CanAm** studios in Tarzana with engineer **Joe Chiccarelli** and assistant **Travis Smith**...**Reel Big Fish** recorded tracks for a new release at **Music Grinder Studios** (Hollywood) with producer **John Avila**, engineer **Donnell Cameron** and second **Jay Gordon**...

## NORTHEAST

New York City-based **Effanel Music** has been busy with projects for Ry Cooder's **Buena Vista Social Club** (recorded by engineer **John Harris** at Carnegie Hall) and a mix with producer **Arif Mardin** for **Patti LaBelle**'s soon-to-be-released live collection, engineered by **Michael O'Reilly** and **John Bates**...**Vibrosoul** mixed their Mercury debut at **Bear Tracks** (Suffern, NY) with producer/engineer **Michael Barbiero**, assisted by **Steve Regina**...**Dru Hill** mixed their upcoming Island Records release in Studios A and K2 at **Battery Studios** (NYC) with producer **Dutch**, engineer **Manny Marroquin** and assistant **Charles McCrorey**...**Apollyon Sun** overdubbed and mixed for Mayan Records at **East Side Sound** in New York City with producer/engineer **Roli Mosimann** and assistant **Gary Townsley**...At **Oz Recording** in Baltimore, **Mindset** tracked and mixed a new F.A.D./Noise release with producer **Brad Divens**, engineer **Drew Mazurek** and assistants **Mike Rippe** and **Jake Mossman**...

## NORTH CENTRAL

**Incoherent** and **Ancient of Days** finished new projects with producer/engineer **Cal Moore** at **Immortal Productions** (Canal Fulton, OH)...

## SOUTHEAST

**DJ Nabs** finished mixing his self-pro-



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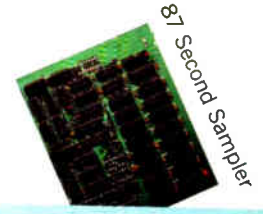

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CIRCLE #154 ON PRODUCT INFO CARD

duced Columbia debut at **Entertainment International Studios** in Smyrna, GA. **Jan Nerud** engineered, assisted by **Andrew Metcalfe**...Recently in at **Mcmix Production Services** (Atlanta): **Da Famm** (produced by **Professor Ace**, engineered by **Don McKinzie**) and **Luvv Jones** (produced by **Phat Phactory**, engineered by **Richard Wells**). The studio added 28 channels of Optifile Drax automation, as well as an Eventide Ultra-Harmonizer... **Wateree Studio** engineer **Eliott James** recorded Philo/Rounder artist **Ellis Paul** in performance at Eddie's Attic in Atlanta, direct to ADAT-XT20s...**James Prosser** mixed for Warner Bros. at **Masterfonics** (Nashville) with producer **Mark Bright** and engineer **Csaba Petocz**. **Crystal Bernard** overdubbed for River North with producer **David Rhyne** and engineer **Dennis Ritchie**. **Patrick Murphy** assisted on both sessions...Miami's **Criteria Recording** played host to the ever-popular **Celine Dion**, in recording a new project with producers including **David Foster**, **Humberto Gatica**, **Bryan Adams** and **Rick Wake**. Assisting on the 48-track digital sessions were **Chris Brooke** and **A.J. Bosco**...Motown artist **Queen Latifah** tracked new material at **Doppler Studios** in Atlanta with engineers **Blake Eiseman** and **John Frye**, assisted by **Ralph Cacciurri** and **Jason Rome**...**Ronnie Milsap** overdubbed for Warner Bros. at Nashville's **Emerald Sound** with producer **Rob Galbraith**, engineer **David Hall** and second **John Saylor**...Australian group the **Mojo Blues Band** recorded on the newly installed Trident Vector console at **Bradley House Studios** (Quinby, SC)...At **The Rock Quarry** in Franklin, TN, **The Fon** recorded for Spiral Staircase Productions with producer/engineers **Dargi** and **Gabriel Katona**...Producer **Michael Omartian** and engineer **Terry Christian** remixed **Amy Grant**'s "River Lullabye" for the *Prince of Egypt* soundtrack on the Sony Oxford at **Ocean Way Nashville**...

### STUDIO NEWS

St. Louis-based **Four Seasons Media Productions** opened a new complex in September. The three-room facility offers full-service music recording and post work and was designed by **Russ Berger**...The **Hit Factory** (New York City) recently purchased two White 4400 ⅓-octave equalizers to be used as a floating pair with its custom Augspurger Quartto monitors. ■


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—FROM PAGE 27, MY FAVORITE VINTAGES

and my favorite feature: It generates SMPTE and MTC locked to an external video source, which can be a black burst generator or, in the case of my cheap studio, the output of a VCR tuned to the local ABC affiliate. Think of it: Everything in my studio is locked to "Politically Incorrect."

**Syquest 44MB removable drive.** Laugh if you will, but this little sucker still works with all my samplers, is very forgiving of long and gnarly SCSI cables, and doesn't complain when I stick in a disk without first loading some special driver. And it can stay in place between my Mac and my samplers without crashing either one of them. Unfortunately, the cartridges have a failure rate of about 30%, which means in another three years all of mine will have died, and the thing goes into the closet with the MO drive, the pre-ADB trackball and the carcass of the Mac IIcx I blew up trying to upgrade the processor.

**Mirror 19-inch black-and-white computer monitor.** I bought it off the back of a truck for about $300 six years ago, before I blew up the IIcx. It requires its own NuBus slot, and the cards that go along with it have long since become scarcer than pre-war Telefunken tubes. But as long as it works, it makes a great second monitor for my Pro Tools system: all those faders visible at once!

**Blue Sky Logic MIXI.** You've probably never even heard of this one. A very clever product, a few years ahead of its time, that no one could figure out how to sell. They sent me one for review and then promptly went out of business. It's a MIDI fader box: 12 sliders, all configurable (if you know a little SysEx) as MIDI controller, pitch bend or aftertouch; with loopback, bank switching and a few other hidden goodies. It was pretty cheap: no readouts, no motors, just faders. I used to use it for Pro Tools, before they disabled most of the MIDI input functions; now it comes in very handy when I need a bank of real-time controllers for handling signal processors and complicated synthesizer functions.

**Bogen MX-6A mixer.** A classic old-fashioned "P.A." mixer, with four inputs feeding a pair of 12AX7As, to a mono output. No EQ or pads, just four knobs. Do I use it for mics? Not a chance—I use it for guitar. With its high-gain, high-impedance inputs, when you crank it up all the way, it makes a fabulous distortion box, complete with the microphonics and compression that cause digital designers weeks of sleepless nights.

**Yamaha EM-130.** A signal processor? A synth module? A piano? No. Yamaha, on the identification plate, calls it an amplifier. But it is *so* much more. I had never heard of it when a friend who was working for a music store called me up frantically and said, "We just bought 500 of these, and they'll all be gone in two days! Get over here!" It's a 6-channel mixer, with high and low tone controls (I hesitate to call them "EQ"), input pads and pan on each channel; a reverb send and a built-in spring reverb; line ins and outs; and a stereo 40-watt power amp with big, impressive meters at the outputs, where they do no good whatsoever. Oh, yes—and a beat box. You know, the kind that used to show up in home organs: It plays patterns like waltz, bossa nova, tango, march, ballad and swing, using various kinds of filtered white noise, pitched to sound vaguely like drums. We're talking mid-'70s here. The rhythm section was in fact very "human" in a way its designers no doubt didn't predict: It sped up.

Originally made to sell for something like $1,200, this was a product that was obsolete before it even came out. My friend's store had bought all of Yamaha's stock and was blowing them out at $250. I bought three and immediately sold two of them for $400 each. Why do I love this thing? Not for the nostalgia factor, although it served as the P.A. mixer, and even on occasion as a recording mixer, for a lot of bar bands I served time with in the '70s. The sound? It's terrible. Honky, noisy, no headroom. The features? The tone controls would shame a transistor radio, the volume controls were scratchy as hell from the beginning and have definitely not improved with age, the input pads are intermittent, the rhythm section is good for testing out the P.A. and very little else, and the reverb sounds, well, like a spring reverb. But for a quickie playing-out gig, when I don't want to pull a whole bunch of stuff out of my studio, I grab this thing and an old dual-15-inch bass cabinet I have wired in stereo, and I have an instant sound system. And it has never once, even if it's been sitting in a hot closet for five years and the hot sun for three hours, failed me. And that, friends, is for me the true meaning of vintage. ■

*Paul Lehrman, editorial director of Mix Online (www.mixonline.com), is from an early '50s vintage, and he just gets better with age.*



World Radio History

—FROM PAGE 34, THE 105TH AES CONVENTION

transferring settings to compatible devices.

TC Electronic (www.tcelectronic.com) announced the M3000 Studio Effects Processor, a dual-engine true stereo, multi-effects processor featuring 24-bit ADCs and DACs. An intuitive user interface allows editing and recall of presets, storable in RAM or on PCMCIA cards. Price is $2,499.

Hardware from Waves. The (www.waves.com) L2 Ultramaximizer™ is a two-rackspace limiter/converter with support for 96kHz sampling rates. L2

**Waves L2 Ultramaximizer limiter/converter**

performs re-quantization to 24/22/20/18/16-bit outputs, and the Waves ARC auto release control feature optimizes levels. S/PDIF and AES/EBU digital I/O is standard, along with 24-bit A/D and D/A converters.

Sony's (www.sony.com) DRE-S777 Sampling Reverberator features reverb algorithms derived from real spaces, not theoretical models. Parameters are adjustable via front panel buttons, a jog wheel and an LCD. An optional expansion board adds stereo input and surround (4-channel) outputs, plus 88.2/96kHz sampling frequency options.

The Vocalist Access from DigiTech (www.digitech.com) is a five-part vocal harmony processor that creates four harmonies from a single mic or line level input. This couldn't-be-easier-to-use, single-rackspace unit includes ten reverb programs and 50 preset harmony and doubling programs. Price is $479.95.

**Manley Massive Passive EQ**

The Massive Passive from Manley Laboratories (www.manleylabs.com) is a stereo, 4-band all-tube EQ with 11 fixed frequency boost or cut (±20 dB) choices per band, and shelf curves inspired by the Pultec EQP1A. Unlike modern EQs, the Massive Passive uses only real inductors and capacitors on rotary switches to select frequencies. I/Os are transformer-balanced. Price is $4,800. Smooth!

Summit Audio (www.summitaudio.com) is the latest company to (briefly) capture Rupert Neve's sought-after design skills; the result is the MPE-200 mic preamp/equalizer, the first product in Summit's new Element 78 product line. Featuring two independent audio paths for each of its two channels, the MPE-200 offers 4-band EQ and boasts a dynamic range exceeding 133 dB.

Esoteric Audio (distributed by Subsonic, Los Angeles) showed a selection of high-end processors designed by Tim deParavicini, including the 660 limiting amplifier ($4,250) and the 825Q stereo 5-band equalizer (5,900). Also on display were the 822Q program equalizer ($3,290) and the 824M dual-channel microphone amplifier ($6,345).

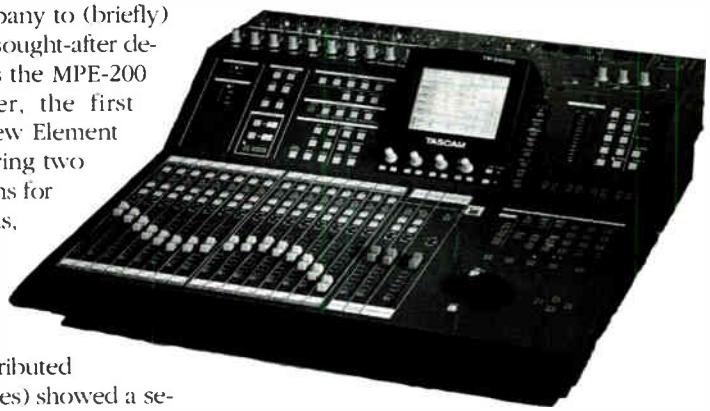
Pendulum Audio (www.pendulumaudio.com) showed its MDP-1 stereo tube mic preamp ($2,495) and the OCL-2 2-channel tube compressor/limiter ($2,795). Pendulum also attracted the notice of mastering engineers with its 6386 Variable Mu Tube Limiter ($4,500), a limited production 2-channel device with the "dynamic signature" of the classic Fairchild tube compressor.

We couldn't get enough of FREQue from DACS (www.independentaudio.com). This way-cool (looking and sounding) rackmount ring modulator offers the ability to frequency-modulate the internal oscillators with internal or external sources. Slammin'! Price is $1,355.

New category: Remote mic preamps! The Aphex 1788 (www.aphexsys.com) 8-channel remote-controlled mic preamp has remote (or local) control of every parameter, with up to 128 channels via MIDI or RS-232/422, scene memory storage and an ultra-smooth new limiter design to prevent overs. Cadac's (Bedfordshire, UK) remote mic amp/splitter is a modular system configurable for up to 576 outputs (six racks with 96 mic pre's in each), all remotely adjustable. Priced at $5,500, the Grace Designs (www.gracedesign.com) 801R is a digitally remote-controllable version of its 8-channel 801 mic pre, and up to 64 channels (eight 801Rs) can be controlled via a single remote unit.

## CONSOLES & MORE...

Consoles are traditionally the centerpiece of AES attention, but this show had lots of updates for existing designs and just a few new mixer debuts. Tascam unveiled the TM-D4000, a 32-channel (plus two stereo returns), 8-bus board with six aux sends, 4-band EQ, full dynamics on each



**Tascam TM-D4000 digital console**

channel with moving fader automation. Three I/O card slots accept TDIF, ADAT AES/EBU or analog sources and all I/O ADCs and DACs are 24-bit. Also featured are on-board DSP effects, MIDI machine control, 5.1 output capability and Sony P2 control. Retail is $4,200, shipping early '99.

Allen & Heath wins the race with the first affordable digital live sound consoles. Available in powered and unpowered versions, the Icon models feature six mic/line and two stereo (which also double as mic inputs) channels with 4-band EQ, two 10-band graphics, two effects processors, gates, compressors and more—all under programmable control, with "Song" and "Venue" snapshot memories.

Analog or digital: Can't decide? Harrison's digital.engine transforms either its MPC or SeriesTwelve boards into hybrid consoles where users get a choice or digital and/or analog pathways. More on this on page 130.

Analog fans now have more choices. Trident founder Malcolm Toft of Malcolm Toft Associates (www.toft.co.uk) launched the large-format Series 924 24-input/24-bus inline console and the Intermix™ modular mixer, offering a choice of mic/line, 4-band EQ, monitor/tape/return, panning/routing, aux send and master modules, letting users design (or expand) a console to fit any need. And fellow Trident alumnus John Oram of Oram Professional Audio (www.oram.co.uk) is now shipping his Series 48 48-bus console, which features motorized 5.1/7.1 joysticks, Oram Hi-Def EQ, and a 386 processor on every channel, allowing full console reset in a matter of nanoseconds. F-a-s-t!

There was more at AES, so watch our new products sections for more AES hits next month. Meanwhile, AES returns to Munich from May 8-11, 1999, and to New York, September 24-27. See you there! ■

World Radio History

# ▪ STUDIO SHOWCASE ▪

## Lobo Recording

2103 Deer Park Ave.
Deer Park, NY 11729
(516) 242-0266 or (516) 243-2983
Fax (516) 243-3964
e-mail: music@loborecording.com
http://www.loborecording.com

Located 35 minutes east of NYC, Lobo Recording is the place to achieve your creative goals. Recent acquisitions include an SSL 9096J, Neve VR 72, Studer D827 and Yamaha C7 Grand Piano. Other equipment includes Amek Angela IIs, Studer A827s, A80s, ADAT XTs 64 tracks and an extensive list of microphones and outboard gear. Please call for more info.

## NPR

635 Massachusetts Ave., NW
Washington, DC 20001-3753
(202) 414-2482; Fax (202) 414-3033
e-mail: rgi@npr.org
http://www.npr.org/inside/technical

Located in downtown Washington, DC, Studio 4A offers a spectacular recording environment well-suited to all music genres. Studio 4A, at 2,600 sq. feet, is one of the largest recording facilities on the East Coast. We offer digital and analog multitrack recording, an extensive mic collection, digital editing suites and CD mastering. NPR also offers satellite uplinking, fiber and ISDN capabilities worldwide.

## GKS Entertainment

1800 N. Argyle St., Ste. 203
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Located in the heart of Hollywood, GKS Entertainment premieres their new state-of-the-art HDCD SONIC MASTERING STUDIO ONE. GKS is fast-becoming the hottest new place for major & independent label mastering. At the helm is accomplished Senior Mastering Engineer Louis Hemsey, whose radio edits include, MCA artists Blink 182, Tracy Chapman & B.B. King, Sublime, The Murmurs, Semisonic, New Radicals and Dada. Mastering credits include: Melky Sedek, Richard Buckner, Old '97s, DA Congregation, Pretty Boy Floyd and Little Charlie & The Nightcats.

## American Holly On the Park

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http://www.americanholly.com

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## Ultimate music corporation

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e-mail: info@U-music.com
http://www.U-music.com

A digital music production/post facility near Boston featuring a Euphonix CS3000, with up to 96 tracks of tape and disc-based multitrack recorders including: Sony 3324, Studer 82, RADAR, ADAT, DA-88, Pro Tools 24 and Avid Audio Vision. All rooms are fitted with world-class outboard gear from Focusrite, Avalon, Manley, API and an extensive collection of new and vintage keyboards. All this set in a relaxed and elegant environment. Call for our brochure or additional information.

## Quad Recording Studios

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New York, NY 10019
(212) 730-1035; Fax (212) 730-1083
http://www.quadstudios.com

Quad Recording is excited to announce the opening of its Penthouse studio, beautifully designed as a tracking and mixing room and featuring a 96-input SSL G+ with Ultimation. Opening up a fifth studio is a wonderful way for Quad to celebrate its 20th anniversary. Studios A and III each have an SSL 9000J console, making Quad the only facility in New York with two of them. Studios B and C each have SSL 4000E consoles with G Series computers and Total Recall.


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# ▪ STUDIO SHOWCASE ▪

## Wildstyle Studios

27-24 Jackson Ave.
Long Island City, NY 11101
(718) 937-7749; Fax (718) 937-7734

Wildstyle Studios is a full recording facility located in Long Island City, Queens, NY, across the bridge from Midtown Manhattan. A George Augspurger-designed studio featuring a 48-track, automated MCI console, 24-track 2" machine and (3) ADATs locked for 48-tracks with Pro Tools editing and a custom Augspurger monitoring sysytem. We have a full lounge, pool table, video games, etc., and live-in loft for month-to-month lock-outs. Live room dimensions: 28'L x 18'W x17'H.

## Goin' Mobile Remote Recording

PO Box 326
Brookline, MA 02146
(800) 656-0095; Fax (617) 566-4368
e-mail: lonnie@goin-mobile.com
http://www.goin-mobile.com

Goin' Mobile's mid-sized mobile truck brings you superb 16, 24 & 32-track digital recording anywhere in the Eastern U.S. 48-input Mackie, 32 tracks ADAT OR DA-88, 60 transformer splits and 13 years mobile recording experience. Clients include: "Live from the House of Blues," Bill Bruford's Earthworks, Peter Wolf, Queens Community Choir and over 100 more satisfied customers. Call for FREE brochure & demo tape, or visit us online.

## Colossal Mastering

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Chicago, IL 60622
(800) 730-2468; Fax (773) 292-1698
cmastering@aol.com
www.colossalmastering.com

Colossal's 4,500-cu.-ft. mastering suite provides the focal point for Chicago's new dedicated mastering facility. Outfitted with names like Avalon, Sonic Solutions, Manley, Legacy and Apogee, we are proud to introduce ourselves as the area's most finely equipped mastering studio. Couple that with great client service and a comfortable and creative studio environment (not to mention experienced ears...), and we hope you'll make us your new source for top-notch mastering.

## Gallery Recording Studios

132 West 22nd Street, 6th Floor
New York, NY 10011
(212) 366-6640; Fax (212) 727-7187
e-mail: claysmash@aol.com

It's a recording studio and an art gallery! A beautifully designed, spacious facility with outstanding acoustics, based in the heart of Manhattan. The best in vintage/modern gear and an inspiring atmosphere enhanced by ever-changing exhibits of striking modern artwork. Built to spoil the most demanding engineer, producer or musician. Some names: SSL 6064 w/Total Recall, Studer 827S, Lexicon, Quested, Pro Tools, DA-88s, Focusrite, Neve, Summit, Pultec, TC, Neumann, Steinway.

## Skyelabs Mobile Recording

520 Penngrave Ave.
Penngrove, CA 94951
(707) 792-2000; Fax (707) 792-2500
e-mail: skyelabs@aol.com

Skyelabs offers the finest in mobile acoustics & equipment for live concert recording, remote broadcast, audio for picture & in-house recording. From live-to-2tk to multiple 3348s & ISDN live broadcast to ADAT, Skyelabs delivers clean, accurate recordings. Our credits range from AC/DC to the San Francisco Opera, Pearl Jam to Herbie Hancock and Van Morrison to Chick Corea. For more than just saturated tracks, give us a call.

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SSL / DIGITAL / ANALOG

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http://www.sheffield@sheffieldav.com

Sheffield is America's largest SSL recording truck. This is not just a remote truck, it is a complete audio facility. Add to this the best crew in the remote business. Partial credits include The Grammy Awards, MTV Music Awards, Live from the House of Blues and Aerosmith.


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## DIGITAL MIXERS

MACKIE

New

### Digital 8 Bus Mixing Console

Everything you've been waiting for and more!!! The new digital 8 bus from Makkie features great sound quality, full recording and mixdown capabilities, motorized faders and an array of digital features geared to take you lying into the next century. See for yourself what the entire industry is raving about.

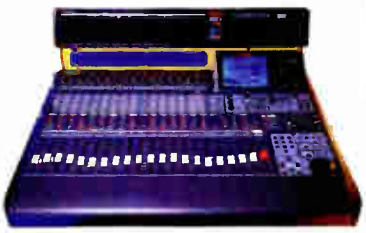
**FEATURES-**
- 48 channels of automated compression, gating, EQ and delay
- Built in 3-way meter display keeps you on top of your mix.
- Built-in meter bridge.
- Ultramix II automation for complete control, hook up an S-VGA monitor and you'll feel like you spent a lot more money.
- All functions can be automated, not just levels and mutes. Store EQ, reverb, compression, gating and even Aux send information.
- Fast SCENE automation allows you to change parameter snapshots on every beat.
- Reads Standard MIDI tempo maps, displaying clock info on the built-in position counter.
- Truly the cutting edge of mixing technology.

Panasonic

New

### WR-DA7 Digital Mixing Console

Stop dreaming about your digital future, it's here! The Panasonic WR-DA7 digital mixer features 32-bit internal processing combined with 24-bit A/D and D/A converters as well as moving faders, instant recall, surround sound capabilities, and much more. Best of all, it's from Panasonic.



**FEATURES-**
- 32 Inputs/6 AUX send returns
- 24-bit converters
- Large backlit LCD screen displays EQ, bus and aux assignments, and dynamic/delay settings.
- 4-band parametric EQ
- Choice of Gate/Compressor/Limiter or Expander on each channel
- 5.1 channel surround sound in three modes on the bus outputs
- Output MMC
- Optional MIDI joystick

TASCAM

New

### TMD1000 Digital Mixing Console

You want to see what all the digital mixing buzz is about? The NEW TMD100 from Tascam will have you smilin' & automatin' in no time. It features fully automated EQ, levels, muting, panning and more in an attractive digital board with an analog 'feel'. Your digital future never looked, or sounded, so clear.

**FEATURES-**
- 4 XLR mic inputs, 8 1/4" balanced TRS inputs.
- 20-bit A/D D/A conversion, 64x oversampling on input, 128x on output.
- Store all settings, fully MIDI compatible.
- Optional **IF-TD1000** adds another 8 channels of TDIF and a 2-channel sample rate converter.
- Optional **FX-1000** Fx board adds another 4 dynamic processors and another pair of stereo effects.

## MIC PREAMPS

Focusrite

New

### Green 3 "Voicebox MKII"

The Voicebox MKII provides a signal path of exceptional clarity and smoothness for mic recording, combining an ultra-high quality mic amp, an all new Focusrite EQ section optimized for voice, and full Focusrite dynamics. The new MKII now includes a line input for recording and mixdown applications.

**FEATURES-**
- Same mic pre section as found on the Green Dual Mic Pre includes +48V phantom power, phase reverse, and a 75Hz high-pass filter. Mute control and a true-VU response LED bargraph are also provided
- EQ section includes a mid parametric band with frequency and gain control as well as a gentle bell shape to bring out the character of the voice.
- Dynamics section offers important voice processing functions of compression and de-essing combined with a noise reducing expander
- Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -95dBu

## EFFECTS PROCESSING

t.c. electronic
ULTIMATE SOUND MACHINES

New

### Finalizer Plus

Improving on the multi-award winning Finalizer platform, The Finalizer Plus delivers an unprecedented level of clarity, warmth and punch to your mix. Inserted between the stereo output of your mixer or workstation and your master recording media, the Finalizer Plus dramatically rounds out your material, creating that "radio ready" sound!.

**FEATURES–**
- Balanced Analog as well as Digital outputs including AES/EBU, S/PDIF, & TOS
- 24-bit precision A/d & D/A Converters
- 5-band 24-bit stereo EQ
- Enhance - De-essing, stereo adjust or digital radiance
- Real-time gain maximizer
- Variable slope multi-band expander
- Multi-band compressor • Word Clock Sync
- MIDI section useful for controlling sequencer fades or any of the Finalizer's parameters from a remote MIDI controller.

lexicon

### PCM81 Multi-Effects Processor

New

The PCM-81 has everything that made the PCM80 the top choice among studio effects processors, and more. More effects, more algorithms, longer delay and full AES/EBU I/O.

**FEATURES–**
- 300 Presets include pitch, reverb, ambience, sophisticated modulators, 20 second stereo delays, and dynamic spatialization effects for 2-channel or surround sound applications
- 2 digital processors including Lexicon's Lexchip for the reverb and a second DSP engine for the other effects.
- 24-bit internal processing
- Dynamic patching matrix for maximum effects control.
- PCM card slot

## EQUALIZERS

Focusrite

New

### Green 2 "Focus EQ"

The Green 2 Focus EQ is suitable for a variety of applications combining a Focusrite equalizer section with a multi-source input section. Use it as a high-quality front end for recording applications or patch it into the send/return loop to upgrade a single channel of console eq, either way it sounds great.

**FEATURES-**
- XLR & 1/4" inputs are similar to the Dual Mic Pre but have been adapted to cope with a wider range of levels.
- VU metering via a 10-LED bargraph
- EQ section derived from the Red and Blue range processors for superb audio quality.

## COMPRESSORS

JOE MEEK

### VC1 Studio Channel

got meek?

The Joe Meek Studio Channel offers three pieces of studio gear in one. It features an excellent transformer coupled mic preamp, a great compressor and an enhancer unit all in a 2U rackmount design. Find out why more and more studio owners can live without one.

**FEATURES-**
- 48V phantom power, Fully balanced operation
- Mic/Line input switch
- Mono photo-optical compressor
- High pass filter for large diaphragm mics
- Extra XLR input on front makes for easy patching
- Compression In/Out and VU/compression meter switches
- Twin balanced XLR outputs with one DI XLR output for stage use
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC

dbx

### Blue Series 160S Stereo Compressor

The dbx 160S combines the best features of all the great dbx compressors in a well-built unit where the craftsmanship is as stunning as the engineering is innovative. This is truly a desirable compressor.

**FEATURES-**
- 127dB dynamic range • Program dependent "Auto", or fully variable attack and release
- Hard knee/OverEasy switchable.

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## HARD DISK RECORDERS

### Roland VS1680 Digital Production Studio

New

The new VS-1680 Digital Studio Workstation is a complete 16 track, 24-bit recording, editing, mixing and effects processing system in a compact tabletop workstation. With its advanced features, amazing sound quality and intuitive new user interface, the VS-1680 can satisfy your *wanderlust*.

**FEATURES–**

- 16 tracks of hard disk recording, 256 virtual tracks.
- 24-bit MT Pro Recording Mode for massive headroom and dynamic range.
- Large 320 x 240 dot graphic LCD provides simultaneous level meters, playlist, EQ curves, EFX settings, waveforms and more.
- 20-bit A/D D/A converters
- 2 optional 24-bit stereo effects processors (VS8F-2) provide up to 8 channels of independent effects processing.
- New EZ routing function allows users to create and save various recording, mixing, track bouncing, and other comprehensive mixer templates for instant recall.
- 10 audio inputs: 2 balanced XLR-type inputs w/ phantom power, 6 balanced 1/4" inputs, and 1 stereo digital input (optical/coaxial)
- 12 audio outs: 8x RCA, 2x stereo digital & phones.
- Direct audio CD recording and data backup using optional VS-CDR-16 CD recorder.

### AKAI DR16 16-Track HD Recorder

The Akai DR16 is a digital hard disk recorder with sophisticated non-destructive editing functions for near instant data access. Recording & playback is as straight forward as tape. The DR16HD ships with an internal 2GB drive for 24 minutes per track of record time.

***TURN YOUR DR16 INTO A PRODUCTION WORKHORSE WITH THESE POWERFUL EXPANSION OPTIONS!***

- ***MT8*** *Mixer controller* • ***DL16*** *Remote control unit* • ***IB801S*** *SCSI Interface board*
- ***IB802T*** *SMPTE interface board* • ***IB803M*** *MIDI interface board* • ***IB804A*** *ADAT interface board*
- ***IB805R*** *RS422 Interface board* • ***IB806B*** *Bi-phase interface board*
- ***IB807V*** *VGS monitor interface board* • ***EQ16*** *16-channel digital EQ board* • ***ALX50*** *Remote Cable*

## DIGITAL MULTI-TRACK RECORDERS

### TASCAM DA-98 Digital Audio Recorder

The DA-98 takes all the advantages offered by the DTRS format and significantly ups the ante for the professional and post-production professional alike. With enhanced A/D and D/A convertors, a comprehensive LCD display and full compatibility with the DA-88 and DA-38, the DA-98 delivers the absolute best in digital multitrack functionality.

**FEATURES–**

- Confidence monitoring for playback and metering
- Individual input monitor select switch facilitates easier checking of Source/Tape levels
- Switchable reference levels for integration into a variety of recording environments with internal tone generator
- Digital track copy/electronic patch bay functionality
- Comprehensive LCD display for easy system navigation
- Dedicated function/numeric keys make operation easier
- Built-in sync with support for MMC and Sony P2
- D-sub connector (37-pin) for parallel interface with external controller
- Optional RM-98 rack-mount ear for use with Accurate 200 system

**DA-88** A standard digital multitrack for post-production and winner of the Emmy award for technical excellence, the DA-88 delivers the best of Tascam's Hi-8 digital format. Its Shuttle/Jog wheel and track delay function allow for precise cueing and synchronization and the modular design allows for easy servicing and performance enhancements with third-party options.

**DA-38** The DA-38 was designed for musicians. Using the same Hi-8 format as the highly acclaimed DA-88, the DA-38 is an 8 track modular design that sounds great. It features an extremely fast transport, compatibility with Hi-8 tapes recorded on other machines, rugged construction, ergonomic design and sync compatibility with DA-88s.

### ALESIS ADAT XT20 Digital Audio Recorder

New

The New ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra-high fidelity 20-bit oversampling digital converters for sonic excellence, it could change the world.

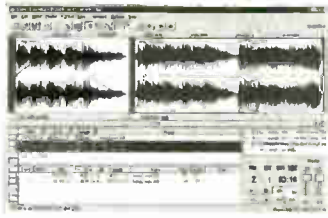
**FEATURES–**

- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Remote control
- Servo-balanced 56-pin ELCD connector
- Built-in electronic patchbay
- Copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder

## SOFTWARE

### SONIC FOUNDRY CD Architect & CD Factory

CD Architect is the perfect solution for designing professional audio CDs to Red Book spec on Windows NT and Windows 95. Sample audio from compact disks, record from DAT, or digitize material through a sound card. It comes complete with an editor including dozens of effects and tools to process sound files and can optionally operate as a Sound Forge plug-in. CD Factory adds a CD burner, SCSI card and cable for a complete production package.



**FEATURES–**

- Multi file playlisting
- Master volume faders (-96dB to +20dB)
- Adjustable envelope levels for any region
- Mix or crossfade overlapped regions
- Convert from mono to stereo on the fly
- Multiple levels of undo/redo
- Up to 99 tracks with 99 subindexes per track
- Make glass-masters directly from burned CDs.

## STUDIO DAT-RECORDERS

### Panasonic SV-3800 & SV-4100

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 2b-bit D/A converters to satisfy even the highest professional expectations. The **SV-4100** adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more. Panasonic DATs are found in studios throughout the world and are widely recognized as the most reliable DAT machines available on the market today.

**FEATURES–**

- 64x Oversampling A/D converter for outstanding phase characteristics
- Search by start ID or program number
- Single program play, handy for post.
- Adjustable analog input attenuation, +4/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search

### TASCAM DA-30MKII

A great sounding DAT, the DA-30MKII is a standard mastering deck used in post-production houses around the world. Among many other pro features, its DATA/SHUTTLE wheel allows for high-speed cueing, quick program entry and fast locating.

**FEATURES–**

- Multiple sampling rates (48, 44.1 and 32kHz).
- Extended (4-hour) play at 32kHz.
- Digital I/O featuring both AES/EBU and S/PDIF.
- XLR balanced and RCA unbalanced connections.
- Full function wireless remote.
- Variable speed shuttle wheel.
- SCMS-free recording with selectable ID.
- Parallel port for control I/O from external equipment.

### Fostex D-15

The new Fostex D 15 features built in 8Mbit of RAM for instant start and scrubbing as well as a host of new features aimed at audio post production and recording studio environments. Optional expansion boards can be added to include SMPTE and RS-422 compatibility, allowing the D-15 to grow as you do.

**FEATURES–**

- Hold the peak reading on the digital bargraphs with a choice of 5 different settings
- Set cue levels and cue times
- Supports all frame rates including 30d
- Newly designed, 4-motor transport is faster and more efficient (120 minute tape shuttles in about 60 sec.)
- Parallel interface • Front panel trim pots in addition to the level inputs

**D-15TC & D-15TCR**

The D-15TC comes with the addition of optional chase and sync capability installed. It also includes timecode reading and output. The D-15TCR comes with the further addition of an optional RS-422 port installed, adding timecode and serial control (Sony protocol except vari-speed)

### SONY PCM-R500

Incorporating Sony's legendary high-reliability 4D.D. Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.

**FEATURES–**

- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator
- Includes 8-pin parallel & wireless remote controls
- SBM recording for improved S/N *(Sounds like 20bit)*
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.

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## MIDI HARDWARE

Mark of the Unicorn

### MIDI Time Piece™ AV
**8x8 Mac/PC MIDI Interface**

The MTP AV takes the world renowned MTP II and adds synchronization that you really need like video refresh, ADAT sync, word clock sync, and even slide design superchick!

*FEATURES–*
Same unit works on both Mac & PC platforms.
8x8 MIDI merge matrix, 128 MIDI channels.
Fully programmable from the front panel
128 scene battery backed memory
Fast fix mode for high-speed MIDI data transfer.

### Digital Time Piece™
**Digital Interface**

Think of it as the digital synchronization hub for your recording studio. The Digital Timepiece provides stable centralized sync for most analog, digital audio, and video equipment. Lock together ADATs, DA-88s, ProTools, word clock, S/PDIF, video, SMPTE, and MMC computers and devices flawlessly. It ships with Clockworks™ software which gives you access to its many advanced features and remote control of some equipment settings such as record arm.

OPCODE

### Studio 64XTC
**Mac/PC MIDI Interface**

The Studio 64XTC takes the assorted, individual pieces of your studio-your computer, MIDI devices, digital and analog multitracks and even pro video decks, and puts them all in sync.

*FEATURES–*
4 In / 4 Out, 64 channel MIDI/SMPTE interface/patchbay with powerful multitrack & video sync features
ADAT sync with MIDI machine control
Simultaneous wordclock and Superclock output.
44.1kHz or 48kHz for perfect sync with ADAT, DA-88 and ProTools
Video and Blackburst in (NTSC and PAL)
Cross-platform Mac and Windows compatibility

## SAMPLING

E-MU

### e-6400
**Sampling and more!**

The e-6400 from EMU features an easy interface that makes sampling easy. Automated features like looping, normalizing and more allow you to flexibly create your own sound palettes or access any of the 400 sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balanced analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.

## KEYBOARDS & SOUND MODULES

Roland®

### XP60 & XP80 Music Workstations

The XP-80 delivers everything you've ever wanted in a music workstation. An unprecedented collection of carefully integrated features provide instant response, maximum realtime control and incredible user expandability. The XP-80 features a pro-quality 76-note weighted action keyboard while the NEW XP-60 features the same sound engine in a 61 note keyboard

*XP80 FEATURES–*
- 64-voice polyphony and 16-part multitimbral capability
- 16 Mbytes of internal waveform memory, 80Mbytes when fully expanded (16-bit linear format)
- 16-track MRC-pro sequencer with direct from disk playback. Sequencer holds approx. 60,000 notes
- New sequencer functions like "non-stop" loop recording and refined Groove Quantize template
- Enhanced realtime performance capability with advanced Arpeggiator including MIDI sync and guitar strum mode and Realtime Phrase Sequence (RPS) for on-the-fly triggering of patterns
- 40 insert effects in addition to reverb and chorus
- 2 pairs of independent stereo outputs, click output jack with volume knob
- Large backlit LCD display

### SR-JV80 Series Expansion Boards

New

Roland's SR-JV80-Series wave expansion boards provide JV and XP instrument owners a great-sounding, cost-effective way to customize their instruments. Each board holds approx. 8Mb of entirely new waveforms, ready to be played or programmed as you desire.

***Boards Include–***
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KURZWEIL

### K2500 Series Music Workstations

The K2500 series from Kurzweil utilizes the acclaimed V.A.S.T. technology for top-quality professional sound. Available in Rack mount, 76-key, and 88 weighted key keyboard configurations, these keyboards combine ROM based samples, on-board effects, V.A.S.T. synthesis technology and full sampling capabilities on some units.

*FEATURES–*
- True 48-voice polyphony
- Fluorescent 64 x 240 backlit display
- Up to 128MB sample memory
- Full MIDI controller capabilities
- 32-track sequencer
- Sampling option available
- Dual SCSI ports
- DMTi Digital Multitrack interface option for data format and sample rate conversion (Interfaces with ADATs or DA-88s)

KORG

### Trinity Series Music Workstations DRS

Korg's Trinity Series represents a breakthrough in sound synthesis and an incredible user interface. It's touch-screen display is like nothing else in the industry, allowing you to select and program patches with the touch of a finger. The 24MB of internal ROM are sampled using ACCESS which fully digitizes sound production from source to filter to effects. Korg's DSP based Multi Oscillator Synthesis System (MOSS) is capable of reproducing 5 different synthesis methods like Analog synthesis, Physical Modeling, and variable Phase Modulation (VPM).

*FEATURES–*
- 16 track, 80,000 note MIDI sequencer
- Flexible, assignable controllers
- **DRS (Digital Recording System)** features a hard disk recorder and various digital interfaces for networking a digital recording system configured with ADAT, DAT recorder and hard disk
- 256 programs, 256 combinations
- Reads KORG sample DATA library and AKAI sample library using optional 8MB Flash ROM board

TRINITY — *88 Weighted-key/Solo Synth*
TRINITY — *76-key/Solo Synth*
TRINITY — *61-key/Solo Synth*
TRINITY — *61-key*

***(Digital IF, SCSI, Hard Disk Recorder, and sample Playback/Flash ROM functions are supplied by optional upgrade boards)***

## MONITORS

KRK

### V8
**Powered Studio Monitors**

These new powered studio monitors from KRK supply 130 watts of clean performance. Their 8" woofer & 1" silk dome tweeter ensure crystal highs as well as the bass response needed for today's studio environments.

New

*FEATURES–*
- 49Hz - 22kHz
- Magnetically shielded for use near video monitors

Hafler

### TRM-8
**Powered Studio Monitors**

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Trans•nova power amp circuitry.

*FEATURES–*
- 45Hz - 21kHz, ±2dB
- 75W HF, 150W LF
- Electronically & Acoustically matched

MACKIE

### HR824

These new close-field monitors from Mackie have made a big stir. They sound great, they're affordable, they're internally bi-amped. "What's the catch?" Let us know if you find one.

*FEATURES–*
- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- Frequency Response 39Hz to 22kHz, ±1.5dB

TANNOY

### Reveal

New

The latest playback monitor from Tannoy, the Reveal has an extremely detailed, dynamic sound with a wide, flat frequency response.

*FEATURES–*
- 1" soft dome high frequency unit
- Long throw 6.5" bass driver
- Magnetic shielding for close use to video monitors
- Hard-wired, low-loss crossover
- Wide, flat frequency response
- Gold plated 5-way binding post connectors

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World Radio History

—FROM PAGE 20, ONE

definitely one of Man's (well, Kid's) deep, dark secrets. Each time a kid popped out of existence, immediate suspicion and denial followed.

**TIME HEALS ALL WOUNDS (NOT!)**

Now, decades later, it's the same: America acts as if mono doesn't exist, *but it does*! And not only does it still exist, but it *dominates*! Our denial is causing more and more problems as the years go on. I was reading audio newsgroups last night (part of my job), and I caught a thread about compatibility issues that amazed me. The new kids are actively questioning what they feel is an obsolete preoccupation with mono.

The truth is that now mono is Audio's dirty little secret, and denial isn't going to help.

Sure, we all want to mix the biggest, fattest, most impressive stereo field that we can, and with 5.1-channel, there is even more pressure to create dynamic 360-degree virtual audio environments. But the dark truth is that most people are listening to most of our work *in mono*! Most televisions and even most radios in use on Earth today are still mono. But even that is not the real issue.

Sure, we all know that we have always had to keep the kick and bass mono. In the Golden Days of Vinyl, one of the main reasons for this was, of course, because those giant low-frequency excursions would pop the needle right out of the groove if the left and right channel information wasn't the same. But now in the Digital Age, where we can abuse low frequencies any way we want, we must still honor this old rule if we want our stuff to have any bottom in the real world of undersized toy speakers. Mono LF means that it will get more driver surface area. Simple enough.

But beyond that, many—far too many—engineers are denying mono exists. While it is not my intention to list all the mono TV stations or cable providers out there, nor the mono AM and FM radio stations, I will remind you to consider not only America's mono, but the world's. There's a *lot* of mono out there.

Still, this is not the entire story. All of us work hard to build a solid, interesting, satisfying stereo field in our work. All of us experiment to some extent with stereo image modifiers and expanders, enhancers and synthesizers.

**TEN YEARS AFTER**

A decade ago, I used to play heavily with that myself. And ten years ago, as today, the most worn out button on my desk was the one labeled Mono.

But today you can buy desks that don't even *have* a mono button! Where have we gone wrong? Are we so self-centered and blind that we think FM radio stations are actually going to transmit properly encoded stereo audio? Or that Joe Blow is going to say no to that boom box with all that stereo enhancement DSP? Or that Mega-Bass L/R logic DSP? Or Karaoke—vocal removal DSP?

**The truth is that now mono is Audio's dirty little secret, and denial isn't going to help.**

No, we are shipping product into a very unstable stereo world, one where FM stations do illegal image processing that happily shreds images without solid centers and can easily explode mixes that are not truly mono-compatible. Stereo broadcast compressors act unpredictably at best to certain types of noncompatible energies.

In light of this, I am amazed that so many engineers don't seem to care much. You would think that they would want consistency and predictability in their product. We all know enough to test our mixes on little garbage speakers before we let them out into the real and variable world, but fewer and fewer engineers test in mono these days. Amazing.

**MORE YEARS AFTER**

Each year I get more CDs that totally fall apart in mono. At best, they get weak and muddy; at worst, entire instruments or vocal backups disappear, reverb dries up, and in general they sound like you are listening through one of those horrible new Bose car systems. Unbearable. And movies! Damn! I have stuff here that does just about every bad illegal thing you can think of when I tell my decoder to process down to mono.

Why is this mode, the most common listening mode, ignored? I can't tell you. The only thing I can think of is that because it's such a downer to listen to your hot new mix in mono, nobody likes to do it, and those who do are faced with some serious questions about what to change to increase mono-compatibility. It takes real experience and skill to engineer a mix that has all the image and field that you want in stereo but is solidly mono-compatible. It is downright hard to do. Almost every adjustment you make in the interest of mono-compatibility flattens out and deadens your stereo field...until you get good at it.

**TEN YEARS BEFORE**

Will mono fade into obscurity? No! Will mono-compatible mixing fall by the wayside and become yet another lost art? Time will tell (and cliches will continue), but I fear the answer is yes. ■

*SSC likes dual-crossover pipes on Harleys because they are stereo, but the important LF information is mono, as nature intended it to be.*

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## DAR's OMR8

### MO RECORDING AND EDITING ON LOCATION

Digital Audio Research's OMR8 rackmount 24-bit magneto-optical recorder was recently used on a high-profile project in Korea, a recording of Paganini's 24 Caprices for Violin and Viola by internationally acclaimed violinist Eun Hwan Bai. The event, recorded live at the Kumho Galleries in Seoul by David Lee of Seoul Sound, marked the first performance in Korea of all 24 caprices and was Eun Hwan Bai's final performance in his home country before embarking on a two-year professorship at Yale University. Lee's recordings from the concert were released on a double CD and also formed the basis for special programs of the event, which were subsequently broadcast by the three principal Korean radio stations.

Lee selected the DAR OMR8 MO recorder for the project. "We wanted to capture the natural acoustic of the Kumho Galleries using high-quality equipment," he explains. Lee used a stereo pair of B&K 4010 mics and the FM Acoustics Model FM210 mic preamp, and recorded direct into the OMR8. Lee also edited the recorded material on the OMR8, in preparation for mastering. "We were impressed with the OMR8's 24-bit performance," says Lee. "Everyone was delighted with the results, and the exercise has gained the OMR8 some well-deserved profile in the Korean recording sector." ■

*—FROM PAGE 60, EDITING CLASSICAL MUSIC*

meant the music would suffer least."

### MASTERING FORMATS

Some of the interviewees commit final edits to tape, whereas others print directly to CD-R. Aubort not only edits on his portable SADiE, but he records direct to its hard disk. At the same time, he records safety copies on two DAT machines. (Once, when someone tripped over an AC plug, the hard disk crashed.) The edited master is backed up on Exabyte tape in 20-bit format and is delivered to the record company in DDP format. "We have totally abandoned the 1630 format as being fraught with transfer errors," says Aubort, "so we deliver DDP tape, and usually a CD-R with it." According to Aubort, the DDP format not only replaces the 1630 but also allows for a direct glass master at double- or triple-speed. "You can proof the [Exabyte] tape and play it one track at a time. It contains all the information for making a Red Book CD." Aubort uses SADiE's internal downsampling algorithms. "We find the triangular the most agreeable," he says.

Sony masters to various formats and typically supplies the pressing plants with 1630s or PMCDs. Safety copies are typically in the Exabyte format. "I resisted the Exabyte for a long time, but Sonic finally convinced me to try it out," recalls Wolff. "My initial resistance came from the thought that I had the edit made, 'Why do I have to make the copy edit?' What I discovered was that if the producer comes back and wants to move an edit one bar, that's a very easy operation on the Sonic if you can restore all of your original edits. It's much harder to do that if you're working from a piece of tape that has all the edits made."

"Ninety-nine percent of what we do is direct to 2-track, even large orchestral works," says Gregg Squires. "We record on DAT, and also go through the Prism box and save to 24-bit or 20-bit depending on the job, and also save a backup on DA-88." Dithering is generally accomplished through Prism boxes, and Squires usually sends a CD-R to the record company or pressing plant.

Moritz also records direct to 2-track, typically to DAT or to DA-88 in 24-bit format via a Prism converter. The final edited master is dithered or noise-shaped via one of SADiE's several algorithms, or via a Prism converter. Moritz is in the habit of sending out CD-Rs for mastering, but this is because her chosen mastering house does not yet have Exabyte capability.

Telarc has, in the past, recorded to 1630 U-matic, and the company still has a Mitsubishi X-86 20-bit reel-to-reel machine. "Most sessions are recorded on DA-88 and have been for the last couple of years," says Brenner, noting that all are recorded at 20- or 24-bit resolution via Prism converters. Edited masters are backed up to Exabyte and DA-88. The 16-bit CD master is arrived at by stepping down through the Apogee UV-22 and is recorded in the 1630 format. The company has also made some records on the Nagra D and is also now recording in the Direct Stream Digital format. (For further information on Telarc's experiences with Direct Stream Digital, see next month's "Recording Notes.") ■

*Chris Michie is a* Mix *technical editor.*



World Radio History

—FROM PAGE 162, MACKIE HUI

tons above transport keys include RTZ, End, Loop, Pre, Post, In, Out, Audition, Loop, Quick Punch and On Line (used for taking HUI on- and offline).

The infinitely rotating jog wheel has two modes, Shuttle and Scrub. Scrubbing with this control is sublime. It works just the way you'd expect and greatly facilitates editing and cueing. In Shuttle mode, the wheel does not automatically spring back to zero (normal play speed) like video deck jog wheels; instead, it stays were you leave it. Once you've reached your cue point, you must physically turn it forward or backward to attain your desired play speed. This is cool for finding edit points or auditioning material at different speeds. Near the jog wheel, a zoom control lets you zoom in/out of waveforms vertically and horizontally.

We were all enthralled by the comprehensive plug-in control section because, again, HUI gave us the real knobs and buttons we've longed for. This is a far more musical approach to signal processing than worrying about numerical values on the computer screen. The knobs and buttons in this section are all soft, changing their functions depending on the plug-in. However, not all plug-ins are currently supported; we experienced a couple of crashes trying to recall and control some of them. Suffice to say, Mackie has high hopes that all plug-ins will eventually conform to the Digidesign protocol that HUI works with, and most popular plug-ins (Lexicon, Focusrite, Drawmer, Digidesign, etc.) worked fine.

Controlling Pro Tools automation from HUI was a piece of cake. Two areas, Auto Enable and Auto Mode, provide all the direct access keys you'll need. Auto Enable lets you select the feature you want to automate (fader, pan, plug-in, etc.), and Auto Mode lets you select the automation mode (read, touch, write, etc.). LED scribble strips above each fader reflect the first four characters of a channel's name as seen in Pro Tools. This is nice, because you don't have to look at the computer screen to know which bank of faders is currently selected. The scribble strips are another HUI feature that let's you concentrate on the music, not the computer.

HUI uses MIDI to communicate with Pro Tools. Originally, we were skeptical and thought there would be a significant lag between the time a button on HUI was pressed and when Pro Tools reacted. Mackie assured us that MIDI was more than fast enough, explaining that most of the commands sent over MIDI only used a fraction of MIDI's bandwidth. They added that any lag time would be a problem in the DAW, not HUI. We watched closely as we used HUI on real-time transport operations and were surprised at how fast Pro Tools responded. We honestly didn't notice any lag. Even punching in/out seemed fine—we were impressed. If you're using a PC you can also hook HUI up via its RS-232/422 serial port. Mackie claims this is even faster than MIDI. And, if you're wondering, HUI's MIDI protocols are not MMC. In fact, HUI does not work as an MMC device at all; this is too bad because it would be nice to have the option of using it as a MMC device for non-supported DAW systems and modular HDRs.

HUI can control Pro Tools even when Pro Tools is running in the background. This means that a software sequencer could run in the foreground and Pro Tools, instead of having to bring it to the front every time it's needed, can be accessed directly via HUI. If a fader needs to be adjusted, just grab the appropriate HUI fader and leave your sequencer alone (the same goes for transport functions). This is an extremely convenient way of working with Pro Tools and any compatible software sequencer. Just make sure you have Pro Tools enabled to run in the background before you try this trick on your own.

As with any new piece of gear, HUI takes some time to learn. But because it's so well laid-out, folks already familiar with Pro Tools won't have too many problems. Once you've mastered HUI's controls, you'll find your productions go much faster and your work more enjoyable. And when you're feeling insecure, HUI's keyboard and mouse in/thru ports give you the option to keep those old interfaces close at hand.

For all you engineers who work day in and day out on Pro Tools, do yourself a favor, check out HUI. When drivers for other DAWs come to fruition, HUI may also provide a better working environment for these products as well. And with a retail price of $3,499, HUI is a sweet deal.

Mackie, 16220 Wood-Red Road NE, Woodville, WA 98072; 888/471-8218; fax 425/487-4337. Web site: www.mackie.com. ■

*Erik Hawkins is the owner of MuziCali Muzica, www.muzicali.com. Michael Denten is a producer, engineer and owner of Infinite Studios in Alameda, Calif.*

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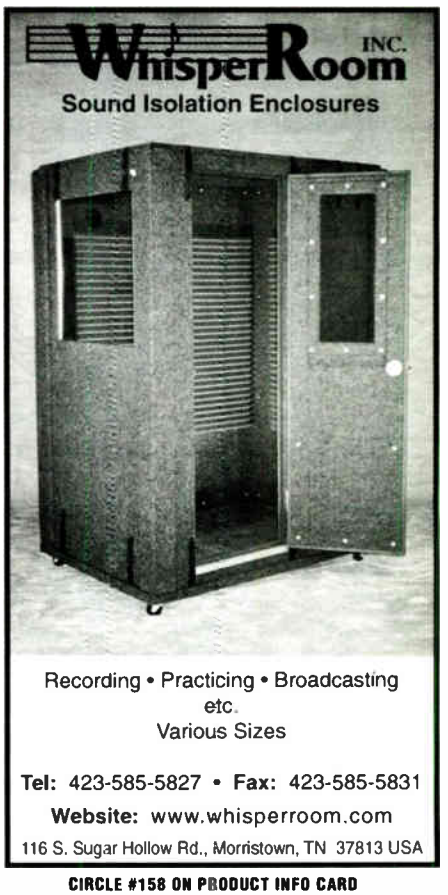

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World Radio History

—FROM PAGE 50, METALLICA

didn't at all. Instead of him telling us what to do, we'd do a few suggestions, and things would come out naturally. By the third album that we've worked on with him, we've got a pretty good relationship.

**Ulrich:** The first thing Bob Rock ever said to me was, "Look, you guys have made four records, and I've seen you guys play live, and you guys have not made a record that comes close to capturing what you guys are about when you play live." And that was the beginning of a turning point where we sort of sat down and realized that whatever we'd done in the past is fine, and we're not going to second-guess it, but we were going to talk about where we can go in the future. Bob had been really instrumental in pointing out the options that are available to us in the studio and trying to slowly make us aware of the potential that we could have in terms of being open to new ideas. And that process is eight years old now, and it's a process that continues, and it's a process that I welcome, and now I'm totally comfortable with Bob in the studio. There's a total sense of trust and respect and tolerance. Once we got to that point, then it was like open season.

***His influence as a producer has been apparent in arrangements. Do you collaborate on songwriting?***

**Hetfield:** Lars and I have always done the songwriting together. Usually, Lars and I will sit through all our riff tapes with blinders on, and take a riff and start jamming on it and see what comes from it. Lars is very good at constructing a song, seeing what part is needed where, or saying the verse/chorus thing is off-balance. He's really good at that, and I'm more or less good at coming up with melody and parts. So it's a pretty good team.

We sit and jam, and all of a sudden, we've got a song. And we bring Kirk [Hammett] in, bring Jason [Newsted] over, and say, "See what you can do here; here's what I kind of had in mind..."

***Do the other bandmembers have a lot of songwriting input?***

**Hetfield:** Not so much input in the writing. It's more when it comes down to their part, playingwise; especially with Kirk, we're going more for the more left-right speaker thing with guitar, instead of just the full-on wall of sound. Before, there would be five tracks of just me doing rhythm. Now I'm in the left speaker, Kirk's in the right speaker, we're trying to play off each other. There's a lot more character to it that way; instead of adding the thickness of five tracks of the same guitar, we've got two guitar guitars playing the riff slightly different. It's got its own thickness to it. Your ears can really have fun—each ear is having its own party! Kirk's got more input that way. We used to just hover over those guys—"What are you doing? Why is your finger over there?" Very strict. Now it's: "Here's the song, go in a room." It's been a lot more fun for all of us. I think it was a big chore for everyone, and now everyone's enjoying the exploration.

***How did you get to this stage, where you can relax more?***

**It always used to be very macho and negative, but we all know our limits now, and we've helped each other bust past them.**

**—James Hetfield**

**Ulrich:** It's hard. We've been making records for 17 years, and you don't wake up one morning and change the way you do things. It's a long process.

**Hetfield:** I think it came a lot through confidence in playing. Playing on the road on the Black Album, we were out for two years. You get to know each other pretty well, and how well each other can play. And a lot of the time it was, "Well I didn't want to try that vocal thing because I can't do it." It always used to be very macho and negative, but we all know our limits now, and we've helped each other bust past them.

***So, are you performing differently in the studio now?***

**Hetfield:** Yes. We all play together now; it's great. If you're doing a song 20 or 30 times, you could maybe come up with a different lyric, or a cooler ad-lib here or there. Bob has got us to all get in there and play off each other.

**Ulrich:** It has been a slow process. It's been years of trying to get to the point where we act more like a band in the studio, and look at things in a band way, and try to capture certain energies together in the studio.

***Tell me about how your music has developed in recent years.***

**Hetfield:** Well, we've evolved, absolutely. We've come to grips that music is there to be explored and expressed. And we're very selfish, we're very bored, and we're honest about it. We get tired of doing the same thing over and over. We want to move on; that's what life's about. Who's to say your band is not doing the right thing anymore? Hey, we're us, and you're not us. We're smiling about this, we're digging what we're doing.

***What do you say to the people who suggest that your changing and developing is selling out to commercial music?***

**Hetfield:** I think there are a lot of people out there that don't understand what "selling out" means. If I was to sit there and write "Kill 'Em All" all over again for that person, that is selling out. That is me compromising to someone or something. And this is the most honest form of expression. We don't really worry about those people. We've gotten that flack all through our career. We did "Fade to Black," a song about depression and suicide, and it was completely from the heart, and people said, "Oh, you guys did a ballad—you're crap now."

***I guess there's always going to be somebody telling you what you're doing wrong...***

**Hetfield:** That's why you have to do things for yourself. That's how the best material comes out. We're very fortunate that there are people who understand and like what we do.

***In what way do you think you've most changed as a band?***

**Ulrich:** The main difference is that we are more open to different things than we've ever been. We try to be more open to new ideas, more open to each other's suggestions, instead of just starting a fist fight. Most of us are in our mid-30s now, so there's a high level of tolerance, and apart from losing Cliff Burton in a bus accident, there hasn't been a lineup change in this band in 15 years. So you figure out what works for you and what doesn't work for you, and I think one of the biggest changes in the band is that we've just become very understanding of what it is that needs to happen for this band to work.

I think the key thing would be to be able to continue Metallica for like another 120 years, but that's got to be on our terms, and it's got to be the way that it will work for us. And so we're getting better at understanding that whole thing. ■

*Sarah Jones is a technical editor at* Mix.



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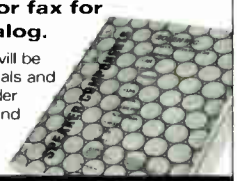

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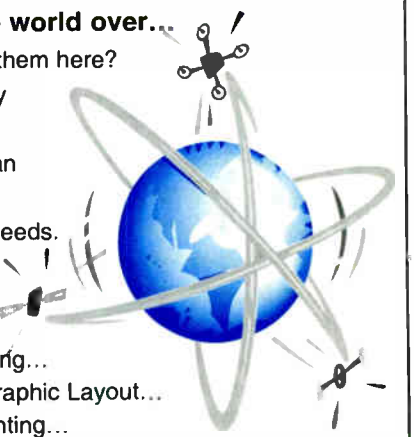

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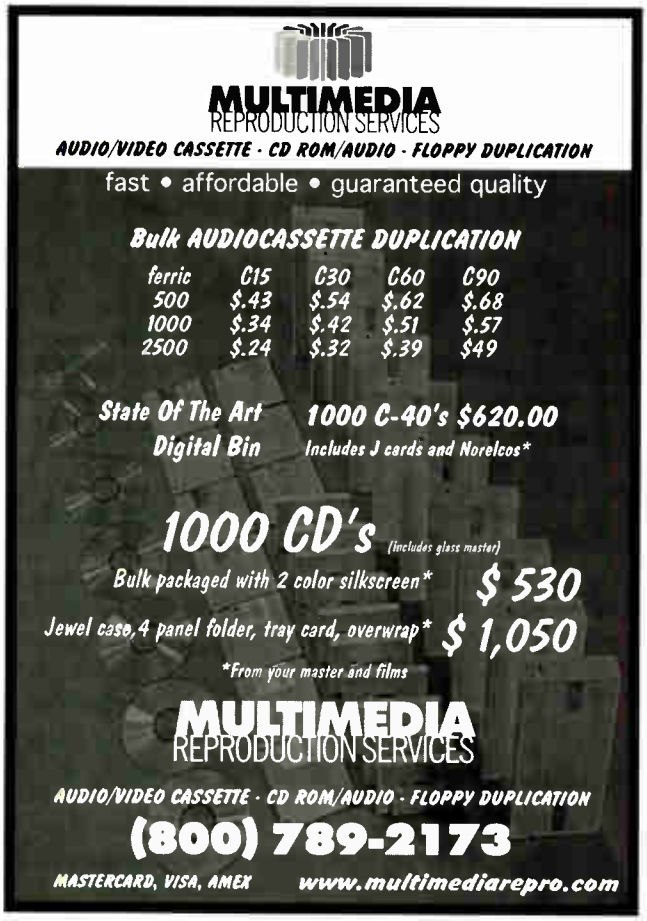


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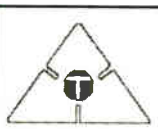


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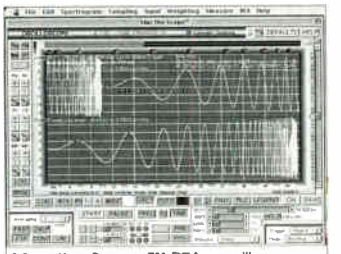

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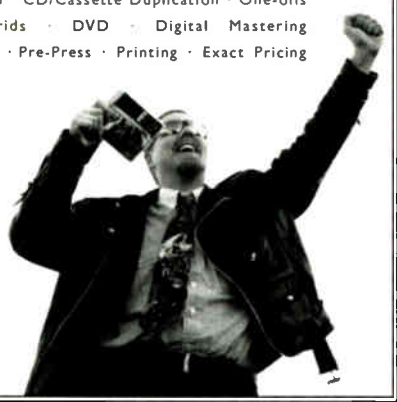

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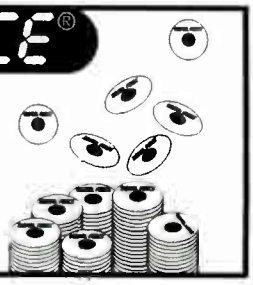

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World Radio History

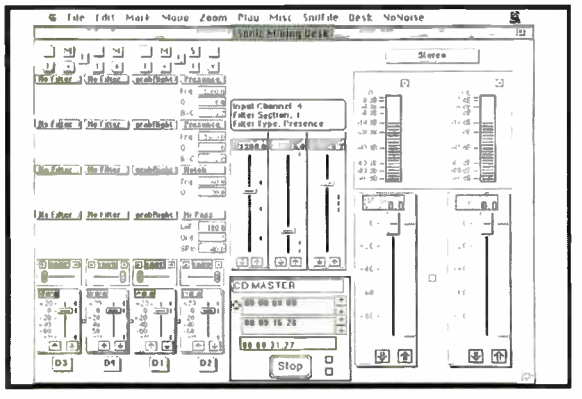
# SONIC SOLUTIONS SONIC SYSTEM

## TIPS, TRICKS AND TECHNIQUES FOR VARIOUS APPLICATIONS

One of the strengths of the Sonic System is its diversity; however, this same advantage can sometimes be frustrating to new users. With systems used in audio post, mastering, restoration, music production, etc., it's hard to determine what tips appeal to a general audience. So here are some general suggestions.

### FAST PULL-UPS ON ONE TRACK

When sequencing songs and editing dialog, you often want to pull up from the last edit by placing the edit point at the end of the last segment and marking the pull-up point. Here's where the "Find and Set Points" feature comes in handy: Place the gates to the right of the edit mark where you want the in-point to go, and hit Find and Set Points. If the gates to the right of the edit were in blank space, the Sonic System puts the in-point on the first edit it finds to the left of the left gate and the out-point on the first edit it finds to the right. Hit "Delete and Ripple" and it pulls the next segment into view—much faster than zooming out to find it. Now, leaving the in-point where it is, you can reset the out-point to the appropriate pull-up spot and hit Delete and Ripple again. The Find and Set Points function is much faster than moving the gate to a specific position and then hitting "Set In-Point." Try it if you use existing edit points as markers.




*The Mixing Desk window*

### SEE THE SONG

Working with multitrack material, it is often beneficial to view one track as text. The fastest way to zoom to a song is to have the text mode sorted by name: Simply click on "Name" at the top of the column. Select the desired tune by clicking on it and "Zoom to Segment." The other tracks in the sync group will also zoom to that segment.

This technique is also useful for dialog editors who want to quickly split out scenes by angle after auto-conforming. The title of the third column in text view is actually a toggle. You can view the information in the default Seg mode, which shows you the name of the segment and the in and out times that correspond with the segment itself. Click it once and the title turns to "Edit." These times are the actual times of the edit points themselves, which will differ from the segment times by fade times and overlap percentages. Click Edit and it becomes "SRC." This changes the time displayed to the times from the original source tape, and the name column to the source name. In this mode, if you click on "Sort by Name," the scene names will be grouped together. Simply select all of, say, "SC 146-3a" and double-click the track assignment of one of them. Change the track to where you want that angle to reside and they all go there.

### QUICK KEYS, QUICK KEYS, QUICK KEYS

No matter how well you know the Sonic System, if you do not master Quick Keys, you will forever trudge along at a mediocre speed. If you find yourself repeating the same set of steps over and over again, you need to take the time to make a Quick Key. I have different Quick Keys sets for Sound for Picture, Music Editing and NoNoise. Doing NoNoise work, I used to spend a lot of time switching between the Real-Time DeNoise window and the edit list to restart the play. I set the start time in the Transport window by starting and stopping quickly to set the now time in the Transport window to be around my desired cue point. Then highlight the cue entry and hit the space bar to enter that timecode number in the cue register. The Quick Key is a sequence that stops the play of the edit list hits, hits the cue button on the transport panel that loads the cue point back into the now time, then hits Play on the transport panel. I simply can't stress enough the benefits of learning how to use Quick Keys effectively with the Sonic System. Even if you don't make your own, at the very least rearrange the stock keys so the ones you use the most be the one-stroke keys.

Note: At AES 98 in San Francisco, Sonic announced a new edit list interface, part of the 6.0 version slated for December release. At press time, text mode was said not to change but point editing will be different, with a click-and-drag interface to select an edit region (as opposed to the current two-gate set edit points scenario).

**BY TRACY MARTINSON**

*Tracy Martinson is a co-owner of MasterVision, the first DVD authoring facility in Nashville. One of her first projects is a benefit for the Missing Children Foundation. She has done extensive sound for picture and DVD audio work. Her recent DVD projects include audio prep for the films* Seven Years in Tibet, My Best Friend's Wedding, Das Boot *and* Jerry Maguire.



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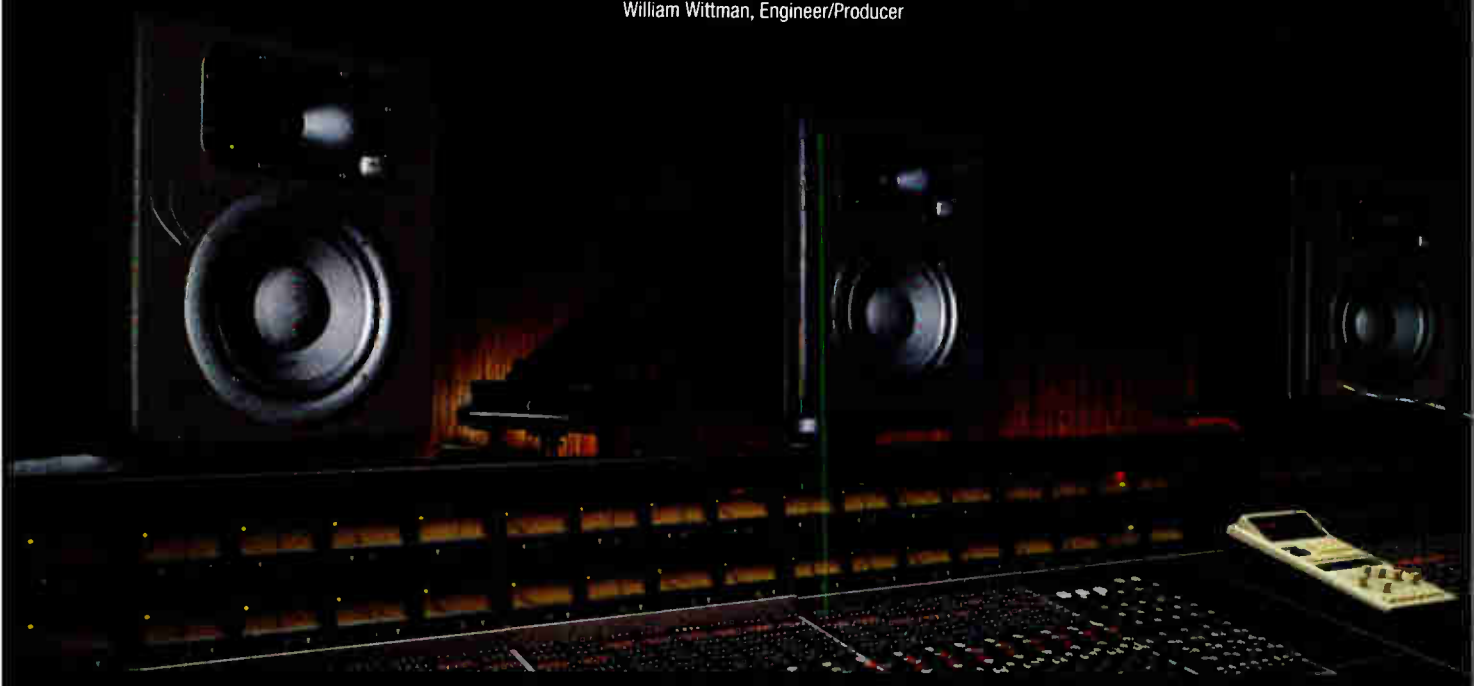

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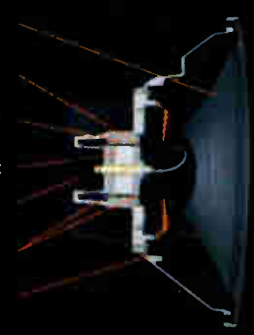


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