The Mix Interview: Buck Owens · QuickTime on the Web · All Access: Shania Twain

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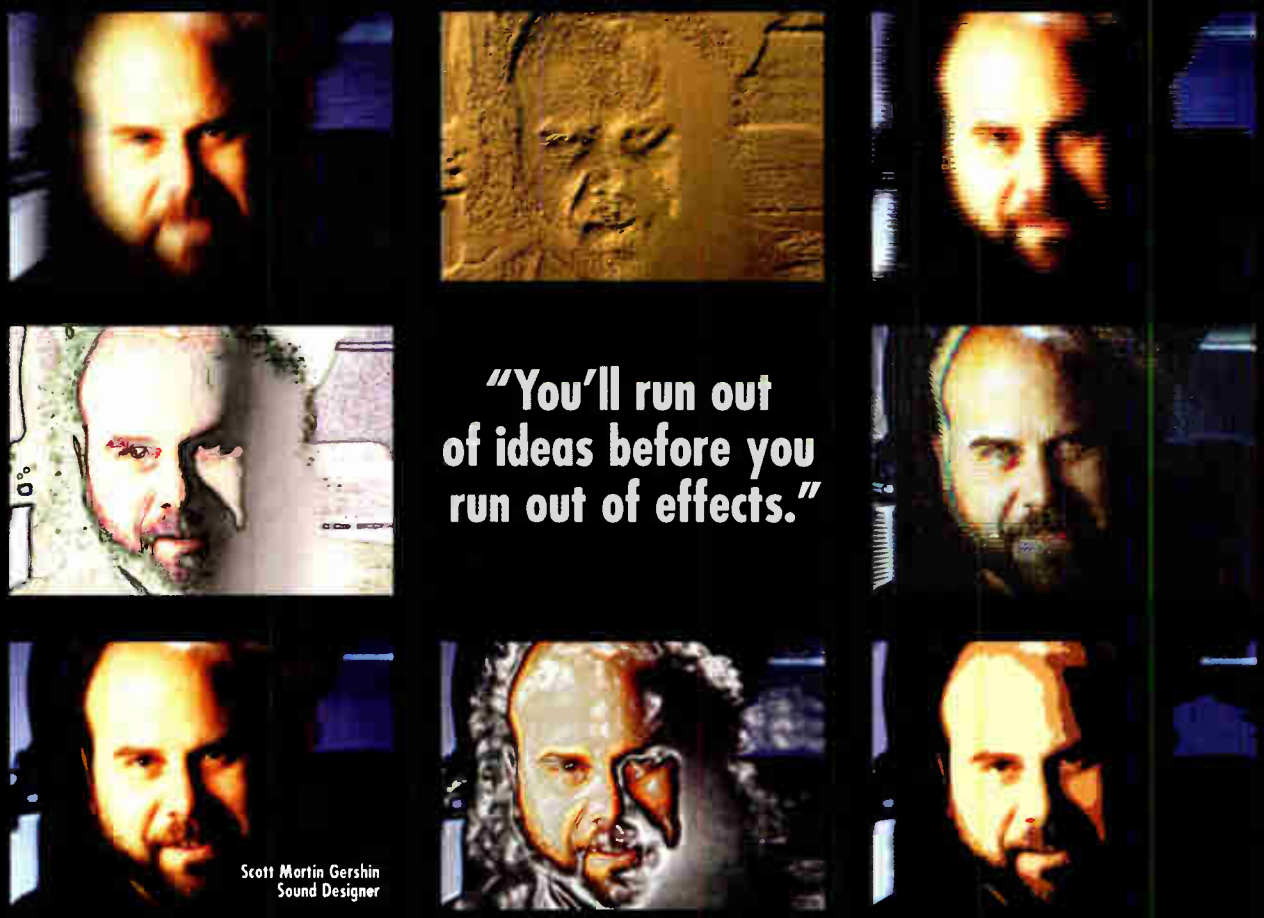
The New PCM 81 Digital Effects Processor



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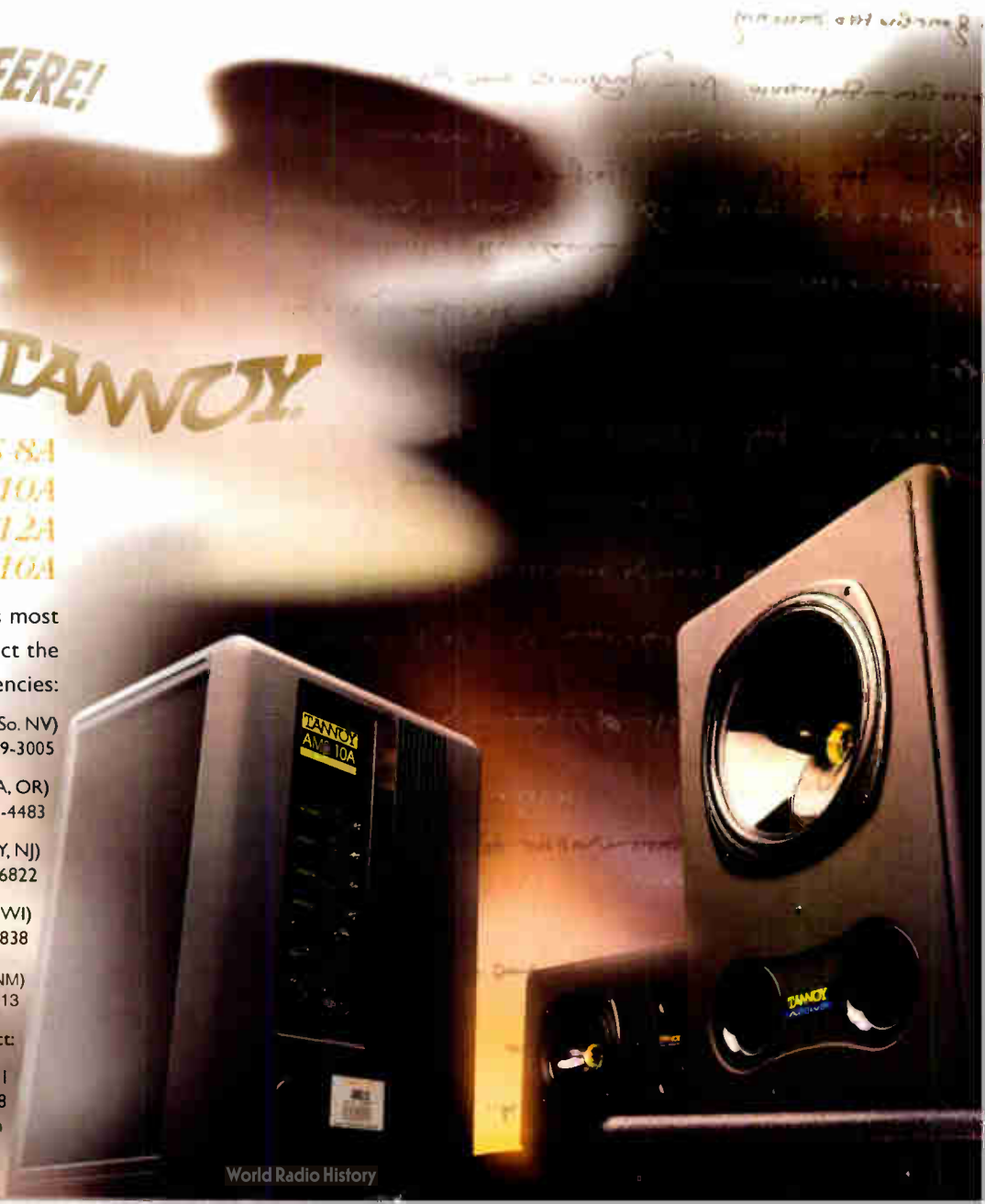

MIX®

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

SEPTEMBER 1998, VOLUME 22, NUMBER 9

AUDIO

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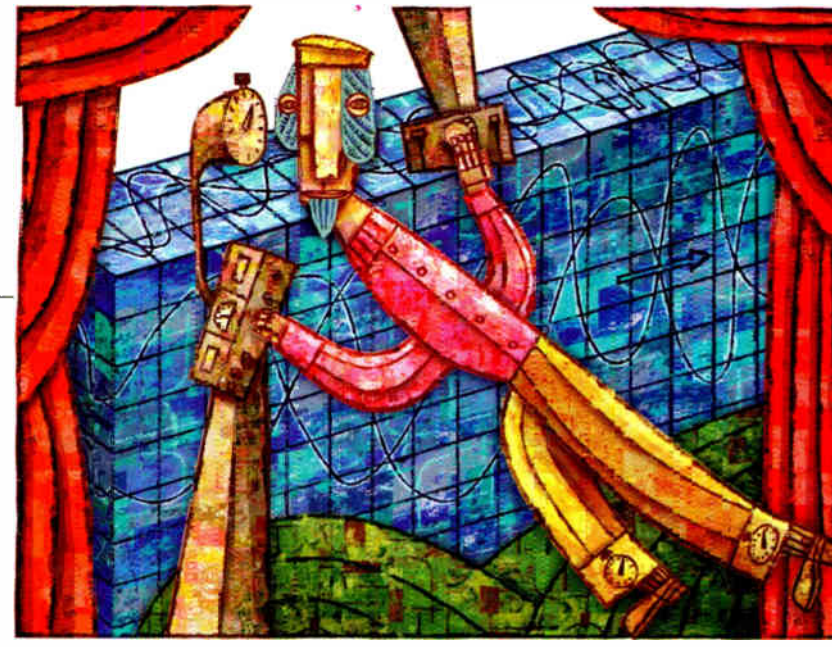
SFP 12

SOUND FOR PICTURE SUPPLEMENT



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PRODUCTS

LIVE SOUND

DEPARTMENTS

Check out Mix Online!
http://www.mixonline.com

On the Cover: The Mix Room in Burbank, Calif., was opened last fall (in the former Saturn Sound) by owner/producer/mixer/engineer Ben Grosse. Shown here is the SSL 9000J-equipped Studio A. Clients have included Madonna, Third Eye Blind, Henry Rollins, Faith No More and others. For more about the facility, see page 76. **Photo:** Ed Colver. **Inset Photo:** Steve Jennings.

GS3000

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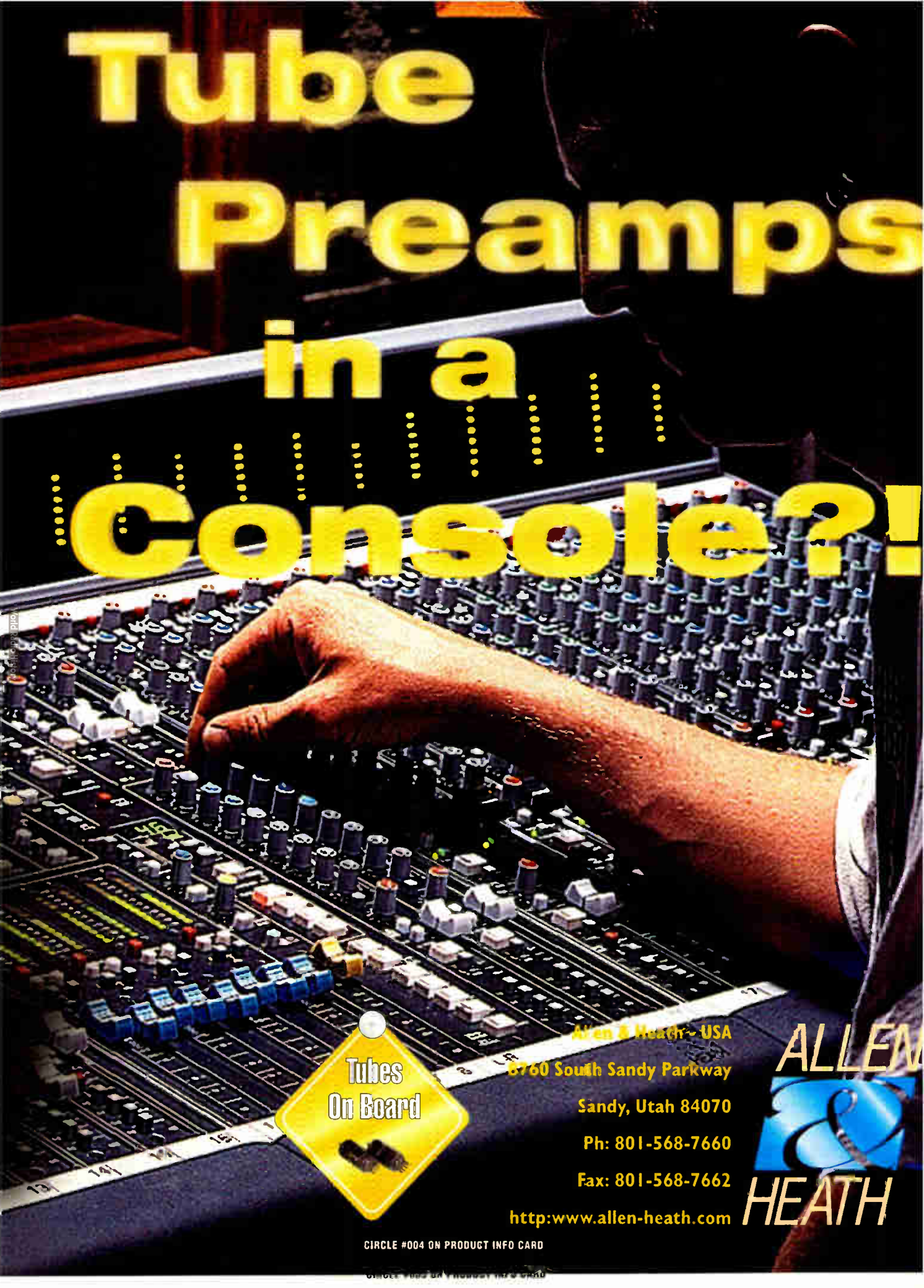

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FEEDBACK

JOB SECURITY

Denny Purcell and all the other talented mastering engineers out there are not worried that the latest version of "the digital promised land" will put them out of business (see "Feedback," July '98). No way, man! Digital sucks! It's a fact that digital recording and reproduction only reproduce sounds between the frequencies of 20 to 20k Hz. Granted, nobody hears pure tone at or beyond those frequencies, but we do hear the residual effect of secondary overtones ringing up, or down, from those outer frequencies, interacting with tones that we do hear! That's full dimensionality, and it's only achieved when there's full fidelity.

So, by design, digital recording and reproduction cannot reproduce full and total fidelity, period. And it will always fall short, until manufacturers elevate the sampling rates through the roof (five times the "limit" of human hearing, the "Nyquist Theorem") and amend its inability to record tones far beyond the current 20 to 20k Hz limit. Until then, it's up to great mastering engineers like Denny Purcell to bridge this gap as best they can.

Science and technology do not replace art and artistry, and as such, you should be grateful to talented folks like Denny Purcell for keeping things sounding good, oftentimes against all odds.

Richie Kessler
New York, N.Y.

FROM THE HORSE'S MOUTH

Thanks very much for the nice sidebar in Steve Albini's article ("A Word About Those Josephson Mics" in "Recording Page & Plant's *Walking Into Clarksdale*," July '98). That sort of detail and interest from a snazzy user like Steve works for me!

Couple of corrections, though: The transformer in the C609 is not from Reichenbach, but from AB Lars Lundahl in Sweden, made especially for us. Jensen and Reichenbach both had a swing at the challenge, but neither was able or willing to make something to my spec that would fit inside a 21mm-diameter tube. The Lundahl design using a metallic glass core works fine, and I am really impressed with it. The same transformer is also used in the C610 vacuum tube mic, which takes the same capsules.

The output stage of the C606 transformerless mic is not a Darlington, but a balanced pair of single emitter followers. The input stage is a little different, being a cascode phase splitter, but the output is fairly conventional. The distortion problem Steve mentions occurs at high levels with any mic having a really low (<20 ohms) output impedance connected to some mic preamps that include the input transformer in the negative feedback path. The negative feedback is loaded down by the low impedance of the mic, which causes the gain and distortion to go up. A lot of big-name transformerless mics include build-out resistors, as Steve described, to avoid this problem, and big-name microphone customizers get big-name dollars to take 'em out. I decided to keep them out from the beginning. The model number of the capsule that became the Albini drum mic is the KA32S. It can be used on either the C606 transformerless or C609 transformer-output bodies, or the C610 vacuum tube mic body.

Thanks again. Hopefully I'll soon have some of these mics on the shelf long enough for you to check 'em out...

David Josephson
San Jose, Calif.

DIRECT RESPONSE

Your recent review of seven direct boxes by Mark Frink ("Active Direct Box Tests: Seven for the Road," July '98) was very informative and well-written. Unfortunately, there are so many active direct boxes on the market, it is hard to compare them all. Companies like LA Audio, Manley and Simon Systems also make direct boxes that were not reviewed in the article.

Most direct boxes on the market today follow a similar design approach. They are designed to use the phantom power scheme that sends signal and power on the same lines. To do this, you must isolate the supply from the signal with isolation resistors, typically 6.8 kilohms. Though phantom supplies have ample output voltage capability, the current that you can draw from them is limited by the 6.8-kilohm isolation resistors that are used in series with that supply. These resistors are a compromise that must be made to send power and signal down the same lines. But this compromise severely limits the design. Only low-current circuit designs can be used with phantom power.

Another common element to active direct boxes is the isolation transformer. Even though the box has active circuitry, it also has a transformer in the audio path of the signal. The good part of a transformer is that it does provide isolation so that ground loops can be broken. It also provides a balanced output. But transformers in the audio path of a direct box have very serious negatives. Typical direct boxes have a gain of -12 dB. That is to say, the output is 12 dB lower than the input! Transformers also cause phase shift and distortion, particularly at low and high frequencies. Good-quality audio transformers that make the best of these specifications are expensive and, in most cases, still do not deliver the performance of active, transformerless designs.

There are active direct boxes such as the Simon Systems DB-1A (single unit) and RDB-400 (4-channel) that take a completely different approach. These units are based on not using phantom power but rather an independent bipolar power supply with lots of current capability. The independently powered, active, transformerless direct box provides excellent frequency response, low distortion, an active-balanced output with tons of headroom, and all of this is achieved because the limitations of the phantom power supply are not there. I think it would be worthwhile in the future to do a review on active direct boxes that take unique approaches such as these and compare them to ones like those reviewed.

Richard A. Simon
Simon Systems

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

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CURRENT

EVENTS, TOURS, HIGHLIGHTS AT AES CONVENTION

The 105th AES convention is offering an impressive range of events and activities. Special Events co-chairs Bill Orner and Ron Streicher have coordinated seven diverse functions, most to be held in the Moscone Center Special Events Salon. "It Doesn't Have to Hurt: SPL and Acoustics" will focus on current and emerging sound reinforcement technologies designed for low distortion even at higher sound pressure levels. "Defining Global Roles for Music Producers and Audio Engineers," a panel produced by the Music Producers Guild of America, will focus on the relationships between the musician and the recording studio. The 10th Annual NARAS Grammy Recording Forum features a panel of prominent engineers and producers discussing issues and fielding questions about recording styles and techniques. Internet2 "Round Table Forum," will be a discussion lead by Zack Settel of the AES/McGill University, Ted Hanss of Internet2 and John Strawn of EAS Technical Council/S Systems.

Technical tours chairman Chris Cain has coordinated seven different tours, including a guided tour of Skywalker Ranch concluding with a screening of one reel from a major Skywalker production followed by a discussion of the sound system; visits to leading Bay Area music studios such as Fantasy, The Record Plant and Different Fur; a post-production facilities tour featuring Russian Hill Recording, Crescendo! Studios and Music Annex; and visits to Dolby Laboratories, Meyer Sound, Sonic Solutions and Digidesign. Attendees can sign up for tours at the Moscone Convention Center at the bus departure area. There will be a program of 14 workshops covering surround mixing, internet audio, DVD and multichannel mastering, and much more.

Visit the AES Web Site at www.aes.org for further information and for locations and times of events. Due to popular demand, attendees can register and pay by credit card online. As an additional service, local hotel information and room reservations are also available online.

NEW DATE FOR SPARS AES CRUISE

The SPARS 20th Anniversary Kick-Off cruise on the San Francisco Bay has been moved from Saturday, Sept. 26th to Friday the 25th at 7 p.m. Call Shirley Kaye at 800/771-7727 for more information.

ADRIAN LOADER REMEMBERED

Professional Monitor Company joint-founder Adrian Loader passed away on May 17, 1998, after a short illness. Loader started work in the audio industry with the BBC where he met his future business partner Peter Thomas. Loader later joined audio distributor FWO Bauch Limited as a field service engineer, and was quickly promoted to manage the engineering department. In his free time he brainstormed with Thomas about the possibility of building a loudspeaker system based on the transmission line theory. Loader and Thomas left their respective jobs to launch the PMC BB5. Early success led to the development of a range of products that appealed to the professional industry in the UK, U.S. and Japan. In the last month of his life, Loader was given the Emmy Award for best sound for television series for the TV sequel to *The Lion King* produced by Advantage studios. Loader is survived by his wife, Jo, and his three children.

SEATING STILL AVAILABLE FOR TEC AWARDS

A limited number of seats are still available for the 14th Annual Technical Excellence & Creativity Awards, to be held Sunday, September 27, at the Fairmont Hotel in San Francisco. Emceed by the popular Father Guido Sarducci, the evening promises to be special, with Neil Young receiving the Les Paul Award and the late Colin Sanders, founder of SSL, being inducted into the Hall of Fame.

Several more companies and individuals have been added as TEC Awards sponsors, bringing the total to 45. Eastern Acoustic Works is a new Gold Sponsor. New Silver Sponsors are AKG, E-mu Systems, NARAS, Neumann, Ocean Way Nashville and Oram Consulting Inc. New Bronze Sponsors are CreamWare US Inc., Dolby Laboratories, Mick Guzauski, Howard Schwartz Recording, Tannoy/TGI North America and Todd-AO Studios.

For more information call Karen Dunn at 925/939-6149. ■

BAAM/AES GALA PARTY

The San Francisco Bay Area Music Manufacturers (BAAM) and The AES are capping off the AES convention opening day with a gala party to be held at the Yerba Buena Center for the Arts on Saturday, September 26th from 8 to 11 p.m. Local entertainment and cuisine will be available continuously during the evening throughout the center. More than 1,600 people are expected to attend. Admission is limited to ticket holders. Tickets are available from the AES at $30 each for members (limit two per member) and $40 for non-members (limit four) and exhibitors (minimum ten). ■

STUDER, QUANTEGY AND BASF/EMTEC SPONSOR MEETING ON ANALOG

The Analog Option Coalition (AOC) has scheduled a "Town Hall Meeting" during the AES convention. Tentatively set for 4:30 p.m. on Monday September 28 at the ANA hotel, the meeting will offer an opportunity for suppliers, studios, producers, engineers and all interested parties to express their views regarding the future of professional analog recording. "We are in a situation that is unprecedented in the history of audio recording," says AOC coordinator Bruce Borgerson. "With only one exception, professional studio recorder manufactur-

—CONTINUED ON PAGE 16

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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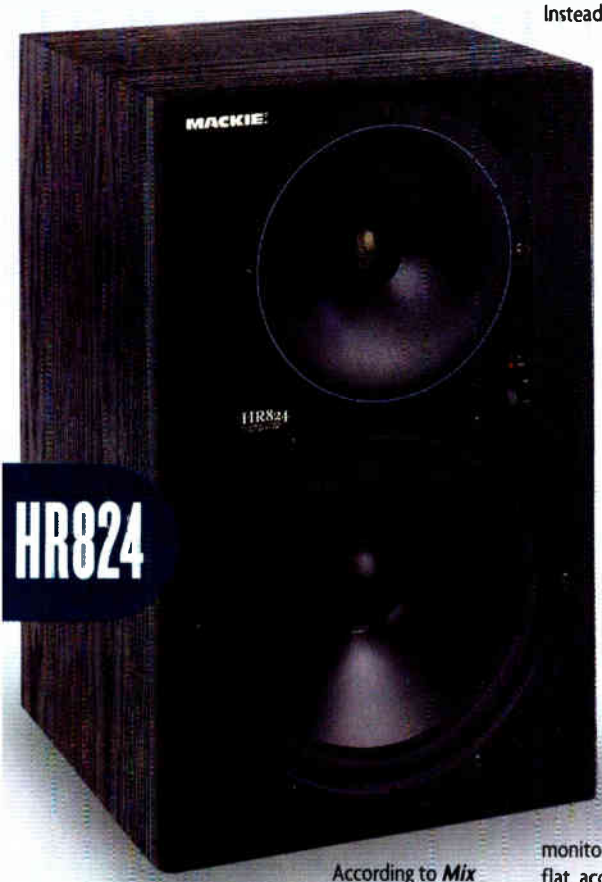
HR824 ACTIVE NEAR FIELD

UNFLINCHING ACCURACY.
We've claimed it. Reviewers and power users are confirming it: the HR824 is the most accurate 8-inch 2-way near field monitor you can buy. It lets you hear exactly what was recorded — from microphones right through to your mixdown deck. You'll suddenly discern fine nuances of sonic texture, dynamics, equalization and stereo perspective that were sonically invisible before. As one owner put it, *"I am correcting a lot of mixes I have made in the past."*



HR824

According to ***Mix*** magazine's recent field test of the HR824...

"Frequency response was the flattest we have measured so far... *there can be no question... they speak the truth."*

"The HR824s performed admirably, allowing us to distinguish very fine shades of tonal color and to establish subtle timbral and harmonic relationships between sounds. When the mixes were played on other monitors, including some that cost more than twice as much, they translated very well. The overall imaging was extraordinarily clear and detailed."

Because the HR824 is active, we can precisely match each transducer's actual output. During final assembly, each HR824 is carefully hand-trimmed to ±1.5 dB, 39 Hz 20kHz. As proof, each monitor comes with its own serialized, guaranteed frequency response printout.

EXTREMELY WIDE SWEET SPOT.
Instead of a traditional, narrow "sweet spot" directly between the monitors, you'll discover that the HR824s have a wide, "sweet zone." They maintain a wide, coherent, stereo panorama that lets you move from side to side — and share what you hear with others.

Again, *Mix* magazine...

"[HR824s] also have a wide off-axis listening range, due to the high-frequency dispersion of the waveguide... *the mids and highs were tightly focused, and the stereo image well defined."*

EXTENDED LOW FREQUENCY RESPONSE (sub woofer is built in*). The HR824 has the lowest frequency response of any 8-inch near-field monitor. It really IS capable of flat, accurate, articulated response below 39 Hz and usable response to 30Hz — low frequency accuracy that simply can't be achieved with passive speakers. Bass notes start and stop instantly, without overhang, distortion or "tubbiness."

*A large honeycomb composite piston mounted on the back of the cabinet couples with the front woofer, acting as a subwoofer.

AC power and input connectors (1/4" & XLR) extend directly from the bottom of the amplifier down, allowing the cabinet to fit flush against any surface.

***Mix* further states...**

"The HR824s handled the ultra-low bass remarkably well... *Mackie asserts that the HR824s are smooth from 39 to 20k Hz (±1.5 dB), and our tests corroborated the claim. This is no mean feat for monitors this size, and at this price."*

BRING ON THE HR824s. HOLD THE ICEBERGS.
Simon Franglen and his cohorts worked on the blockbuster hit Titanic at Castle Oaks Studio in Calabasas, CA. The studio was equipped with expensive studio monitors (one each for left, center and right) and a matched sub woofer. When Simon received three Mackie HR824s, he immediately did a series of rigorous listening tests against the old monitors. The unanimous decision: replace the studio's previous near field monitors with the HR824s.

"The difference was extremely pronounced," explains Simon. *"Three HR824s gave us better bass response than the larger monitors with a sub woofer. The HR824s were louder, had more dynamic response, and the imaging throughout the room [was incredible]."* Simon says the HR824's sweet spot is much larger, which made listening to things easier, *"when you were off to the side of the room."* *"Apart from very expensive speakers,"* says Simon, *"I've not come across any other speakers that sound as good. They absolutely tell me what I'm putting on tape."*

One person who's taken Mackie to heart is British-born synth player/producer SIMON FRANGLEN. You may not know his name, but you most certainly know his work. Simon Franglen's curriculum vitae includes work with Grammy winners Eric Clapton, Madonna, and Celine Dion (including the single from the blockbuster movie *Titanic*), rockers Yes and Crash Test Dummies, and legendary performers such as Michael Jackson and Barbra Streisand. Simon's done work in the movies, too, including Titanic, The Client, Dances With Wolves, Mission Impossible, Seven, and Contact. He's won seven Clio Awards for his work in television commercials—his clients have included Nike and Lee Jeans. His talents as a session synth player and programmer, as well as producer, are well-known throughout the entertainment world. With such credits, you'd think the guy was using incredibly esoteric, expensive gear. How else could he get such award-winning results? Well, Simon will be the first to say: you don't have to spend wads of money to get tough, quality sound gear. Not with Mackie.

MONITOR—WELL WORTH DISCOVERING.

How much is unflinching accuracy worth to you?
As we talk to more and more professional engineers who have converted to Mackie HR824s, one thing is becoming especially apparent — our near field monitors can uncover nuances that other speakers miss. In fact, one Very Prestigious Major Los Angeles Studio Complex has now installed HR824s in its Quality Control Department — because our monitors can uncover miniscule audio flaws that were undiscovered during the tracking and mixdown process on "big studio monitors." When you value the quality of your creative product, HR824s should be in your studio, too.

HUMBERTO GATICA, TRIPLE GRAMMY AWARD-WINNING ENGINEER/ PRODUCER

Being at least nominally humble we thought it would take years for mixing/producing legends like Humberto Gatica to publicly admit — much less proudly proclaim — to prefer our HR824 near field monitors.

We're delighted the esteemed Mr. Gatica proved us wrong. After being turned on to HR824s by Simon Franglen, Humberto now uses them at his private facility and has carrying cases for a second pair so he can get the same accuracy in studios that haven't yet become HR824 converts. Talk about a traveling ad!

Humberto's stellar ear for mixing has served him well as a producer: Grammy awards and nominations for engineering (Chicago, Michael Jackson, Streisand) led the way to a Grammy for producing Celine Dion's "Falling Into You" and mixing/producing her 18X platinum album "Let's Talk About Love."

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Mix Magazine quotes from Mix Magazine Field Test by Barry Cleveland, April 1998. Reprinted by permission. And this isn't the only glowing review we've gotten. Check out the February 1998 issue of Recording Magazine, beginning on page 30; the April issue of Pro Audio Review, page 16; and the October 1997 issue of Audio Media, page 46.

CIRCLE #008 ON PRODUCT INFO CARD

INDUSTRY NOTES

Lakewood, NJ-based **Neutrik USA** has acquired UK-based **REAN Ltd.** products and U.S.-based **REAN Inc.** For more information contact Neutrik USA at 732/904-9488...**Fairlight USA** (Culver City, CA) appointed **Keith Risinger** to serve in the newly created position of national vice president of broadcast sales. Risinger assumes responsibility for developing and implementing a broadcast industry sales and marketing program. Risinger previously served as senior sales engineer for broadcast and post-production at SSL...Farmingdale, NY-based **Beyerdynamic** announced the appointment of **F.M. Valenti Inc.** as its representative to handle New England and upstate New York. Based in Massachusetts, R.M. Valenti also has offices in Connecticut and upstate New York... **Robert Carver**, president of Sunfire Corporation, announced that the company formed a new division called **Sunfire Laboratories Professional**, which will design, manufacture and market audio products for professional applications. Carver founded Sunfire Corporation in 1994, shortly after leaving Carver Corporation, which he founded in 1978...PMI (Torrance, CA) has gone through a reorganization and is now named **PMI Audio**. The company recently announced its appointment as U.S. distributor for **BPM** microphones and North and South American distributor for **CLM**...**Harris Corporation** (Quincy, IL) was named the exclusive broadcast distributor of the **Sonic Foundry** Professional CD Factory...**Jean Tardibuono** was promoted to vice president of sales and marketing for studio and broadcast products at **EMTEC Pro Media** (Valencia, CA), and **Mike Ingalls** was promoted to vice president of sales and marketing for duplication products. Tardibuono and Ingalls had each been serving as national sales managers in their respective areas. It was also announced that **JRF Magnetic Sciences** will be the U.S. master distributor for BASF-brand calibration and alignment cassette tapes...**Audio Precision** relocated its corporate headquarters to a new purpose-built facility. The mailing address and telephone numbers will remain unchanged; the new address for shipments is 5750 S.W. Artic Drive, Beaverton, OR 97005...**MountainGate** (Reno, NV) announced the completion of financial agreements with all outstanding shareholders in the company, making the company completely independent and employee-owned...**Seer Systems** of Los Altos, CA, announced the appointment of several regional rep firms for Reality Software: New England—**Richard Dean and Associates**; New York Metro—**Metro Sales and Marketing**—Mid-Atlantic—**Devins and Associates**; Northwest—**RS Marketing**; Northern California—**Sirius Sales and Marketing**...**Bobby G. Frasier** was hired as digital product specialist at **Panasonic/Ramsa** (Cypress, CA). Frasier will organize and lead efforts in product training and assist with implementing marketing support strategies at all levels of distribution...**Leitch Technology Corporation** announced that it will re-organize European and Asian operations to consolidate Leitch and Tekniche sales and customer service...**White Instruments** (Austin, TX) announced the appointment of **Duke Ducoff** as vice president of sales and marketing...Sydney, Australia-based dSP (Digital Studio Processing) recently appointed **Digital Media Technology** as its exclusive agent for China, Hong Kong and Taiwan...VAC (Valve Amplification Company), located in Durham, NC, announced its appointment as exclusive U.S. distributor of **J.J. Electronic** vacuum tubes for the MI market...**ATM Fly-Ware** (Carson, CA) has a new client service and distribution center in London, located at 102 Grafton Road, London, NW5 4BA; phone 44/0171/482-3300. ■

—FROM PAGE 12, CURRENT

ers have all but abandoned analog. But at the same time, many prominent engineers, producers and studio owners still express a strong preference for analog technology." The meeting is open to all AES attendees. Contact Bruce Borgerson at 541/488-5542 for additional information.

NIGHTPRO TECHNOLOGIES SOLD

Provo, Utah-based NightPro Technologies International (NTI) has been sold.

The sale of the company, which manufactures and markets equalization systems EQ3 and others and had been planning to move into consumer electronics via a planned IPO, closed June 22. According to co-founder Richard Zimmerman, who will remain on with the company as a consultant, the operations of NightPro have been acquired by former Marathon Mining chairman Bud Farnsworth, under newly formed holding company Newco, and will move to new corporate headquarters in Grand Junction, Colo. Research & development and promotion will remain in Provo. No price was given for the sale, but NTI had a market valuation of $30 million in 1997. The company is still expected to be taken public sometime in the future.

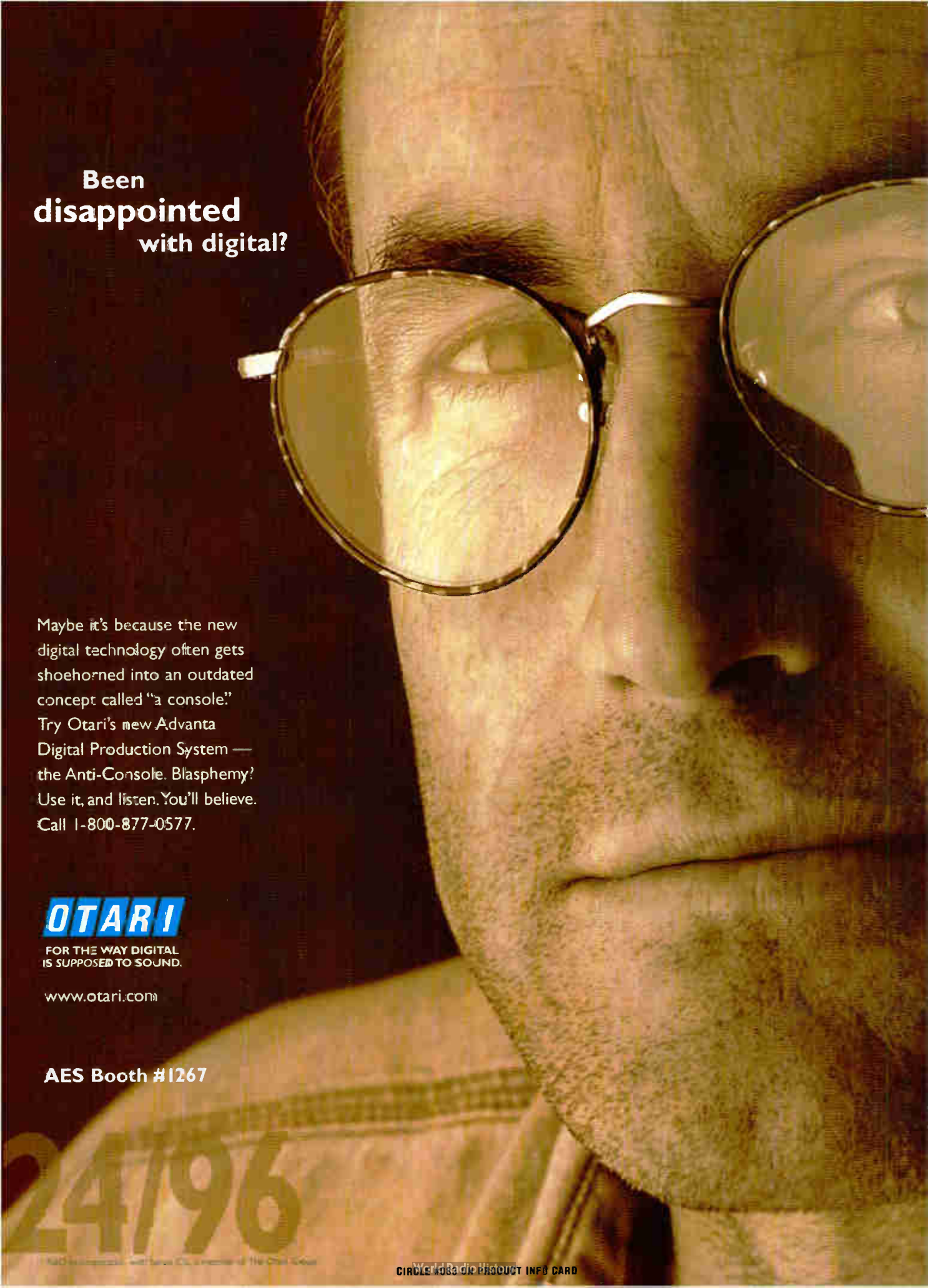
—Dan Daley

UPCOMING SHOWS

Tomlinson Holman is offering to television producers, mixers and network broadcast engineers a comprehensive, eight-hour course in audio for advanced television. The course covers the new features offered by the digital television system of the ATSC, including the three-level setting mechanism and production information metadata. Microphone technique employed by multichannel audio broadcasters is covered, as are post-production mixing processing techniques and proper monitoring conditions for 5.1-channel audio. Classes are held nationwide. The fifth class will be held in Dallas on September 12. For more information, call David Miraglia or Courtney Miller at 213/742-0030.

CORRECTION

In our July photo profile of "30 Years at the Record Plant," we inadvertently misspelled Phil Kaffell's name. Our apologies. ■



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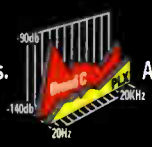
Our exclusive PowerWave™ Technology  used in our PowerLight™ Series for chest pounding bass and crystal clear highs. 

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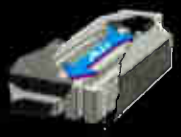
An advanced thermal management system  for true 2-ohm performance. And not to mention QSC's 30 year 

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CIRCLE 17 ON READER PRODUCT INFO CARD

96 BOTTLES OF BEER ON THE WALL

96 KILOS OF HURTS

96 kilos of Hertz—on the damn wall! Well, now, that's what this is all really about, isn't it—the wall. It ain't about the pain—it's about that wall.

Well. Thank you again for reading my column. I hope that it got you to look at a small part of the world around you in a different way, even if just for a minute. ■

Stephen St.Croix has decided that it is time for him to leave his twisted, excessively organic, rambling writing style behind, and to move on to a clear, concise new era of communication.

P.S.

After I handed in this month's column (above), it seems the editors at *Mix* had a series of meetings and decided that though a certain number of readers would be just fine with it, others might feel either a bit lost and disoriented, or worse yet, might feel that my views were presented in a somewhat didactic and cavalier manner. Once this was pointed out to me, I saw the error of my ways. I certainly wouldn't want that.

Now, I *told* the editors that you people were right on top of it and would understand exactly what I was talking about, but I get the feeling that they might not have shared my faith. Then I tried my other standard approach: telling them that it might in fact be quite a bit better for the magazine if the readers *didn't* actually fully grasp my point, but they just referred me to some liability clause in my new contract. Mmmm. That *used* to work with the old contract.

So anyway, all that, along with another somewhat cold-hearted point about money and word count, made me decide to go back and fluff it out with some background and details. So here you go...the screenplay:

BY STEPHEN ST.CROIX

DOES LIFE REALLY WORK LIKE THIS?

96 kHz! Man, I wish there had been this kind of thinking when I was in school! "Gee, teach, I just can't seem to stay in the lines here." "Okay, Little Stevie, we'll just move them pesky lines out of the

—CONTINUED ON PAGE 233

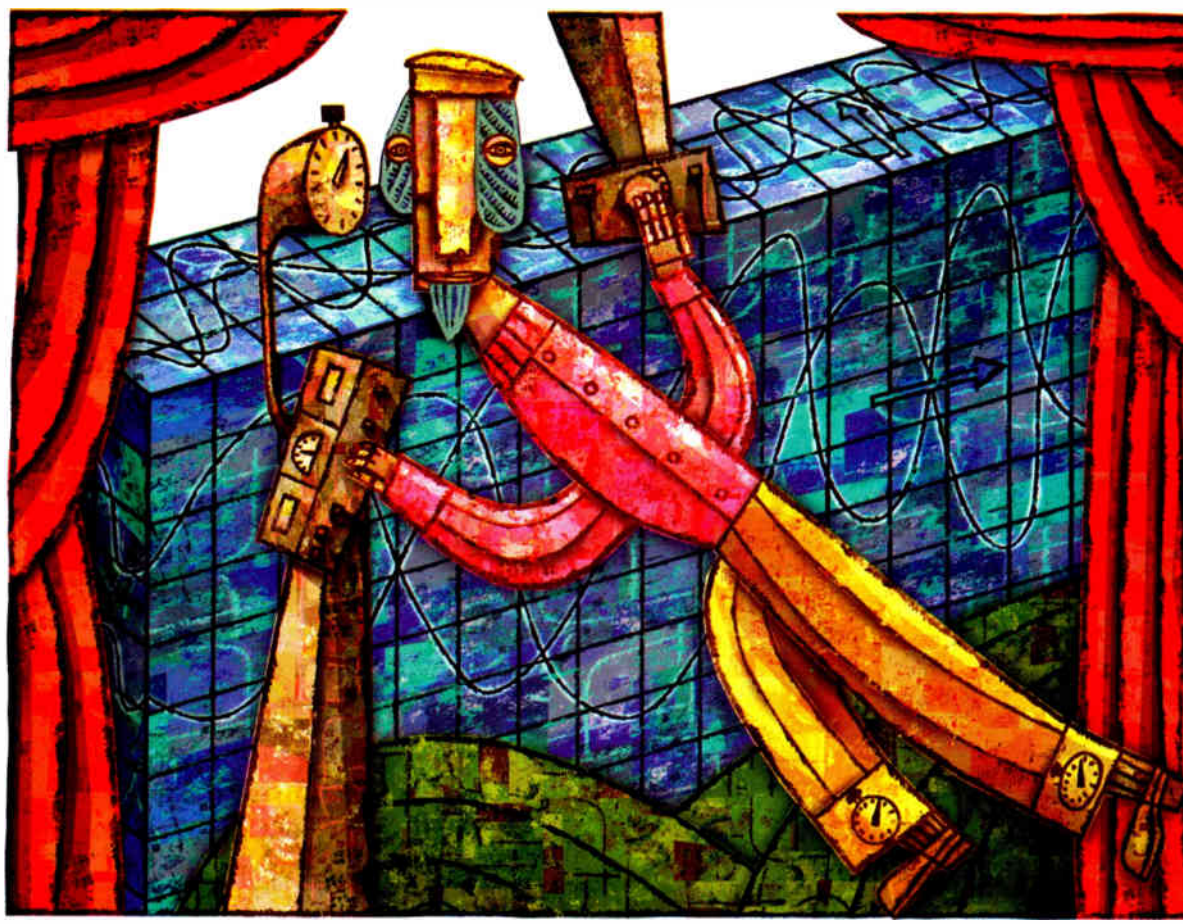
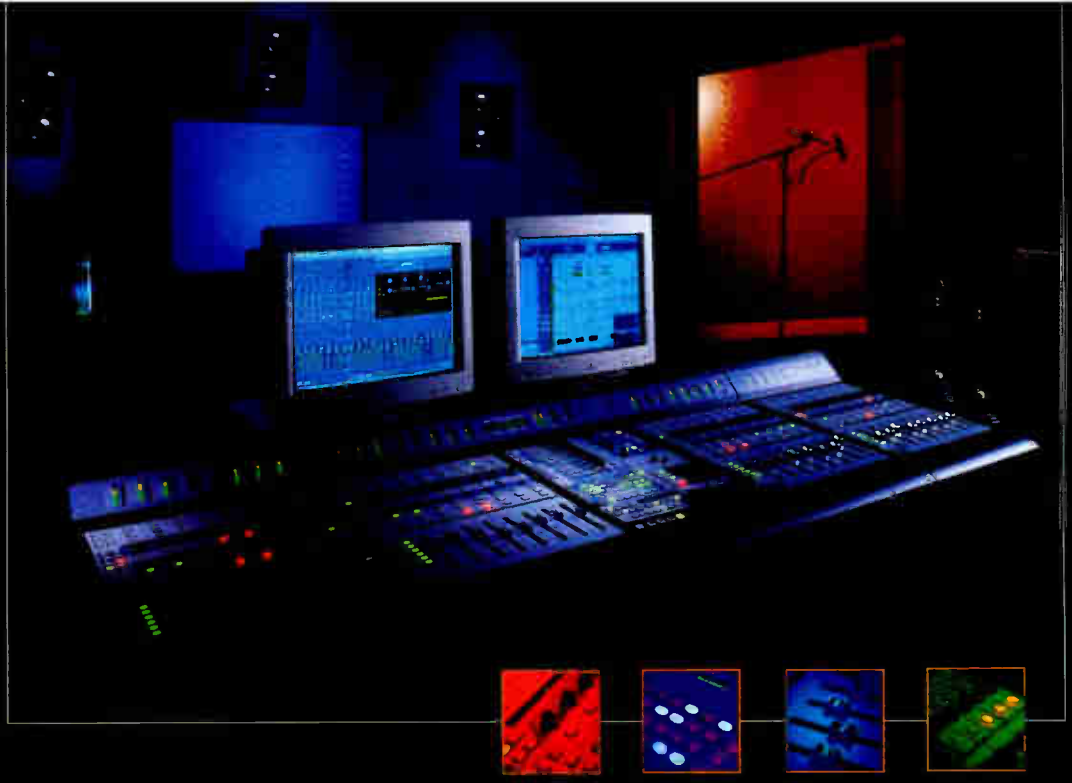


ILLUSTRATION: RICHARD DOWNS



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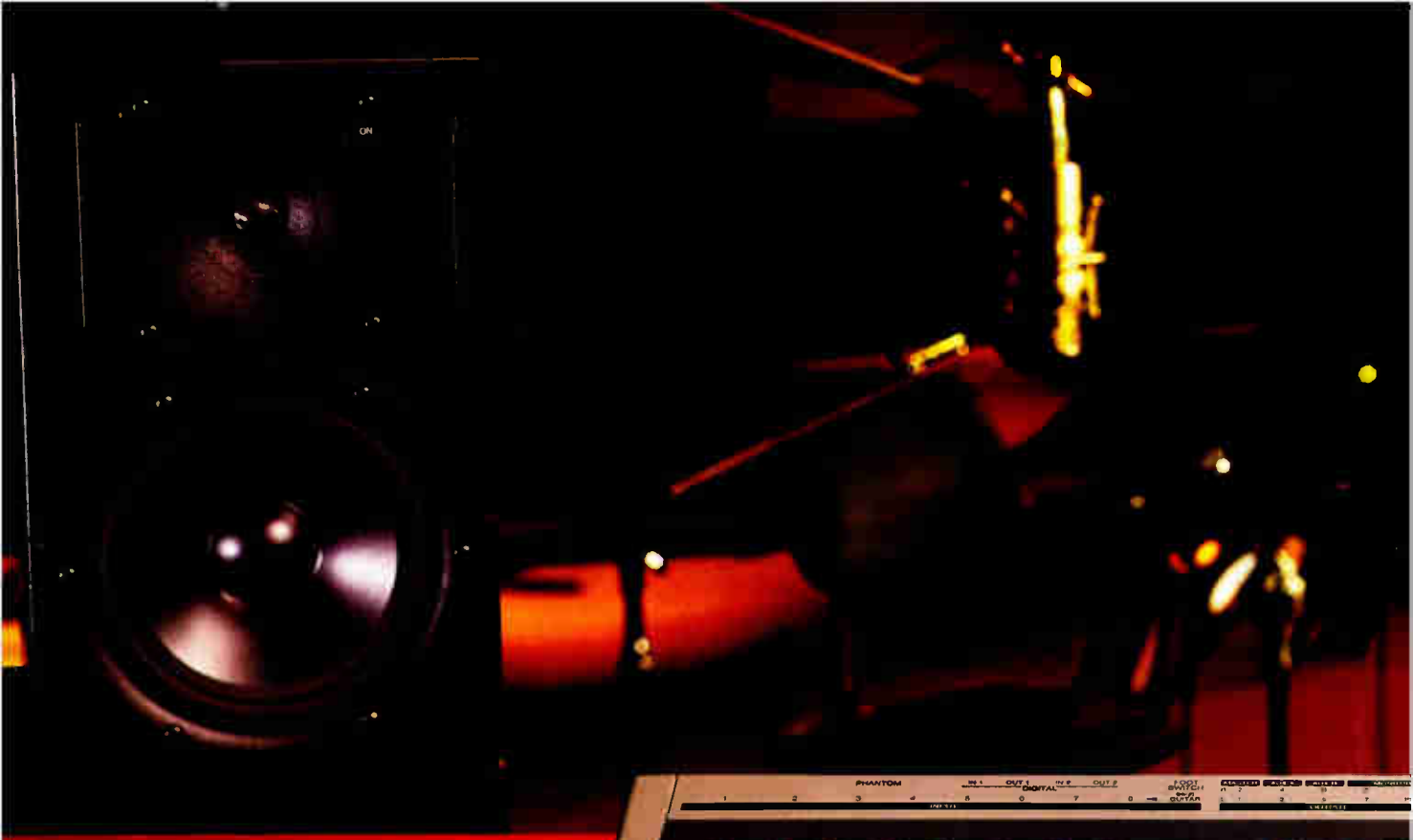

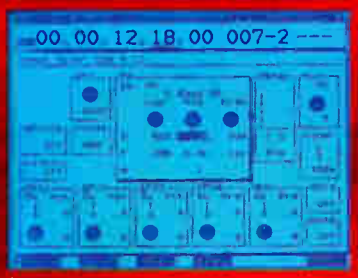

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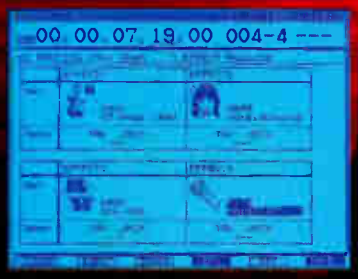

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CIRCLE #012 ON PRODUCT INFO CARD

IN MEMORIAM

THREE PIONEERS OF ELECTRONICS AND INFORMATION

In this month's column, I was going to continue the discussion I started last issue on the future of documentation, but that can wait. Instead, I want to pay tribute to three people who passed away recently—two after good long lives, and one, sadly, in the prime of his career. You may never have heard of them—they were never on the cover of *Rolling Stone*, or of this magazine, for that matter—but each of them, in his or her own highly individualistic and modest way, had a profound influence on the way I and, I would venture, many others make and think about music.

•••

Clara Rockmore, who died in May at the age of 88, was the first musical virtuosa of the electronic age. Her instrument was the Theremin, that eerie-sounding invention of the Russian physicist by the same name. It was the first musical instrument that could be played without touching it, and it found its way into dozens of science-fiction film soundtracks, started Bob Moog's career as an instrument designer, and captivated a new generation when Brian Wilson laid it on top of his masterpiece "Good Vibrations."

Rockmore, who was born in Russia, had been a child prodigy on the violin but developed hand problems that forced her to stop playing. She immigrated to New York in 1927, the same year Theremin first came to the U.S., and here the two of them struck up a close friendship and an intense professional collaboration. She played her first solo recital on the instrument in the early '30s and continued to be in demand as a performer for the next two decades.

By today's standards, the Theremin is a very simple instrument: two very high-frequency oscillators heterodyne ("beat," for those of you who missed Electronics 101) in the audible range, with the frequency of one of the oscillators controlled by hand capacitance. As can be seen in Steve Martin's remarkable 1994 film, *Theremin: An Electronic Odyssey*, Rockmore invented her own remarkable technique for the device, which transformed it from a curiosity into a true musical instrument. By using finger gestures that almost looked like sign language, she was able to produce a precise, repeatable vibrato and play consistently in tune.

PHOTO COURTESY BIG BRIAR INC.

Clara Rockmore

She also demanded of the instrument that it be able to play staccato notes, and she had Theremin build her a special version with that capability. In his original design (which was marketed by RCA), moving the left hand controlled the volume by changing the temperature of the filament of the amplifier tube, a technique that invariably caused a distinct lag in the amplitude change. The instrument Theremin custom-made for Rockmore used grid control, which meant it could respond much faster. Using quick hand movements, she was able to make the instrument articulate in a totally unique way.

She was married to Robert Rockmore, a show-business attorney with clients including the great singer/actor Paul Robeson, with whom Rockmore toured before his career was destroyed by the House Un-American Activities Committee. Rockmore was not politically active, but she did count among her circle of friends many of New York's cultural and intellectual elite. Her sister, Nadia Riesenberg, was a celebrated pianist and teacher, and her nephew is the longtime program director of the city's only remaining commercial classical radio station.

Curiously, Rockmore never made any commercial recordings until 1976, when Bob Moog convinced her to go into the studio and record a large chunk of her repertoire, accompanied by her sister. That record is still available, now on CD, of course, on the Delos label, and Moog says enough material was recorded to make a second album, which he hopes to release in the near future.

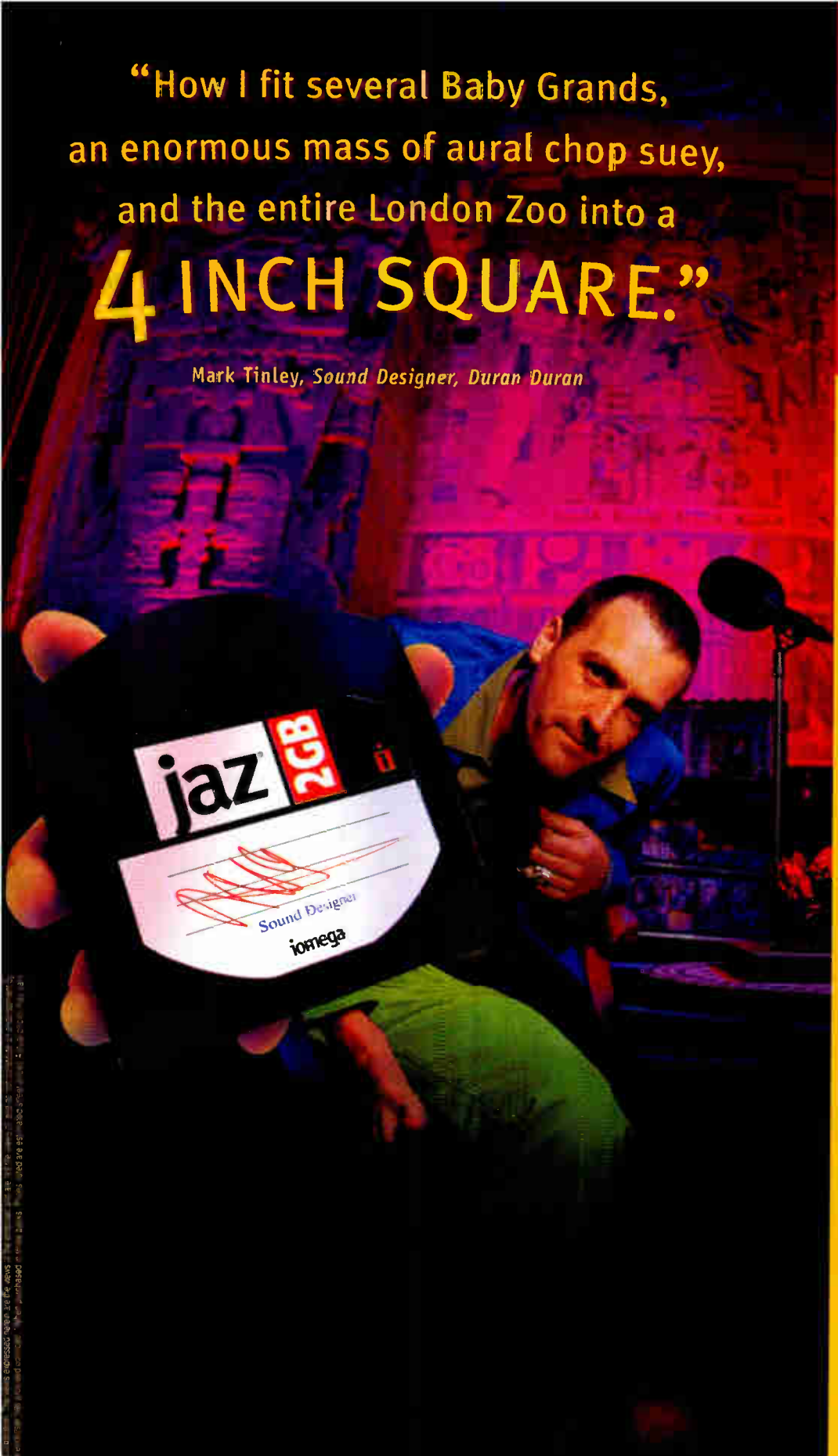
Moog (who is very happily and successfully making Theremins again) also recently produced a video of Rockmore, consisting mostly of footage shot in the mid-'70s, much of which was used on the CBS-TV arts magazine (remember those?) "Camera Three." It's available through his company, Big Briar—on the Web at www.bigbriar.com.

"She saw herself as a virtuosa, with all the responsibility that en-

BY PAUL D. LEHRMAN

"How I fit several Baby Grands, an enormous mass of aural chop suey, and the entire London Zoo into a 4 INCH SQUARE."

Mark Tinley, *Sound Designer, Duran Duran*



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tails and all the respect that commands," says Moog. She was also a very private person. At the end of Martin's film, there is a fabulously touching scene in which Rockmore and Leon Theremin are reunited after 53 years—just before World War II, the inventor was abducted from his New York apartment by the KGB and taken back to Russia to do military research. The film makes us wonder whether their relationship might have been more than just mentor/student, but as he enters her apartment, she looks straight at the camera, says tersely, "Cut," and shuts the door.

There's a very brief QuickTime video of Rockmore playing the Theremin, taken from Martin's film, on MTV's Web site: If you have a fast Internet connection or don't mind waiting several minutes for a few seconds of video, you can download it from http://download.mtv.com/news/mov/t/theramin980512.mov. The movie, which I cannot recommend highly enough, is available on VHS through the usual outlets. It's a tribute to a great man and scientist (he died literally days before the movie was released) and a great woman and artist.

•••

If you are familiar with the family name of Tcherepnin, it's either because you're a student of 20th-century classical music and know the work of Alexander (a composer who combined musical traditions of various cultures into charming and accessible music), or you're a student of early electronic music, and you know about the Serge Modular, one of the great toys of the analog synth age, developed by Alexander's son Serge. It's still being built and maintained by fanatical fans long after the age of Arp. But if you were lucky enough to be a student in the music department at Harvard University in the last three decades, or you hang around the contemporary music scene in Boston (which I am often guilty of), then you knew another Tcherepnin: Ivan.

The composer Ivan Tcherepnin (who, depending on his mood and whom he was with, sometimes pronounced his name the "American" way, EYE-van, and sometimes the Russian way, ee-VON) was one of a kind. He was an analog guy in a digital age, and an individualistic voice at a time when many composers seemed to be emulating fashion, as well as each other. He was never afraid to mix many disparate elements in his music during a period when "pigeonholing," which makes it easy for record stores to know where to put things, is the rule. While many "serious" (or at least academic) composers still seem to judge their worth by how much they can intimidate their listeners, Tcherepnin's music was audience-friendly, yet always challenging and demanding the attention of the listener; accessible, but never dumbed-down. And every new piece of his that you heard sounded unlike anything you'd ever heard, from him or from anyone else.

As might be expected of Serge's brother, he was an early adapter of electronic techniques, and he was director of Harvard University's electronic music studio for some 25 years. But you would be hard-pressed to classify him as an "electronic" composer: His use of the technology never drew attention to itself, but instead his synthesizers and signal processors were always used to serve a more universal compositional purpose, and he frequently combined electronics with acoustic instruments in mutually complementary ways. In Ivan's hands, the synthesizer was never an end in itself; it was a processing tool as much as anything else, and the sounds emerging from his system were just as likely to be instrumental and concrète sounds as purely synthetic tones. As if to emphasize the "organic" orientation of his music, his studio was known for the abundance of green plants among the machinery.

The composer Ivan Tcherepnin was an individualistic voice at a time when many composers seemed to be emulating fashion, as well as each other.

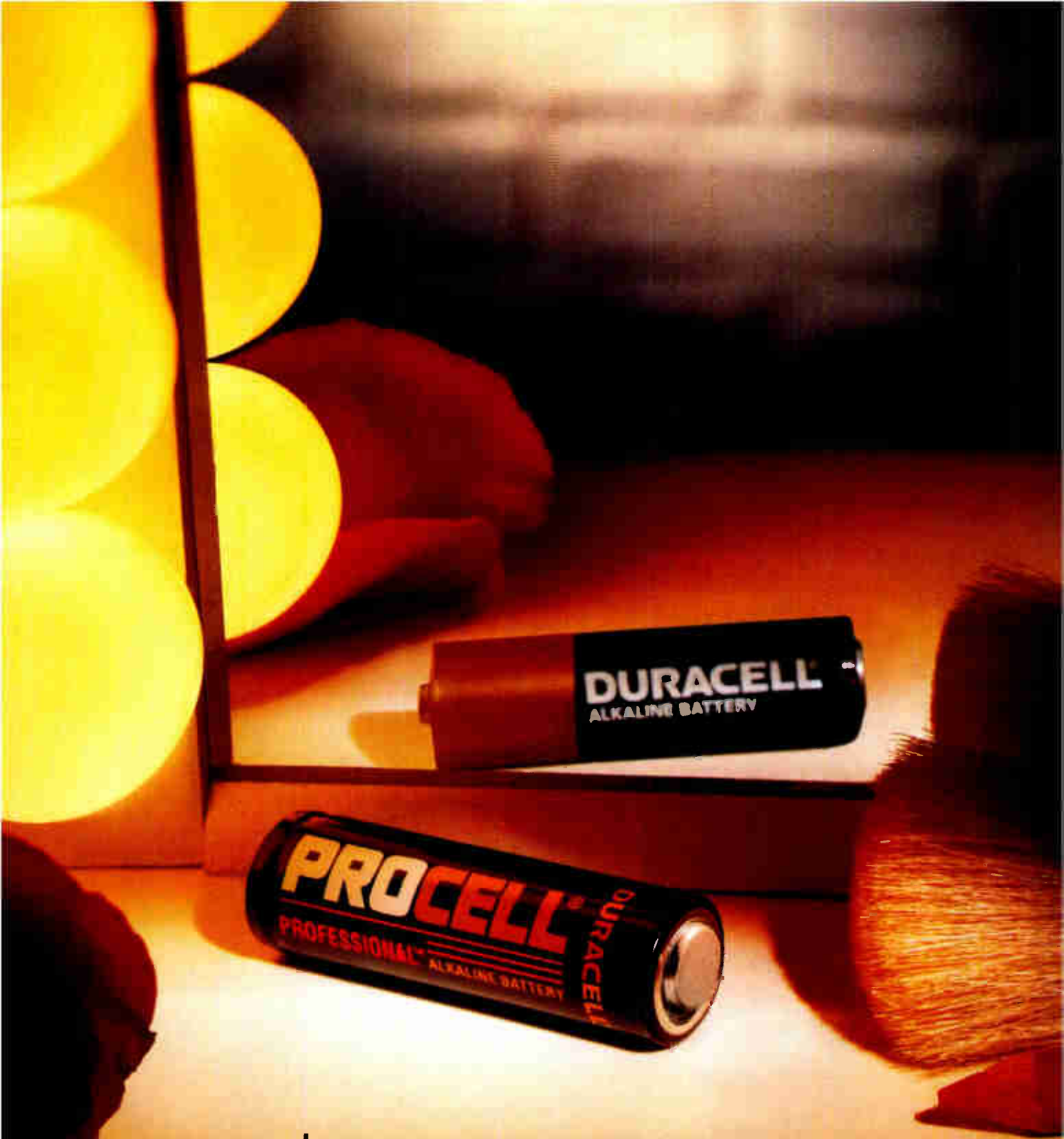
His persona reflected a bit of the United Nations—his father was Russian, and his mother was a well-known Chinese pianist, and since he spent his early childhood in Paris, he spoke with a distinct French accent—and his music did, too. Besides combining widely varied sonic elements, he brought a diversity of cultural elements into his music, drawing from his own multicultural background and cheerfully adding other influences. For example, one of his best-known works is an opera based on the sounds he could get by processing a santur—a kind of lute he was given by an Iranian student—through racks of electronics.

PHOTO: KRIS SNIBBE/HARVARD NEWS OFFICE

Ivan Tcherepnin

In his music, the listener could count on a mixture of intelligence and humor, thoughtfulness and playfulness. His compositions were always surprising and often delightfully so—what came next was never what you expected, but it always seemed to make sense after you got there. He liked to use familiar themes, like folk tunes and references to other composers, not as samples but as compositional elements, which could reveal themselves over time, so that the listener felt not the instantaneous shock of recognition but the calm joy of having arrived at some place known and comfortable.

Ivan was constantly looking for new ways to add to his vocabulary, and he and I had a number of stimulating, sometimes near-shouting conversations over whether this or that new electronic gadget could do what he wanted it to. He never asked, "What's cool about this?" as if a new hardware or software tool could ever dictate to him what he would do; his question was always, "How can I get it to do what I need?" He was always



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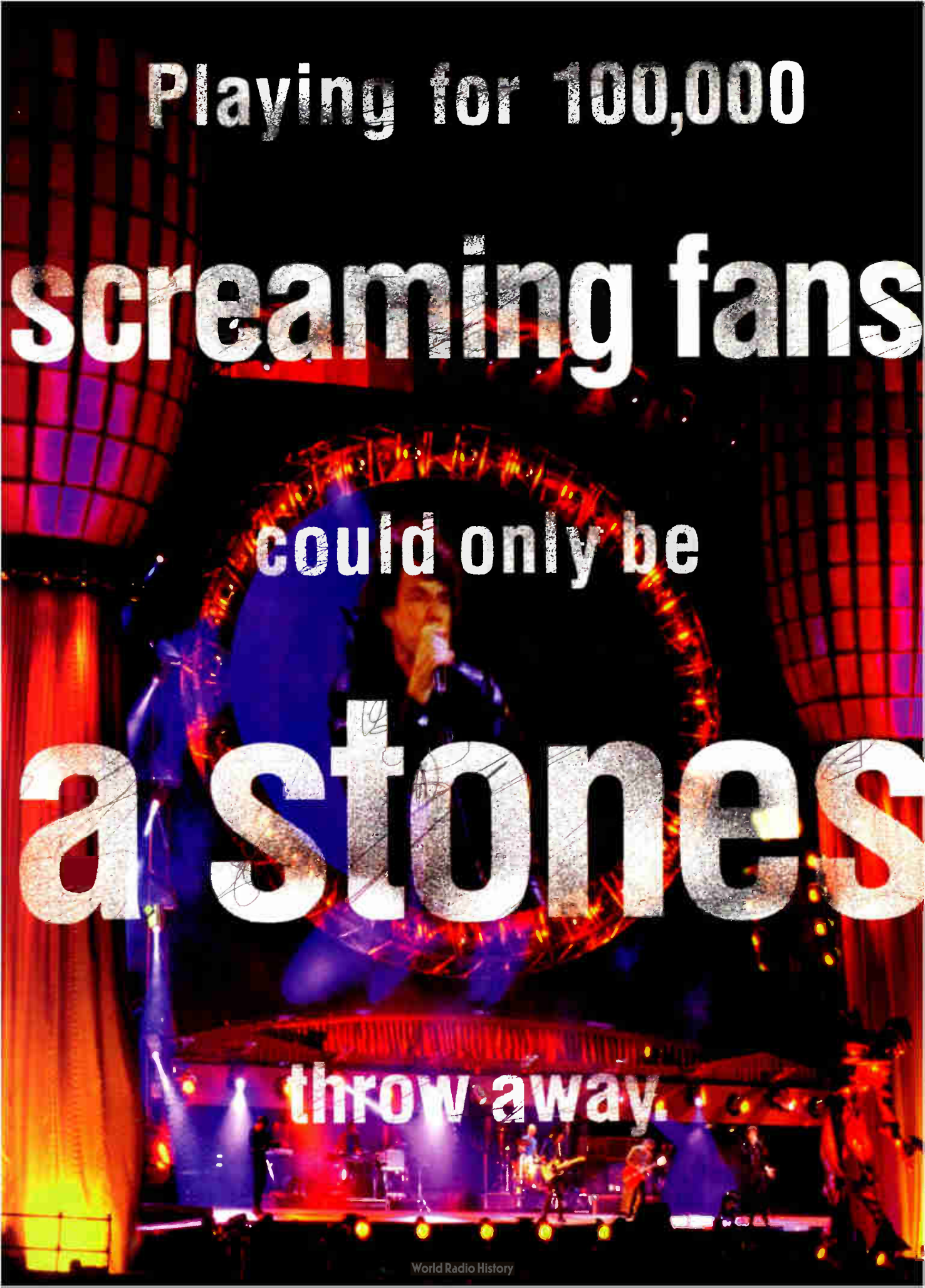

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getting the latest and greatest software toys for his students, but for his own work, intolerant as he was for buggy or unfinished software, he stuck with tried-and-true programs and, much to the chagrin of his wife and colleagues, used the same notation program for nearly 15 years.

Although he had a solid reputation among contemporary music cognoscenti, because he never engaged in the kind of self-promotion needed to become a "star" in even the "classical" composition business, his fame was always somewhat local. Nevertheless, in 1996 he won the prestigious (and remunerative) Grawemeyer Award from the University of Louisville for composition, in recognition of a Double Concerto he wrote for two of his former students, violinist Lynn Chang and cellist Yo-Yo Ma, and the Greater Boston Youth Symphony Orchestra.

But sadly, the award will not result in more music from Ivan. In the summer of 1995, he was diagnosed with liver cancer and told he had six months to live. He began a regimen of Chinese medicine, meditation and herbs, and confounded his doctors by maintaining, as a friend says, "a high quality of life" for almost three years, which included a hiking trip to New Zealand, recording some of his works in Moscow and a new marriage. This past April, however, at the age of 55, he succumbed. A unique musical voice, with something to teach everyone, has been stilled.

If you'd like to hear some of Ivan Tcherepnin's music, there's a collection of vocal and instrumental pieces, including selections from the "Santur Opera," available from CRI. The Double Concerto is on an Olympia (UK) CD, along with compositions of Ivan's father and his grandfather, Nikolai.

• • •

"Do you have this record?" "Has this piece ever been recorded?" "When did this album come out?" "Who's the soloist on this disc?" "Which one is this group's latest?" In the days when record-store personnel did more than inspect your shopping bags and serve lattes, if you asked any of these questions, or almost *any* question about a recording, you would invariably get the response, "Let me look it up in Schwann."

The Schwann catalog, also known over the years as The Schwann Long Playing Record Guide, The Schwann Record & Tape Guide, Schwann Opus, and a few other variations, has been the *ne plus ultra* of reference guides to American recorded music since it was started in 1949 by a Cambridge, Mass., record store owner named William Schwann.

Schwann went to school in Kentucky, and when I met him in 1981, he still had a bit of the Kentucky Colonel about him. He was a large, friendly, soft-spoken man, with a bit of a patrician air, but with nothing but kind words for those around him. He started his professional life as an organist, coming to Boston in the 1930s to study with the great E. Power Biggs, and was able to supplement his income by writing music criticism for local newspapers and setting up a small record shop—called, oddly enough, The Record Shop—across the street from MIT. "I was in a situation I always wanted to be in," he told me. "I was getting free tickets from the newspapers and free records from the store."

After World War II, in the face of shortages of the shellac used in 78 rpm

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What turned the music technology industry on its ear?

CIRCLE #018 ON PRODUCT INFO CARD

records, he started a record dealers' association that allowed stores to share resources and trade inventory. In 1948, the LP was introduced, and by October 1949, there had been an explosion in recorded repertory (or so it appeared at the time): 11 labels had issued some 650 classical and popular discs.

"My memory was never all that good," he explained, "and I could never remember which records were on which labels, so I got the idea for a catalog that would combine all the labels." The first issue, released that month, contained 24 typewritten pages. Distributed through his dealer network, it quickly sold out its run of 11,000 copies.

With the second issue, the catalog went from bi-monthly to monthly, and within a year it was being distributed nationally through record dealers, and Schwann was selling ads to record companies to generate revenue. In 1953, after 14 years in retail, he closed the store and devoted full time to the publication, which now had a staff and offices across the Charles River in Boston's Back Bay.

Accuracy and completeness were always the hallmarks of the Schwann catalog. Schwann was a stickler for detail and relied on his loyal readership to point out mistakes and suggest changes. Errors never lasted long in print, and soon the catalog gained a reputation for exactitude that made it as valued a reference work as the Grove or Grout musical encyclopedias. Classical listings included all of the soloists, conductors and ensembles. Cross-listings let the reader easily find the other works on a disc. Jazz and pop listings, in the first month, gave song titles and, in later years, recording information; in subsequent issues, the date of the initial expanded listing was included for cross-referencing.

As the record industry grew, the amount of information Schwann encompassed became staggering, but the accuracy of that information, the consistency of the formatting and the overall usefulness of the work maintained its amazingly high level. Records that were about to be deleted by the labels were highlighted, so you knew that if you wanted a copy, you'd better run out and get it before it disappeared.

And as new genres and technologies developed, the catalog adapted. When Wendy Carlos' *Switched-On Bach* came out, and there seemed to be no easy way to classify it (do you list it in the classical section under Bach, or under Carlos? Or is it pop?), Schwann created a new category: Electronic Music. When the size of the publication started to get unwieldy, he created a "supplementary" catalog, issued less frequently, with categories like spoken-word and international folk that didn't have to be updated quite as often. Stereo recordings appeared—Schwann responded by adopting new typefaces that allowed the reader to differentiate between stereo and mono versions. Then there were open-reel tapes, cassettes, 8-tracks, three competing quadraphonic formats, "audiophile" and dbx- and CX-encoded LPs, and finally CDs—all of which were handled cleverly and gracefully.

As a teenager, every couple of months I would go into my favorite big-city record store, take a new issue of Schwann off the huge stack by the front door, and drop a quarter in the box—the catalogs were the only items in the store sold on the honor system. I would immediately turn to the "New Listings"

—*CONTINUED ON PAGE 235*

You've Heard of the Industrial Revolution ...

PREAMP

PREAMP

Good solid handles for easy lifting and rack installation

Separate 1/4" send and return inserts on each channel

Big analog VU metering

Output switchable between +4/-10 operation

Insert in 'n' out. Yes, you can leave the inserts connected when not in use. It makes happy patch bays.

-20dB Pad

EQ in/out. Hardwired

Digital output dither and shape controls

Compressor threshold LEDs, so you can see what you're doing

PREAMP

COMP

The dbx name. Brownie points if you know what it means.

In phase, out of phase, in, out, in, out, rinse and repeat

Utilitarian 2-tier brushed aluminum face plate, just because silver is cool

Meter switchable from drive, insert, or output metering

Mic/Line from the front panel

COMP

COMP

Drive control for a wide variety of tube sounds: soft and warm to hard and in your face!

OverEasy®

Hand selected Premium 12AU7 tubes for the best tube sounds

dbx Lightpipe switches for easy viewing under any lighting conditions

Detented pots for easy setup and tactile feedback

Optional dbx Type IV™ Conversion System

Now You've Seen It.

Wide or narrow Q on mids

XLR and 1/4" inputs per channel. Mic or line, line is switchable between instrument or line levels

This tells you what you bought

Full 48V phantom power

12dB/OCT 75Hz Bessel Low Cut filter

PeakPlus™ limiting. Great for the digital output

All sidechain functions accessed on the front panel

Contour eliminates low frequency threshold triggering

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Call your dealer now. You'll be surprised at the small price tag.

We promise.

Manual attack and release or program-dependent Auto mode

Limiter hit light...you went over the line

Annoying Peak LED

dbx has long been known as the leader in signal processing technology, and superior mic preamps and compressors have always been a strong part of that reputation. Our new "Silver Series" Vacuum Tube Processors carry the heritage of those past products into the vacuum tube arena. They all have the ability to operate in linked stereo or dual mono modes. The 586 Vacuum Tube Preamp is a dual channel preamp with a three band EQ circuit (that's hard-wire bypassable) with swept mids and adjustable Q. The 576 Vacuum Tube Preamp/Compressor also has the ability to send the preamp channel's signal to the compressor channel. The 566 Vacuum Tube Compressor has comprehensive control over threshold, ratio, attack, release, as well as tube Drive and makeup Level controls to add just the right amount of tube sound.

The Silver Series also boasts a minimalist approach to signal path engineering, resulting in pristine audio signal, in addition to custom designed analog VU meters that monitor tube level, insert path (or gain reduction, in the case of the compressor) or output levels. The preamps also have +48V Phantom Power, 20dB pad, phase invert, and a low cut filter. Getting in and out with virtually *any* source device is easier than ever too, with Line/Instrument and mic inputs. Add extras like an insert loop, optional 24bit dbx TYPE IV™ digital output, and the new patent-pending PeakPlus™ limiting topology and you've got a winner.

Hand-selected and matched premium 12AU7 vacuum tubes ensure ideal triode gain matching, distortion, microphonics and drive characteristics. What does all that mean? It means you get the best tube sound with the most versatility available today.

So get to your dbx dealer and hear how the dbx Silver Series of Vacuum Tube processors will give your projects that professional edge, no matter which model you choose.

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Professional DAT

Still Standard After All These Years

by George Petersen

Who would have dreamed that a failed consumer digital audio tape format would someday become the most common 2-track recording medium in use by audio professionals? First marketed to consumers in 1987, the DAT format encountered significant obstacles (does anyone remember the congressional copy code "notch" hearings of 1988?) and failed to live up to sales expectations. DAT might have gone the way of the 8-track cartridge, had it not provided a reasonably priced, fairly rugged, dependable alternative to the Sony PCM-F1 digital format. Pro users—particularly those who had previously been working with the unwieldy, quirky (and occasionally unreliable) PCM-F1s—soon adopted the DAT format for a wide range of recording, live sound, audio-for-video and broadcast applications.

Over the years, DAT has undergone numerous refinements. Fostex pioneered the incorporation of timecode, and other developments include advanced converter and digital filter technologies and improved tape stocks with better shells and higher-performance formulations. Sony's Super Bit Mapping and Apogee's UV-22 offer alternate methods for packing more resolution onto this little 16-bit wonder. Now, 11 years after its inception, DAT is still with us, and—until a universal digital stereo mix medium is proposed—should be around for some time to come.

Sony PCM-7040

Panasonic SV-3800

Tascam DA-30 MKII

Listed here (alphabetically by manufacturer) are two dozen DAT recorders for pro recording applications. Unless noted, all DATs in this article support 44.1 and 48kHz sampling rates. We've also included a sidebar spotlighting DC-powerable DATs designed for location and field recording applications.

Fostex D-30

FOSTEX D-30

The D-30 is a 4-motor, 4-head deck with off-tape confidence monitoring. Among its sync features are VITC and LTC support, timecode chase sync at any frame rate (including pull-up/pulldown for telecine applications); onboard TC reader/generator; automatic offset calculation and auto front panel readout of TC frame rate on tape. VTR emulation with IDs for most popular machines is standard.

The D-30's spot erase capability allows erasing short segments with TC accuracy, and the two record channels can be accessed independently for SAP programming, a facility that also allows the machine to be used as a dual-mono track recorder for creating two separate channels of sound effects, etc. Full jog/shuttle is standard, and a 10-second RAM buffer allows instant starts as well as the ability to scrub timecode and audio simultaneously—while the transport is stopped.

Ten softkey functions ease operation, and five user presets provide for the storage and recall of custom setups. The D-30 also has ±12% timecode. Assembly editing can be performed by interfacing two D-30s via 9-pin and executing an EDL stored and configured in the master machine. The XLR AES/EBU digital I/Os can be switched to electrical S/PDIF, and optical S/PDIF is also standard. ADCs and DACs are 18-bit. Retail is $10,995.

FOSTEX D-25

Priced at $7,995, the D-25 is similar to the D-30. Shared features include timecode chase sync at all frame rates, VTR emulation with RS-422 control, TC synthesis from tapes with absolute time, 4-head (confidence monitoring) design, RAM buffer for instant start and scrubbing, 0.5x-to-16x jog shuttle, balanced +4dB XLR analog I/O, ¼-inch (-10dB) analog outs, word clock, VITC and video sync inputs, AES/EBU and S/PDIF digital I/Os.

There are some differences between the D-25 and D-30. Both are 4-motor transports, but the D-25 uses one motor to control both reels, while the D-30 uses a separate motor for each reel. Like the D-30, the D-25 offers separate record on either audio channel and timecode; however the D-30 provides front panel access for those controls, while on the D-25 they are only accessible via RS-422. The D-25's front panel display is fluorescent rather than LCD, and the D-25 does not offer user-programmable settings or multimachine assembly editing via EDLs. Heads on the D-30 can be cleaned by removing the head door whereas the D-25 is like other DAT decks; the unit must be pulled from the rack to clean the heads manually. And while the D-30 has 18-bit converters, the D-25 has 16 bit ADCs and DACs.

FOSTEX D-15

At $3,295, the Fostex D-15 is said to be the lowest-priced timecode-*capable* DAT recorder available. However, in order to add features such as word clock and video sync, the ability to stripe tapes from external timecode sources and output LTC or convert absolute time to LTC, an optional sync card is necessary. Alternatively, a full timecode version (model D-15TC) is available for $3,890. Another version, the $4,085 D-15TCR, includes timecode sync, as well as a RS-422 port for all Sony 9-pin control functions (except varispeed) allowing control of the machine via external editors.

Among the features common to all D-15 models are RAM for instant start and scrubbing, jog/shuttle wheel, store/recall of 100 cue points, a GPI I/O for assembly editing using A-time, S/PDIF (optical) or AES/EBU digital I/O, balanced +4dB XLR and -10dB RCA analog I/O and 18-bit/64x oversampling ADCs and 20-bit/8x oversampled DACs. A new software update for D-15s adds a "Batch Digitize" function for creating Avid-compatible EDLs.

FOSTEX D-5

Priced at $1,195 (including wireless remote), the Fostex D-5 offers features such as a 4-motor transport, S/PDIF (optical) and AES/EBU digital I/O, 1-bit ADCs and DACs, a 32kHz half-speed recording mode, switchable (-10/+4dB) input levels, GPI trigger connection for fader start or hard-wired remote functions and full jog/shuttle functions using the fast wind keys with the play key. Additionally, a Q-Code system on the optical input detects track numbers on a CD and automatically records a Start ID for each track for creating clones of CDs.

OTARI DTR-8S

This fully featured DAT machine offers balanced +4dB (switchable to -10dB) analog I/O with XLR connectors, AES/EBU and coaxial S/PDIF digital I/O, a 2-head design, 1-bit wide range linear ADCs, pulse flow 1-bit D/As, 32/44.1/48kHz sampling rates and the ability to monitor input signals at either the analog or digital inputs. Character Pack allows storing up to 60 characters of alphanumeric data to the start ID at the beginning of each program, which is displayed on the front panel for each program on tape. The DTR-8S can also read the track indexing data from CDs and automatically write Start IDs based on these codes, for exact DAT copies of CDs. The DTR-8S retails at $1,395, in-

LOCATION DAT RECORDERS

Whether you're recording music in a Tibetan temple, doing dialog for feature films, capturing gorilla mating rituals in the wild or merely gathering some fresh samples for your next hip hop hit, there are times when only a DC deck does the duty and an AC umbilical is, at best, inconvenient. Listed alphabetically, here are your choices in compact, portable location recorders—all offer onboard mic preamps, DC or AC powering capability and useful field recording functions such as backlit status/counter/metering displays.

Fostex PD-4V2

FOSTEX PD-4V2

The latest incarnation of the Fostex PD-4, the Model PD-4V2 is a professional, portable timecode DAT featuring a 4-head transport for confidence (off-tape) monitoring through the headphone or XLR outs, thanks to a new software update. Other features include a built-in 3-channel mixer with three-position pan, 48V phantom powering, variable lowcut filters, a jam sync function, -20dB pads on each channel, switchable onboard limiting, a 48.048kHz mode for digital pull-down applications and six software settings to store operational preferences. A two-way powering system with a rechargeable battery or an AC adapter allows changing batteries without stopping timecode generation. The PD-4V2 offers about 1.5 hours of battery time, and any Betacam-compatible power options can be used, such as NP1A/NP1B cells, gel cells, power belts, etc. Weight is six pounds including battery; analog I/Os are +4dB balanced XLR; digital I/O is AES/EBU. Retail is $7,395.

HHB PORTADAT

HHB's PortaDAT line is available in timecode (PDR1000/TC, $6,395) and non-timecode (PDR1000, $2,995) versions, as well as the PortaDAT Plus, a new timecode model ($6,995) that adds advanced master sync and headphone monitor matrix functions.

All PortaDAT models feature 4-head/4-motor transports, AES/EBU and S/PDIF digital I/O and analog balanced mic/+4dB line inputs, unbalanced RCA line outputs, 48V phantom power, switchable stereo limiter, -30dB pad, highpass filters, nickel-metal hydride (no-memory-effect) batteries for up to two hours of operation and a wide

—CONTINUED ON PAGE 43

HHB PortaDAT

ONE LISTEN, YOU'LL GET IT.

DRAWMER MX30

MIX *George Peterson, March 1998*
"The MX30 is one versatile compressor/limiter/gate. . . . anyone wanting to step up to Drawmer-level performance should check out the MX30."

STUDIO SOUND *Zenon Schoepe, July 1997*
"This box has got to be the most simple and effective box in this class that I have ever tried. It represents an amazing value for the money. . . . highly recommended."

KEYBOARD *Craig Anderton, May 1998*
"Although competition in this price range is intense, the MX30 is not another me-too device, thanks to the ease of use and project-studio oriented feature set."

GIG *Gordon Jennings, June 1998*
"In summary, the Drawmer MX30 is a fine sounding unit, sturdily built and easy to use. In fact, I plan on adding one to my rack."

RECORDING *Gino Porfido, December 1997*
"It inspires confidence that whatever you send in will come out sounding better – in record time."

ELECTRONIC MUSICIAN *Brian Knave, March 1998*
"With the MX30, Drawmer is positioning itself well within reach of the personal studio. . . . this unit delivers what almost every manufacturer boasts about . . . professional quality at an affordable price."

SOUND ON STAGE *Martin Walker, July 1997*
"With its easy to understand panel graphics . . . cleverly designed circuitry . . . easy set-up, and other little touches like LEDs . . . it is very well thought out."

PRO AUDIO REVIEW *Russ Long, June 1998*
"At a cost of $479, the Drawmer MX30 is a jaw dropper . . . a budget minded easy-to-use piece of equipment that sounds like a million bucks."

The Drawmer MX30 Gate/Comp/Limiter MSRP $479

Drawmer

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CIRCLE #021 ON PRODUCT INFO CARD

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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TAKING DIGITAL FURTHER

For more information call:
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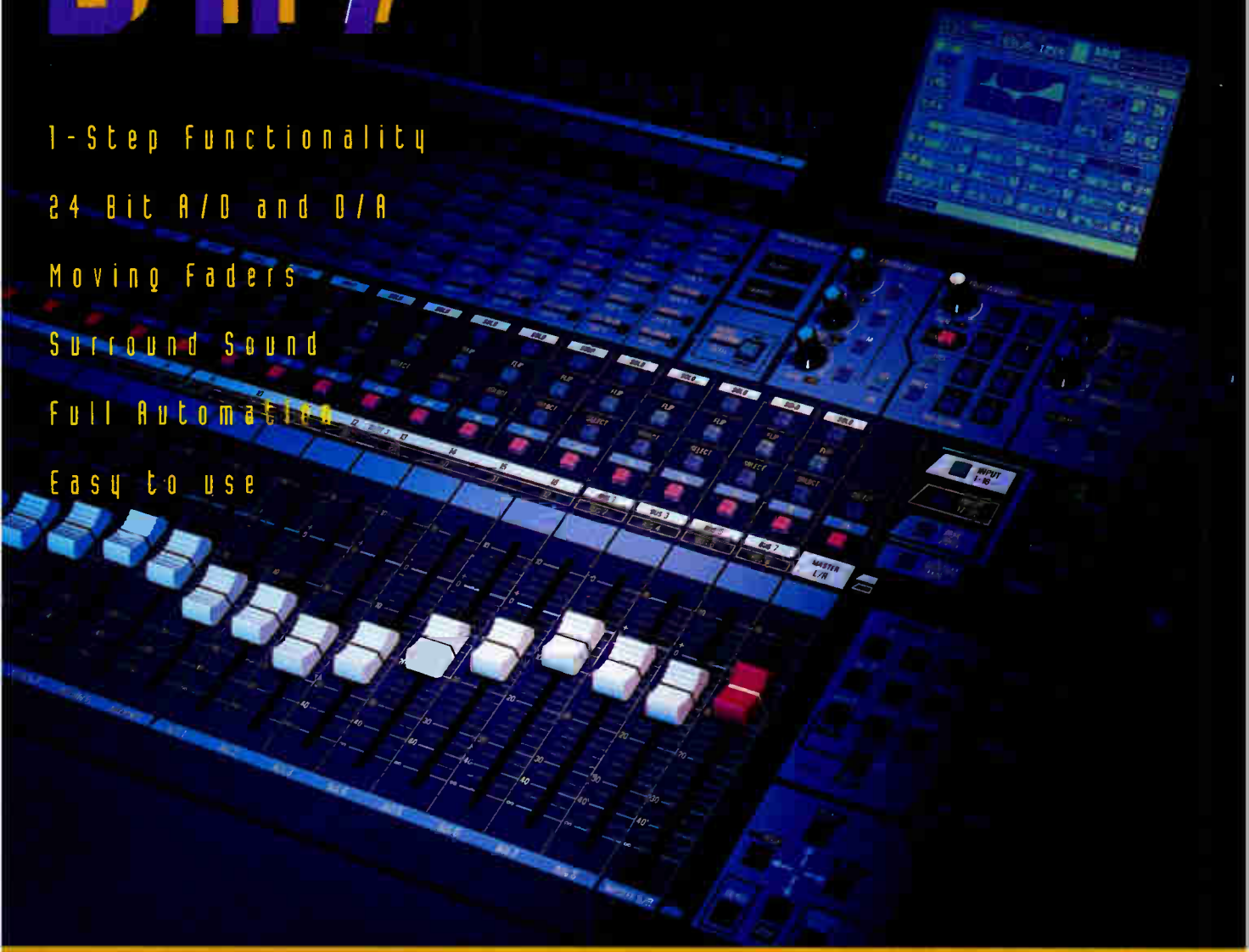

1-Step Functionality

24 Bit A/D and D/A

Moving Faders

Surround Sound

Full Automation

Easy to use

Taking Digital Further

Panasonic

Broadcast & Digital Systems Company

Al Schmitt

Photo: Alain McLaughlin Studio: Capitol Records

on BASF tape

"I expect a lot from my analog tape. Warmth, good tape handling, and hearing back exactly what went on it...that's why I use BASF 900 *maxima*. It delivers all that and more."

Al Schmitt's acheivements include seven Grammy® awards for engineering and over 140 gold and platinum recordings for artists such as **Natalie Cole, Willie Nelson, Madonna, Steely Dan, Vanessa Williams, Toto, Dolly Parton and Frank Sinatra.**

SM 900 maxima is a high-output analog tape designed specifically for multi-track recording and mastering, with extra wide dynamic range, low noise and low print through.

EMTEC Magnetics

CIRCLE #022 ON PRODUCT INFO CARD

BASF

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cluding wireless remote and rack-mounting kit.

PANASONIC SV-3800

The successor to the popular SV-3700, Panasonic's SV-3800 adds 20-bit equivalent DACs, 4-stage/1-bit Delta-Sigma ADCs, 0.5 to 15x speed range shuttle wheel, balanced XLR analog I/O (+4/-10dB switchable), independent L/R recording levels and a wireless remote. Digital I/O is AES/EBU, S/PDIF RCA and S/PDIF optical. Retail is $1,695.

PANASONIC SV-3900

Designed for automated play, audio post, broadcast or duplication chain applications, the SV-3900 features bidirectional serial interface support of standard P2 and ES-bus protocols. An optional SH-MK390 remote controller provides ES-bus serial control of all transport modes and functions, and a

—FROM PAGE 38, LOCATION DAT RECORDERS

range of options and accessories, such as various AC and DC powering systems, plus hard and soft carry cases. A two-bay charger and battery are included with all recorders; a four-bay fast charger is available.

The PDR1000/TC records and syncs to timecode, can jam sync and converts absolute time to timecode. Supported sync protocols include video sync, field sync (48/50/59.94/60 Hz) and 44.1/48kHz word clock as well as handling timecode at all frame rates, standard and drop frame. Weight is 5.5 pounds.

Formerly the PDR1000/TC/MS/HM, the PortaDAT Plus (essentially a "fully loaded" PDR/1000TC) offers extremely accurate sync (±1 frame in ten hours) with timecode film cameras, and its crystal frequency can be manually tuned to match a calibration difference in a particular film camera. A standard LEMO jack for direct connection to Aaton cameras is also provided. Its headphone monitor matrix includes switching for Stereo, Mono Left, Mono Right, M/S Stereo or Mono Sum monitoring.

SONY TCD-D10 PRO MK II

Now in its third generation, this 2-head design features balanced XLR mic/+4dB line analog inputs, and switchable attenuator, highpass filter and limiter from the mic inputs, but no phantom power. AES/EBU digital I/O is supported, and analog outputs are unbalanced -10dB RCA jacks. Weight is 4.4 pounds. Retail is $4,000, including case, strap, two batteries, AC adapter/charger, remote control and digital I/O cable.

SONY TCD-D8/PCM-MI

One of the smallest DAT recorders available, the pocket-sized TCD-D8 improves on its predecessor (the TCD-D7) by offering recording at 32/44.1/48 kHz via the analog inputs. A long-play mode offers up to four hours of record time on four AA penlight batteries. Analog I/Os are unbalanced -10dB on ⅛-inch stereo TRS jacks and a choice of auto or manual record level control is offered. Based on a consumer design, the TCD-D8 records SCMS on the tape, but this can be bypassed by playing the tape back on a pro DAT and dubbing the signal using AES/EBU I/O. Retail is $899; options include an AC adapter, wired remote control, S/PDIF digital I/O breakout cable and a Super Bit Mapping adapter. The PCM-MI ($999) is an enhanced pro version with defeatable SCMS.

TASCAM DA-P1

Priced at $1,899, the DA-P1 features balanced XLR mic/line inputs with switchable phantom power, built-in limiter and -20dB pad, unbalanced RCA line in/outs, SCMS-free S/PDIF coaxial digital I/O on RCA connectors, and a quick-charge battery system with two-hour play/record time. Options include an external charger/AC adapter, carrying case and rechargeable battery pack.

Tascam DA-P1

—George Petersen

Introducing Cakewalk® Pro Audio™ 7

NEW! Put the power of a professional mixing console on your desktop. The new Console view enables you to record, edit, and mix all your MIDI and audio tracks from a centralized window.

NEW! Get more help with online tutorials, context-sensitive online help, and a redesigned User's Guide.

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cakewalk

CIRCLE #025 ON PRODUCT INFO CARD

DAT deck offering a 4-head/4-motor design with confidence monitoring, forward/reverse jog/shuttle wheel, ±12.5% timecode on playback, auto punch in/out with rehearse function and support of Sony P2 (9-pin) protocol, for integration with edit controllers. Timecode features include support of all standard frame rates, jam sync capability and the ability to pre- or post-stripe timecode. Analog connections are +4dB balanced XLR I/O with -10 RCA outputs; digital ports include AES/EBU with selectable S/PDIF. Retail is $6,499.

TASCAM DA-30 MKII

Tascam's most popular studio DAT, the DA-30 MkII features AES/EBU and S/PDIF coaxial digital I/O, a 15-pin parallel port for external control, analog inputs and outputs on balanced +4dB XLRs, and -10dB unbalanced RCA connectors and a data/shuttle wheel for cueing and fast locating. Retail is $1,299.

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George Petersen, the editor of Mix, *owns four DAT decks, three analog 2-tracks and two Sony PCM-F1s.*

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QuickTime

ILLUSTRATION: MIKA CHISAKI

3.0 Adds Audio Streaming by QDesign

by Philip De Lancie

When Apple Computer introduced QuickTime in 1991, video on a computer monitor was a curiosity: pixelated, herky-jerky and the size of a postage stamp. But QuickTime—aided by the mushrooming of CPU horsepower—rapidly evolved into a major enabling technology for the multimedia revolution of the mid-'90s. Never solely about video, QuickTime's ability to deliver synchronized sound and picture (video, animation, etc.) from CD-ROMs helped that market develop from a fantasy to a real business. And because QuickTime playback has long been supported on both the Windows and Mac platforms, the format has been an attractive option for audio-only material as well.

In recent years, however, interest in the CD-ROM-oriented multimedia market has been eclipsed (in terms of press coverage, anyway) by interest in the Internet. Apple has been slow to respond with QuickTime enhancements focused on Web-based delivery, and other vendors such as RealNetworks (RealAudio, RealVideo), Macromedia (Shockwave, Flash), Liquid Audio and Headspace (Beatnik) have taken the lead in bringing audio and multimedia to the Web. According to the Consumer Electronics Manufacturers Association, 68% of multimedia PC users have RealAudio installed on their computers, compared to 36% with Shockwave and 19% with AudioActive.

Despite Apple's sluggish pace, however, it's too early to count QuickTime out of the Web mix. In February, the International Standards Organization (ISO) announced it had adopted a proposal—advanced not only

On the Web

by Apple but also IBM, Netscape, Oracle, Silicon Graphics and Sun—to use the QuickTime file format as the basis for developing a unified digital media format for the network-targeted MPEG-4 specification. And at the end of March, Apple released QuickTime 3, re-asserting its commitment to keep QuickTime relevant. In Version 3, Apple has used alliances with vendors of Web-ready data compression technologies to make QuickTime a viable and versatile streaming platform for the Internet. Some music-related sites—such as Atlantic Records (Fig. 1)—have already begun to take advantage of the new Web-wise features.

In addition to newly incorporated video codecs (compressor/decompressor) from Intel and Sorenson, QuickTime 3 includes two new audio codecs tailored for Web use—the QDesign Music Compressor and Qualcomm's PureVoice—as well as new Sound Canvas instruments from Roland supporting MIDI-GS. The QDesign alliance in particular is relevant to music-related Web applications. Apple has also, for the first time, made the Windows 95/98/NT version equivalent to the Mac not just in terms of playback but in its media-authoring capabilities as well.

While QuickTime's improved Internet savvy makes it a contender for Web sound applications, gaps remain in the QuickTime feature set. Apple is working to address some of these issues, and at press time some announcements from QuickTime tools vendors were expected as soon as the New York MacWorld show in early July. But it remains

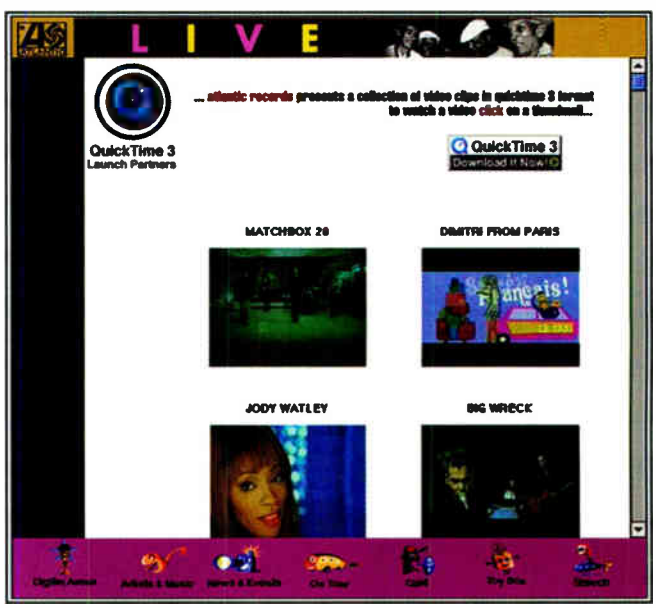

Figure 1: Atlantic Records' Web site makes use of QuickTime 3's new Web-ready features.

to be seen whether QuickTime's current benefits and promised enhancements can overcome the long head start enjoyed by rival approaches.

A QUICK PRIMER

QuickTime is not application software like Pro Tools, Sound Forge or Premiere. Instead, it is an extension of the computer operating system,

QuickTime On the Web

adding capabilities that can be accessed not only in media production programs (which require the $29.95 "Pro" version), but also in simple playback situations such as a multimedia CD-ROM (using the freely licensed and distributed regular version). "You can play back anything with the basic version," explains Mitchell Weinstock, senior QuickTime product manager, "but if you want to save it, encode it, edit it or change it in any way, you need QuickTime Pro, which, in some cases, will be bundled in when you buy media production tools." With the QuickTime foundation in place, the production or playback software need only know how to work with QuickTime, which in turn handles the details of working with the host computer's OS.

To access QuickTime's capabilities, media elements are stored in the .mov file format. This "movie" format is essentially a container that allows a wide variety of media types and file formats to be synchronized and combined into one. QuickTime 3 includes built-in support for ten different media types (video, audio, text, timecode, music/MIDI, sprite/animation, tween, MPEG, VR, 3D), and an appropriate set of media-specific services are provided for managing tasks related to each type. For audio, such services include timing and synchronization, data compression and decompression, format conversion, track mixing, sample rate conversion, effects and transitions, capture, import and export. QuickTime also provides standard user interface elements, such as movie controllers, media previewers and media capture dialogs.

Within each of QuickTime's supported media types, specific file formats are supported for either conversion to or direct playback from QuickTime movies, making some 35 file formats in all. Supported audio formats include .WAV, AIFC, AIFF, AU, AVI, Macintosh Sound Resources, OMF, Sound Designer II and Law.

Additional music capabilities are offered by QuickTime's inclusion of a built-in software-based synthesizer and instrument library, intended to ensure a consistent platform for music playback across all supported software and hardware systems. In Version 3, the synthesizer supports Roland's GS extensions to the MIDI format, and the Roland sound set includes 128 General MIDI-compatible instruments, plus more than 100 ad-

PROTECTING FIDELITY IN LOW BIT RATE AUDIO

by Spencer Critchley

The world of interactive multimedia is kind of like the old Soviet Union: Looks impressive from the outside, but the plumbing is bad. Although the situation is improving, moving audio and video through data buses and around the Internet still involves lots of disappointment. You turn on the tap, and out comes a rusty dribble. You learn to be an expert at making the most of the dribble. Multimedia audio producers spend a lot of effort making their work fit through narrow pipes. They do this by one or more of the following: reducing the sampling frequency, reducing the bit resolution or using data compression. Out of these practices emerge two guiding principles:

1) You probably can't keep all frequencies, so make the most of what you do keep.

2) And watch your amplitudes: Generally, you want them HIGH.

The first principle comes into play with reduced sampling rates and with some data compression. When you reduce the sampling rate, you reduce the audio frequency spectrum. This is because you can only sample audio frequencies up to half of the sampling frequency—otherwise you get aliasing errors. And with perceptual encoding data compression, as used in MPEG or Dolby's AC-3, frequencies likely to be masked by louder neighboring frequencies are not encoded.

Before reducing the sampling rate, it makes sense to boost frequencies leading up to half the *new* sampling rate. This will roughly preserve the balance of high vs. low-frequency energy. It will also compensate for the slope of the downsampling software's anti-aliasing filter—that slope is not likely to be a brick wall, but will rather start rolling off somewhere below the new maximum audio frequency. Note: In order to see what the anti-aliasing filter is going to do, you can prepare a file of a full-range tone sweep and downsample it. You can then study an amplitude display of the result, noting the roll-off.

Most current software that performs downsampling includes a compensating EQ option. You can choose to use this EQ, or design a curve of your own. Remember that you may want not just to restore flatness, but to exaggerate high end in order to compensate for the overall loss of high-frequency energy. Watch out for clipping when you do this.

In the case of perceptual encoding data compression, it's possible that the full frequency spectrum *will* be preserved—in particular, where relatively high final data rates are okay. But it is nevertheless a common practice to filter frequencies that are not considered critical, such as the very low and high ends. This is because these frequencies might mask more valuable frequencies, causing the latter to be rejected by the compression algorithm.

There are other uses of compensating EQ specific to particular flavors of perceptual encoding. For example, for some kinds of Shockwave encoding (a form of MPEG Layer 3), Macromedia recommends some filtering of frequencies between 4 and 8 kHz.

Principle number two, watch your amplitudes, is important whenever bit resolution is reduced. With fewer bits per sample, quantization error increases and dynamic range decreases, both dramatically. For example, 16-bit audio features 65,536 possible quantization values—a relatively fine "ruler" for measuring amplitudes—and a dynamic range of about 96 dB. But 8-bit audio has only 256 possible values and a dynamic range of about 48 dB. If you keep amplitudes high, you use more of the available bits for each sample, minimizing quantization errors. You also avoid the sudden dropouts and gross distortion that occur at levels near the least significant bit, when the only two sample values available are 1 and 0.

One way to keep amplitudes high is to normalize before reducing bit resolution. Normalization raises a file's peak amplitude to a maximum limit, and all other amplitudes are scaled up accordingly. There are a

—CONTINUED ON PAGE 54

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ditional sounds in a variety of instrument categories, including keyboards, woodwinds, strings, brass, percussion and sound effects. The QuickTime Music Architecture also includes support for custom instruments that can augment or replace the standard instruments that ship with QuickTime 3.

INTERNET ALLIANCES

For Apple, the strategy of striking alliances with outside vendors such as Roland and QDesign grew out of a recognition of the limitations of previous versions of QuickTime for Internet applications. "The compressors and some of the technologies we had weren't really well-suited for very low, constrained bandwidth operations," concedes Weinstock. That was not a comfortable position to be in some three years after the "discovery" of the Internet by the world beyond government and academia.

"We knew," Weinstock continues, "that if we wanted to bring the same kind of richness to the Internet that we bring to CD-ROM and high-end audio applications, we were going to have to quickly come up with some ways that we could provide the needed services. So we decided to go out and take a look at what was available in the marketplace. We found that QDesign and Qualcomm and the others we are working with have some very innovative technologies that provide some things that are not available elsewhere. They were very interested in establishing themselves as a standard, and they knew that QuickTime was a distribution vehicle that could establish them very quickly. So it's a collaborative effort that works very well for both sides."

From the vendors' perspective, incorporating their technology into QuickTime gives them access to a huge, established base of end-users. Apple does not actually have a solid figure for the size of the installed base because QuickTime licensees are allowed to distribute the program freely without reporting the number of copies distributed. But Media Metrix, which compiles the SoftUsage report on the popularity of PC applications, says that "the largest single owned software application or utility product outside those bundled with the Windows operating system is Apple's QuickTime, which is installed on 23.9 million Windows PCs, 67.6% of the 35.3 million Windows PCs installed in March 1998." Assuming that most existing users upgrade to the new version, the alliance with Apple is one of the only ways a codec vendor could hope to rapidly reach a Windows base of this size, while tapping into the Mac market at the same time.

Not all users will upgrade, of course, and some will not actually be able to because there is no QuickTime 3 for Windows 3.1, which is still in use on many older machines due to its lower memory requirements. (According to Apple, Microsoft's own NetShow, DirectShow and ActiveMovie technologies are also not available for Windows 3.1). One key for Apple in getting as many as possible to make the change will be its success in arranging for QuickTime to be bundled in the installation packages that users download to upgrade their browsers. Apple has yet to convince Microsoft to include QuickTime with the Windows version of Internet Explorer, but it is included with IE for Mac and with all Windows and Mac downloads of Netscape Navigator. (By comparison, RealAudio comes with all versions of IE but no versions of Navigator.) But as of mid-June (nearly three months after the Version 3 launch), the downloads still included QuickTime 2.5

—FROM PAGE 52, PROTECTING FIDELITY

couple of trade-offs to watch out for, though. The first is that if you normalize to 100% "full code," any further digital signal processing may cause clipping.

The second trade-off arises from the fact that normalization itself involves quantization, and therefore adds small amounts of new quantization error. In the context of reduced-resolution audio, the damage is probably unnoticeable, but it's still preferable to record with a good level in the first place.

Check for DC offset in your recordings. It's added by some digital recorders and audio cards. If a file has DC offset—a steady positive or negative voltage—it will not be possible to maximize its amplitude fully. Many kinds of editing software have the ability to remove DC offset.

In any case, high peak levels are only the first step. Multimedia producers soon lose any shyness whatsoever about using dynamic compression. They typically compress and limit while recording, compress again during mixing, and compress and limit aggressively while mastering. With brickwall limiting software, such as Waves' L1, you can give your file a regular marine flattop. But if you compress this much, take care with the spectral balance of the file. Too much low end, for example, can be grabbed by the compression and cause boominess or distortion. Also, brickwall limiting should be the last step in the chain, since any further DSP will almost undoubtedly cause clipping. (Although there are always occasions to break the rules: Sometimes running a file through L1 twice can be a creative effect.)

At those low levels that do survive this kind of aggression, the choice and management of dither becomes important. Dither is a constant analog noise often added to audio during sampling and DSP. It reduces the effects of quantization errors by randomizing them (because, being noise, it's random), making the errors less noticeable.

Unfortunately, in 8-bit (or worse) audio, standard dither is clearly audible—in many cases it makes your file sound subjectively worse. Luckily, software and hardware makers are developing improvements on the basic idea. These include various kinds of noise shaping, in which the frequencies of the dither noise are shifted to less objectionable parts of the audible spectrum, and newer techniques such as Apogee's UV22, which places what Apogee calls a "bias" signal near 22 kHz (assuming a high enough sampling rate), above audibility.

There are also creative choices that can help when amplitudes are low. Where the audio design allows it, you might mix steady background sound or music into your file, thereby avoiding the lowest bit values. It also makes sense to keep fades fairly steep—a long reverb tail, for example, is just going to break up.

And once you have reduced the bit resolution, you may want to use downward expansion or gating to clean up grunge in quiet passages. ■

Spencer Critchley manages the Creative and Audio groups at Silicon Gaming Inc. in Palo Alto, Calif.

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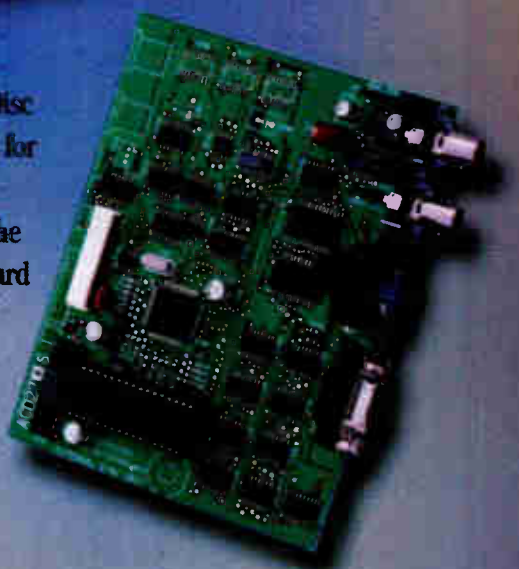

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(Mac) or 2.1 (Windows) rather than 3.0.

According to Weinstock, the delay stems from requests from "the development community" for revisions to Apple's software licensing agreements. While completion of the new agreements was imminent, Weinstock could not predict when the downloads themselves would be revised. But Charles Wiltgen, a QuickTime evangelist responsible for developer relations, points out that the Web is far from the only route by which users can get and install QuickTime; it can be acquired by downloading directly from Apple, and it is included with many multimedia CD-ROMs and various other software applications. When products incorporating Version 3 are installed, the browser plug-in will automatically be updated at the same time. (The version number for the new plug-in is 2.0.)

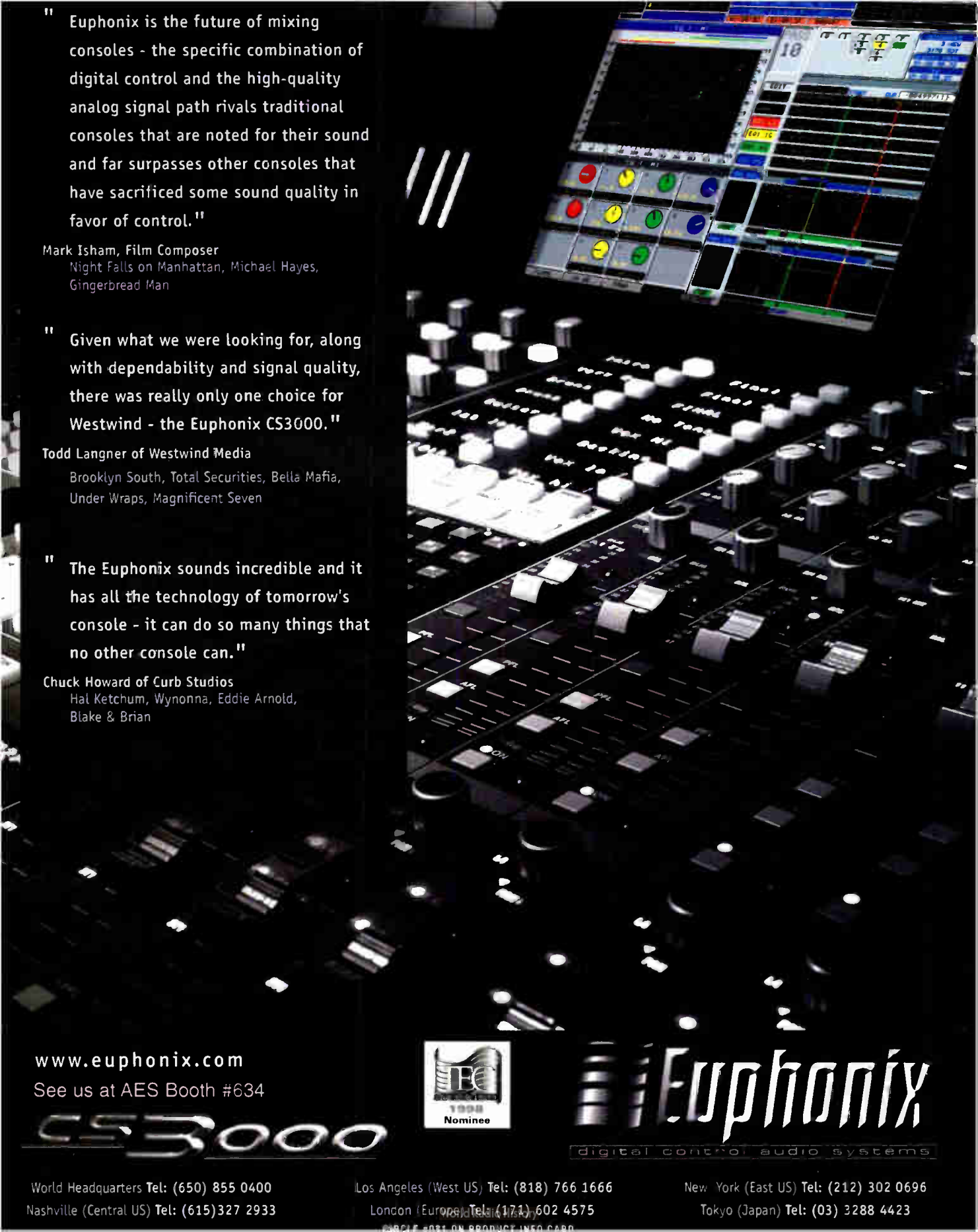
As for actively promoting the adoption of Version 3, Wiltgen says that he will be "making sure that all the title developers know about the availability of 3.0, and then they will start using it on titles. As far as the Web developers, my job is to make sure that there are tools that provide a really easy way to get audio into a low-bit-rate format, which can be tricky. So I'm working with companies such as MacSourcery to make sure that BarbaBatch, its audio batch-processing program, has great support for QuickTime 3's new codecs. And with Terran Interactive, to facilitate the addition of the new codecs into Media Cleaner Pro, which is known for doing video."

THE QUICKTIME PLATFORM

Because QuickTime is an OS extension rather than an application, its potential can only be realized if tools developers provide ways for movie creators to utilize its underlying capabilities. (The text track feature, for instance, has been around for years without being supported by Adobe Premiere, the leading movie-making application.) Given the right tools, QuickTime 3 can offer Web designers the possibility of sophisticated media integration. "We can combine and stream audio with any other media type," says Weinstock. "People haven't really thought much before about using slide shows with audio, or having text read to you from a targeted frame. I think that because it is an integrated product we are expanding people's capabilities, teaching them to leverage all the features so they don't have to deal with a bunch of separate pieces."

QuickTime's integrated Sound Manager allows the audio and/or music (MIDI) from multiple movies to be mixed on-the-fly (limited only by available CPU power). That makes it possible to create some interesting interactive music experiences. The Mouse Jam site (www.mousejam.com), for instance, has a "Pangaea Jam" page (see Fig. 2) with QDesign audio that allows visitors to layer sax, vocal and percussion elements over a predefined rhythm track, which sounds remarkably good streaming over a 28.8 modem. It may not be a high-priority application for Web audio, but it is a fun illustration of how audio and MIDI can work together within the QuickTime framework.

At the same time, Mouse Jam also illustrates a couple of weaknesses in the current QuickTime implementation. The site lets you start and stop sounds only by clicking on the standard controller buttons for each sound's movie, rather than on a graphical representa-



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tion of an instrument within a still movie. And unlike Shockwave, which allows Web delivery of highly interactive multimedia created in Macromedia Director (see "Shockwave Audio" in the March 1997 *Mix*), QuickTime currently has no mechanism available for adding intelligence or conditionality to the interactivity through "scripting."

According to Wiltgen, however, support for "Director-type interactivity within a QuickTime movie" is already built into QuickTime 3. "With what we call 'wired movies,' you can create an interface that looks like anything you want. Any QuickTime media type can be assigned an interface functionality." But this feature has not yet been publicized much because the tools for creating these interactive movies are not shipping. Wiltgen says he expects Lari Software's Electrifier Pro, currently in private beta testing, to be available by October.

Another important capability that is not yet available is live Netcasting (as contrasted with playback of prerecorded movies). "We demonstrated live streaming technologies for the first time at this year's Worldwide Developer's Conference," Wiltgen says. "Anything that can play QuickTime will be able to play these streaming broadcasts of any QuickTime media type." While Real Audio has been in use for Netcasting for a couple of years already, QuickTime's Netcasting capabilities will not be available until at least this fall. Like with RealAudio, QuickTime Netcasting will require purchase of special server software, though Apple's approach is based on RTP rather than the UDP favored by RealNetworks. Both protocols are theoretically more robust than plain old HTTP.

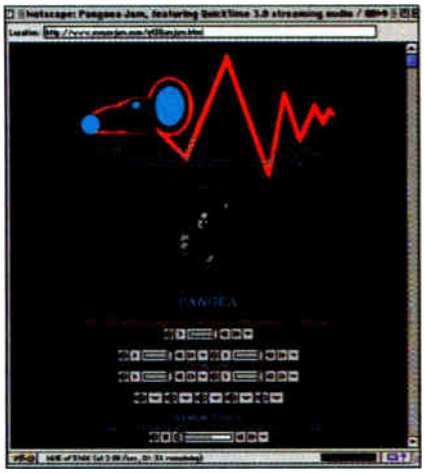

Figure 2: QuickTime's Sound Manager allows audio from multiple movies to be mixed on-the-fly. The "Pangaea Jam" page on Mouse Jam's Web site, for example, lets visitors layer various musical elements on top of a predefined rhythm track.

QuickTime also supports another feature that can be used without paying for a special server such as Real Server or Liquid Audio's LiquidServer: the ability to pick for playback a movie appropriate to the user's current Internet connection. QuickTime addresses this by using multiple data-rate movies that are accessed through a "reference" movie. "You can create media that is optimized for different connection speeds," Wiltgen explains, "such as audio optimized for 14.4, and then create versions for 28.8 and ISDN. The higher-quality versions will automatically be used if the user has a faster connection." Apple provides a full explanation of reference movies at www.apple.com/quicktime/authors/idataref.html.

QuickTime movies may be integrated into Web pages using a simple link, but the preferred method is to use HTML's EMBED tag. "Accessing the audio via a link provides very little control over the playback and appearance, while the EMBED tag offers the Web master a number of options," says Richard Beaton, QDesign's president and

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CTO. The tag's parameters are used to define the movie's attributes on that particular page, including playback volume, the size of the interface, whether the interface is visible, autostart status, looping, links and hotspots within the file. By way of example, Beaton offers the tag: <EMBED SRC="background.mov" CACHE=TRUE VOLUME=25 PLUGINSPACE="http: //quicktime.apple.com" HIDDEN AUTOPLAY=TRUE CONTROLLER=FALSE LOOP=TRUE>. This might be used to embed an ambient movie called "background.mov." The parameters defined will, he explains, "force the movie to be cached [ideal for background music], play at 25 percent volume [suitable for a background track], tell the browser where to get the QuickTime plug-in if it is not present, make the QuickTime movie invisible to the client, begin playing immediately, not show the QuickTime movie controller bar, and loop continually until the user leaves the page."

A complete explanation of EMBED tag parameters and their uses is posted at www.apple.com/quicktime/authors/webmas.html. Once you are familiar with the parameters, the tag is relatively straightforward to use. The only limitation of this approach relative to QuickTime's rivals is that in addition to embedding into a page, RealAudio also offers the option of playing sounds from a separate floating window (the "Player"), which remains active even when you leave the page where you initiated playback. With QuickTime, when you leave the page, you leave the embedded movie behind, though if a site uses frames, you can play a movie in one frame while you browse in another. You also have the option of using JavaScript to make a floating browser window that will continue playing the file.

USING QDESIGN

Of the two new audio codecs supported in QuickTime 3, PureVoice is tailored to speech applications, while QDesign is initially being promoted for music applications. Unfortunately, QDesign is more limited in its platform support than QuickTime 3 itself; not only is there no Windows 3.1 codec, but there is also no codec for pre-PowerPC Macs.

Like other Web audio codecs, QDesign uses "perceptual coding" to reduce audio files to as little as 1% of their original size while maintaining at least some semblance of the program material. But the company claims that at data rates below 40 kbps QDesign achieves better quality than its rivals by also incorporating "advanced algorithmic techniques based on parametrics." According to Beaton, "The algorithm builds a sophisticated model of the source signal itself, which allows high-quality stereo encoding at data rates far lower than can be achieved with psychoacoustic techniques alone. And the bitstream multiplexing techniques employed are optimized to maintain quality over packet-based transmission networks such as the Internet, even when packets are lost due to severe network congestion." Another interesting aspect of the codec is that encoded files are editable in their compressed form.

Using QDesign, it is possible for a 28.8 connection to deliver stereo audio encoded directly from a 16-bit/44.1kHz file without first downsampling. Read the well-executed manual, however, and you realize that audible artifacts from the encoding process are less like-

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QuickTime On the Web

ly if you encode from a 22kHz mono file (still 16-bit). That will also create a file that places fewer demands on the end-user's CPU during playback, which may be important if you are trying to play multiple files at once or to accompany video. "If the source is stereo," Beaton says, "we recommend encoding in stereo, because the QDesign Music Codec performs outstandingly for stereo content at low data rates." If, however, you find unacceptable artifacts encoding with stereo 44.1, you have the mono 22kHz option to fall back on.

Because QDesign is a QuickTime component, it is used within other applications such as Movie Cleaner Pro or the version of Apple's MoviePlayer that comes with QuickTime Pro. For QDesign, integration within QuickTime makes it simple for a variety of tools developers to allow their users to encode audio with the codec. That creates a market for the $399 "Pro Edition" of the QDesign encoder. Selling the Pro Edition is how QDesign makes its living; a Basic Edition is included free with the QuickTime 3 download but lacks the parameter controls that make it possible to fine-tune the encoding process for the best results.

Using QDesign in MoviePlayer is a bit cumbersome, involving working your way through a series of dialog boxes for each file you wish to encode. The process may be slicker within BarbaBatch 2.4 ($399) or Media Cleaner Pro ($359); both programs support batch processing. But buying one of those applications and then shelling out for the QDesign Pro Edition brings the total price tag up to nearly $800 (ouch!), which is only justifiable if you need to process a lot of files at once. And of course batch processing is only helpful if you can come up with encoder settings that work well for all files in the batch. Another option, according to QDesign, is to use Opcode's Vision 4.11 or BIAS Peak 2.0 to export directly from an audio session into a QDesign QuickTime movie file. And the next release of the Pro Edition will ship with QDesign's own stand-alone application (Windows and Mac), enabling users to export directly into a QuickTime movie file.

Using MoviePlayer, you first open the source file, then select Export (File menu). After specifying the folder and file for the encoded file, and selecting

—CONTINUED ON PAGE 255

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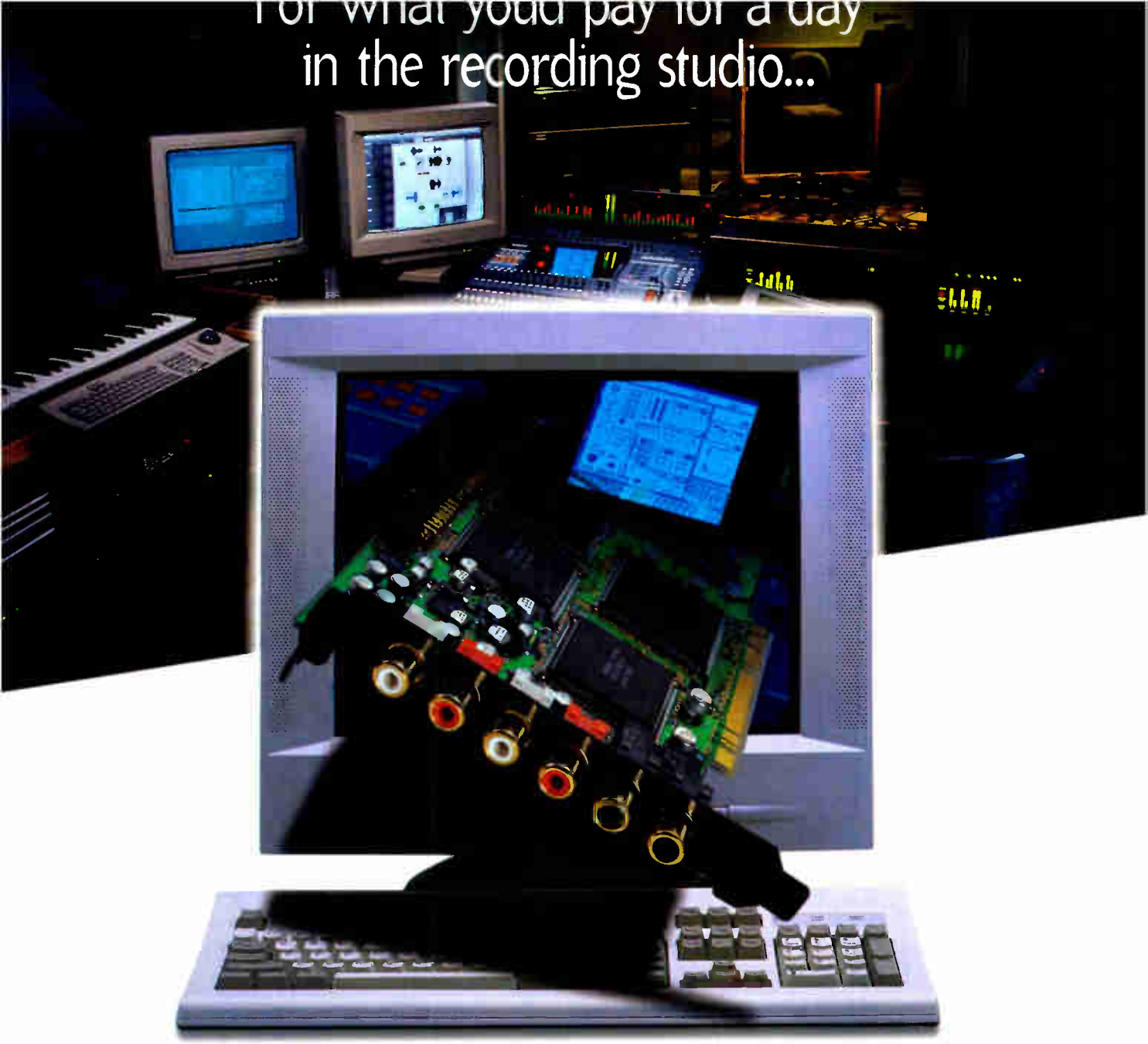

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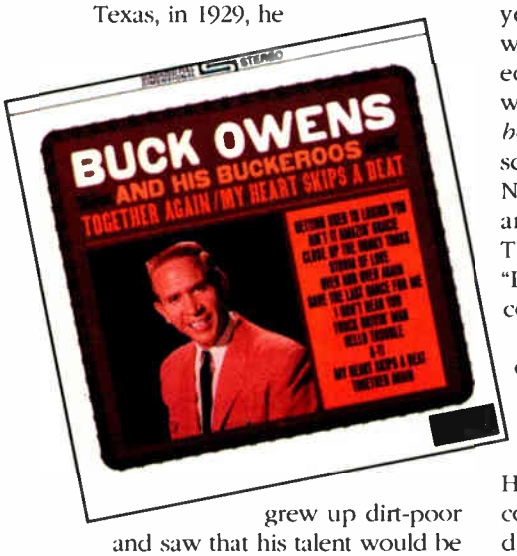
BUCK OWENS

FROM THE STREETS OF BAKERSFIELD

Bakersfield, California, is home to the Crystal Palace nightclub. This venue won the Country Music Association's Club of the Year honor for 1997. You sort of have to feel sorry for the other clubs competing for that award, though, because the Crystal Palace has an unfair advantage: It has Buck Owens. Owens not only owns the club, but he performs there most Friday and Saturday nights, singing his own songs as well as covers ranging from Merle Haggard songs to "The Macarena." His shows have much the same flavor as they have for decades; they're designed to make the audience smile, laugh and *dance*.

Owens still works hard and works steady for his pay, an ethic that hasn't changed since he started playing in honky-tonks in the '50s. In those early years, he often played guitar on sessions all day before working as a DJ or performing at night. This was not just because his desire to succeed in the music business was so strong, but because, born in Sherman, Texas, in 1929, he



grew up dirt-poor and saw that his talent would be his way out.

After years of playing on other artists' sessions, Owens signed his first major-label contract with Capitol Records in 1958. During his 18-year stint at the label, with and without his Buckaroos, he recorded dozens of albums, 12 of which went to Number One on *Billboard*'s country chart. He also scored an impressive stretch of 19 Number One songs between '63 and '74, including "Tiger by the Tail," "My Heart Skips a Beat," "Love's Gonna Live Here" and, of course, "Act Naturally."

Like his Bakersfield compatriots—such as Merle Haggard, Lefty Frizzell and Wynn Stewart—Owens made a career of playing country music on his own terms. He was among the first to play country to the beat of a rock 'n' roll drum kit, as well as his driving rhythm guitar, and over the years, he has been recognized for his success and innovation by the Nashville establishment. The Academy of Country Music endowed him with its Pioneer Award in 1989, and he was inducted into the Country Music Hall of Fame in 1996. Today, in addition to performing at his club and on tour, he owns a number of country radio stations in Bakersfield and Phoenix, and he co-owns (with ABC Radio) the Real Country network, which is broadcast on 180 stations.

When *Mix* got the chance to interview Owens, we asked Hightone recording artist Dave Alvin to do the honors. Alvin is a singer/songwriter with a great appreciation of roots music. He is also a producer who works with a lot of the neo-traditionalist bands who have been strongly influenced by Owens. To prepare for a recent album project for the Austin band The Derailers, Alvin, the band-

BY DAVE ALVIN

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members and engineer Stuart Sullivan spent hours on end listening to Owens' recordings, getting a feel for the way those classic songs were made. This heightened the producer's understanding of the Bakersfield sound, as well as his curiosity about how it developed.

So, Alvin drove up to the Crystal Palace from his L.A. home, bringing along another roots-oriented producer, Hightone label founder Bruce Bromberg. Owens sat down with them between sets on a Saturday night to share a few of his memories and his typically outspoken ideas.

—Barbara Schultz

Alvin: Tell me about the early days, how you started out.

Owens: When I was a kid, I always tried to hang around where the people were who played music. My mother played the piano. Boy, she could swing. She was self-taught—one of those that had a great big, wonderful left hand that I always wished to hell I could have. She'd just make the whole little old place thunder. I used to marvel at the fact that she learned how to do that all by herself.

Myself, I used to always try to get the nearest I could to where the band was playing, from the time I was 14. I was a big old kid. I was 6 foot tall when I was 14. I looked like a bean pole. In Arizona, when I was 16, the guy that owned this bar where I used to go would let me fool around a little bit in his place and be around the musicians, and if they needed a cigarette, I was their man. I was handy and didn't cause any trouble, so I got to hang around.

Later, I played in the honky-tonks. I was a disc jockey, too, and I played five or six years of the Elvis craze—all the labels looking for another Elvis. It's just like now they're all looking for another Garth. But I love what Chet Atkins said about today's records. He said, "To make it now, you got to have some boots and a hat." And I thought, "Yeah, okay, I have a hat." And then he says "...and a tight ass."

Alvin: [Laughs] What do you think of today's country music? You obviously have a big stake in it because of your involvement in radio.

Owens: Raul [Malo] from The Mavericks—they were here [at the Crystal Palace] recently—we kind of have a mutual thing going. I just love their stuff, because it's *unafraid*. He was saying—I think it was in yesterday's paper—that he was just lamenting the state of radio. Now, I'm in the radio business in a big-time way. I have three stations here, and I have four stations over in Phoenix: three country and one adult contemporary, and the morning program [on the adult contemporary one] happens to be the Number One program in the town.

Alvin: In a way, aren't you kind of split, because on one hand you're a creative artist who's done revolutionary things, and on the other hand you're famous for being a very astute businessman. You're kind of caught between two worlds.

Owens: I have an answer for that: I'm not in the radio business; I'm in the advertising business. A lot of people don't realize how important Madison Avenue is to radio and TV. If we don't get the demographics as well as Madison Avenue in New York wants, then they can't sell us to Chevrolet, they can't sell us to Ford, they can't sell us to IBM. They can't sell it, and that's where you make your big money.

I have people like you who I like to hear. I'm a Little Richard fan. I'm a Bob Wills fan. Who are my influences, my first influences, outside of the gospel aspect and the bluegrass aspect? There's a town in Arizona called Wiggleman. A little bitty town that had one store. We lived in Mountain Country, and my daddy had this old car radio. We had a '31 Model A, and this is 1938. He had this car radio, and it had this dial that you turned that went all the way around the radio, but we didn't have to turn it much, because there were only two stations you could get. They were these big, powerful AMs from Mexico. I remember them like it was yesterday. One was way over on the right hand side, and one was at 800, and they'd play all these acetates that these guys would cut: Bill and Charlie Monroe, and Wayne and Lonnie Dawson. That's what they played late at night. Those were my early influences.

It's not easy being a broadcaster *and* being a musician. What I love about listening to the radio, about listening to music, is separate from the business side.

Alvin: Tell us about an early session.

Owens: Okay. You guys ever heard of [songwriter/recording artist] Stan Freeberg?

Alvin: Oh, yeah.

Owens: Well, this was on one of his sessions. Jack Marshall, who was the guitar player who used to play all the movie music, he was the bandleader on

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this particular session. This was about '54. He had ten of us in there: A piano player named...I can't think of his name right now...he was from San Diego.

Bromberg: Merrill Moore?

Owens: Yeah, you got it! My God, how'd you think of him? Just a great, wonderful touch on the piano—a great left hand.

Bromberg: He's still going, did you know that? Still playing.

Owens: No! Still in San Diego?

Bromberg: Yeah.

Owens: If you see him somewhere, tell him to call me. But I want to tell you this story. They gave us music. Well, I read music a little bit. I taught myself to read some music, and I can pick out the notes a little bit, but not good enough to sight read. The music had an e-flat diminished with a suspended fifth. [Laughter] Well, I was about from here to there where Merrill was sitting, and I asked him, "Okay if I scoot over there? I'd kind of like to. I'm hearing some kind of harmonic or something here." [Laughs] He said, "Sure." Of course, you couldn't just do that in those days. You had to have the engineer move you over. So I go over next to Merrill, and he's an old country boy, you know, so I said to Merrill, what the hell do you make of this suspended fifth stuff? And he said, "Well, we gotta find out which one's the fifth." [More laughter] He said to me, "Is there a diminished scale?" And I said, "I'm diminishing sitting here right now." But he could read good enough to do the chords, and what he didn't know, it didn't take me long to figure out. Those were the fun times, playing on sessions. Most of the time, I'd drive back and work at night, too, though, because at 23 years old you don't feel anything.

Alvin: What was that like? You'd work

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in Bakersfield or the Valley honky-tonks, then have to be [in L.A.] at 9 a.m. sessions?

Owens: Right. I'd just drive down there. They never started before 10 down there, most times not till 1. And we'd be working, and then who comes in but Frank Sinatra or Kennedy's brother-in-law—Peter Lawford—and next thing you know, Stan's leaving with them—they're out going into the other studio, and I'm just sitting around thinking it's the most I ever made on a record. Ten hours at that time paid like 120 bucks. Well, you know, I'm talking like 1954.

Alvin: One thing I was curious about was, do you remember the Gene Vincent sessions?

Owens: Yeah, I remember. The main song we did over there was [sings] "Well, I wanna wanna lotta lotta lovin'..."

Alvin: You were on that? Wow!

Owens: Yeah. By that time, I was writing some songs, too, and I was doing some new things on a little bitty label called Pep. The guy who ran it, his entire record label was his bedroom. He had a little desk, and, you know, where's the rest of it? I'm sure it was tough, but somehow it seems like it was more fun then. It wasn't easy, because I tell you the big difference between cutting now and cutting then is that, if the three of us go in and play, we would make some kind of cut. But everybody on those sessions was not always what I'd call adequate. Sometimes there was somebody on the session because they were a brother-in-law or something, and you'd get all the way up to the end, or two-thirds of the way through, and someone makes a mistake. You had to go all the way back to the top.

On my own records, I always used my own band because I didn't want to sound like everybody.

On my own records, I always used my own band. And I did that for a reason—not just because they were all good musicians. I did that because I didn't want to sound like everybody.

Alvin: With a lot of the bands that I work with when I produce, and when I make my own records, the latest trend is to do it live, the old-fashioned way. And I was curious about the way you recorded in that classic period. When you made "Tiger by the Tail," "Together Again," your vocals were live, right?

Owens: They all were live, yeah. What we would do, though, when we would have three tracks, we would save a track for the harmony vocal, because I was real sticky about harmony. I can't recall ever doing just a vocal in those days. After we got to 8-track—I didn't get to 8-track myself until '67 or early '68, but once I got there, I liked it, because man it gave us so much more space.

Bromberg: Who sang the harmony on "Excuse Me"?

Owens: I did. [sings] "Excuse me..." and I split the harmony off and went into the high part. I never liked to sing like a fifth against a first or a first against a fifth. Layering sometimes was why I made those little different harmonies.

Alvin: Now, let's talk about Ken Nelson. Not to say he discovered you, but you

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fell in with him pretty early on as a session musician.

Owens: Yeah. The way I got in with Ken Nelson was because of Ferlin Husky. He got a big hit in '53 with Jean Shepherd called "Dear John Letter." It was a million-seller, and so they got a chance to go on a tour. He had played with Tommy Collins, so he called me up the night he was leaving and said, "Could you go down tomorrow and play on Tommy's session? I forgot to get somebody," and Ken was the producer on Tommy's session. The first record he had didn't do anything, I don't think, but the second one was "You Better Not Do That," and then, "What you Gonna Do Now?"

Alvin: You played on those?

Owens: Yeah, that's me. That's how I got in with Ken. And Ken remembers it one way, and I never dispute it, but I'll tell you this: I read on several different occasions where he's said I bugged him to death. But I never did even ask him about recording for his label. He knew what I was—although I don't think he was real familiar with my singing—but I was doing a lot of sessions for him, and I didn't want to mess that up by hounding him about recording Buck.

But Ken might have been the best producer for a person like me, for a person like Merle [Haggard], for a person like Hank Thompson, who have our own bands and our own songs. I'd see Ken Nelson sit there with a pad and a pencil, and all he'd do was doodle. Every once in a while, he'd say, "You there," and that used to be me sometimes, and he'd say, "Ah, ah, are you in tune? Is that string in tune?" And I'd say, "Uh, let me check that, Mr. Nelson." He was so smart. He never injected himself into these records.

I guess I became kind of his fair-haired boy; if you ever talk to him, he'll tell you. He liked the fact that I came on time, that I was dressed, I was ready, I was talented, I brought my guitars, that I had a lot of nerve, and a lot of ideas—preposterous as they were sometimes, he'd say.

I worked on a lot of his sessions that I got credit for being on and got paid for; I might not even have played a note, but when you look on there it says Buck Owens guitar, Buck Owens ukulele, Buck Owens banjo. Or Buck Owens drums! With Jean Shepherd one time—now this was before the multitracks—they had a little syncopation on the song "I Used to Love Him." It would go, [sings] "I used to love him but I don't—*bam*—anymore," but the drummer couldn't keep the beat. He stopped the beat to do that "*bam*," and the whole thing would stop just about, and Ken says to me, "Can you play something there?" and I said, "Well, yeah, I guess. What would you like me to play?" And he said, "Hell, if I knew that, I'd tell ya. That's why you're here." And I said "Yes, sir," and I made this little sound with sticks and a pillow that made a kind of whack, and he said, "That's what I mean, why don't you play that?"

Or there was a time when we was recording, and he'd say, "Damn, we need a ukulele. Uh, Buck, can you play ukulele?" I said, "Well, I never have, but it's got strings on it, maybe I could." So he holds out a $20 bill and he says, "There's a music store down here, the one nearest to the tower, go get us a ukulele. I think it's $11. A little plastic ukelele." I'd been around a ukulele, although I don't think I'd ever had played one, but I knew that it was tuned like the last four strings of the guitar, so I figured it out. Those were the fun days. Those were the creative days, the carefree days.

Alvin: Let's talk about some of your work in TV.

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Owens: I did a television show called *The Buck Owens Ranch Show*, which I think there's about 400 [episodes] of. We use them here [at the Crystal Palace club] often. Some people in New York are interested, and I might syndicate it. It's a seller because you got a lot of people on there, from Waylon [Jennings] to Roy Clark to Jimmy Dean.

Alvin: I grew up watching that show. Were those filmed here in Bakersfield?

Owens: No, they were filmed in Oklahoma City at WKY—the same people who owned *Hee Haw*. I own all the masters. I got all of the masters for my albums, too.

Bromberg: That's amazing for that time.

Alvin: How did you do that?

Owens: There was this guy who was running the department then [at Capitol], and he and his business lawyer came to Reno while I was appearing; it was 1970. I'd never heard about anybody ever having their masters at that time; the record companies owned them forever.

So I told my attorney to tell [Capitol] that tomorrow the contract is up, and Clive Davis has offered me a half a million dollars signing bonus with Columbia. That deal was kind of a mess, and I don't think I would have ever signed with them anyway, but that is another story. And so I told them first thing I wanted all my material back, everything, and then we'll talk about a record deal. I said don't come if that's not a deal; then we'll work out the other. I worked out a five-year contract, and they would have a five-year sell-off, and then I would get everything back. So, it would be ten years from then before I got the catalog, but I'd get it all complete.

For a long time, I didn't think about it being such a big deal. I just left them in there. Once in a while, there'd be a movie thing—a guy comes along with ten grand—and then I'd get them. But otherwise, we didn't do anything until about 1990. Then I started taking things out, and I leased ten albums all at once to Toshiba over in Japan. I got $50,000 guaranteed from Toshiba, and then along comes this guy from up in New York, with [the label] Sundazed, and I get $100,000, and then I did all these little things with Time Warner, so we're averaging about $420,000 a year—of course, there's about 65 or 70 albums in there, too.

Alvin: That's a lot of material.

Owens: In those days, there'd be years you'd have three or four albums; they'd put out an album every three or four months. And [after the sessions], if you had a little time left over, you'd cut another song. I cut a song called "Buckaroo" when we had 15 minutes left over of a session. I'd say, "Any of you guys got something we can cut?" Because I knew that once I had ten instrumentals, one of these days, I'd release them. So [at one time] I had an instrumental album, and I had a religious album, and I had a Christmas album, and I had three other albums out; I had six albums out in six months' time. The labels didn't care, and I thought the more the merrier. So, I ended up with about 70 albums over the period of 18 years I was with Capitol.

Alvin: One of the reasons you're successful and you're a legend is—and this has to do with when you were discussing your influences, Little Richard and Bob Wills—Buck Owens is everything to everybody. To country people, you're a country singer, and I know to me growing up you were a rock 'n' roll singer, because I heard you on the radio with rock 'n' roll.

Owens: People still say that to me, "You were a rock guy," and I tell them, "No. Wait a minute now. Don't

—CONTINUED ON PAGE 236

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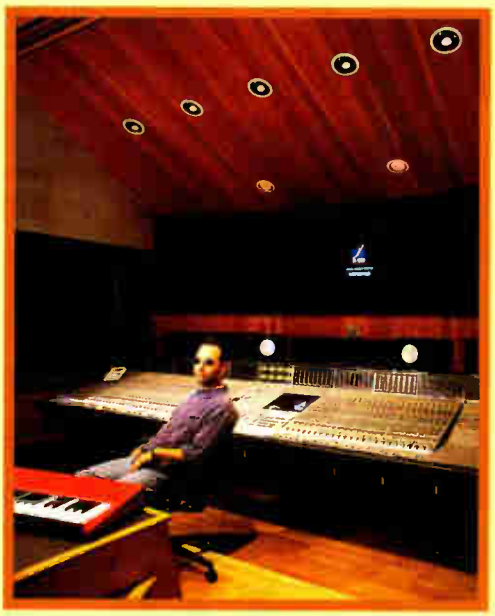
THE MIX ROOM

ON THE COVER

The Mix Room, in Burbank, Calif., is a relatively recent addition to the Southland's inventory of top-flight mixing environments. Originally built by Stephen Bray in the early '90s and operated until recently as Saturn Sound, the three-room studio complex was purchased last year by producer/mixer/engineer Ben Grosse (Third Eye Blind, Love Spit Love, Red Hot Chili Peppers, Bootsy Collins, Malcolm McLaren, etc.). Grosse began using the Mix Room in late 1997; the first outside clients were Madonna and producer William Orbit, who remixed tracks for Madonna's *Ray of Light*. Since then, the studio's growing client list has included Third Eye Blind, Henry Rollins, Joe Walsh, Faith No More, Abra Moore, Filter and Powerman 5000, among others.



Ben Grosse in Studio A

Originally designed by Vincent Van Haaff, the 20x25-foot Studio A control room features a 64-input SSL 9000J (upgraded from 56 inputs since the cover photo was taken) with Ultimation and Total Recall. The monitor system includes TAD drivers, Perraux amplifiers, Avalon crossovers and Meyer Sound parametric equalizers, with Yamaha NS-10Ms on the meter bridge. Tape machines include two Studer A-827 24-tracks (all of the facility's rooms are wired for 48-track) and Studer A-80 and Ampex ATR-102 ½-inch mastering machines. Digital multitracks are rented as needed, and the facility owns a number of "floating" ADATs, DA-88s and Pro Tools systems. The rooms were tuned by Bob Hodas.

Grosse, who established himself as a sought-after mixer with records such as Filter's "Hey Man Nice Shot" and Republica's "Ready to Go," had been looking to move his base of operations from Detroit to California for some time. "Phil Wagner of SSL found the place for me and sold me on the 9000," recalls Grosse, who had previously been a Neve user. The three-room layout was just what Grosse had been looking for: Studio A has a small recording space and two overdub booths attached; Studio B has an overdub booth; Studio C is a production room only. "I did a little bit of modification," says Grosse, "but in general it was almost exactly what I had been looking for, which was a great mixing situation with a couple of little overdub rooms surrounding it."

Grosse is a busy man—a ten-day vacation planned for August had to be scratched in order to schedule an album remix, and he is currently producing Vertical Horizon for RCA. Grosse is also booked to mix Maverick recording artist Swimmer and will co-produce the next Filter album for Warner Bros. this fall. So when he starts a project, he likes to have everything to hand. "Basically, the room is tweaked out for the way I like to work and has the gear I like to work with," he says. "It's pretty much a no-expense-spared room and so far the reaction from other engineers and producers has been great."

The list of available outboard gear is extensive. Notable items include multiple mic pre/EQ units from API and Neve, compressors from Aphex, dbx, Focusrite, Joemeek, Neve and UREI, and reverb/effects units from AMS, Eventide, Lexicon, Roland and Yamaha. A selection of vintage processors, including five Pultec EQs, two Teletronix LA-2As, six Valley People Gain Brain IIs and an Ursa Major Space Station, round out the equipment choices.

Connected to Studio A are three recording spaces. "Sizewise, it's a little cramped for big section recording," says Grosse of the main recording space. "With a console like that, it's a bit cost-prohibitive, so people rarely end up using the room for tracking." Studio B, which contains a Trident 80B, also has an overdub room; Studio C, which offers a 56-channel Mackie 8-bus and a Pro Tools setup, is generally used for production work and has no dedicated overdub facilities.

Located only minutes from the Burbank airport, The Mix Room is convenient to Universal City and a range of entertainment industry-friendly hotels. The facility is fully staffed and Grosse brought studio manager Karen Pinegar, chief engineer Michael Tuller and assistant engineer Alan Mason with him from Michigan. Assistant engineer Aaron Lepley was hired locally. "We packed up the old studio and all headed out here," recalls Pinegar, who has been working with Grosse since 1996. "We had the new studio up and running in three weeks." ■

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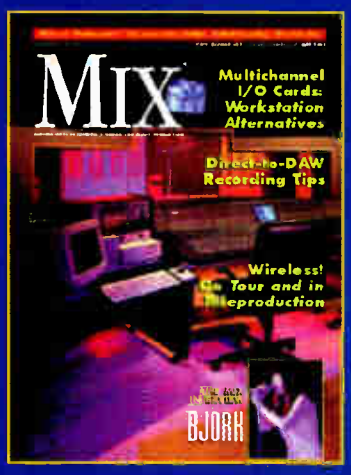

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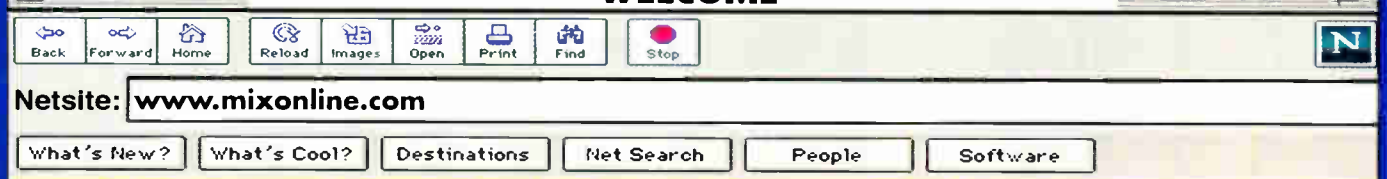

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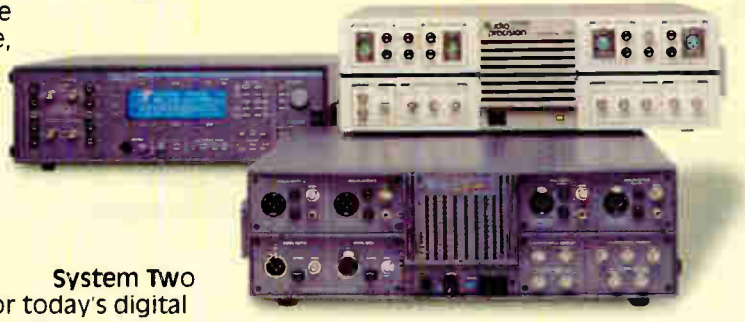

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TODD-AO

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SOUND FOR PICTURE

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by Maureen Droney

Few facilities in the world, outside the film studios themselves, can match Todd-AO's real estate or commitment to sound for picture. Since its formation in 1952 by the legendary producer and showman Mike Todd and his two partners, Dr. Brian O'Brian of the American Optical Company and George Skouras of the Magna Theatre Corporation, the Todd-AO Corporation has been known for its creative and technological contributions to the film industry.

The company's original mission was to develop and market a new process for the photography and projection of motion pictures; the result was a 70mm format projected on a curved, wide screen with 6-track stereo sound. *Oklahoma*, the first feature film released using the new Todd-AO technology, received the 1955 Academy Award for Best Sound. Since then, films mixed at the facility have gone on to win ten more Oscars for sound, including for *The Exorcist*, *Out of Africa*, *Last of the Mohicans*, *West Side Story*, *E.T.* and *Apollo 13*, not to mention 24 nominations, most recently for *L.A. Confidential*. Todd-AO has also been the recipient of 19 Emmy Awards for the television series *Mission: Impossible*, *Hill Street Blues*, *Cagney and Lacey*, *Cheers*, *Doogie Howser, M.D.*, *Flipper*, *Law and Order* and the miniseries *The Shining* and *Titantic, Part I*.

The late '90s find Todd-AO in the vanguard of vertical integration in the post-production industry, its upfront position stemming from a simply stated corporate objective: to be the leading worldwide independent provider of sound and video post-production services. Under the direction since 1994 of CEO Salah Hassanein, the company has made giant steps toward realizing that objective.

The all-in-one plan began to be implemented with the acquisition of Glen Glenn Sound, a TV sound pioneer. Glen Glenn had become an industry leader by signing on with Lucille Ball and Desi Arnaz in 1957 to supply sound for the *I Love Lucy* series at a reduced rate; in return, he garnered the contract to provide all future sound services for their company, Desilu. Glen Glenn Sound then went on to become sound provider to some of the most memorable shows on television, including *The Dick Van Dyke Show*, *Bonanza*, *Gunsmoke*, *My Three Sons*, *Mission: Impossible* and *Get Smart*. The company was also responsible for numerous technical innovations in sound recording, including the development of ADR (Automated Dialog Replacement), first used in 1964 on the *I*

TODD-AO

Spy TV series.

In 1987, Todd-AO established its first presence outside of Hollywood when it purchased New York's TransAudio and changed the name to Todd-AO East. In 1988, several soundstages on the CBS lot in Studio City were added to the growing empire, and in 1992 the Todd-AO Scoring Stage was constructed on the site of the old Evergreen stage, also on the CBS lot.

Today, there are Todd-AO divisions in London and Atlanta, as well as in Los Angeles and New York, and a new partnership with Disney has led to a German dubbing and post-production studio, which is expected to expand into Spain, France, Italy and Asia. According to analysts at New York-based Deutsche Morgan Grenfall, Todd-AO's current volume of production accounts for 75% of all the out-sourced mixing for feature films.

We are independent, and we are only as good as our last job—if we aren't the best, people will go somewhere else.

—Chris Jenkins

It's hard to take in all the scope of today's Todd-AO; Chris Jenkins, a busy working mixer as well as vice-president of the company, has been with the organization for 22 years and is one of the best sources for putting the whole business into perspective.

A BIT OF HISTORY

"Todd-AO was part of United Artists Theatres when they went public," Jenkins explains. "There were the UA Theatres, UA Columbia Theatrevision and this little sound company that was us, sandwiched in between. When we went public, United Artists' owners, Marshall and Robert Naify of San Francisco, decided to hold onto the sound business.

"We had only about 30 employees at the time, and we became a home for directors who wanted to get away from the studio lots," he continues. "We had no advertising and no signage; they would park in back, and nobody knew what was here. Eventually, the clients were Barbra Streisand, Sydney Pollack, Steven Spielberg and all these sorts of mavericks who wanted to run their own show. This was their place—their home away from home.

"Buzz [Robert "Buzz" Knudson, three-time Academy Award winner, 11-time nominee for sound] was the number one draw for many years, and he took me under his wing. We had two studios and were doing great business. Then we acquired Glen Glenn, which was a big TV presence. And always in the background was Salah Hassanein, who is now our CEO. He ran UA Theatres and also started Warner International; Salah's a mogul in the exhibition world, a deal-maker at the intersection of investment banking and entertainment.

"J.R. [DeLang, COO] came onboard ten years ago," Jenkins continues, "I became president of the studio about nine years ago, and Buzz retired from mixing, but he still spends every morning here, and the three of us lock ourselves in my office from about 7 a.m. on. Together, we rebuilt the studio group and re-equipped it. We were doing well, but people were always saying we should try to grow the company. So the charter was to go looking for undercapitalized companies that have good management and that, if nurtured, would grow.

"Also, at about that time, we started to package. Glen Glenn had developed a business called PAP, post audio production, that was the concept of doing electronic editorial—electronic sweetening for TV—everything that we now call prelay. We'd just acquired Glen Glenn when we got a call from Sydney Pollack and Mark Rosenberg saying, 'We're going to do seven or eight movies in the next two years; how can we do a predictable budget?'

"We did *Major League* and *Fabulous Baker Boys* for them, putting the whole package together—editorial and mixing. It was a needed service because the process was getting more and more complicated. So packaging was our underlying thread. We didn't invent the concept, but we were advocates of it and helped push it along. Now, that's all there is in the post world—that kind of packaging and consolidation."

THE BUSINESS ANGLE

"We've also realized that there are cyclical and noncyclical businesses," Jenkins says. "If you do 85 percent capacity in the studios over the course of the year, you're doing great business—75 to 80 percent is more the norm. If somebody says they are doing 100 percent, that's really what they mean. We do 110 or 120 percent some months, with people doing double-shifts and weekends, but you're always going to have a month where you will do 60 percent.

"So we decided to look at other businesses that offset the cyclical nature of our core business; now our emphasis is to get the company to 60 percent non-seasonal business. When the Evergreen stage became available, we acquired it to offer scoring. We took over Todd-AO Video Services, which was Pascal; we acquired what was Editworks in Atlanta—they do advertising and service J. Walter Thompson, McCann-Erickson, Coca-Cola, Turner Broadcasting. Our first acquisition in London is what was Chrysalis—they do satellite transmission, editing, some telecine and formatting subtitles for satellite transmission all through Europe. It's a great business; people love that it's all there under one roof. Now we've increased our European presence by the acquisition of Tele-Cine Cel.

"But we are independent," Jenkins continues, "and we are only as good as our last job—if we aren't the best, people will go somewhere else. Remember, our clients are also our competition, which makes it a particularly unique business. The studios—Warner, Sony, Universal—they all have facilities, so we are competing with them. It's a difficult, expensive time, because we have to have the best of technology to keep good talent and good clientele, and turn out good work."

One major, very expensive equipment upgrade was the decision to be-

come the first major facility to go all-digital with the purchase of three Neve DFC consoles.

"We needed a manufacturer who understands the film business," explains supervising engineer Bill Ritter. "Typically, consoles are designed for another application. Our business may be a smaller market, but it's an expensive one because a facility like ours will be purchasing several consoles. We require a lot more inputs, along with an understanding of how we utilize record controls and monitoring systems, DSP techniques and how we tie them to the inputs; those kinds of

Right: J.R. DeLang, COO, and Chris Jenkins, vice-president of Todd-AO
Below: AMS Neve Logic DFC on Stage C, Todd-AO mixing Lost in Space.

things differentiate our needs from their other target markets. Then we're talking digital technology and automated routers and the open architecture concept that means you can assign where your input power and your DSP power are. These are the kinds of issues we had to deal with."

Still, no matter how advanced technology gets, media and entertainment are people-based businesses, a concept that runs deep at Todd-AO. "Our rooms are really marketed by the people who work in them," states COO DeLang. "We have great mixers who are at home on our stages, and I think that's what separates us from the crowd. We're a service company, and what makes any service company great is the personnel; here at Todd-AO, along with a rich historical tradition and the latest in technology, we have an unparalleled creative staff."

SPANNING THE GLOBE

Certainly, there's no way Todd-AO could have grown the way it has without talented personnel. But here's how the many locations shake out practically:

The Todd-AO Scoring Stage, housed on the CBS lot in Studio City, is one of the crown jewels of the company. Among the largest and most technologically advanced studios in the world, the stage has nearly 11,000 square feet of working space and is big enough to accommodate a 130-piece orchestra comfortably.

The facility was originally constructed by Bell Labs as the Republic Corporation Stage, one of the only studios ever built from the ground up specifically for recording orchestras. When Todd-AO took over, the facility was completely remodeled under the auspices of chief scoring mixer Shawn Murphy, with design by BOTO Design, under the guidance of Brett Thoeny, and acoustical treatment by Charles Salter of San Francisco.

Murphy, one of the most in-demand mixers in the business (with more than 200 films to his credit; he most recently won an Oscar for *Jurassic Park*) is joined by studio manager Kirsten Smith and chief engineer Marc Gebauer in the operation of the stage, which features a Neve V3 console with 60 mic and 120 line inputs and Flying Faders automation. The stage is equipped with both analog and Sony digital 48-track capability, Albrecht 35mm film recorders with 3-, 4- or 6-track heads, 78 channels of Dolby SR, an 8-channel film monitor system, large-screen video and film projection, a click regeneration system, full SMPTE and MIDI routing, CD writing capabilities and a fully integrated transfer facility.

The Todd-AO Sitcom Stage was busy even before its official opening in March 1997. One of the first totally tapeless sound facilities designed specifically for the sitcom and television market, the five-room facility includes a mix stage outfitted with an SSL 5000 console, two 24-track Fairlight MFX3^{plus} workstations and random-access digital video. The mix

stage is also picture-in-picture video-linked to an ADR/VO booth and has a third Fairlight wired directly to the console from the recordist. The two prelay rooms also feature random video, Yamaha 02R consoles, and digital busing from/to DAT, CD and DA-88. Also accessible are the extensive Todd-AO sound effects library and commercial CD libraries.

Key personnel at Todd-AO Sitcom include facility manager Roy Gilbert, re-recording mixer John Cook, prelay editor Mitchell Gettleman, and transfer supervisor Larry Ellena. "In our first season," says Gilbert, "we did full audio post-production for Steven Bochco's *Public Morals*, Carsey-Werner's *Men Behaving Badly*, Disney's *Unhappily Ever After* and Brillstein-Grey's *News Radio*, among others. Our new shows this season include, Touch Stone's *Zoe Beam*, Paramount's *Maggie* and Brillstein-Grey's *The Steve Harvey Show*. We also provide sound effects and ADR for many other shows."

Todd-AO Studios West opened in 1995 when the company took over what had been Skywalker Sound South, with facilities in Santa Monica (Lantana) and West Los Angeles (Bundy).

Together, the facilities offer three large, dedicated 35mm feature dubbing stages, two smaller rooms for film and television, a dedicated ADR stage, a dedicated Foley stage and an ADR/Foley stage. All stages can project in either 35mm (except for the TV stage) or ¾-inch video format. Stage A at Bundy features a Neve DFC. Both facilities have full-service sound transfer departments, and both can transmit and receive audio through ISDN lines from any stage to any compatible location worldwide.

Lantana comprises the large feature Stages 1 and 2 and the smaller Stage 3, used mainly for premix and dubbing work; Stage 4 is used mainly for episodic television. All four rooms are equipped with Otari Premiere consoles. "With the compressed post schedules on features these days, clients often have to work on multiple stages at the same time," says Lantana engineer Tom Lalley. "That's very convenient here; clients will often use

With the compressed post schedules on features these days, clients often have to work on multiple stages at the same time. That's very convenient here.
—Tom Lalley

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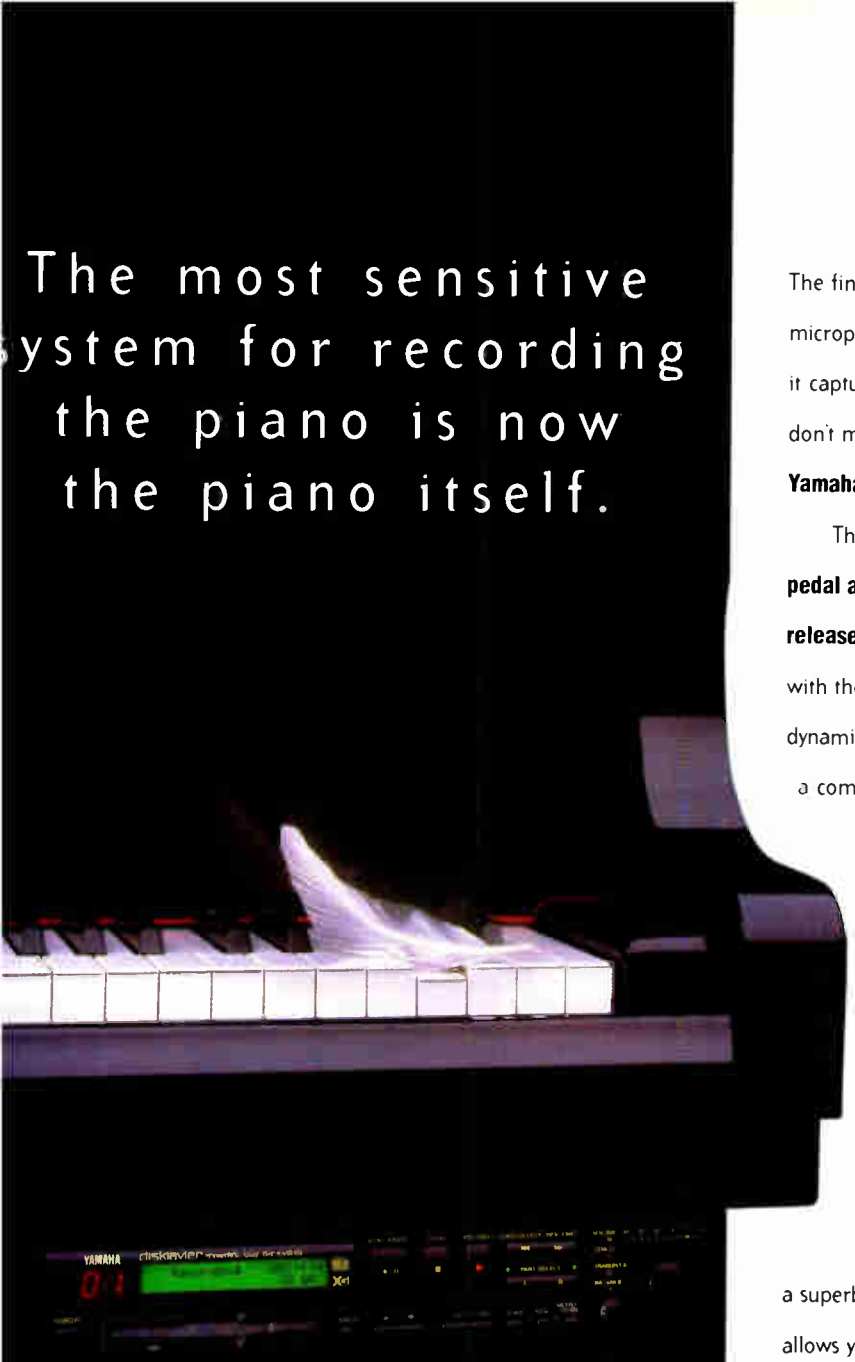

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Stage 3 for premixing dialog for a feature that's dubbing on 1 or 2, and if 4 isn't booked with a project, it can also fill that need. The material translates very well between rooms here, with no EQ problems."

Stage 5 is set up for ADR; 6 is for Foley. Both are equipped for film and video with Lartec consoles and Fairlight MFX3^{plus} workstations. Lantana has three digital editorial suites fitted with Fairlights that are used for dialog, music and effects. It also features a 47-seat DTS/Dolby Digital-compatible THX screening room with a CP200 cinema processor capable of mag interlock or optical.

Projects completed at Todd-AO West include Paramount's *Clueless* for director Amy Heckerling, Oliver Stone's *Nixon*, Fox/Cinergi's *Die Hard 3* for director John McTiernan, and, more recently, Alan Parker's Academy Award-nominated *Evita*, Luc Besson's *The Fifth Element*, John Woo's *Face/Off* and Oliver Stone's *U-Turn*.

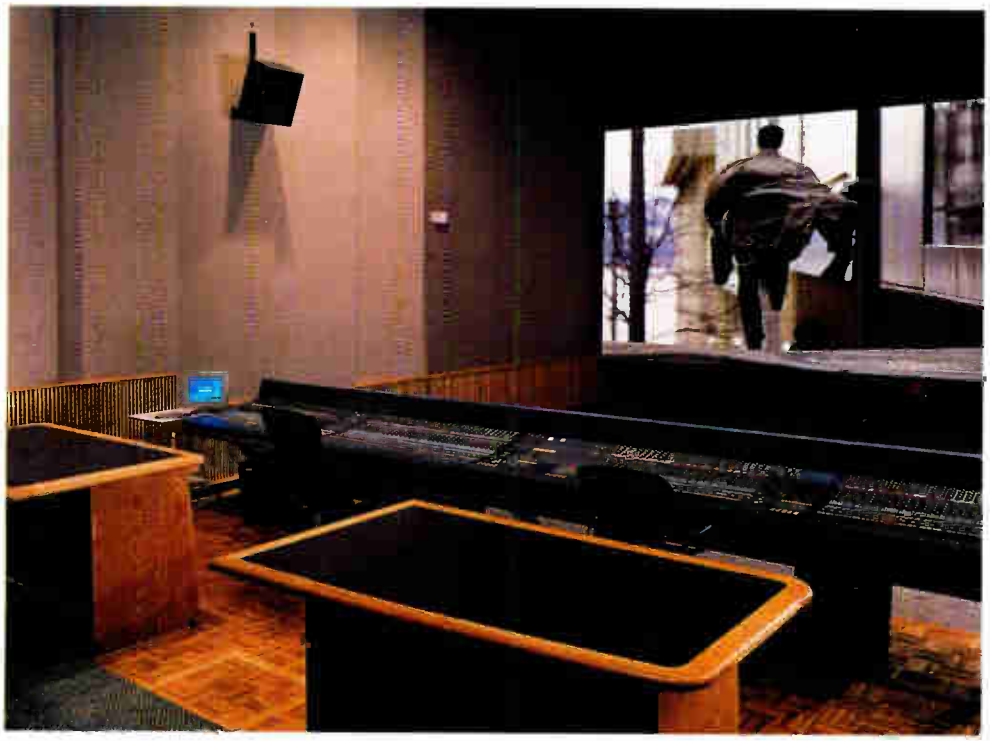
"We're very proud of our credits," says West's president, Richard Hassanein. "But most important to us is the relationship we have with our customers. If possible, we like to get involved with our clients from the beginning, taking a personalized approach to dealing with all phases of production. Even though we're equipped with state-of-the-art technology and employ some of the industry's top mixers and engineers, we're always looking for new and better ways to do things."

In 1997, the Los Angeles divisions of Todd-AO acquired **Hollywood Digital**, which provides digital video post-production, audio editing, prelay, mixing, sweetening and tape duplication. Concentration is on long-form product for all markets, including sitcoms, episodic television, miniseries, feature films and trailers.

Audio facilities consist of two mix suites, with the centerpiece of each being an SSL Omnimix. "Both our audio and video are really becoming self-contained units," explains mixer Ed Golya, "where everything is loaded into the system, worked on in a tapeless environment and then output to whatever format is needed. Our clients usually come in a day before they mix and do editorial—track-splitting, sound effects searching and replacing, ADR if needed—then the next day we'll take the drive and start mixing. The Omnimix has full editorial capability; it has Screensound as its main editor, it's a 32-track digital mixing board, and it incorporates picture stored on hard disk with Visiontrak."

Todd-AO Studios East features the largest film mixing studio in New York City, Stage C, a one-of-a-kind room that accommodates all current digital formats and provides 16mm, 35mm and 70mm capability. Stage C, with its newly installed AMS Neve Logic Digital Film Console, is also said to be the only room on the East Coast that can produce stem screenings, something that, according to president and general manager Stephen Castellano, is extremely helpful to directors and producers, giving them the opportunity to make last-minute changes before print mastering.

Bob Chefalas, East's VP of engineering, has been with the facility 13 years and explains C's advantages: "Listening to the stems is like listening to the masters of the film, and in some cases that can be up to 48 tracks of audio that



AMS Neve Logic DFC on Stage A (Bundy), Todd-AO

need to be leveled, combined and monitored through the stage for the screening," he says. "It takes three different components to do it: the screening projectors, all the playback machines and a console big enough to fold all the audio down. Most rooms in town can only handle a couple of 6-track masters; we are able to handle up to eight."

Both Castellano and Chefalas are industry vets who worked for Trans-Audio, the original owner of the facility. When it was acquired by Todd-AO in 1987, an additional re-recording stage and ADR room were constructed. The 20,000-square-foot complex now includes a screening room that is both DTS- and Dolby Digital-compatible, two SSL 5000 consoles, Foley and sound transfer rooms, and a full complement of Sonic Solutions systems and Tascam DA-88 recorders. In June 1998, the company installed 16 Akai DD8 digital audio dubbers, nearly abandoning the use of its mag machines. The technology was put to use on both *Deep Impact* and the upcoming Sidney Lumet film *Gloria*.

East employs two of the industry's top re-recording mixers, multi-award-

TODD-AO

winning lead mixer Frank Morrone and Paul Zydel, an ADR/Foley mixer with 15 years' experience, seven Golden Reel nominations and more than 200 films to his credit. Projects mixed at Todd-AO East include *Apollo 13* (the only film posted in New York to win an Oscar for sound), *Dead Man Walking*, *The Pelican Brief*, *Ransom*, the Academy Award winner *When We Were Kings*, the Dreamworks-produced Academy Award winner for best short, *Dear Diary*, Joel Schumaker's *Eight Millimeter* and Ron Howard's forthcoming *EDTV*. In the last year Todd-AO East has established itself in post for TV, handling the mixes for HBO's *Sex in the City* and CBS' *Della Ventura*.

Atlanta is arguably the media center of the Southeast; there, Todd-AO/Editworks, acquired in 1996, offers a wide range of audio and video post-production services. In July 1997, the facility upgraded its original studio and opened a second audio mixing and recording room, acoustically rated NC15 and designed to meet Todd-AO specifications by Clay Davis, VP of engineering for Todd-AO in Los Angeles. Both rooms feature Fairlight MFX3™ 24-track workstations and Yamaha 02R mixing boards with instantaneous backup and restore, ISDN lines and an APT system that allows mono or full-bandwidth stereo phone line recording and playback. The Editworks team is also preparing to provide surround sound monitoring and has equipped their Fairlights with its ADR package.

"We are growing and emphasizing our audio capabilities, and we now have the entire Todd-AO family as a resource," says audio production manager Buddy Hall. "We have a very production-oriented setup where we can do everything from commercials and audio for TV to radio production, original music with our in-house composers and score to picture."

President Britt de Bie says recent projects at Todd-AO/Editworks include work for TNT and TBS, Ford, Coca-Cola, Six Flags Theme Parks and sweetening for music video clients such as La Face Records.

In 1996, Todd-AO merged its recent London acquisitions, Chrysalis Television Facilities and Filmatic, resulting in Todd-AO UK Ltd., making the company a post-production leader in London and providing a gateway to Europe.

Equipped to cater to a broad spectrum of post-production activities, including television network transmission, the company currently puts on air MTV's VH-1, and Turner's TNT and The Cartoon Network for the UK and European television markets. It also provides facilities to UK-based film and video producers serving both a local and an international client base in film, TV, cable and satellite markets.

"We were the first all-digital facility in Europe based on the Digital Betacam format," states Graham Hall, managing director. "We provide all of the technical personnel and equipment, as well as a range of support services, including engineering maintenance, library storage, and day-to-day account management. We are also equipped to handle live transmissions through the use of our two broadcast-specification television studios."

In addition to its broadcast TV transmissions, Todd-AO UK features digital editing bays, digital film-to-video tape transfers and graphics capabilities. Facilities also are devoted to broadcast-quality duplication, where the company services clients such as Disney and BBC International. ■

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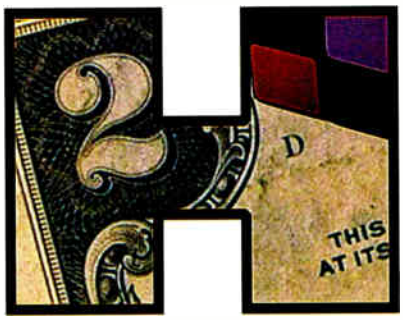

Do not arrive late to *Snake Eyes,*

Paramount Pictures' late-summer thriller directed by Brian De Palma. Reel 1AB, set around a championship boxing match at the fictional Millennium Casino in Atlantic City—with an oncoming hurricane as a backdrop—is about as energetic and frenzied as movie openers get. There are no car chases, no comets hurtling from the heavens, no monsters from the deep. Just solid, well-paced editing, an amped-up Nicholas Cage and the excitement brought on by 14,000 fight fans anticipating the main event.

BY TOM KENNY

DUSE

SOUND FOR BRIAN DE PALMA'S

"Snake Eyes"

PHOTO: ATTILA DORY / COURTESY PARAMOUNT PICTURES

"Snake Eyes"

The film actually opens outdoors, with a glimpse of the Millennium sphere (a 20-foot-diameter ball atop the casino) and a television reporter announcing the fight and warning of the approaching storm. It then quickly moves inside the casino, where the camera follows Rick (Cage), a local cop-on-the-take, through the labyrinthine passageways of the in-house arena. It's a complex scene, with Cage wandering through the arena, moving through hallways, popping up in the dressing room, descending an escalator and finally circling the ring en route to his front-row seat. All the while he's delivering rapid-fire dialog on pay-per-view camera, in negotiations with bookies and even setting up a post-fight celebration with his girlfriend on a cellular phone. And for the first 11 minutes, until the gunshots, there is no music, so dialog and effects carry the film. The environments change continually, the rush of the crowd adds a full, all-consuming background, yet you hear every word: It's a tribute to the entire audio crew, from production sound mixers James J. Sabat, Patrick Rousseau and Keith A. Wester, to dialog editors Laura Civiello (supervising dialog editor), Dan Korintus and Marlena Grzaslewicz and re-recording mixer Lee Dichter, whom many label the "dean of dialog mixing." All editorial and mixing was done at Sound One in New York City.

The opener is essentially an intentional exercise in "controlled confusion," say co-supervising sound editors Maurice Schell and Richard Cirincione. The plot revolves around an assassination attempt at the fight, which throws the arena into chaos. Throughout the next hour-and-a-half, Cage tracks the conspirators through the casino-hotel, and through a series of flashbacks/replays, complete with alternate visual and aural cues, the layers of the conspiracy are peeled back. It was, Schell and Cirincione say, an exciting approach for the sound team.

PHOTO: ATTILA DORY / COURTESY PARAMOUNT PICTURES

Co-supervising sound editors Maurice Schell (top) and Richard Cirincione joined Lee Dichter (front) at the Neve during the final mix.

"We knew we had to start off very full," Cirincione says, "where the audience doesn't really know particularly when the fight begins—you hear the crowd and you hear the commentators through the handheld radio, but we had so much going on that you don't know what to listen to. In subsequent flashbacks, little by little is revealed and the tracks unfold. We had so much material from production that we never had to play the exact same tracks. For a particular crowd reaction, we would play a different take because everybody remembered the moment differently. That applied to both picture and sound, where, for example, Tyler, the fighter, might remember four shots, when in the opening sequence we had seven or eight."

Because De Palma wanted the energy of the arena at the same time he wanted to protect the dialog, the scenes were shot with a silent crowd and Cage, Gary Sinise and the other actors on lavaliers, with the occasional buried mic. Consequently, Dichter received very clean dialog, which had been recorded to DAT—everything stereo—then loaded into Sonic Solutions workstations for editing, then dropped onto the Akai digital dubbers for playback at the mix. (It should be noted that all dailies were loaded, not just the printed takes, and eight discrete guide tracks, rather than the usual four, came from editor Bill Pankow at the Lightworks. Loading and track management became a time-consuming issue.) Alternate readings were always available; sometimes, individual syllables were slipped in right on the stage, transferred from the Sonic to

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the left of the Neve onto the Akai DD8s.

"Snake Eyes"

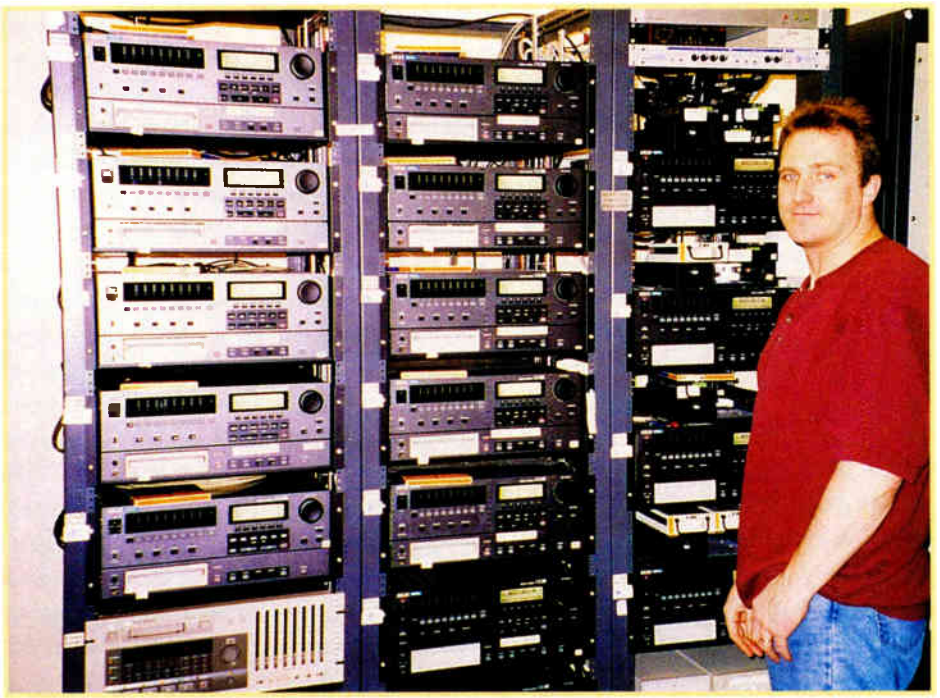
CROWDS AND DIALOG

Some of the crowd roars were also delivered on DAT, later augmented by individual spikes from group ADR. (Schell and Cirincione went so far as to employ a lip reader to get exact readings.) Crowds, like rain, can be troubling at a mix for a number of reasons, chief among them the frequencies they eat up and the danger of monotony. Because production provided a number of crowd recordings, Schell and Cirincione were able to provide Dichter with enough variety and perspective shifts to keep the roars interesting, assembling different crowds for the challenger's rooting section vs. the champ's and the front-row vs. the cheap seats, often pulling from 20 years' worth of their own libraries, as well. Then Dichter premixed down to as many as six crowd groups. His challenge at the final was getting dialog to poke through.

"When you're putting dialog over a loud background, such as a crowd, it needs a different type of equalization and compression," Dichter explains, "because it would feel oversqueezed and overequalized without the background. A lot of that I learned in mixing TV commercials, which I did for the first ten years of my career. Many times after we would mix a commercial, we would play it back and one word wouldn't be heard, so the producer would say, 'Lower the music.' And I'd say, 'Why lower the music for one word when I can raise the one word, or the one syllable? Or equalize the one syllable?' I brought that technique into film mixing. For me, if you can't hear every syllable in a film, then we've done something wrong. Go back and get a replacement, or equalize different syllables in different words differently. I don't go with one setting for a dialog shot and ride the level or compression. I'm constantly riding equalization as we're rolling.

"And I'm talking about a tremendous amount of rolling equalization—bringing lines and words and syllables into focus with tremendous EQ shifts," he continues. "You notice in music that people will contemplate, 'Oh, should we add 3 dB at 2,300 cycles, or should we add 1 dB at 5,000 cycles?' I'm taking those equalizers and ripping 'em. I'm going 15 dB at one little word, then back off again—really swinging it, drastic moves to dig out that one word. I'll punch into a line of dialog with a tremendous EQ boost, then get back to normal two or three frames later. I use the technology to get that dialog to really sing and sit on top.

"Also, you have to remember that sometimes the longer reverbs will get soaked up. If you took away the backgrounds, two or two-and-a-half seconds would be too long, but with the BGs, you're losing half a second to three-quarters. [In the opening scene] I'm constantly riding reverb as he walks along. And it's definitely in stereo, to give you the space and feeling."



Machine room operator Harry Higgins helps keep the Akai DD8s and DR16s running at Sound One.

Then the crowd is seated and the fight begins. Punches, roars, paranoid activity in the front row—Kevin Dunne (Gary Sinise), who is guarding the Secretary of Defense, leaves his post to investigate—screaming, whispers, then bullet impacts. More gunshots are fired, then people duck, chairs scrape, people scream, flashes are seen in the crowd—effects have taken over.

"The intention with the gunshots was that it was supposed to be somewhat confused, so we stretched some of them in the first reel," Cirincione says. "The audience isn't quite sure what it's hearing—is it thunder? And the first shots were with silencers, so we're just hearing impacts. There's so much going on in Reel 1AB that we don't notice the assassin getting shot in the back of the room, but we hear it."

I'll punch into a line of dialog with a tremendous EQ boost, then get back to normal two or three frames later. I use the technology to get that dialog to really sing and sit on top. —*Lee Dichter*

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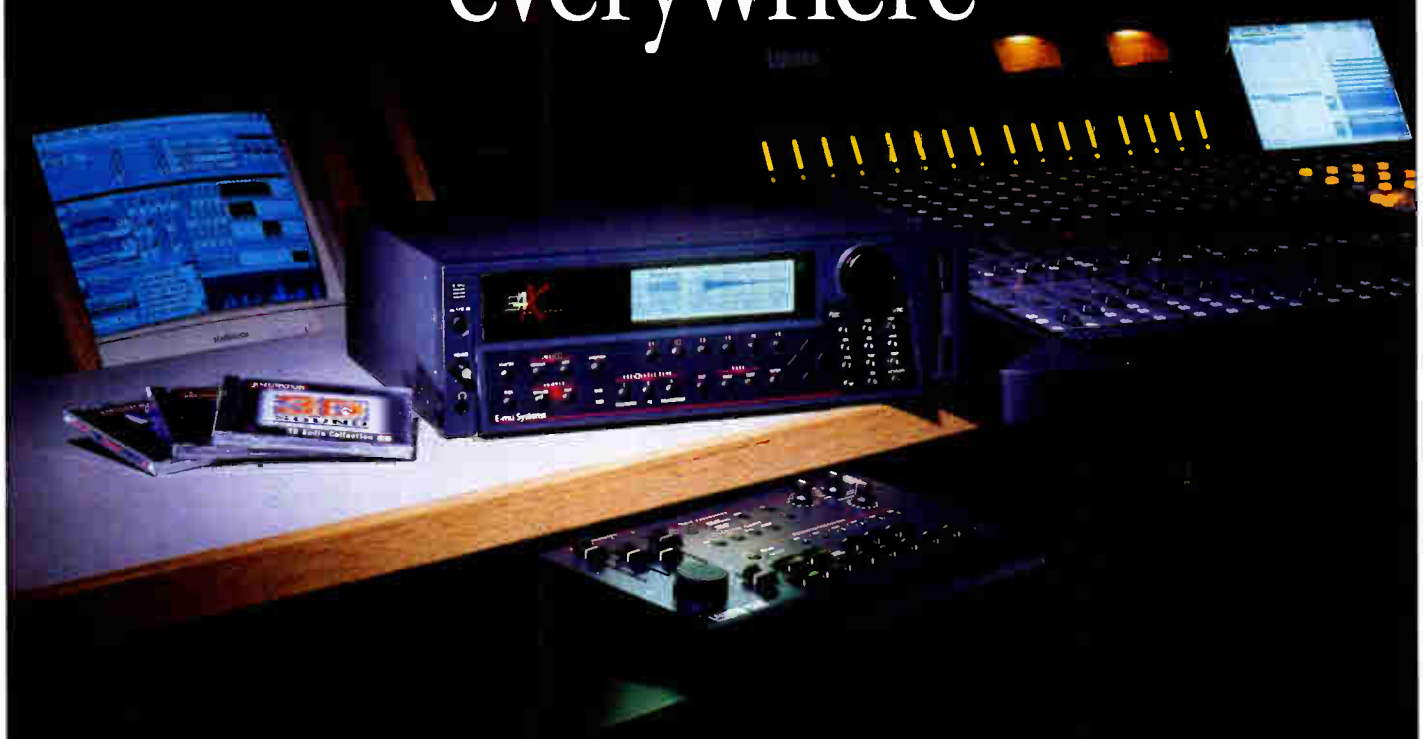

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"Snake Eyes"

Then the arena empties as the crowd streams for the doors. Cage seals off the casino, as all 14,000 fans are potential suspects or witnesses, and the search for the killer begins.

"After the fight, we tried to keep a quiet, reverberant atmosphere in the arena, where they're taking away the bodies and picking up the chairs," Schell explains. It's quiet, with light movement, and that's where we begin to introduce the outside world, with thunder, police sirens and ambulances. That's the first chance the audience gets to catch its breath."

EFFECTS: HEAR THAT STORM A' COMIN'

Schell and Cirincione got a first look at *Snake Eyes* in late December 1997 and had to be ready for the first temp mix by mid-January. Their first impression was that the film was deceptively big, with a large amount of crucial effects, including gunshots (where the number of shots become a plot point), boxing punches (ditto) and the impending Hurricane Jezebel (essentially a character).

"From the very beginning, we're told there is a storm, and it is set up as a driving force," Schell says. "The next thing we're introduced to is the ring, and those two components become the driving force for the whole film. But we had to use them carefully to accommodate the energy. For instance, Brian [De Palma] told us at the beginning that he didn't want any storm in the pay-per-view booth or the casino, but everywhere else he said 'be my guest.'

"We were worried about the storm in that we didn't want it to be repetitious," Schell continues. "We were constantly trying to make it change as we went along so it never stays steady—adding a new element, playing with rain on different surfaces. We had layers and layers of maybe 20 different types of rain—from rain on umbrella, rain on a raincoat, rain on boardwalk, rain on cement, blizzard sounds, blizzard rains."

The intention with the gunshots was that it was supposed to be somewhat confused. The audience isn't quite sure what it's hearing—is it thunder? —*Richard Cirincione*

Sometimes rains had to be removed, sometimes lowered. In a key scene, where Cage is beaten mercilessly by the conspirators in the boiler-room bowels of the casino, a loading door is open, and the storm is raging outside, but it's played for emotion. "Rain on metal would have interfered with the dialog at the mix," Cirincione explains. "And the drama is of the guy getting beat up. Gradually, after he's thrown on the boxes and it quiets down, we introduce the rain-on-metal more. Before that, it's mostly basement and thunder, so we try to be careful. It's a big, dramatic moment."

The storm also figures prominently in the climax. As the action builds toward a showdown, as the chief conspirator is tracking Cage and Carla Gugino, both the storm and the Millennium sphere begin their assault, with the latter rolling along the boardwalk and the former manifesting itself in a huge tidal wave, headed for the shore. Both have been properly introduced as threats, and by the end, they are running completely in parallel.

"The biggest challenge in getting the ball to work was the many, many, many tracks," Cirincione says. "Because of the intensity of the ocean

laid on top of it, it took a bit of doing to get the proper balance so you can hear both menaces at the same time."

"They're both in the same sound area—too much bottom end," interjects Schell, "so we tried to make one distinct from the other. One thing was to try to make the ocean feel wet, with a wash and waves, some peaks to poke through. And the ball of course was many things put together, trying to make it organic. One of the elements was a bowling ball in a gutter. Another was a tank. Then we used wheels going over wood for that echo-y feel. And earthquakes and avalanches. But usually, to be honest, we don't in most cases reveal what we use because people tend to focus on the element and they hear it differently."

The climax is huge on effects, to be sure, and without judicious mixing, it could easily have fallen into a dull, albeit loud, wash of sound. "I tried to protect certain frequencies so that the ball had room to cut through," Dichter says. "The wind and water combination can just fill up the soundtrack, the total spectrum of the sound envelope. So for the ball, I found a frequency somewhere between 150 and 200 cycles that I overemphasized to give it a voice, to get it to cut through the water. I also compressed it tremendously to give it power. Then, the closer we come to it, we used the subwoofer for the ball only, so the low, low rumble—that 30 or 40 cycles down below—was another element used to give the ball voice and presence. I kept the rain and water completely out of the subwoofer."

MARRYING THE MUSIC

Because of previous commitments, Dichter was not onboard for the various temp mixes. De Palma apparently wanted a full-blown stereo mix by the fourth go-around in order to give Ryuichi Sakamoto (*The Last Emperor*) something to write the score against. Sakamoto, who has a studio in New York, has been actively producing for interactive media, even producing a live Internet concert where people could send MIDI information in real time and play along with his symphonic work. For *Snake Eyes*, there are roughly 56 minutes of music and 34 cues, four of which are source cues. Of the remaining 30, three or four are completely electronic, according to music editor Nick Meyers, though viewers will be hard-pressed to distinguish which ones they are.

"This is not your normal film

"Snake Eyes"

score." Meyers says. "It's very dramatic, and Sakamoto has a style that's very much his own. He's loyal to his own inner ear. It has a very contemporary feel, and it's modern music, but I hesitate to say that, because when people think of modern music, they think of atonal composers who are more for a concert audience. This music is not that. It's accessible, yet it uses tonalities that are not immediately recognizable as film music tonalities.

"Tension in any film is set up by the visuals," Meyers continues. "One of the wonderful scenes in this movie is the sequence where the two characters are chasing the female lead through elevators and hallways, and it's about a six-minute cue, the longest in the film. Most movies don't have chase sequences lasting quite that long, and it's hard to sustain a 'hunt' cue for that long. The tension that you feel is all about this inevitable meeting that never takes place, which, of course, is reserved for the end of the film. It's a constant tease that keeps you on the edge of your seat."

The orchestral cues were all recorded to 48-track digital by engineer Goh Hotoda at The Hit Factory in New York. Fernando Aponte mixed the tracks on the Capricorn at Right Track to 3-track left-center-right, with splits for certain instruments and overdubs on a separate channel. The mix was digitally transferred to DA-88, then loaded into Meyers' 16-channel Sonic system for editing, with electronic instruments kept separate, basically untreated.

PHOTO: ATTILA DORY / COURTESY PARAMOUNT PICTURES

The music, with its film noir sensibility and thoroughly modern approach, works beautifully in the film. And it never seems to compete with effects. Apparently, De Palma was so enamored of the temp mix on the final reels that he was willing to go with just effects if it worked out that way. But then Sakamoto's score was created to interleave and was woven in masterfully ("weave" was a word that cropped up a lot at the final, Meyers says), particularly in the tracking scene leading up to the final confrontation, where screeching metal effects punctuate the rhythmic, pulsating score. It's a scene that could be used in film schools to illustrate the blending of music and effects.

Snake Eyes opened nationally on August 7. If you can, see it in a properly aligned theater, because it's a big film, with big moments, and it never gets too loud. And most importantly, you hear every word. ■

Tom Kenny is managing editor of Mix.

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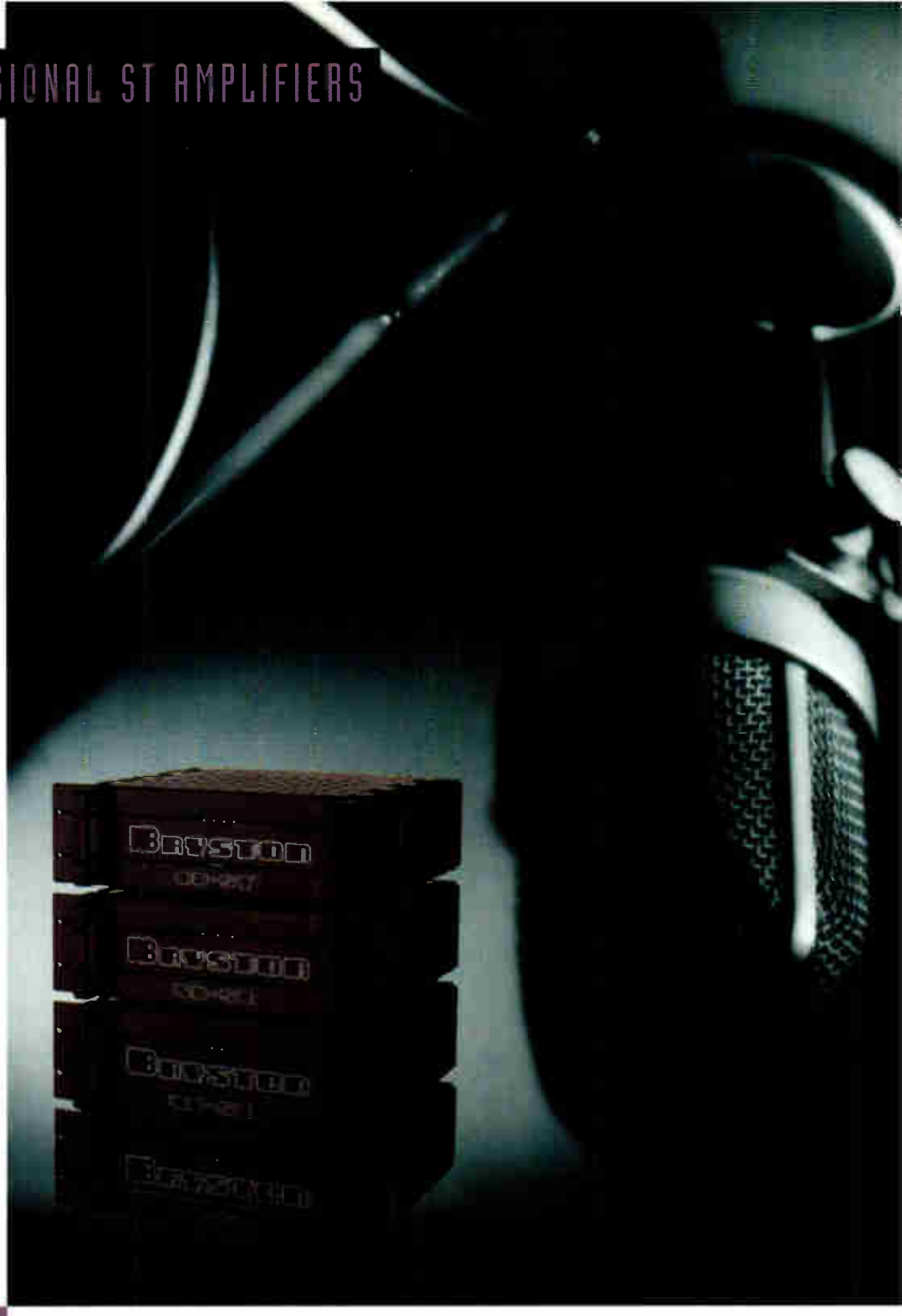

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CIRCLE #065 ON PRODUCT INFO CARD

BY TOM KENNY

POST SCRIPT

SOUND FOR FILM

DOING A LOT WITH A LITTLE

by Larry Blake

Ever since I have been able to mix in my hometown of New Orleans, I have been juggling both low-budget films down south and more standard Hollywood films in LA-LA land.

I feel very comfortable in both territories for obvious reasons: L.A. because it's *L.A.*: ground zero of film sound and the film industry in general. In terms of behind-the-scenes technical personnel and the quantity and quality of creative juices that are put into feature film soundtracks, no other city comes close (although if you're judging per capita, then Nicasio, Calif., the home of Skywalker Sound, is the champ). It's the daily contact with the best and the brightest in my field that makes L.A. tolerable to this Southern boy.

And, of course, L.A. is not lacking in equipment either, although film dubbing stages there, if not cookie-cutter, are fairly similar from facility to facility. A few dozen mag film dubbers, four 6-track mag recorders and a big console. Until recently, this was defined as no more than 80 inputs in their factory-native configuration, with additional sidecar consoles being brought in to accommodate everything at the final mix. This is awkward in terms of busing and automation flexibility, not to mention being a patching nightmare.

Armed with the knowledge that modern, too-damn-loud sound jobs require hundreds of inputs at the final mix to create the desired incoherent jumble of noise (phew, I'll be better in the morning), the current generation of *really huge* digital and digital-ready consoles being installed in L.A. have approximately 300 simultaneous inputs, with some boards measuring over 30 feet long. "Preposterously large," as described by a good friend of mine who bought one for his major studio a few months ago.

One might think that such manly sized equipment would be one of the big draws of Los Angeles to me. It would be understandable for you to think that...but you would be wrong. In this context, I disagree with the makers of *Godzilla*: Size does *not* matter. Think about it.

Consoles exist for one purpose: to route, combine and process multiple audio signals. But are you going to tell me that you can *hear* the difference between an 02R and a Capricorn when faced with the same digital inputs and utilizing the same digital recorder? Of course you can't, and if you think you can, you damn sure won't *bet* me that you can hear the difference. But a console isn't only about the sound, it's about such factors as monitor modes, automation and routing, and indeed a Capricorn (or, more commonly in the film world, an AMS Neve DFC or a Harrison MPC/Series 12) is infinitely more elaborate and flexible in this regard. If you're a major studio owner who can charge $1,000-plus per hour in your best rooms with your best-known mixers, I guess such a board will help attract clients who buy into the *Godzilla* motto.

But what about the rest of us who can't even entertain the notion of spending nearly a million dollars for a console or a few million for the whole place? Well, the truth is, we don't have anything to worry about.

The point I want to emphasize here for the umpteenth time is that the quality of equipment that you can afford will not limit you creatively in any way. If you believe that it does, then it will, Luke, and you will be a living example of the old saying "the poor craftsman blames his tools." The pro audio community's obsession over equipment, with magazines such as this aiding and abetting manufacturers in sowing the seeds of technolust, diverts users from

—CONTINUED ON PAGE SFP 24

PHOTOMONTAGE: TIM GLEASON

FACILITY SPOTLIGHT

MEDIA CITY SOUND

A FACILITY FOR ALL SEASONS

by Kim Wilson

With that promised 500 channels closer to a reality, the demand for quick and cost-effective audio post-production has increased substantially, not only for new TV shows but commercials and on-air promotions, too. Budgets may be smaller, but producers still expect the highest possible standards, putting untold pressure on post-production facilities to provide faster and cheaper service on a variety of projects.

In early 1998, Emmy Award-winning composers Alan Ett and Scott Liggett opened the doors to their 10,000-square-foot facility in Studio City, Calif., home to the Alan Ett Music Group, Media City Sound and Opus 1 Productions. These three separate audio production companies fall under the umbrella of the Alan Ett Creative Group and are equipped to handle any type of project, from dubbing a Movie of the Week to sound design for a 30-second commercial.

Media City Sound is a fully automated digital post-production facility. The Alan Ett Music Group provides music production services, and despite their heavy responsibilities as president and vice president for the entire group, Ett and Liggett remain the principal composers and music supervisors. The newest service, Opus 1 Productions, distributes one of the largest music libraries in the world. Launched in July 1998, it comprises 72 CDs with several thousand tracks of original music created by the Alan Ett Music Group. The library spans a variety of styles, moods and orchestrations for scoring network and cable TV, feature films, ads and promos. Along with original music, Opus 1 Productions has distribution rights for three other libraries: Kosinus from France, and Phonic and JW Media out of England.

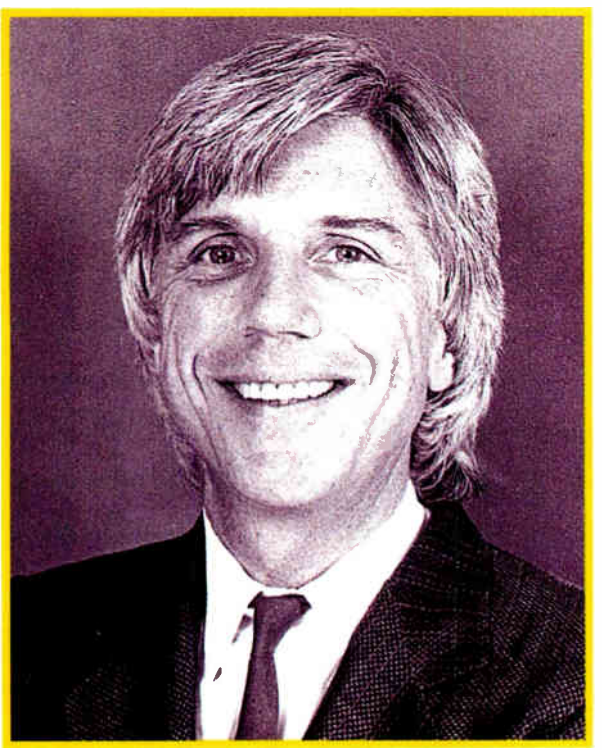
PHOTO: MATT GRUBER

From left, Scott Liggett, composer and VP of production, Alan Ett Music Group; Alan Ett, composer and president/CEO; and Donna Walker, VP operations, Media City Sound, in front of the Otari Concept Elite.

Ett and Liggett took an hour out of their hectic schedule to chat about the creative oasis they've built in the middle of Los Angeles, the world's largest entertainment community.

"This whole thing is really a lot of fun," asserts Ett, as he settles into the cushy black leather couch that is part of his combination office and music production suite. "The people we deal with across the board are some of the most creative, brilliant people on the planet. There are no mediocre days here. This is an audio

—CONTINUED ON PAGE SFP 27



John Boylan

WHEN 'TOONS SING

JOHN BOYLAN FINDS A NICHE THAT KEEPS HIM YOUNG

by Dan Daley

John Boylan's hair turned prematurely gray when he was in his late 20s. Combined with an affinity for tweed sport coats and button-down collars, which he developed in Etonian prep schools, it may have made him look like a rock 'n' roll anomaly as he produced milestone records with an eclectic assortment of major recording artists. He started with Ricky Nelson in 1967, moving on to the first two Linda Ronstadt solo records, the classic Boston debut, Commander Cody & the Lost Planet Airmen, Little River Band, the Charlie Daniels Band, Carly Simon, REO Speedwagon, the *Urban Cowboy* soundtrack, right through Nelson, going full-circle with the sons of his first production foray. But the look is just right for the new niche that Boylan has carved out for himself since 1990: producing music for equally famous animated characters.

"Look," he says, "I'm in my 50s, and I'm not expecting Matchbox 20 to come knocking on the door anytime soon. It's a youth-driven culture. But what I'm ecstatic about is that I've found this niche that I really enjoy, and in the last ten or so years remaining in my ca-

—CONTINUED ON PAGE SFP 28

—FROM PAGE SFP 22, DOING A LOT WITH A LITTLE

the really important issues. If you're a musician, stop drooling over that tube preamp and spend more time writing songs or learning your instrument. If you're a sound editor, spend more time in the field capturing original material. Okay, off the pulpit and back to my original point.

If you're not looking to attract huge Hollywood films that need 120 inputs of sound effects at the final mix, you can free yourself to build the mix room that will serve your needs best. For the purposes of this column, let's assume that you're aiming to do small feature films and television shows.

One of the toughest nuts to crack is monitoring because there are so many variables. Room acoustics, monitor matrix (I'll explain later), speakers and amps, and room equalization—these are all part of the elaborate film sound "B-Chain," which is considerably more convoluted than the equivalent in the world of records, where two NS-10s on top of a console constitute a monitoring system. Unlike with consoles, there's no easy, inexpensive way to achieve high quality.

It really boils down to what you're trying to do and what, if anything, you're trying to sell. If you're doing your own microbudget films and TV programs, then, yes, three matched, high-quality bookshelf speakers will do you just fine. They can be active professional studio monitors or top-of-the-line home theater speakers—you will still be able to achieve a certain level of quality.

But the sad truth is that the smaller your space, the harder it is to make it work. The low end, especially, will always be problematic in small rooms—you can't just equalize everything to make a flat line on a real-time analyzer, as some would have you believe.

The issue of how to equalize a monitoring system invariably gets back to a music vs. film standoff. Music=flat, high-quality; film=rolled off, lo-fi. This is a common misconception that mostly derives from the "look" of the standard film "X" (extended) response, which rolls off at 3 dB per octave after 2 kHz. Because it is rolled off, it is perforce not flat, right? No.

Speaker measurements that indicate a flat response are measured near-field, whereas film mixing stages are measured in the far field. So, if you play a CD on a properly aligned film monitoring system, the high end should feel just about right. Twice I've done the reverse—mixed an album in a film mix room—and found that minimal EQ was needed to meet the mastering engineer's standards on his very hi-fi towers.

I always recommend aligning small film rooms flat to 2 kHz, rolling off 1.5 dB per octave beyond that point. In my experience, this appears to work better than the other common small room curve of flat to 4 kHz, rolling off the standard 3 dB/octave. But don't take my word for it; you must always, always test a new room in two directions. First, play old, familiar material and see how it sounds in your studio. Then you should take samples of the project you're currently working on, recording what EQ and surround level feels right, and then proceed to "bracket" those settings. (For those of you who have never dabbled in photography, bracketing is when you shoot tests at different apertures and shutter speeds to determine how to meter and expose with a given camera/film stock combination.)

In the current example, you would

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adjust the dialog EQ so that it sounded rich but not tubby, clear but not brittle. Then print the same section again, but more and less low end (or perhaps utilizing different turnover frequencies), along with more and less midrange boost. Do the same type of tests for surround level and for music EQ. Take the resulting tape with all variations and play them in top-notch screening rooms and mixing studios, and a pattern should emerge. Your room is bright or dull, the surrounds need to be raised or (usually) lowered.

Again, these tests are the *sine qua non* of room alignment. If you don't do this, you're fooling yourself, no matter what speakers you've installed or who designed your room or (for a fee) sprinkled holy water on it.

While on the subject of translation, let me restate my own personal party line that I have formed through 18 years of closely observing the film sound process, the last ten of which I've also been a doing it: Mixing feature films in small rooms is a snap once they have been carefully aligned. Period. You've cut good-sounding tracks? You know how to make something sound nice? As they say in the UK, you're home and dry.

A small film re-recording room will be much more revealing than a large one, and I have never had a problem stick out in a big room that got past me in a small studio. On the other side, I'm always pleasantly surprised that problem areas that stuck out in the small room were simply not an issue when played in the *real* far field. They used to say in Hollywood that you have to poke the sound through the little holes in the screen, so there's really no need for "music-quality" attention to sonic detail.

I disagree very strongly on this point. Yes, small details do get lost in a theater, but eventually all films will come home to roost in a home theater, which is, of course, very revealing. (I won't even broach the subject of people listening to mixes with headphones. Brrrr.) We therefore should always be mixing if not *for* the best/worst case situation (revealing home theater system), then taking its eventuality into account and making sure that opening up our sonic kimono on home video won't reveal bad punch-ins.

Let me now define "small." "Large" in a Hollywood sense can mean a mixing room that is also a 300-seat theater, whereas "normal" is usually in the realm of 50 feet long. Once your room is 40 feet long, you should have no grief whatsoever with low-end translation.

The most notable problem with real small rooms has more to do with people than with sound, or put another way, a producer will remember being uncomfortable in a room during the mix long after she remembers that there were translation issues. Now that I have completely exhausted the realm of monitoring, let's look at console requirements.

The good news and bad news of consoles is that I believe that any small 8-bus board can be made to work.

It can't be that simple, can it? Yes and no. On a basic "how does it sound," yes, absolutely. The problem will come when you have to mix over 40 tracks of effects onto one 6-track stem. Since most of the inexpensive boards that you might consider max out around that number, your only choice will be to daisy-chain two consoles.

Undoubtedly you will end up with a minimum of two such consoles (each connected to its own 8-track recorder) and a practical maximum of four. You will also need to get some form of a monitor matrix that will allow you to assign your various recorder outputs to different speaker channels. Said matrix can either be literally that (as is the case with the PicMix system) or hobbled together by using an additional console. Either way, you must take this into account when designing any room that will be mixing film or television programs in the 21st century!

Good luck in building your small mix room. I'm happy to have one in NOLA (that's short for New Orleans) because I can sleep in my own bed and go over to my mama's house for red beans and rice. And so should you, although I can't believe her cooking is as good as my mother's.

My apologies to faithful readers for my two-month absence, during which time I was working hard to get the film *Out of Sight* onto the screen. As always, I can be reached at PO Box 24609, New Orleans, LA 70184; fax 504/488-5139, or via e-mail: 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 there are plenty of places in the swamps to hide from his Mix *editors should they send out bloodhounds or hit men in search of his latest overdue column.*

—FROM PAGE SFP 23, MEDIA CITY SOUND

playground, where you can do anything you want in one state-of-the-art facility."

Media City Sound was designed to give producers the utmost control and flexibility of all the elements necessary for a production. It houses three recording studios, four sound design rooms, two music production suites and five isolation booths.

The 330-square-foot Studio A is the largest room in the facility, and it is fully loaded for any kind of session. It features an 80-input Otari Concept Elite console with 32 tracks of Tascam DA-88 and 16 tracks of Pro Tools. It is the only room providing surround sound capability and a front screen projector (Runco 300). Studios B and C are smaller, using 48-input Otari Status 18R consoles with 16 tracks each of Tascam DA-88 and Pro Tools. The rest of the facility makes use of a variety of Mackie, Yamaha and Soundcraft consoles, and every room is outfitted with Tannoy monitors. The sound design rooms are used primarily for prelay, dialog editing and music editorial. The music production suites, with their array of synthesizers and processors, are used to create scores for various TV shows and feature films.

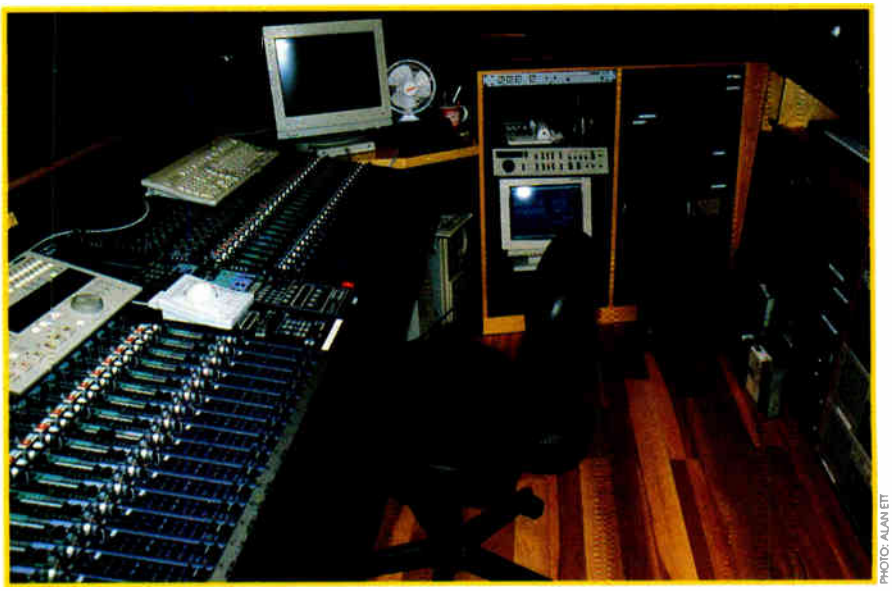


PHOTO: ALAN ETT

A side view of the 330-square-foot Studio A, with an 80-input Otari Concept Elite and 16 tracks of Pro Tools.

A single machine room for the entire facility allows mastering to ¼-inch, ½-inch, CD, DAT, DA-88, Beta SP, Digital Betacam and D2. It also contains a sound effects file server that allows access from any room to a Denon DN1200F 200-CD changer. ISDN lines provide audio transmission via phone lines at 48 kHz (stereo), allowing real-time recording from anywhere in the world.

Few facilities are capable of jumping from one medium to another as swiftly as Media City Sound. On any given day, engineers in Studio A could be dubbing

the CBS series "Kids Say the Darndest Things," while Studio C is busy recording voice-overs for a Nike or ESPN commercial. Sound Design 1 could be doing a prelay for a Warner Bros. or Universal on-air promo while music production Suite 1 is creating a score slated for an upcoming Movie of the Week.

"We are capable of providing ADR/Foley, music production, sound design and V.O. recording under the same roof," remarks Liggett. "This allows us to cater to every conceivable media, from network and cable TV to commercials and on-air promotions, even feature films."

"You don't have to spread your work all over town," adds Ett. "It can be a real advantage when you're in the middle of a mix and discover you need to change or modify some of the sound effects or music. You don't end up with costly down time. The engineer who did the prelay, or the designer who did the sound effects, even the music composer who created the score, is right here, and we can fix the problem now."

Even as budgets for TV shows and Movies of the Week are being slashed, production values are expected to meet higher and higher standards. "Technology really allows us to meet this new mandate set down by the networks," states Ett. "MOWs were typically $2.5 to $3 million, now they're closer to $1.5 to $1.7 million, and we have to deliver the same, if not better, quality material."

"And if the pressure wasn't enough in that regard, production deadlines are getting shorter and shorter," Liggett adds. "This is where technology can make it faster and more cost-effective. There really is no need for a 90-foot room to mix TV shows when a smaller room with the same capabilities will do the same job."

"The curse of technology is that the executives at the networks keep raising the bar, and we keep jumping over it," Ett interjects. "It's not uncommon for us to get a call from a producer who's just gotten the green light on a project, and he has a total of three weeks to complete it."

In a town where entertainment is the cash crop, competition among audio post-production facilities can be fierce. "Of course, everyone says they are service-oriented, but we do things other organizations wouldn't consider," boasts Ett. "We'll go to the client's edit bay to get a heads-up on the project or send memos to their staff giving them specifics on how to deliver material to us. We even have meetings with the clients to discuss technical issues, making them familiar with the options available. This really allows them the opportunity to choose the most cost-effective method for each individual project."

It is rare to find a facility with floating engineers, but Media City Sound wouldn't want it any other way. "Every engineer is fully trained to run a session in any one of our rooms," explains Ett. "This allows clients to work with the engineer of their choice regardless of the size of session. The same guy who mixes a sitcom can mix a commercial or do a sound design project."

Several TV shows currently on the air use the facilities at the Alan Ett Creative Group, including Fox's "America's Funniest...," History Channel's "Modern Marvels" and Lifetime's "Intimate Portraits." It was the ESPN NCAA basketball promos with Robert Goulet that garnered Ett and Liggett their Emmy.

"Media in general is defining what culture will be called in the late 20th century," philosophizes Ett. "This means we have to be responsible, creative and aware of the issues around us when we let something leave this place with our name on it." ■

—FROM PAGE SFP 23, WHEN 'TOONS SING

reer, my goal is to elevate the level of music aimed at children, which quite frankly hasn't had the best production values over the years, mainly because of budgets. I want to change that."

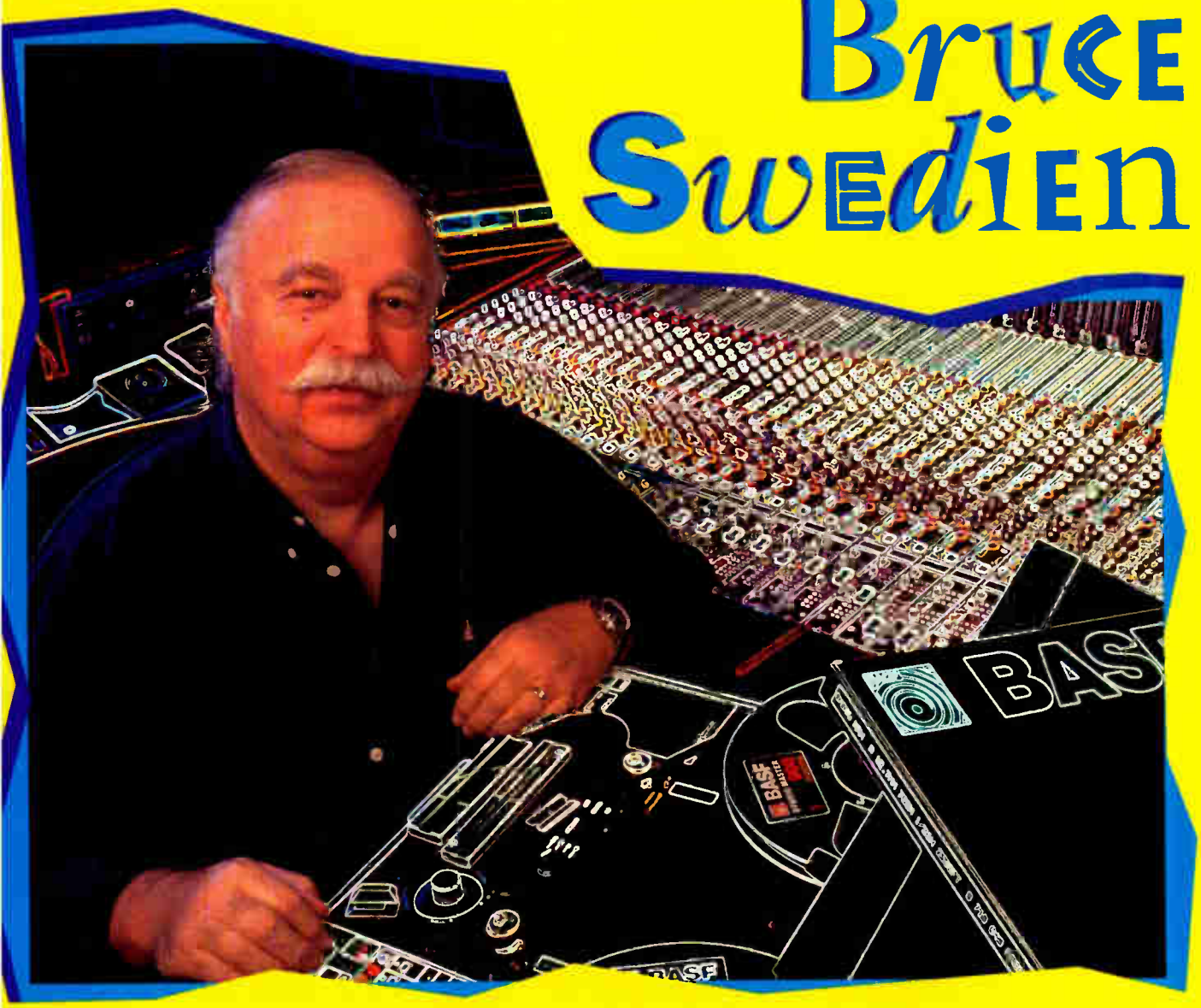
He's already started. His production of *The Simpsons Sing the Blues* (1990) has gone multi-Platinum, and 1992's *The Chipmunks in Low Places* country-oriented record has achieved Platinum status. His most recent project, Sesame Street's *Elmopalooza*, spent ten weeks at Number One on *Billboard*'s Children's charts this year, and in the Top 10 of the overall video sell-through charts. With the children's category growing two-tenths of a percent to nearly 1% of a $12.2 billion market in 1997, this is not small change.

"The critical thing in making these records is to not lose sight of the character," Boylan says. "Often in the studio, my role is to watch for things like pitch and timing, especially when some of the characters aren't singers by vocation. It's their job to keep the character intact during the performance. Many of the people who performed [the characters] on these records are great singers"—Chipmunks alumni include Andrew Gold, Billy Burnette and a slew of top L.A. and Nashville session singers—"but some of them aren't. Truth is, if you give me a non-singer who is a good actor, who can act out the emotional content of the song appropriately for the character, I can make the vocal performance sound good. Just listen to Rex Harrison—his pitch is terrible, but you listen to him on *My Fair Lady* and he's the consummate actor carrying it off."

The Simpsons Sing the Blues was Boylan's first recording project involving animated characters. He knew James Brooks, the project's executive

John Boylan, right, mixing a Linda Ronstadt album with engineer John Haeney, 1973

Bruce Swedien



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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producer, via his Gracie Films company, and that brought Boylan to the top of a short list of producers that Geffen Records was considering. "Jim Brooks and [Simpsons creator] Matt Groening wanted it to be a very character-driven record; it wasn't going to be the *Simpsons* with a lot of high-powered celebrities on the record," explains Boylan. "So I took home every *Simpsons* episode that was out on video and watched them in sequence. We didn't want a weird record; we wanted a *Simpsons* record where they just happen to be singing the blues." Danny Castellaneta, the voice of Homer, and Yeardley Smith (Lisa) were already accomplished singers, as was Harry Shearer, who does Mr. Burns, Smithers and an assortment of minor characters. "But we had to use the techniques I mentioned earlier working with Julie Kavner, who is a great actress and who is the essence of Marge in her delivery," Boylan says. "I just watched for pitch and tempo."

In choosing microphones for the *Simpsons* characters, Boylan held a shoot-out at The Complex in Los Angeles—in the process, testing the singers' ranges, as well—deciding on an AKG C-12, a Telefunken 251, an AKG 414 and a Neumann 87 as the primary mics for the project. The tracks were recorded at the now-defunct Lion's Share Studios in Los Angeles through a Neve 8078 console, later mixed by Mick Guzauski back at The Complex. Most of the tracking and overdubs for Boylan's "animation" records are done by either Paul Grupp or Guy DeFazio.

"On animation, the voices are always done first, including dialog," says Boylan. "The pictures are drawn to match the audio. We did the record the same way, and the first two singles off of it—'Do the Bartman' and 'Deep, Deep Trouble'—had videos cut to them, as well. The hardest thing about doing this record was getting all the cast together to sing it." The record also has a few guest stars, including Joe Walsh and B.B. King, who played a Homer-ized version of "Born Under a Bad Sign." (A Linda Ronstadt duet with Homer, along with some other guest vocals, were recorded for a second project, and they remain on the cutting-room floor, based on the show producers' decision to scuttle a follow-up record.)

THE CHIPMUNKS

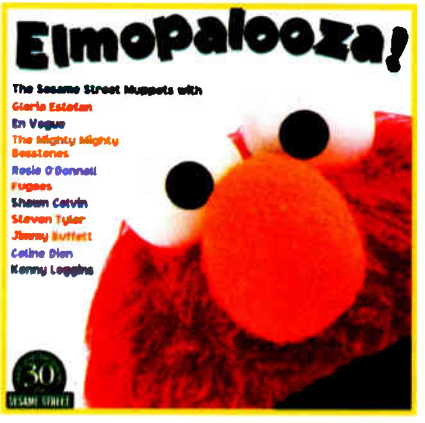
While *The Simpsons* is heading into its tenth season, The Chipmunks have a far longer character legacy. In 1992, Ross Bagdasarian Jr., son of the Chipmunks creator (and known as David Seville on the records), called Boylan to produce a kind of comeback Chipmunks record, this one capitalizing on the early '90s boom in country music: *Chipmunks in Low Places*, a play on Garth Brooks' "Friends in Low Places." Special guests included Billy Ray Cyrus, Alan Jackson, Waylon Jennings and the late Tammy Wynette. The album was tracked at Quad Studios in Nashville and mixed in L.A. at the Complex.

For the Chipmunks recording, Boylan worked with Bagdasarian and his wife, Janice Karman, who did dialog rather than singing voices. Boylan at first attempted to use modern sampling technology to record the sped-up vocals that produce the Chipmunks sound but found it didn't produce the desired result. "We tried a lot of systems in 1992, but DSP at that time just didn't give you the sound we were looking for," he says. So they went back to the techniques Bagdasarian Sr. had devised in the 1950s for Alvin, Simon and Theodore.

"We used the same techniques, refined only slightly," says Boylan. "We recorded the basic tracks to analog tape running at 30 ips, then for the vocals we'd drop down to 15 ips and then VSO up a certain percentage for each particular chipmunk."

The exact VSO percentage is "proprietary" says Boylan, but it's significant enough so that one person could sing all three parts and still sound like the individual character. It was the same technique the younger Bagdasarian uses for the Chipmunks' dialog parts. The tape is then run back up at 30 ips for sound effects and mixing. "The really hard part is that the singer has to sing bel canto," explains Boylan. "There can't be any vibrato because it would sound ridiculous once you doubled the tape speed again. And that's not easy for a lot of singers to do. The best Alvin I ever worked with was Billy Burnette. He could hold a note without vibrato for a long time."

Two years later, Boylan did a second Chipmunks record, a Christmas release, this time with Celine Dion, Alan Jackson, the Boys Choir of Harlem, Kenny G, and even an Alvin duet with the original singing cowboy, Gene Autry, courtesy of some electronic manipulation. This one was recorded at numerous studios and mixed at The Complex. The same recording techniques were used, though this time Boylan used a Digidesign Pro Tools system for editing the final takes and flying voices and dialog around.



TICKLE ME ELMO

The most recent animated music project Boylan worked on was this year's *Elmopalooza*, based on the *Sesame Street* character that had parents threatening each other with axe handles two Christmases ago. The project is a joint venture between ABC Television, the Sony Wonder children's label and the Children's Television Workshop (CTW), which owns *Sesame Street* and several of its characters. Again, Boylan's growing reputation as an animation music producer was the initial spark, but as it turns out, his brother-in-law, Jeff Moss, was a co-founder of the *Sesame Street* concept and remains a chief writer at CTW.

This production had plenty of celebrities, too, although it seemed like everyone wanted a duet with Kermit, including Jimmy Buffett, who sang "Caribbean Amphibian" with him. Every Muppets actor was a good singer, Boylan says, which helped tremendously, since Boylan was flying around the country with 2-inch reels, going to the

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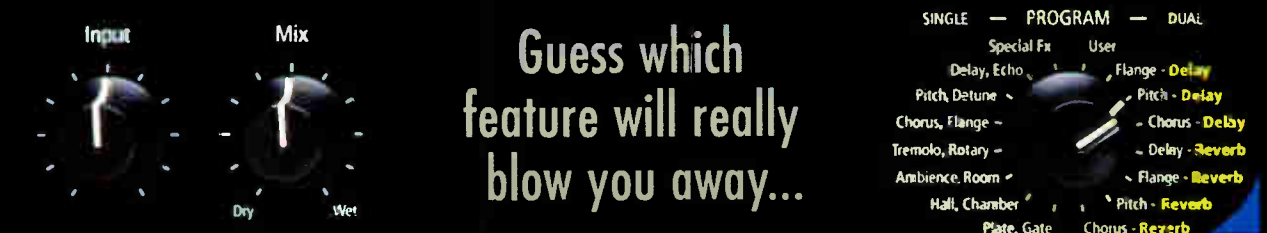

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artists. In some cases, he was a co-producer, such as on the Gloria Estefan track, which he recorded with the singer at her studio, Crescent Moon, in Miami. Aerosmith's Steven Tyler did his tracks with Mark Hudson producing, and En Vogue used their own engineers for their track.

It was only after the guest vocals had been recorded that Boylan started on the Muppets themselves. "The whole thing took 14 months, which is a long time for a children's record," Boylan recalls. "And if *The Simpsons* actors seemed hard to get a hold of, that was nothing compared to rounding up the Muppets. They do *Sesame Street*, Henson productions, television specials, movies, videos and live shows. It's a full-time job being a Muppet."

There were plenty of other opportunities for creativity, though, especially in song choice and matching them with Muppets and guest artists. "The main rule is to maintain the character," says Boylan. "Then it becomes a matter of matching the song and the guest to that character. I mean, who better to sing 'Mambo, I, I, I' than Gloria Estefan? Or a duet of 'I Love Trash' between Oscar the Grouch and Steven Tyler?"

Basic tracks were recorded at Boylan's own studio and at Ocean Way in Los Angeles, but overdubs with guest artists ranged all over the United States, from Boston to record Tyler's vocals to Right Track in New York for Buffett. The record was mixed mostly at Westlake in L.A. For all the projects, final mixes are sent in on timecode DATs, but with so much of it destined for the screen, Boylan gets as many or more requests for stems on Tascam DA-88s, with a few requests for a 48-track master.

Despite 30 years' worth of major pop and rock album success, Boylan seems to feel that the work he's been doing for the last few years with children's records will be the best part of his cultural legacy. "And it's a legacy worth leaving," he says. "I want to give this stuff better production values, because so much of children's music productions are aimed down at them, not straight at them. Kids are a lot hipper than we give them credit for." And Boylan has a daughter of his own, now 15, but who was right around Lisa Simpson's age when Boylan did his first animation music production. "I introduced her to all the Simpsons, and boy, was I the hero that day," he smiles. ■

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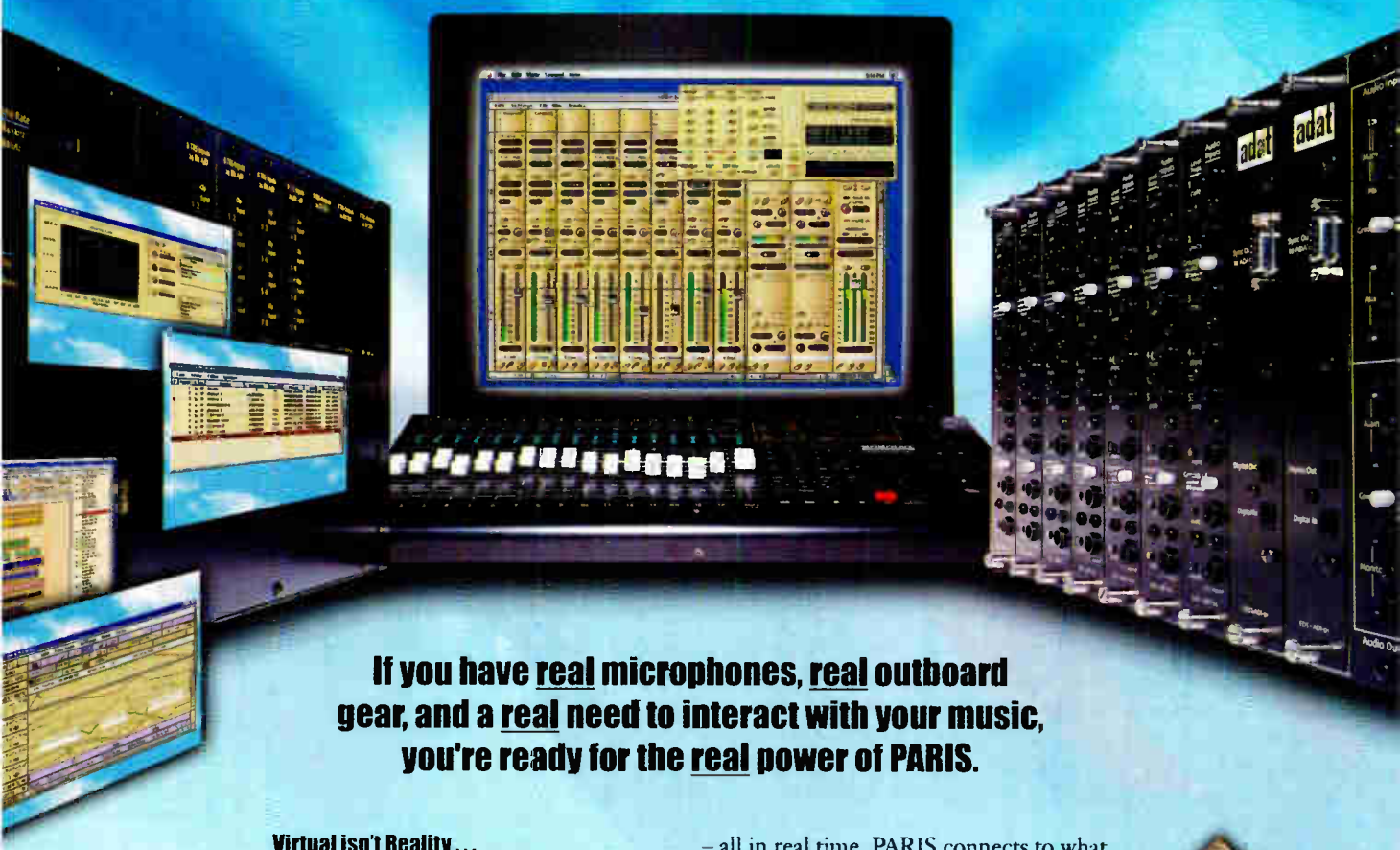

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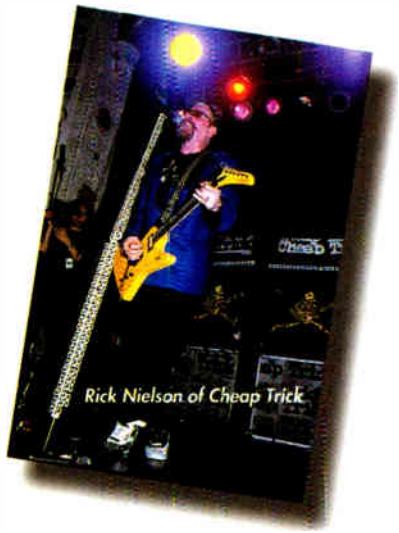
by David John Farinella



HBO'S "REVERB"

One-Take Club Dates for Television

Let's see, Monday is punk day, Tuesday is clearly ska, and Wednesday was made for electronic folk music. Thursday through Sunday? Whatever happens, happens. No, this isn't some sort of FM radio schedule from the '70s, this is the musical variety of HBO's late-night show "Reverb." The man in the middle of this audio soup is mix engineer Doug Olson, aka Mr. Colson, who has kept up with such talented bands as Ben Harper, Goldfinger, Smash Mouth and Grammy Award-winner Paula Cole during the show's second season.

"I figure that the whole point of the show *is* that it's really a show. It's not a prepared environment made nice for television and audio people," Olson says. "It's a club somewhere, and there's people paying to see the show, regardless of whether HBO came to film and record it." With that in mind, Olson looks to clean up random bits of noise such as a monitor squeal, but he's more than happy to leave in "cool bits" such as a guitar being plugged in or a pedal being stepped on at the wrong moment. "They did it, it happened. The best moments are the ones that have that human feel. That's what live is all about, just people playing," he says.

Other than the backstage band interviews and crowd shots, what makes *Reverb* different from live performance shows such as MTV's *Unplugged* or *Live From the 10 Spot* is the fact that the location changes. Episodes this season have been shot at Club 9:30 in Washington, D.C.; The Fez, CBGB's and Roseland Ballroom in New York City; and the Electric Factory in Philadelphia. New Jersey-based AVMS handles the six-camera video shoot, while Steve Lettie and Frank Papitto of Audio Alchemist are responsible for the on-site audio recording.

Lettie and Papitto deliver anywhere from 24 to 40 tracks of audio on Tascam DA-88s about three days after a performance. The Audio Alchemist truck, a custom 24-foot Grumman, has been outfitted with a

Mackie 32•8 desk with a 24-channel sidecar. The signal, split from the stage box between the front of house, the monitor desk and the truck, goes straight into ART Dual MP tube mic preamps and then right into the DA-88s. As Lettie explains, they leave those tracks completely alone: "Frank and I look at it from the standpoint that if we got something in to mix, we'd want it as clean as possible—to be able to do what we wanted to do with it at the mix."

The live tracking is monitored at the Mackie board, and a simple 2-track mix is prepared for the line cut. There have been times in the 2-track mix, however, when Lettie and Papitto have added a bit of compression, gating and reverb, making use of the truck's Drawmer gates and compression, ART Pro VLA (tube leveling amps), an Eventide Ultra Harmonizer, Ensoniq P4, and various Lexicon and Yamaha reverbs. Their amp is a Hafler Trans•nova, and they listen to the performance on Klipsch KG1 and KG 1.2 reference monitors.

Fortunately, the engineering/mixing team has nailed the technical basics, because the recording dates have provided a handful of additional challenges. "Even simple things like how loud somebody sings is going to have a big effect on how much bleed there is," says Olson. "The lead vocal mic is prob-

The whole point is that it really *is* a show. It's a club somewhere, and there's people paying to see the show, regardless of whether HBO came to film and record it. —*Doug Olson*

ably the biggest source of general bleed of cymbals into the mix. I've run into all kinds of odd problems that I've had to try to figure out how to get around. Occasionally, a mic will get pressed onto a drum in the middle of a song, and somebody will get out there and correct it at some point. But there's awhile there where they hit the drum and there's a clackety sound. So, what do you do? It's all history by the time I get it."

As soon as Olson gets the elements, he sits down and locks to picture so he can get an idea of what happened during the taping. He'll then start to work on the songs he knows will appear on the show (the set list is determined by the band's manager, label and the show's producer) by listening through and mixing piece by piece. "I do mess with everything, but I try to do it in the context of the song, rather than just dissecting and hoping that it all comes back together," Olson explains. During that listening process, he's also looking for spots to fix or add along the way. For example, during a recent show featuring Fastball, Olson knew right away that he had to do something with the EQ on the kick drum. "It had a real clicky sound, so I'm going to make it sound a little warmer, a little fatter," he says. "That kind of decision you know right away, just from experience." He also looks out for bass boost on the vocal track because singers have a tendency to get right up on the mic while performing live, and occasionally guitars will sound a bit heavy. "A lot of it is just getting rid of the flab, leave the muscle," he says.

Because Olson made his name in the music engineering and mixing world, he wasn't accustomed to the amount of compression he had to use for television, but he caught on quickly. "I generally do [compression] post-EQ so that there isn't a lot of sonic information affecting the compressor that's not part of the sound I want," he says. "Especially since I'm cutting bottom end out, you don't want all that bottom end going into your compressors." Smart Studios in Madison, Wis., where Olson mixes the series, is equipped with, among other compressors, a pair of Summit TLA 100s, Daking's 91579, an Empirical Labs EL8 "Distressor," the standard dbx 145, 161 and 160x, as well as the UREI 1176 LN, LA4 and 1178 stereo model. Other outboard gear includes mic preamps from Neve (1081), Daking (52-270) and equalizers by API (550B) and Summit.

While guitars have remained nearly compressor-free, Olson has used the Distressor for vocals and bass tracks, as well as his bus compressor. "It kind of reminds me of an old Neve that has a kind of sound to it—it doesn't really impart a particular coloration, but there's something cool about it. Musically, you can put a mix through it and it doesn't wreck it," he says.

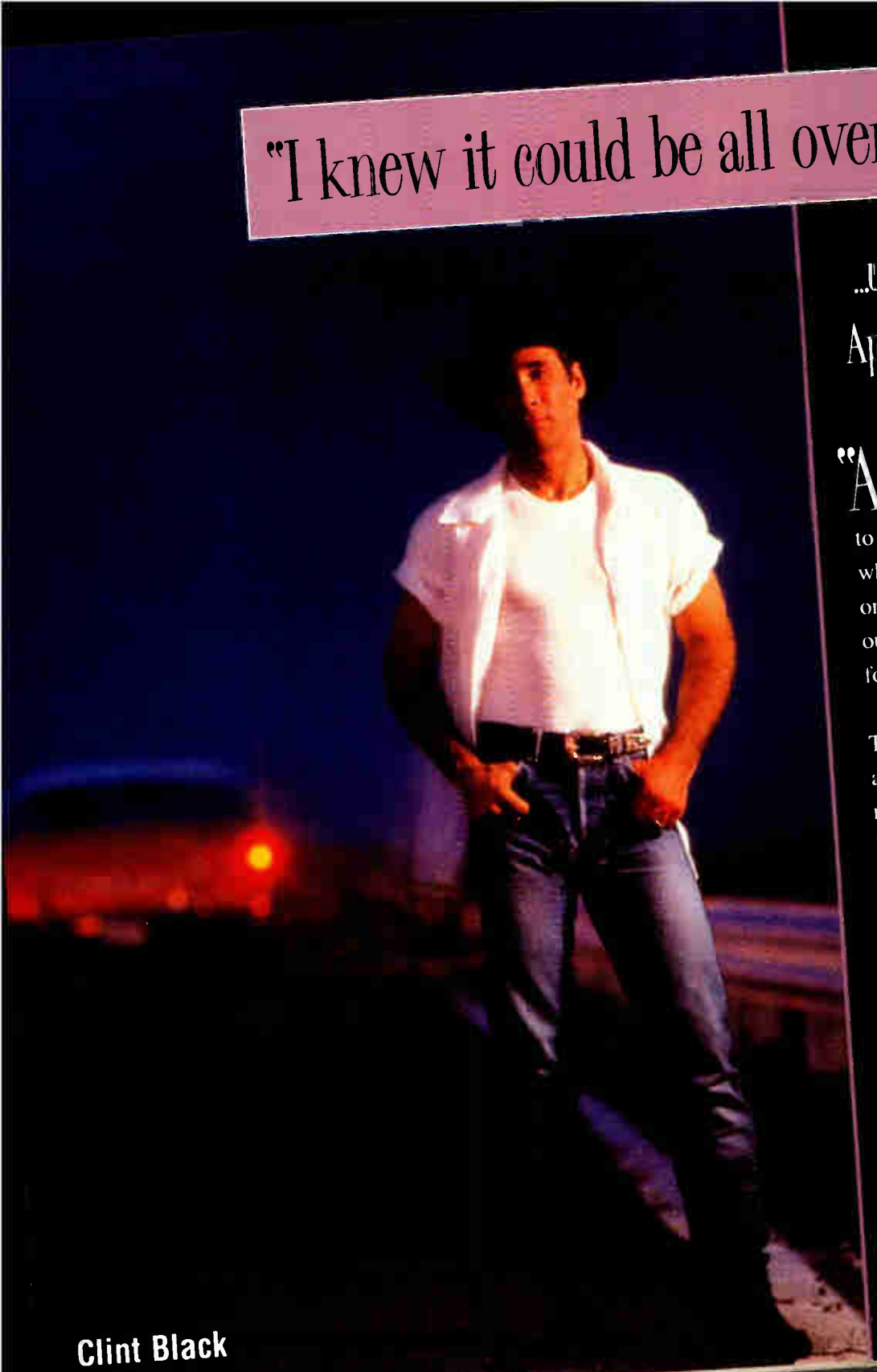
Not only does Smart have a nice collection of outboard gear, but the studio, made famous by producer Butch Vig (Nirvana, Garbage), boasts two vintage consoles. In the A Room, where Olson worked on the Paula Cole and Save Ferris shows, the board is a 32-channel Trident 80-C; the B room, where he's done everything else, houses a Harrison 56-input board that has been modified quite a bit. Originally, the Harrison was two different boards (32-channel and 24-channel) welded together. Legend has it the original 32-channel console was once owned by the Osmonds. Both desks feature Uptown Moving Fader Automation. The monitoring system—Yamaha NS-10s, Genelec 1030As, B&W 808s and an Auratone "Cube" for mono playback—is the same in both rooms.

Olson mixes back to a Tascam DA-98, using all eight tracks. Tracks 1-2 are the mix, 3-4 are an instrumental mix, 5-6 are for vocals alone, and 7-8 are the audience tracks.

Through his experience on the "Reverb" sessions, Olson has seen the difference between live performance and recording dates. "The interesting thing about doing the show is that everything is a one-taker—it's from start to finish," he says. "There's nothing comped, there's nothing sampled, it's all done live. So, it's just interesting to hear when people are charged up and really motivated to perform what they are capable of doing. When you make a record, it's bizarre—we take it completely out of the context of a performance, but we try to create a performance. It's definitely made me think about that. I guess I'm not going to have every record I make from here on out be a live setup in the studio, but there's something you can take away from this." ■

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

"I knew it could be all over one day...



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THE HIGH Art OF COMMERCIAL COMPOSITION

At Sacred Noise (clockwise from left): Michael Montes, Jeff Rosner, Chuck Lovejoy and Dave Gennoro.

SACRED NOISE, NEW YORK CITY

BY GARY ESKOW

Composers who make their living in the advertising world are often considered sellouts by colleagues—generally less affluent—who find the notion of helping Procter & Gamble raise their bottom line somewhat distasteful. The perception that these writers, as a group, lack individuality is often borne out by listening to music production company reels, which tend to recycle a few "idea du jour" styles ad nauseam.

Sacred Noise, located in downtown Manhattan, is somewhat unusual in that its two principal composers, Michael Montes (a Sacred Noise partner) and Robert Miller, are both artists with impressive "legitimate" credentials. Montes, who gained early sound design experience at the Elias Brothers music house, has his own experimental group, Zoar, which records on Philip Glass' Point Music label. His film credits include *The Headhunter's Sister*, which won director Scott Saunders the 1998 Independent Spirit "Someone to Watch"

award, and *I Remember*, a short directed by David Chartier that premiered at the 1998 Sundance Film Festival.

Miller, an orchestral writer in the Romantic tradition, is the composer in residence of the Jupiter Symphony, a highly respected ensemble led by the iconoclastic conductor Jens Nygaard. It's not too much of a stretch to say that these composers are carrying on a tradition that goes back to Bach. The great master turned out chorales—short settings of liturgical texts—on a weekly basis. Intended to be sung by amateur choirs, these tunes had to be simple and immediately accessible to the average listener. Many of Bach's great works are based upon ideas found in these tiny gems.

Jeff Rosner, a fixture in the music business for many years, runs the day-to-day operations at Sacred Noise. "The idea here is that we've got a stable of composers who love the advertising work but are constantly looking for challenges outside the field, as well. We believe that every stretch they make as artists allows them to bring fresh ideas back to the advertising community."

Zoar's *In the Blood* CD (you can keep up with the band at their Web site, www.zoar.com) is a compelling collection of short, repetitive, sample-based phrases combined with haunting string lines to produce "mood" music of a high order. Satisfying extended form is very difficult to achieve with samples, which are essentially musical blocks that cannot be altered very much. Montes shifts texture and themes just often enough to keep the listener's interest. "Form *is* very hard when you use samples," he says. "Blending the organic with the mechanical or industrial—however you would label the samples—is critical to our record-making process."

Miller composes at home and in his modest office at Sacred Noise. He has a pair of E-mu E-IV samplers and a handful of synths routed through a Mackie 8-bus console at the studio, but no sequencer, since he prefers to play ideas directly to an Akai MPC 60. He cued up a DAT and shared excerpts from his score to *Pants on Fire*, written and directed by Rocky Collins. Miller was high on the film—which won the Best Screenplay award at this year's Los Angeles Film Festival—and his relationship with Collins. "All of the music goes against the grain of the picture, and it works because Rocky and I were the only judges of how we wanted the piece to look and sound."

That, of course, is not the case in ad land, where any number of people get involved before a track is signed off on and conservative thinking tends to rule the roost. "Music houses—all of us—tend to be insular in our approach," Rosner says. "We want the track to sound great and work with picture, and that's all we're considering. But the agency people have focus group results they have to deal with, clients who can sometimes get nervous when the creative is on the edge, and other concerns we know nothing of. It can

—CONTINUED ON PAGE SFP 40

TRIVERS/MYERS, LOS ANGELES

BY DAVID JOHN FARINELLA

It's a story straight out of a John Mellencamp song—daughter of a Southern Baptist minister meets a rock 'n' roll bass player and sometime writer for Blue Oyster Cult in the orchestra pit of a Broadway play. He plays her some of his songs, she asks him to come back to her loft to write some music and nearly 20 years later they win a Clio for Polaroid's "Dog and Cat" television spot.

With a laugh, Elizabeth Myers recalls the initial invitation she extended to John Trivers: "I guess that was the beginning of the miscommunication we have. It spawned a lifetime career and a commitment in a relationship," she explains. "It was appealing to me because I'm a Southern Baptist minister's daughter, and here was this guy who was writing lyrics about lady vampires. That kind of concept was appealing to me, so I could break out of my formative role."

John Trivers and Elizabeth Myers

Shortly after their first songwriting dates, the couple moved to Southern California, where Myers began working with former University of North Carolina-Chapel Hill classmate Jill Fraser on commercial scores. Trivers soon caught his first break when he got a job as a musical director at Chiat Day advertising agency in 1983. After his first spots for Apple Computer, he was hooked on the advertising world.

After they opened the doors as Trivers/Myers in 1986, their next break came when they were asked to compose the opening theme for the *CBS Evening News*. Before then, most networks/affiliates played the sound of teletype machine to open their shows. "News channels, in those days, felt it was glossing over the news, it was too Hollywood," recalls Myers. "This was the first big theme to put something under

—CONTINUED ON PAGE SFP 42

—FROM PAGE SFP 39, SACRED NOISE

be difficult and frustrating at times. When Robert worked with Rocky, their vision was all that counted. The same goes for Michael and Zoar. He and his co-composer, Peter Rundquest, follow their muse only. The fact that so many people seem to be into the band is icing on the cake."

Montes laughs when asked if the Synclavier's onboard sequencer is a beast. "Yes, it is! I've heard that Opcode is thinking of making Vision work with the Synclavier, but right now you're pretty much locked in to using the onboard sequencer. The Synclavier is simply the best-sounding sampler in the world, and to me its strengths vastly outweigh its shortcomings. Compare identical samples on the Synclavier and any other machine and you'll see what I mean."

Miller's compositions have been played by the Toronto and Minnesota Symphony Orchestras, and the prestigious Aspen Music Festival commissioned a score from him in 1996. But he's also had one foot in the pop world, and even spent some time playing George Harrison in the Broadway production of *Beatlemania*. Still, Miller found that mastering commercial writing took a bit of time. "The form took me by surprise," he says. "I was a concert composer—a good tunesmith and orchestral composer—but I didn't realize how to phrase in the 30-second form. Your period of communication with an audience is very short, yet people really want the shape of an entire piece. Your composition has to have a curve, just as a longer piece will have, with a strong beginning, a bit of relief and a nice resolution. Only experience can teach you how to make a real impact in a television underscore. There's no way I'd ever look down my nose at this work."

Miller rose to prominence in the early '90s, when spots were dominated by synth-oriented composers like his colleague Montes. He's particularly proud that he stuck to his identity as an orchestral composer and has been able to make a success of it. "People told me that there wasn't enough work in the orchestral field, that I wouldn't be able to sustain a career in this area of the business. Here I am, six or seven years later, having done 50 to 60 spots each year. I feel that I've helped out the cause of live music. I hate to see that tradition die in favor of synthesizer versions of the orchestra."

Sacred Noise has a live room that can house 20 to 25 players easily, with control rooms on either side for tracking or mixing. The main mix room houses a Euphonix CS2000, which Montes loves in combination with his Synclavier. "We're constantly putting mixes up," he says, "working for a while, and then moving on to the next project, knowing that at any moment we'll be asked to go back to an earlier piece and rework it. The Euphonix console has great automation; it's saved us on more than one occasion."

Echoing the thoughts of Miller, Montes says that the variety of his work helps him to grow, and that commercial scores, no less than his film and record work, are critical to his artistic development. "I'm in a position to mix artistic creativity with commercial creativity," he says. "I used to believe that I had to separate the two—one side of my brain for spot work, the other for my personal work. But I found that since I was never getting called to do the 'jingly' work, I was able to explore the dramatic potential of sound design. Instead of being fixed on a way of working, I began to take a random, accidental approach to scoring, viewing it as a crap shoot where I could explore a lot of different avenues. It brought a lot to my personal work. Then, away from the din I could find a quiet space to exercise my talents in the wider art. Hopefully, the lessons you learn there you can bring to the advertising world."

Your period of communication with an audience is very short, yet people really want the shape of an entire piece. Your composition has to have a curve with a strong beginning, a bit of relief and a nice resolution. —*Robert Miller*

The Sacred Noise philosophy includes making room for new talent. Rounding out the in-house composing team are guitarist Dave Gennaro and keyboardist Chuck Lovejoy. When we popped in on Gennaro, he had just installed Digital Performer and was synching up some hard disk tracks with a Tascam DA-88 to use on a series of promos he was scoring for MTV. Using MetaSynth, a program from Arboretum that lets the user take a sample and draw it into different shapes, Gennaro had created some powerfully bizarre and appealing textures from guitar samples that flowed from his own ax. Lovejoy was off in the main console room rescoring a spot using groove loops, Synclav samples and a bank of sounds coming from a Roland JV-1080. Interestingly, Lovejoy says that most of his tracks remain virtual—a classic Otari MTR-90 went unused but was available throughout the process—and are simply dropped to timecode DAT.

When asked what makes a music supplier successful in the advertising business, Rosner replies, "Flexibility! It's essential. Being able to adapt is really important, and you have to stay aware of the fact that everyone you're dealing with has their own set of pressures and responsibilities. Stay open to everyone involved in a project, have faith in your own talents, and you can have a great time in this business." ■

Gary Eskow, a producer, musician and writer, is Mix*'s New York editor.*

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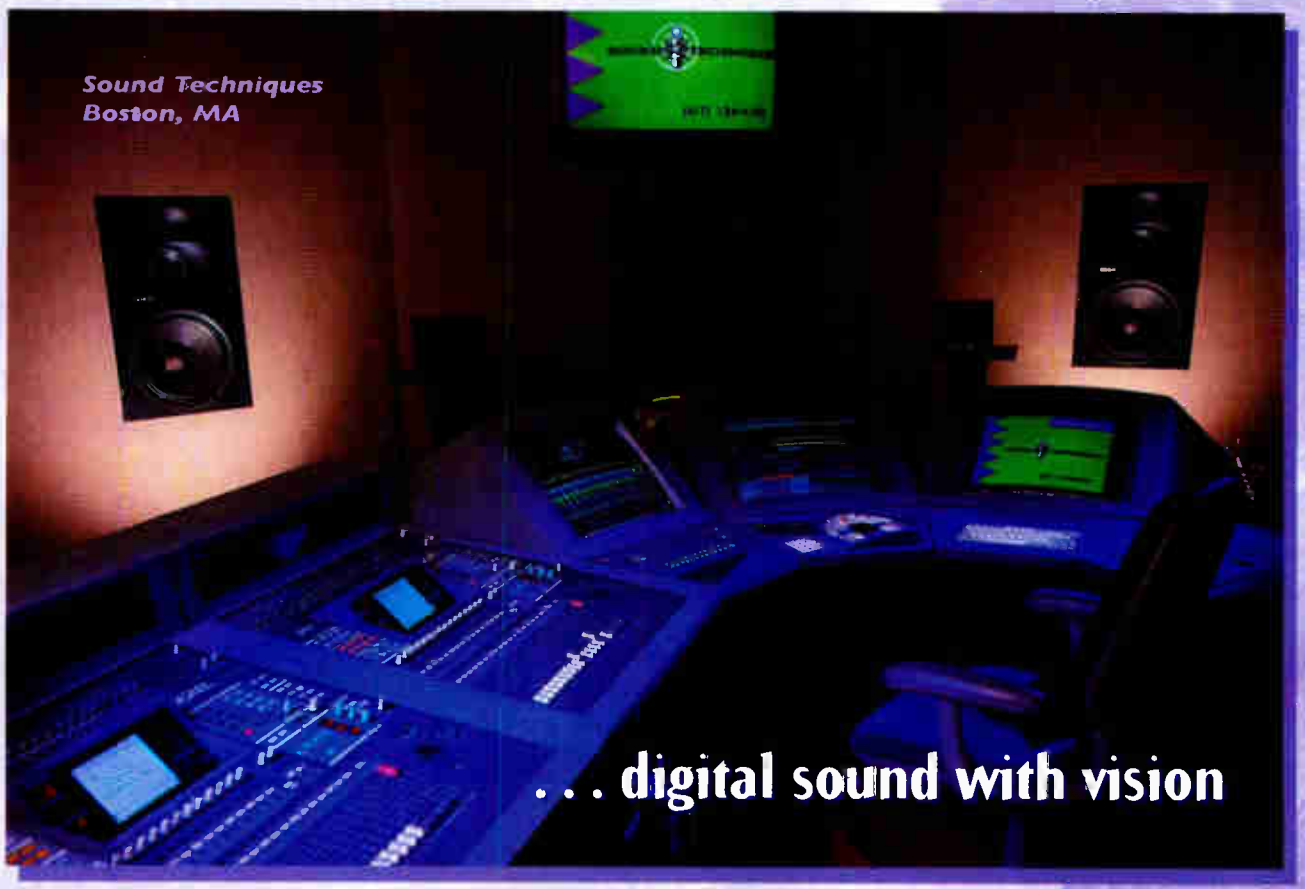

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—FROM PAGE SFP 39, TRIVERS/MYERS

Dan Rather to make him palatable to the Walter Cronkite crowd."

As their professional project list grew, so did their piles of recording equipment and instruments, which necessitated the move to a dedicated space. They had operated a writing room out of their home for years, but it was time for them to start looking for a studio. After hunting around the Los Angeles area, they found a 1926 duplex in Manhattan Beach, which they converted to one large house, complete with a tracking room, offices, equipment room and an instrument storage room.

The goal behind building the studio, aptly called Sound of the Ocean, was to have a place where both Trivers and Myers could write. Though it's happened on occasion, the sessions at Sound of the Ocean are not intended as final prints. For simplicity, they have stocked the studio with a Mackie 24x8 board, with a 24-channel sidecar and three Tascam DA-88s. They have the standard complement of outboard gear, including an Eventide 3000, a handful of dbx and "vintage digital" Yamaha SPX 90 units, a Little Labs DI and three Roland SE-70s, which Trivers uses for guitar. For sequencing, they run Logic Audio 3.0. (Myers' tip of the day for Logic Audio users: "When you get your Mark of the Unicorn interface box and go to your sync page, instead of going right—like we do in the Western world—go left one notch and there's this thing called Quick Lock, which makes everything cool.")

The medium of composing for advertising is a bit bizarre in that so much of it is committed on the demo stage to what the music is. —*Elizabeth Myers*

In addition to her Yamaha C3 grand piano, Myers turns to a handful of synthesizers to augment her acoustic sounds. Because they often travel abroad or to New York City to complete sessions, they've duplicated her equipment list, which includes a Roland JD-1080 (with the World and Vintage Keyboard expansion cards), Roland SP-700 sampler, Korg X5DR, Roland JD-800 and Proteus 1 and 2 for old orchestral sounds. Trivers has stocked Sound of the Ocean with 25 assorted guitars and basses, which he keeps hidden from the ocean spray.

As Myers explains, the studio was built for writing and ease of use and not as an engineering masterpiece. "The point is that John and I are one of the few writing teams in the country that actually play our own stuff. A lot of the music that you will hear on our reel was either of us sitting down and playing it from our heads. Nothing was written down in advance for any of that music; it was just the result of improvisation. Our equipment is an

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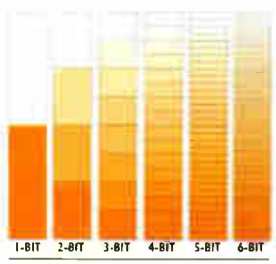

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outgrowth of that need to improvise.

"I think in some ways the medium of composing for advertising is a bit bizarre in that so much of it is committed on the demo stage to what the music is," she continues. "We recently did an opera aria for Ford. We had the luxury of creating it here as a pre-score with two singers from the L.A. Opera Company. They came down, and we did a piano demo, then we did it a second time with the L.A. Philharmonic members, so we had a chance in essence to have a rehearsal and then to do it. That was really a great thing, because a lot of our music doesn't get a chance to be rehearsed and then recorded."

As one of the few husband and wife composing teams in the business Trivers and Myers have a strong connection and vision, musically speaking. Their spots range from the more rhythm-oriented tracks that rocker Trivers devises, to the more symphonic and melodic tracks that Myers envisions. The final shape a commercial score takes usually depends on the first reaction both have to the visuals. As Trivers says, "I think we look at it and think, 'Is this a rhythm thing or is this a long tone swirly impressionistic thing?' I think we talk in very general terms, and we kind of imagine the shape of the music in our heads, and then we start playing."

Myers adds, "I think it comes down to people having different writing styles. John maybe in his head verbalizes what he thinks it should be. For myself, I go blank and I say to myself, 'What would I like to hear while I was watching this?' If that doesn't work, I just say, 'What would I like to hear?'"

The key, she says, is that it's two of them working on the spot together, bringing in both aspects of their background. "Our writing is not really Lennon and McCartney—you can't really separate one piece from the other. You can tell if John was more active in writing something or if I was more active in writing something; it's truly a collaboration. Often, one of us will play the first or second effort of improvisation on an idea that we think is not quite right. We would move on if we were by ourselves in the room, but the other guy will say, 'Hey, wait a minute, what was that?' That's why we always run an audio cassette in the studio, because often our first or second idea is the best one. If we were left to our own devices, we'd go on to the next idea." ■

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AUDIO PRODUCTS FOR FILM/VIDEO

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The Director, from Adgil Design Inc. (distributed by Sascom, Oakville, Ontario), is a programmable, microprocessor-controlled system for multichannel audio monitoring. Consisting of a rack-mount chassis containing all audio and control connections and a remote control unit, the Director can handle all monitoring and switching functions for up to 30 sources, eight output channels and two auxiliary stereo systems. Functions that can be driven from an external console include mute, dim, mono and solo, and the unit offers speaker mute control, two programmable preset monitoring levels and variable level control via an endless shaft encoder with 0.375dB-per-step attenuation. The modular system may be specified in various configurations; a 48-input/6-output system is $6,500.

Circle 301 on Product Info Card

M&K POWERED SUBS

Miller & Kreisel Sound Corporation introduced two new powered subwoofers, the MX-5000THX Mark II ($2,695) and the MX-125 Mark II ($1,095). Both models feature dual 12-inch drivers and offer low-frequency response to 20 Hz. The MX-5000THX Mk II features magnetically shielded woofers and flexible interface options for matching the subwoofer with main speakers and highpass filters.

Circle 302 on Product Info Card

SA FILM LOUDSPEAKER UPGRADES

Stage Accompany (Bay Ridge, NY) has upgraded its S26 and S27 cinema loudspeakers, which now feature an active/passive switchable crossover network. Capable of 132 dB SPL and offering a frequency response of 30-30k Hz, the S26 and S27 feature SA's Ribbon Compact Driver™ mid/high-frequency transducer for extended, low-distortion HF response. Cabinets are only nine inches deep for optimum behind-the-screen positioning.

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AZDEN UHF RECEIVER

Azden Corporation (Franklin Square, NY) debuted the company's first portable UHF receiver, the 400UDR, which works with Azden's 41HT handheld and 41BT bodypack transmitters. Designed to mount directly on a camera, the receiver offers 63 user-selectable frequencies in the 794-806MHz range. The true diversity receiver is crystal-controlled and PLL-synthesized and has dual antennae with BNC connectors. Status LEDs monitor RF and AF levels, and battery life (1.5V AA). The unit may also be powered from a 12VDC/300mA source. Features include XLR and headphone (adjustable) outputs. Prices start at $995.

Circle 304 on Product Info Card

KATA RECORDING BACKPACKS

KATA (Burbank, CA) offers the Koala Mixer Case and Panda Sound Organizer Pack for location recording. The Koala features a main pocket for a mixer and/or DAT and connectors. Additional pockets house wireless mics and receivers, power supplies, batteries, spare cables and tape. The Koala may also be supplied with a detachable vinyl top and rain hood. The Panda is a larger backpack-style carrying case that can house a loaded Koala and also provides storage space for cables, batteries, microphones and headsets. Mesh pockets hold a Zeppelin and boom.

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PARADOXX SOUND

DIGITAL AUDIO IN THE ANTELOPE VALLEY

John Sweeney has been involved in music and audio since the late '60s, when he began working as a drummer in a variety of studios. He learned from engineers along the way and got more into the schematics end of things, running his own business manufacturing equipment for electronics. Having kept up with all the changes in the audio industry over the years, he got the opportunity to begin creating his own signal path four years ago when he opened Paradoxx Sound in Palmdale, Calif. (north of L.A. in the Antelope Valley).

He designed and built Paradoxx from the ground up, and the facility's 2,200 square feet include a control room, a large tracking room and an isolation booth. Sweeney started out with ADATs and a Tascam M3700 console but was not entirely happy with the sound. "I ended up going with a Sony APR24 24-track, which I like a lot better, but one of the things that the digital revolution has done is made clients expect more for less money—people who have small budgets want things done quickly, and they want professional quality. That's one of the things that turned me toward all-digital."

In his search for a new console, he came across the Soundtracs Virtua. "With its capability of having a compressor and a gate on every channel built right in," he says, "and the 32-bit floating-point processors, which really sound good, I knew it was the answer. Right now I could be working on a project mixing ten different songs and going back and forth from one to the other instantly. With a client base that wants fast action and to be able to walk away with a CD and call the next day and say, 'I want this and that changed,' it's really ideal."

And though Sweeney still uses the APR24 sometimes, he mostly tracks to his three Genex GX-8000 MO recorders, which he installed about a year ago. "On the front end of the Genexes, I've got 8-channel Studer D19 mic pre's; so basically the way my setup works is I patch mics right into the mic pre's, out of the mic pre's right into the Genexes, then out of the Genexes into the console. I always try to track without EQ and compression because I'm running the Genexes in the 20-bit mode right now, and the resolution is so good that as long as you have good mic placement, you can get a really good sound. Then you can adjust everything in the console on the playback side. It works really well, because when you go back to do an overdub, you're not trying to remember what EQ and compression you had."

PHOTO: MORLEY PHOTOGRAPHY

Paradoxx handles mostly recording sessions for local musicians, and Sweeney will do everything on a project, from tracking through mastering. Among his mics are a Sony C8000G (his vocal mainstay) and Sanken CU-41 and 44x, which he really likes. He monitors through KRK 9000s, as well as custom speakers.

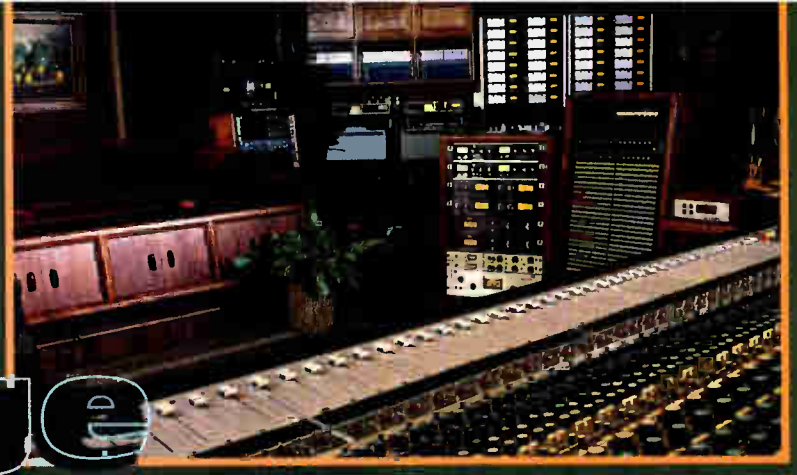
"I also have clients all over the country who send me material to be mastered," he adds, "and unfortunately a lot of people still seem to have a big noise problem." For noise reduction, Sweeney uses CEDAR's N-R 3 V.1.04 software. "Most noise-reduction systems work on a noise fingerprint concept, which is great if you can get a noise fingerprint that really represents what's going on, but it gets more complicated. The NR-3 is an unbelievable product—it responds instantly to transient response material. I've had excellent results with it."

Sweeney uses a SADiE system for editing, having recently installed the 24/96 card. "I can go from the Genex's AES out to the SADiE and have no loss of quality whatsoever, make all my edits and adjustments, drop it back over to the MO disks and mix. Working with the SADiE system is almost blurring the line between editing and mixing, because when you're working with a 24-track lineup, and you've got, say, a guitar solo section in the middle, you can go into the editing software and fade it in or out. The flexibility of being able to do the fade-ins and fade-outs onscreen with a waveform is a completely different approach than listening and working the faders and the mutes."

For effects, Sweeney uses four Power Technologies DSP FX cards, and he also has a TC M5000, an Eventide H3000 and various Sony reverb and delay units. "What I'm finding in mixing is the more digital I can stay with everything, without going to any digital-to-analog conversion for outboard effects, the better noise floor I get. The way my system is set up, when you hit 'stop' on the transport control, the noise floor is about 110 dB down with all the faders up. So I've got a pretty clean setup right now, and I'm really happy with the overall sound quality." ■

BY ADAM BEYDA

30 YEARS at The Village



The Village Studio D

George C. Scott in Studio F, 1968-69

Tom Petty at the Village recording vocal tracks for Ringo Starr's latest album, Vertical Man.

Bones Howe in Studio D, 1998

Village founder Geordie Hormel

The ability to reinvent itself and to change with the times has been a hallmark of The Village. Established in 1968 in a former Masonic Temple in West L.A., it was the creative vision of musician, technical innovator and television music composer Geordie Hormel. By 1972, The Village had become one of the city's top studios, with artists like Steely Dan, the Allman Brothers, Joni Mitchell and the wildly creative Sly & the Family Stone in residence, followed by late-'70s Platinum, from the Rolling Stones (*Goat's Head Soup*) to Supertramp (*Breakfast in America*).

Today the facility is as successful as ever, becoming, as longtime client Jeff "Skunk" Baxter aptly puts it, "an historic studio that has adapted to the demands of modern musical technology without losing its charm and musical heart." Recent clients include Smashing Pumpkins, Nine Inch Nails, Brian Setzer Orchestra, Robbie Robertson, the Rolling Stones, and soundtracks for *Ace Ventura*, *Pet Detective*, *Good Will Hunting*, *Phenomenon*, *The People vs. Larry Flynt*, *X-Files*, *Mulan*, *Dr. Dolittle* and *There's Something About Mary*.

The Village has a reputation for combining a homey, creative atmosphere with technical excellence, and the studio has been the site of many firsts. It was an unheard-of-at-the-time 24-track facility when it opened, was the first studio in L.A. to offer 24-track Dolby, and was one of the first facilities anywhere to commit to digital with the purchase, in 1984, of three of the first Sony 3324 digital multitracks.

The philosophy of The Village has always been "whatever it takes." In 1978, Studio D was rebuilt for Fleetwood Mac, who then recorded *Tusk* there, and Robbie Robertson's acclaimed first solo album, made over 16 months at The Village, was recorded in Studio A, in his on-site office (outfitted as a 16-track studio) and in one of the facility's cavernous upstairs spaces.

Village CEO Jeff Greenberg sums up the philosophy that has helped the facility stay vital over 30 years: "We strive every day to completely satisfy every client. We never forget how lucky we are to be working in this business." —*Maureen Droney*

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THE THIRD ANNUAL

Mix L.A. Open

Photos and story by Maureen Droney

(Above) Co-champion and charter sponsor, Record Plant, from left, Paul Brown, Amy Burr, Tim Goldman, Rose Mann, Steve Dubin and Dave Rideau

(Above) Engineer and tournament chairman Ed Cherney with House Ear Institute's Dilys Jones and Jim Boswell

(Above) Co-champion SST, from left, Rick Winquest, Chip Swanson, Jeff Jones and Ed Winquest
(Left) Howard Schwartz flew in from New York for the event

(Above) Two-year sponsor Quantegy, from left, Bruce Thorkelson, Carl Erickson, Bill Stark and Bob Wartinbee

(Right) Alesis: Jeff Klopmeyer, Christen Pocock (Mix), Stacey Moran and Jimmy Church

It was no surprise that L.A.'s unseasonably cool and gloomy June weather would lift on Monday the 15th, presenting the third annual Mix L.A. Open with its requisite blue skies and balmy temperatures. The Open was held for the second year at the challenging Brookside Country Club in Pasadena, where 41 foursomes headed out onto the course after a 10 a.m. registration, barbecue, plenty of warmup balls and a putting contest. At the appointed 12:30 tee-off time, 82-plus golf carts careered onto the fairway, with designated drivers focused on the right of way and designated navigators clutching course maps tightly in their hands.

On the course itself, a carnival atmosphere prevailed, with many sponsors greeting golfers with refreshments, souvenir items and lots of good cheer. "The tournament has grown beyond our wildest expectations," says tournament director Terry Lowe. "Through the hard work of the Mix Foundation for Excellence in Audio, the *Mix* L.A. staff and many others, it's becoming the golfing event for the audio industry."

Top honors were a tie this year, with both the Record Plant (Paul Brown, Steve Dubin, Tim Goldman and David Rideau) and the SST team (Jeff Jones, Chip Swanson, Ed Winquest and Rick Winquest) scoring 11 under par. Reports that the two teams came to blows over who got to take home the actual trophies are highly exaggerated; as anyone would expect of music business professionals, each team member exhibited only the finest in sportsmanship.

Second-place medals went to Universal's team, with members Mike Cardellio, Bob

(Above) The Mix crew: Hillel Resner, Dilys Jones (HEI), Jeff Turner, Karen Dunn and Terry Lowe

(Right) Fairlight: Gary Ward, Tamara Rogers, John Lancken and J. Paul Huntsman

(Below) Two-year sponsor Tape Specialty: Jim Rouse, Stu Feldman, Bob James and Fred Jones

(Above) Two-year sponsor BASF: Joe Ryan, Mike Ingalls, Mike Butler and Steve Klein

(Right) Ocean Way: Dave Russo, Michael Lanolt, Lee Decarlo and John Koenig

(Above) Audio-Technica: Joel Singer, Dweezil Zappa, Robert Scovill and Tim Rovnak

Euphonix: Andy Wilde, Rich Nevins, Peggy Blaze and Dave Christenson

Group One: Steve Burdik, Chris Fichera, Ken Dahlinger and Rob Grubb

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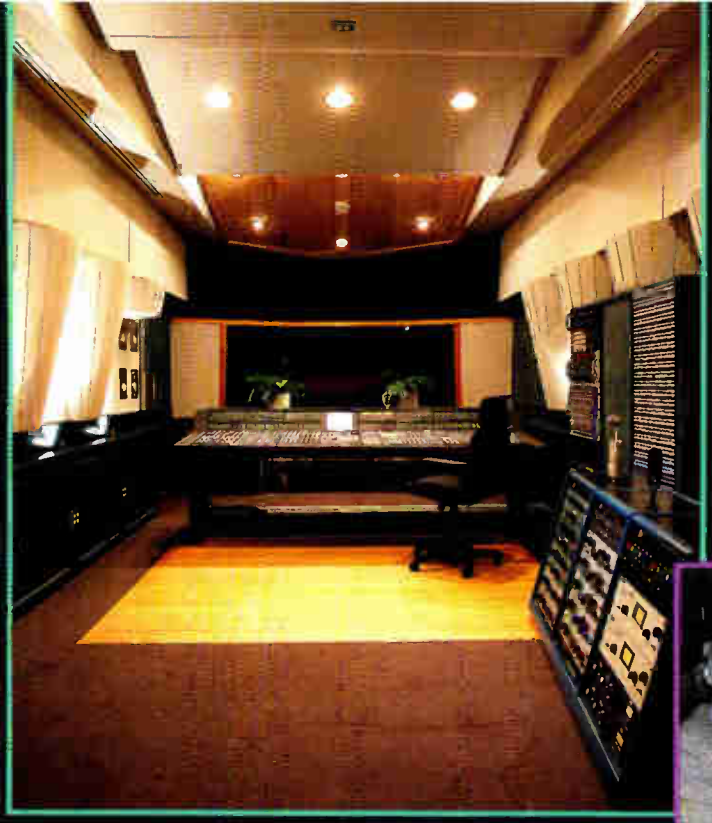
Minkoff, Brian Morehead and Ed Zeier.

Other 1998 winners included Doug Michael, who was awarded a Taylor Made titanium burner sand wedge for the TSI-sponsored Closest to the Pin contest; and Scott Thurston, who walked off with a Taylor Made titanium bubbleburner driver for the Audio-Technica-sponsored Longest Drive and a Taylor Made putter from Group One for the Longest Putt. The pregame miniature golf putting contest was won by Ken Dahlinger.

This year a new contest, dubbed "Beat The Pro," was sponsored by BASF and raised more than $600; golfers challenged University of New Mexico champ Shannon Engels. Engels was, as Lowe diplomatically commented, "not beaten very often."

Proceeds from the L.A. Open go to Hearing Is Priceless, the outreach program at Los Angeles' House Ear Institute. Special thanks to all the sponsors and participants; keep practicing and we'll see you all again next year. But remember to sign up early for June 1999—1998's tournament was sold out and had a long waiting list. ■



Left: A&M founder Herb Alpert in 1989

Below: Paul Sloman, former general manager of A&M Recording Studios, points out the first Focusrite modules installed on the West Coast.

A&M renovated Studio C last year, implementing acoustician Vincent Van Haaff's innovative designs for 5.1-channel mixing. The studio houses a 96-fader Euphonix CS3000M, Sony PCM 3348 tape machines and a large complement of vintage outboard gear. Main surround monitoring is a custom dual-concentric, DTS-ready system consisting of PAS/TAD components.

A&M Recording Studios

Celebrating 30 Years

A&M Recording Studios has always successfully combined creativity with technology. A movie lot since 1918, it was the site of Charlie Chaplin's stages and of television studios where the *Superman* and *Perry Mason* series were taped. After A&M Records purchased the site for its record company, the studio became home to the label's artists, who both wrote and recorded there, establishing an artist-friendly reputation that has lasted through today. Herb Alpert, of course (the A in A&M, the M being Jerry Moss), Chuck Mangione, The Carpenters, Carole King, Cat Stevens, Burt Bacharach, Peter Frampton and Procol Harum were among the A&M artists who developed their hits at A&M Studios. No longer exclusively for label artists, the studio has been the site of recent projects for No Doubt, Melissa Etheridge, Yes, Blondie, Chicago, Black Sabbath, Vonda Shepard, Grant Lee Buffalo, Ringo Starr and Fastball.

One of the benefits of 30 years in the recording industry is the ability to acquire large amounts of quality equipment; A&M's mic collection is legendary, as is its complement of vintage and modern outboard equipment. A&M is also one of the few studios in town that still has live chambers—there are six, as well as 16 classic EMT plates with tielines to all rooms.

Studio A is a spacious tracking room fitted with a Neve 4972 console that was specially designed by George Martin and Rupert Neve. Studios B and D are SSL tracking and mix rooms; B houses a 6056 E with G Series EQ, and D has a 4072 G Series. Studio C features a new Euphonix CS3000M and 5.1 surround mixing, and the fifth studio, called The Mix Room, has an SSL 6072 E/G Series desk.

A&M's six mastering suites are headed by chief mastering engineer Dave Collins. The main room, where such hit albums as Soundgarden's *Superunknown* and the *Evita* soundtrack were mastered, features vacuum tube and solid-state tape equipment, as well as a custom A&M console built without any relays, coupling capacitors or transformers.

Tradition continues today at A&M, where the staff strives to combine technical expertise with a creative, friendly atmosphere. "When you work at A&M Recording Studios," says studio manager Ron Rutledge, "you're considered part of our constantly growing family." —*Maureen Droney*

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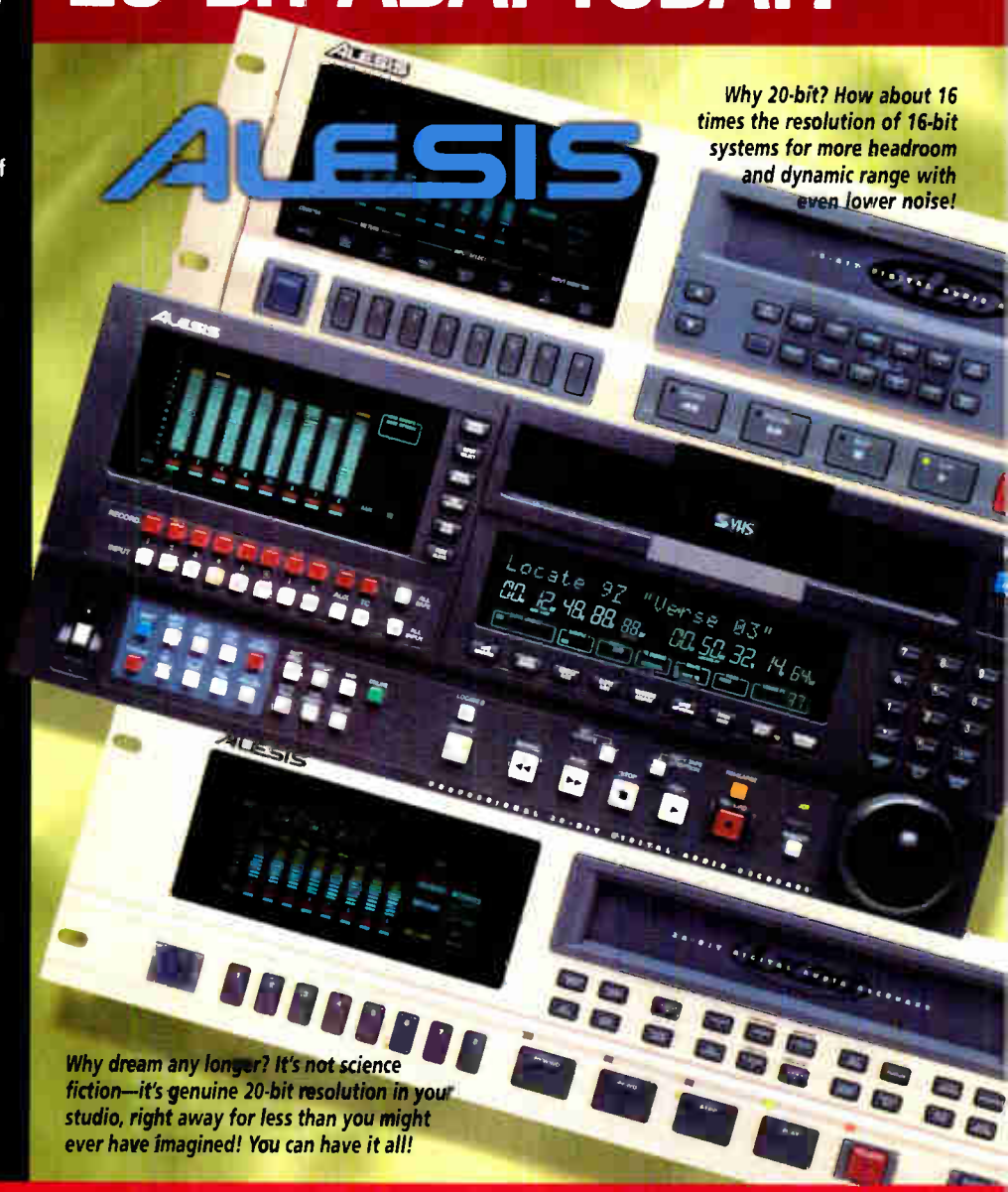

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PREVIEW

WAVEFRAME 408 PLUS WORKSTATION

The new 408 Plus digital audio workstation from WaveFrame (Pacific Palisades, CA) is designed to work seamlessly with the Tascam MMR-8 multichannel digital recorder. Like the MMR-8, the 408 Plus provides playback of eight digital audio tracks from a single SCSI bus, reducing system requirements. V.6.2 software for the Pentium-based system provides OMF 2.01 file compatibility, support for optional multichannel digital I/O and import/export filters for .WAV, AIF and SDII file formats. Price for an 8-track, 8-analog-I/O configuration is $10,995.

Circle 327 on Product Info Card

EUPHONIX SHIPS MIXVIEW VERSION 3.1

Euphonix Inc. (Palo Alto, CA) is now shipping Version 3.1 software for CS Series mixing consoles. Featuring total automation for Euphonix Hyper Surround, V3.1 supports surround sound automation in any format, including stereo and Dolby-Digital and HDTV 5.1 formats. With V3.1, as many as 48 discrete inputs can be simultaneously automated for surround sound mixing, and multiple punch-in/-out markers may be entered in the Cue List for automated

recording. Other automation features include Loop and Build Modes. V3.1 also includes fader swap and allows as many as 50 fader name sets per title to be stored with console Snapshots. With a required hardware modification, V3.1 allows the Solo bus to be linked across multiple consoles.

Circle 328 on Product Info Card

AARDVARK HARD DISK RECORDER

Aardvark (Ann Arbor, MI) announces the Aark 20/20 multichannel hard disk recording system for the PC. Consisting of a PCI host card, a breakout box with ¼-inch TRS connectors, cables and software drivers, the Aark 20/20 offers eight analog inputs and outputs (20-bit A/D, D/A), two 24-bit digital S/PDIF I/Os, word clock I/O and optional video sync. A software control panel provides ten individual peak meters, routing and mixing facilities, tone generator and system performance analysis software. Aark 20/20 will work with Steinberg's Cubase VST and WaveLab, Sonic Foundry's Sound Forge, Cakewalk, Cool Edit Pro, I.Q.S.'s SAW Plus and SAW 32, SEK'D Samplitude, and all other Win95 editing programs that use standard MME drivers. Multiple Aark 20/20 systems can be sample-locked together via word clock. Retail: $995.

Circle 329 on Product Info Card

MC2 DIGITALLY CONTROLLED POWER AMPLIFIERS

MC² Audio Ltd. (distributed by Audio Independence, Middleton, WI) offers the MC Series of digitally controlled stereo power amplifiers. Featuring complementary Class AB bipolar outputs with a unique floating drive stage, the amps can be mono bridged and will drive 2-, 4- and 8-ohm loads. Features include onboard limiting, peak level meters, separate and linkable level controls, individual mute switches, low-noise varispeed fans, and automatic fault protection and reconnection. Options include crossover cards and bidirectional remote control via RS-485. Inputs are XLR (with loop-through connection); outputs are binding posts. Driving a 4-ohm load, the amps are rated as follows: MC 1250 ($3,990): 1,250 watts per channel; MC 750 ($2,878): 750 W/ch; MC 650 ($2,699): 650 W/ch; MC 450 ($2,495): 450 W/ch.

Circle 330 on Product Info Card

ACE REFERENCE MONITORS

Audio Composite Engineering (Escondido, CA) has introduced its 500 Series of reference monitor systems, all featuring ACE's patented carbon composite cabinet construction. Model 540 includes a 5.25-inch woofer with a 3-inch voice coil and a 1-inch dome tweeter. The unit is extremely weather-resistant (the 540 was exhibited operating under water at NSCA) and has a 100-watt RMS capacity. Frequency response is 80-22k Hz. The 550 is identical but is vented for extended bass response. The 570 substitutes a 7-inch woofer and offers a 55-24k Hz frequency range. Prices are $699 for the 540 and 550, $799 for the 570.

Circle 331 on Product Info Card

PREVIEW

ATI 16-CHANNEL MIXER/PREAMP

Audio Toys Inc. (Columbia, MD) has introduced the ATI 16MX2 16, a 1U rackmount, 16-channel mixer/preamp based on the successful ATI 8MX2. The 16MX2 contains eight high-voltage mic preamps; each channel provides both a main and auxiliary direct output with independent level controls, plus each channel's signal may be assigned to a stereo mix bus, with independent pan and level control. Inputs feature rear panel phantom power and ground lift switches; front panel controls include polarity reverse, and mix and cue bus assign buttons. The unit may also be used to monitor multitrack tape playback, and internal jumpers allow the unit to be configured as a 16-input stereo mixer with aux output. Inputs and multitrack sends and returns are on DB25 multipin connectors. Dual aux and stereo monitor and mix outputs, plus stereo tape returns, are TRS connections. Additional features include headphone output and 10-segment LED metering. Price is $2,395.

Circle 332 on Product Info Card

SABINE 31-BAND EQ WITH FBX

The GRAPHI-Q from Sabine (Alachua, FL) is a digital 31-band EQ that includes compression and delay functions plus Sabine's patented FBX automatic feedback control technology. A 24-bit device, the GRAPHI-Q is available in four models: the single-channel GRQ-3101 ($899.95); the dual-channel GRQ-3102 ($1,299.95); and slave versions GRQ-3101S ($699.95) and GRQ-3102S ($1,099.95). The GRAPHI-Q features 24-bit A/D and D/A, 31-band graphic EQ with switchable boost/cut, high- and lowcut filters, compressor/limiter, delay (up to one second, adjustable in 20-microsecond increments) and Sabine's FBX Feedback Exterminator, with 12 filters per channel. Additional features include CLIPGUARD adaptive clip level control and GRAPHI-Q Remote for Windows software for controlling up to eight master or slave GRAPHI-Qs.

Circle 333 on Product Info Card

NEW FRONTIER AC DISTRO

New Frontier (New Hope, PA) introduced the SurgeX SX-202-R, a 12-output rackmount AC distribution unit offering comprehensive surge protection and EMI/RFI filtering. Featuring 12 grounded AC receptacles in two switched banks, the SurgeX SX-202-R meets government purchase specifications (A-1-1 rating) and provides protection from multiple surges of up to 6,000 volts and unlimited surge current. Features include magnetic shielding, thermal overload protection and two self-test circuits with visual indicators. Retail price is $699.

Circle 334 on Product Info Card

RPG FLATFFUSOR

RPG Diffusor Systems (Upper Marlboro, MD) announces the Flatffusor!, a sound diffusor with a thin, flat profile designed to provide uniform diffusion between 1 and 16 kHz. The Flatffusor! forms a variable-impedance, binary-amplitude grating and diffuses sound by varying the amplitude of the incident sound, rather than the phase. Units are sold two per box and mount with construction adhesive or included metal impaling clips. Retail is $59.90 per panel.

Circle 335 on Product Info Card

MERGING TECHNOLOGIES INTERFACE

The DUA 20-bit AD/DA converter from Merging Technologies (Northbrook, IL) is a cost-effective digital audio interface for Pyramix users. Linked to an Adiana PC card that occupies a single ISA slot, the DUA interfaces with the Kefren and Keops series of audio cards via an onboard MTM interface. The Adiana card contains all of the D/A and A/D electronics and AES/EBU circuitry; the DUA provides XLR I/O connections and headphone monitoring facilities. Features include four analog inputs and six analog outputs (all 20-bit conversion), four digital I/Os (two 24-bit AES/EBU), internal crystal lock, external AES/EBU sync and external word clock. Retail: $1,295.

Circle 336 on Product Info Card

ADK A-51 SERIES MICS

From Audio DeutchKraft (ADK™) (Portland, OR), comes the A-51 series of "German-inspired" studio microphones. The A-51 is a phantom-powered, condenser mic with a large-diameter, gold-sputtered diaphragm, cardioid capsule and low-noise discrete FET electronics, housed in a machined brass body with a scratch-resistant anodized finish. The model A-51 is priced at $349, including shockmount and carrying case. Priced at $399 (with shockmount and case), the A-51S is a similar mic, but is equipped with a low-frequency roll-off switch and a switchable -10dB pad. Both mics carry a one-year warranty.

Circle 337 on Product Info Card

PREVIEW

MIDIMAN BREAK OUT BOX
The DMAN 2044™ Break Out Box from MIDIMAN (Arcadia, CA) is designed to supplement the company's DMAN 2044 PCI audio card and provides four inputs and four outputs on ¼-inch TRS connectors. Measuring 5.7x2.7x1 inches, the Break Out Box is designed as a tabletop unit, though it may also be rackmounted. Supplied with a shielded three foot connector cable, the Break Out Box is priced at $59.95.
Circle 338 on Product Info Card

STEDMAN TUBE CONDENSER MIC
Stedman Corporation (Richland, MD) has introduced the 1100B Tube Condenser Microphone. Based around a dual-membrane capsule design and featuring a 12AY7 twin-triode tube, the mic offers 11 selectable patterns (switchable at the power supply) and a frequency response of 40-18k Hz. The microphone diaphragm is gold-sputtered (3 to 4 microns), and the mic body is nickel-plated brass. Supplied with an adjustable shockmount, power supply and mic cables and a lined wooden case, the 1100B retails for $4,500.
Circle 339 on Product Info Card

HOT OFF THE SHELF

Pelican Products' Alignlite™ combines an electronic alignment screwdriver with a 6,000-candlepower flashlight. Priced at $16.95, the package includes two different screw tips, two AAA batteries and two vision aid lenses. Call 310/326-4700 or visit www.pelican.com... **Middle Atlantic Products offers loudspeaker stands** in 36- and 42-inch heights. Features include "tipless" triangular bases, rotating top platforms and speaker fastening holes. Prices range from $178 to $199 per pair. MAP has also introduced a range of desktop rail racks in 8/12-space versions ($35 and $40) and offers oak laminate racks in 8/12/16/20-space versions. Units are 18 inches deep with a steel caster base and wheels; sloped front racks are also available. Priced from $169. Call 973/839-1011...**WaveFrame/StudioFrame users can achieve** audio playback of eight audio channels over a single SCSI bus, thanks to the new R8-Plus board from WaveFrame. The R8-Plus is included as standard in WaveFrame's new 408 Plus workstation, and is retrofittable to any exiting 408, 401 or StudioFrame DAW-80 running Version 6.2 software. The R8-Plus also provides seamless integration with the Tascam MMR-8. Price: $995. Call 510/654-8300...Version 1.27 software for the **Tascam MMR-8 and MMP-16 Modular Multitrack digital recorders** is free to registered owners, includes OMF enhancements, Bowties, Overlapping Events, Tape Mode Export to OMF, Dynamic Backup Status Display, a Locking Kingston Carrier Option and OMF-to-WaveFrame Conversion capability. Download the new software from www.tascam.com or call 213/726-0303...***Introduction to Loudspeaker Design*** **by John L. Murphy** is written for anyone seeking an introductory overview of the technology of loudspeaker design. The indexed 166-page paperback edition is $24.95 and may be purchased on the Internet at www.trueaudio.com or at www.amazon.com, or call 800/621-4411...**AKM Semiconductor's AK4350 18-bit stereo digital-to-analog converter** offers dynamic range greater than 90 dB, yet consumes only 4.1mW from a 1.5V power supply under test conditions. Specs list a S/N ratio of 82 dB and a power consumption of 7.4 mW, ideal for portable recording systems. Incorporating multibit delta-sigma technology, the AK4350 is priced from $2.95 in 5,000-piece quantities. Call 888/AKM-SEMI or surf to www.akm.com...**Cirrus Logic's Crystal™ CS4334 24-bit D/A converter** is an 8-pin SOIC that rates as the industry's smallest delta-sigma audio D/A converter. The CS4334, which supports multiple interface formats from 16 to 24 bits and provides 96dB dynamic range, -88dB THD+N and 96kHz sample rates, is available for $1.95 each in 1k quantities. Call 800/359-6414 or visit www.cirrus.com...**FPC Inc., a subsidiary of Kodak, introduces a line of high-density magneto optical (MO) digital audio cartridges** under the Kodak Recording Products label. The Kodak MO cartridges are available in 5.2, 2.6, 1.3 and 1.2-gigabyte configurations. For more information, visit www.kodak. com/go/motion or call 800/ 814-1333...**Edac Inc. adds the 521 series of multimedia connectors** to its line of multipin connectors. The 521 series is available with a variety of contact options, including hermaphroditic Edacon contacts, 75-ohm and 50-ohm contacts and power contacts capable of up to 40 amps. Call 416/754-3299 or e-mail to edac@edac.net...**Denon's ACD-27 SMPTE timecode** card allows users to sync Denon's DN-C680 CD player or DN-M1050R MiniDisc recorder/player to SMPTE timecode. The easily installed card provides 9-pin RS-442, BNC video reference and XLR timecode input connectors, plus an additional BNC for Word Clock synchronization. The ACD-27 is priced at $550. Call 973/575-7810. ■

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CIRCLE #088 ON PRODUCT INFO CARD

SOFTWARE AND HARDWARE FOR AUDIO PRODUCTION

CREAMWARE SCOPE FINALIZES SPECS

CreamWare (U.S. offices in Sumas, WA) has finalized its SCOPE DSP system for modular sound creation and synthesis, signal processing and studio integration. The version now shipping uses a new version of the SHARC DSP that boasts 50% faster speed. In addition, the system now features 15 built-in DSP processors, up from the previous six. One I/O option adds four additional SHARC DSPs and offers 20-I/O capacity. (Each base SCOPE card is capable of 64 inputs and outputs.) As a result, configurations of more than 100 DSPs are possible. Systems start at $6,500; expect shipment this month.

Circle 340 on Product Info Card

MEDIAFORM CD2CD POWER PRO/CD-5900

Exton, PA-based MediaFORM recently debuted the CD2CD/Power Pro, a stand-alone CD duplicator capable of copying up to eight CD-Rs simultaneously. A slave tower with eight additional drives can be added to the CD-5900 for a total of 16 drives and four CD-5900s, and expansion units can be chained together for a total of 64 drives. The CD2CD/Power Pro offers an option bay, which enables use with Jaz, Zip and Plextor CD-ROM drives, plus other SCSI devices. Other features include a Pre-Scan for finding errors prior to burning, password protection (against unauthorized operation) and compatibility with MediaFORM CD-2600/2700 autoloaders. An EasiDAT/Easi-AUDIO option provides an interface with DATs and SCSI drives.

Circle 341 on Product Info Card

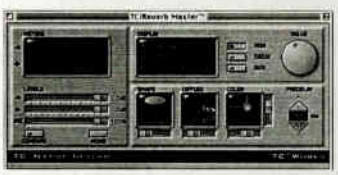
HIGH BIT-RATE SADIE

Studio Audio & Video Ltd. (Nashville, TN) is shipping the SADiE 24 96 digital audio workstation, featuring support for 24-bit 96kHz and 192kHz audio recording and editing. The modular system, based around 8-input/8-out PCI cards, can be configured to provide up to 32 inputs and outputs and supports surround sound editing and mixing. A single 8-I/O card can replay 24 tracks of edited 16-bit audio, and each channel offers AES/EBU digital I/O and 20-bit AD/DA converters. A CAT card provides timecode generator and four channels of RS-422 interface. Connections are made through the Breakout Box 800, with eight digital I/Os on XLR, eight unbalanced analog I/Os (unbalanced XLR) and timecode and RS-422 I/Os. An optional 800B breakout box adds balanced analog I/Os. A standard 8-I/O system, including a Windows 95/98 computer, timecode reader/generator and four RS-422 interfaces, costs $9,995.

Circle 342 on Product Info Card

UPGRADES AND UPDATES

TC Electronic announces TC Native Reverb for Power Macintosh, a VST version of the plug-in. Visit www.tcelectronic.com...New from Bitheadz, the Version 1.1 release of the Retro AS-1 programmable analog synthesizer implemented in Mac software. Features include additional filters and oscillators and interface enhancements; the upgrade ($259 suggested retail) is free for users; download the file at www.bitheadz.com...Gefen Systems (www.gefen.com) introduces Version 3.3 of M&E Pro. Additions include a sound effects editor, QuickFetch search feature and an Add Notes field. The update for existing customers is $250...Event Electronics and DSP•FX (formerly Power Technology) teamed up to provide software-based audio processing tools for PC. The first product announced is the DSP•FX Virtual Pack 4.0, a suite of eight tools, available for $299. Visit www.dspfx.com...The Audio Production Studio software encoder from Telos converts PCM files and stores them in compressed MP3 (MPEG Layer 3) and compressed .WAV formats; visit www.telos-systems.com... Arboretum (www.arboretum.com) debuts the following: The Hyperprism Plug-In Pack, combining Arboretums's Mac and PC plug-in effects sets; Version 1.1 of the Ray Gun noise reduction plug-in software (now available for PC and PowerMac); Hyperprism-TDM Version 2.1; and Ionizer Version 1.2...MacSourcery (www.macsourcery.com) and Audio Ease jointly released Version 2.4 of BarbaBatch batch audio processor. New features include support for QuickTime QDesign technology, enabling high-fidelity streaming over the Internet. BarbaBatch 2.4 also adds support for Ensoniq PARIS 24-bit and Dyaxis MacMix digital audio formats...Wildcat Canyon (www.wildcat.com) announces Version 2.0 of the Autoscore software system for real-time transcription of audio input. The basic package, including free microphone and sequencer, is $119; the pro version is $249 and adds editing and effects features. ■



DSP POSTATION

DIGITAL AUDIO WORKSTATION

On the DAW timeline, we are now beginning the third generation of the digital audio workstation. The cost spectrum has remained about as wide as it was in 1990: everything from freeware to full-blown software/hardware solutions costing $450k, with obvious differences in capability. In 1990, there were about 15 solutions for editing audio on a dedicated workstation or some sort of computer. Now there are more than 100. As competition has brought faster, cheaper and smaller chips, faster buses and affordable storage, we've passed the dedicated controls vs. M&M (menus and mousing) debates and are now faced with a labyrinth of choices in networking and cross-platform file compatibility.

With a market full of contenders, getting attention for a new product is no easy task. But that's exactly what Australian-based Digital Studio Processing (dSP) has set out to do with its Desktop and Postation workstations. Aimed at the audio and sound-for-picture markets, the two scaleable systems provide 8/16/24/32 tracks, with up to 80 channels of digital mixing. Each audio drive supports up to 32 tracks of playback. The Desktop provides a less expensive entry price with an *a la carte* approach, allowing tracks and capabilities to be added as needed.

The amount of audio clips, imported cuts and storage varies, depending on the size of the system. The 8-track Desktop system supports 2,500 audio clips, 2,500 Qimport entries and allows 10 GB per single SCSI ID. The P32 Postation supports 10,000 audio clips, 10,000 Qimport entries and 40 GB per single SCSI ID.

BY TY FORD

The P32VRRC 32-track Postation we reviewed came with the P32 Digital Editing Processor (DEP), Nonlinear Video module (NLV), Virtual Control Surface (VCS), two Yamaha 02Rs, the optional OMF Connect station, custom cabinetry and a $188k price tag. Software for the OMF Connect station comes with any Postation, but a separate Windows NT computer is recommended.

The top-of-the-line P32MAX ($207k) includes the 16x16 MM Bus Router Module for feeding the 16 02R buses. The 16 outputs are used to create simultaneous mixing stems. P32MAX also comes with the SPEED Monitor, a system that combines all control room functions including monitoring, selectors for eight different mixes (from mono to 7.1), tape source select, 85dB Dolby calibration, mute selects and solos of all speaker arrays, dim, talkback and cue, inserts for Dolby LCRS. The company also offers video networking but has had no takers so far.

Audio and nonlinear video on the networked versions are stored on separate systems on local drives or on networked RAID arrays in the machine room. The local drives are hot-swapable, but the RAID drives are not. The two slots for local drives currently support drives of up to 18 GB. The RAID Center hosts the RAID controller and five network drives. Additional drive enclosures are configurable to hold anywhere from an additional five to 40 drives, for a maximum of 1 TB. *[Note: Ready or not, "TB," or terabyte, is an abbreviation we all had better start to get used to seeing—Ed.]*

NETWORKING VIA 100BASET

Up to 16 Postations can be networked via 100BaseT. Using this network and a system of RAID drives, multiple stations can work on the same project at the same time. One station, acting as a Master, can arm tracks to be record-enabled for the other stations. Changes to a mix are instantaneous or can occur in the

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background on another station during a mix. A Save command from any station updates individual data, edit and automation information for everyone working on the project.

The cuts-only NLV runs on the NT platform and uses a touch-screen with 13 automatic locate points for location and editing. It's capable of cuts-only video editing and has composite I/Os, but supports multiple versions of productions. The video is also fully networkable when RAID drives are implemented, allowing multiple operators to access the video simultaneously. Each of the two slots in the NLV accommodates up to 18GB drives, with up to seven SCSI drives added. Video compression is MJPEG and ranges from 4:1 to a lot more MJPEG. According to John Bolen, senior editor/mixer at Roland House in Arlington, Va., an hour on the hot-swappable 9GB drive gives you video quality that passes for Betacam SP. At present, Roland House is loading from Digital Betacam.

The NLV supports DOS text importing and creates a list with ins, outs and a script on screen and cue tone countdown for ADR sessions. The text feature is also good for leaving instructions for spotting sound effects.

SPECS

Through the Yamaha consoles, the current I/O resolution is 16-bit, according to Joe Narai, Technical Director of dSP. "The digital connection between the DEP and the 02R is either Y2 or AES/EBU, both of which are a standard 24-bit word length," he says. "If we run in 24-bit mode, then the full 24 bits are used. If we run in 16-bit mode [as most installed Postations and DEP are], the bottom eight bits are simply set to zero. The 02R itself does not have 24-bit converters, but its I/O is fully 24-bit-capable, and in fact the internal processing [EQ, etc.] is 32-bit, if I remember correctly. So there is nothing special to do, other than use a 20 or 24-bit AD/DA converter."

Sample rates of 31.968/32/44.056/44.1/47.952/48 kHz are supported. There are up to 32 channels of I/O, depending on how many 02Rs or 03Ds are used. Clocking is accomplished by internal crystal, AES/EBU, Y2, external word clock or video sync. LTC frame rates of 24, 25, 29.97D/ND and 30D/ND are supported. The system uses a 4mm DAT drive for backup.

Two of the most obvious things that differentiate the Postation from the contenders are the double action touch-screen controls and the use of an 03D or up to two Yamaha 02Rs as I/O hardware, effects generators and part of the routing system. The P32 DEP editor also can be interfaced with other digital consoles in banks of eight buses, via DB 25 connectors for AES/EBU or Y2 (Yamaha format).

The console, edit and NLV monitors, and SPEED control surface are placed ergonomically for two-handed operation. The left hand is free to use the touch screens, while the right hand hits the track select, edit, bus, transport, scrub, buttons and numeric keypad.

If you've been working over in "mouse-land," the return to two-handed operation creates a real sense of freedom and an increase in productivity. Instead of pushing a mouse around on the screen, you touch the screen to activate the desired control and then use your finger, a fader or rotary pot or scrub wheel to change the value. The double-sensitivity screen takes a bit of getting used to. On some functions, one touch activates the control and a second harder touch activates another function of the knob. The system is designed to minimize superfluous button-pushing and menu navigation.

The VCS (Virtual Control Surface) module is designed to work with the

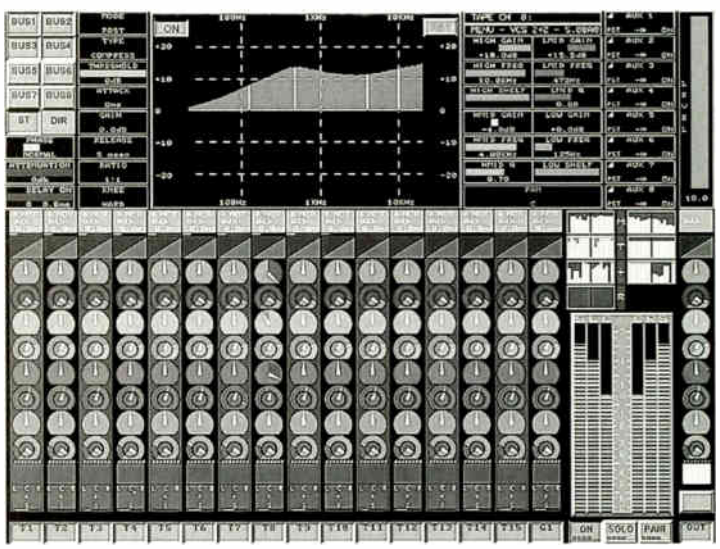
Desktop or Postation and communicates via MIDI to the Digital Editing Processor (DEP) and via RS-422 to the 02R, the 02R meter bridges and the VCS fader panel. The VCS includes 18 100mm touch-sensitive faders and Uptown control boards. dSP uses its own automation software, however, rather than Uptown's or Yamaha's.

Automation is region-based, in non-real or real time. A large Protect screen lets you protect all automatable functions. You can apply processing to a track and apply that process for a region of any length. You can have multiple processes applied to one track and have those changes occur concurrently or independently. The auto-release function provides a user-selectable time period that brings the level back to its last current position after you punch out. Region level adjust is global and lets you change levels on individual tracks or the entire production.

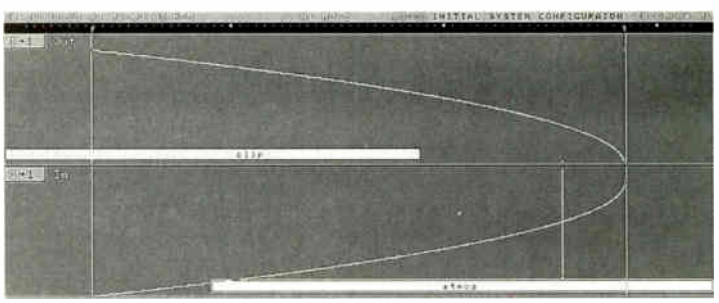
The DEP (digital editing processor) screens are easy to read and provide a lot of information. There are different colors for each element, a line showing the relative mix level and onscreen markers for compression, EQ and reverb. You can see 32 tracks at a time with simple block displays and one track of waveform display. With display of up to 24 tracks, you can see two tracks of large waveform displays. There are two ways of displaying audio waveforms—linear and logarithmic. You can split the display: linear on the bottom, logarithmic on the top. DSP functions include varispeed, mono and phase-locked stereo time compression/expansion, sample rate conversion and digital gain.

Edits can be done across all 32 tracks, regardless of how many tracks are in the scroller window. The scrub is exceptionally smooth and precise, and you can scrub all 32 tracks or solo select to scrub just the ones you want. Individual channel setups or the entire disk scenes (buses, auxes, sends) are stored within the DEP. User setups for compression and reverb, phase, buses and null settings for global and individual presets can be stored and recalled from within the DEP.

There are ten levels of undo, and the Un-top and Un-tail features let you go back to the original clip, regardless of the number of undos. Each track is 64 layers deep. You can have 64 takes and only use up one track. The layers are ac-



The main mix screen



An example of the crossfade window

cessible in whole or in part, so your final take can comprise one complete layer or parts from up to 64 layers.

Larger drives allow more storage but create their own problems as the number of cuts and projects build. When laying effects and music, the Quick Import page lets you see the directories of other projects on the drive and every cut by name. You can audition clips against picture, saving the inpoint in case you need to try other clips. Any clip on a system's local drive or on any drive on the network can be accessed. If you know the name of the clip you're looking for, you can restore part of it by selecting only a portion of a clip.

Roland House's John Bolen says his favorite dSP features include Threshold Record, Auto Fill, Gain Match, EQ Compare, T-Group Edit and Surround Pan Moves. Threshold Record cleans out the dead space automatically when loading in from Digital Betacam, leaving pad handles of up to three seconds on the front and back. Auto Fill saves tracks by placing the copied audio in its entirety on a lower layer of the same track as the primary audio. Any spaces between primary segments of audio are automatically filled by the layer beneath. For repetitive ambiences and footsteps, spaces between two edit points are filled with however many copies of the original are needed. Full copies are always made even if they exceed the size of the hole. Any audio that hangs over can be tailed or edited.

For ADR and customization, Gain Match uses a reference clip, matches the level of another clip and places it on the existing clip. EQ Compare gives you a graphic representation of two clips so you can compare them. A soon to be implemented feature will display the resultant EQ fix curve on the VCS monitor, where it can be fine-tuned. T-Group edit allows you to select a group of clips and move/copy/paste them. If in/out points are chosen, the function will also copy automation moves. When you copy or move a piece of audio, the copied piece shows as a hollow waveform so you can see its properties against the other waveforms as you move it—and you can move it in real time. Surround Pan Moves can be done in real time by tracing a finger over a field on the NLV screen while watching the movement on the NLV screen.

Although time did not permit a bust-the-chops-of-the-workstation session, Narai reports no output overflow problems. "Most hard disks have large read and write caches and we have our own caches, so with the combination of fast seek drives (typically less than 7 ms now), fast transfer rates and large cache sizes, this does not appear to be a limitation." That fact turns to optimism for the company in that they expect to get 48 tracks from a single drive within the next year or two and more with RAID technology.

The editing system supports three variations of crossfade. Crossfades are rendered (rather quickly) to eliminate digital output bottlenecks. Rendering is nondestructive, and crossfades can be re-rendered if necessary. The Quick Crossfade fades from the beginning of the clip to the play head, or from the play head to the end of the clip, with one keystroke. Regular crossfades allow you to determine which side of the clip fades and can create crossfades as long as the length of a clip. Full crossfades allow independent control of both the incoming and outgoing clip, including graphical control of the gain parameters and the shape of the curve.

OMF OOMPH

The system imports and exports OMF

Versions 1 and 2 from Avid systems with crossfades, full names and no file size limit. You can export completed mixes back to an Avid. The system also supports import and export of .WAV, AIFF import and 3-times real-time transfers from CD. From a CMX 3600 EDL list, the system will control up to three video machines and conform the list. Currently, the system will auto-conform up to eight tracks at a time. It will also re-conform from already loaded audio. At Roland House, Bolen said the system reconforms with incredible speed, with as many as 500 edits a minute.

Backing up an hour-long show to DAT takes about 20 minutes for the primary backup, which may be repeatedly updated with shorter incremental backups. Incremental backups happen at 16x and usually take only a minute, depending on the amount of material. You can import from a backup tape, choosing by directory and cut, so you don't have to restore an entire show for one cut. On a single system you can't back up during a session, but larger networked facilities can use an 8-track dSP station in the machine room as an economical, dedicated background backup device for 32-track systems.

On a weekday afternoon I called the emergency hotline just to see how long it would take to get a response. Six minutes later, the tech called in. He apologized for taking so long but said he was in the car when he got the page and was on the way back to the office. Thanks and a hat tip to John Bolen and Roland House for letting us look over their shoulders. Incidentally, Bolen says they were running the system smoothly within a week. It showed up on a Monday, and on the following Monday they used it on an hour-long documentary.

With 150 systems sold worldwide (50 in Japan, over 50 in Australia, over 20 delivered or in process to the U.S.), dSP appears to have already made an impact in the DAW market. Making it happen in the U.S. will be their next big test.

DSP North America Ltd. 25W 658 St. Charles Rd., Carol Stream, IL 60188; 630/653-1940; fax 630/665-4966. Web site: www.dsppl.com.au. ■

Ty Ford can be reached at www.jagunet.com/~tford. Ford's commercial and narration demos are available at www.jaguNET.com/~tford. He has also just uploaded an upgraded list of mic preamp reviews, production music and SFX library companies.

CREAMWARE TRIPLEDAT & TDAT16

DIGITAL AUDIO WORKSTATION

Over the years, CreamWare has earned a huge following of fans of its TripleDAT workstation, which has consistently been updated and improved. With the debut of the TDAT16, CreamWare now offers a PCI card with two ADAT interfaces for 16 channels of I/O between a Pentium PC and any ADAT optical interface. The system provides multitrack recording, editing, 256 virtual tracks, mixing, real-time DSP, mastering and full Red Book CD writing. I reviewed the system over an extended period, using the original TripleDAT system for five months and then adding the TDAT16 for an additional three months.

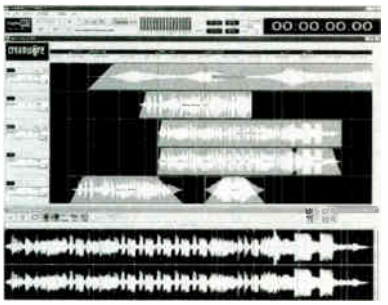


Figure 1: The Arranger and Cutter make up the TripleDAT workspace.

The original system for review included the TripleDAT software and TripleBoard hardware ($1,198 for both); CreamWare's new TDAT16 board and A-16 TDAT analog converter were subsequently added. The TripleDAT software works with either or both of the hardware options; in fact, you can switch between them in the middle of a project, and with both boards installed, the system can also use the TripleBoard's interface for MIDI Time Code sync.

HARDWARE

TripleDAT using the TripleBoard works on a wide a range of hardware; CreamWare lists the minimum requirement as a Pentium 133 with 32 megs of RAM. I actually tried the TripleBoard and TripleDAT on a P-100 with 16 megs of RAM, running Windows 95, and it did manage basic work with limited track counts, but moving up to a Pentium Pro 200 provided much faster operation. TDAT16-equipped systems require a minimum of a Pentium 166 with 64 megs of RAM, and either Ultrawide SCSI or UDMA EIDE drives for audio storage.

At this time, TripleDAT can still run on Windows 3.11, though the TDAT16 card requires Windows 95 (or 98); future versions of CreamWare products will likely require Win 95 or higher. Windows NT 4.0 is not currently supported, though CreamWare reports that it is the company's intention to support TripleDAT and other products on NT 5.0 when it becomes available.

TRIPLEBOARD INTERFACE CARD

The original computer interface card included with TripleDAT systems is called the TripleBoard (referred to as MMport when purchased separately), a 16-bit ISA card. Each TripleBoard has Toslink in and out connectors for connecting to external digital devices. There is also a ¼-inch TRS connection for the cleverly implemented optical remote transmitter for remote control of a DAT deck. Finally, there is a 25-pin connector for the remainder of the interface options using the supplied breakout cable, terminated with connectors for MIDI In and Out, and seven gold-plated RCA connectors providing one S/PDIF coaxial digital output pair and two S/PDIF coaxial digital input pairs, and stereo analog I/O. An optional version of the board (TripleBoard Plus) provides a pair of XLR AES/EBU ports in lieu of the S/PDIF.

The TripleDAT system manual contains a well-written and reasonably detailed description of the hardware and clear instructions for installation.

BY DAVE TOSTI-LANE

TDAT16 INTERFACE CARD

The TDAT16 is a plug-and-play PCI card providing two optical inputs and two optical outputs configurable as either ADAT optical connections or as S/PDIF Toslink connections. In addition, there is a stereo analog output on a ⅛-inch TRS jack, though there is no analog input. Installation of the card was easy: Windows 95 recognizes it at start-up and prompts the user to insert the provided driver diskette. Once installed, the drivers allow instant reconfiguration of the optical inputs and outputs in various combinations, including two ADAT in/outs, one ADAT and one DAT (or other digital S/PDIF connection), two S/PDIF in/outs, or Korg 168RC digital mixer. Clock source can be either internally derived, locked to either optical input, or locked to an external word clock connection via the supplied word clock input terminals. (These terminals can also be used to allow TripleDAT to serve as the word clock master source.)

I had no problems using the TDAT16 interface with a number of external digital devices, ranging from CreamWare's own A-16 converter to DAT, MiniDisc and CD connections. In addition, I found it easy to use the TDAT16 with other software digital editors on the same machine; it showed up as eight stereo wave devices in each case and worked without problems. The driver includes a meter bridge for the inputs, as well as faders for each input and output channel.

A-16 (AND A-8) AD/DA CONVERTERS

CreamWare has recently introduced two AD/DA converters for use with TDAT16. The A-8 and A-16 TDAT converters each take up one rackspace and share the same components, with eight channels of AD/DA and one ADAT in/out on the A-8, and 16 channels of AD/DA and two ADAT in/outs on the A-16.

Both feature balanced ¼-inch TRS analog connections, switchable to -10 or +4dB signals. Both the A-8 and A-16 are equipped with BNC in/out terminals for word clock, for master or slave operation. Front-panel switches select sync sources as either master (internal), optical or word clock, along with 44.1 or 48kHz sample rates. Optionally, the A-8 can be equipped with a second set of optical connectors for S/PDIF I/O as well.

I used the A-16 extensively and found it to be a high-quality, reliable unit. In terms of characteristics of the sound of the converters, I would describe them as clear and very slightly on the "warm" side, though this is an entirely subjective impression.

SOFTWARE

TripleDAT comes with a very nicely produced manual. In fact, this is definitely the first thing you notice, because the TDAT16 card and all the software ship inside the cover of the manual! Its loose-leaf format lays flat for easy use and is handy when those free updates arrive. The manual is quite comprehensive; the first 50 or so pages offer installation instructions and a brief tutorial.

Installation of the drivers for the TDAT16 board was handled by Plug and Play without difficulty. Installation of the TripleDAT software was similarly trouble-free. If one of the TripleBoard cards is used with the TDAT16, the driver installation is a bit more complex, as the TripleBoard is an ISA card, which is not a plug-and-play device. It is necessary to install the drivers for this card using the Install New Hardware icon in the Control Panel of Windows 95, using the Have Disk option.

RECORDING WITH THE ARRANGER

The Arranger and the Cutter (Fig. 1) are two main components of the TripleDAT workspace. The Arranger is the multitrack interface used for positioning bits of sound on tracks. The Cutter, as its name suggests, is for modifying single pieces of audio. Many of the most common operations—adding fades, trimming length, creating loops, duplicating bits of sound and applying DSP—can be done in either the Cutter or the Arranger. Each has its advantages for specific tasks.

Initially, I found the look and feel of the Arranger interface to be conservative and severe, but after working with it, I appreciated the layout to the point that I began using TripleDAT as the system of choice for most of my projects. This is largely due to the very good hardware and the ease of digital interfacing using ADAT optical connections, as well as the straightforward layout of the software.

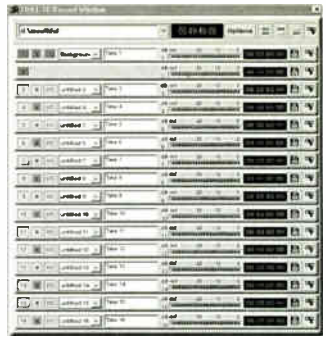


Figure 2: The Record Window

The actual file recorded to the disk is called a Take, while the basic building block in TripleDAT is the Sample, essentially an edited portion of the physical recording. When a sample is placed in the Arranger, it becomes a Region and can be manipulated, duplicated, changed in length, faded, chopped, sliced and diced at will, all nondestructively. To get sound into the system, you can record new tracks directly or import .WAV files from other editors.

Clicking a Record button opens the Record Window (Fig. 2), where you select the input track and the destination track for the region/sample you will be recording. The meters in the Record Window do not show input signal (and there is no signal routed to the monitor outputs) unless you are either in Monitor or Record mode and the "transport" is "playing." Although I found this somewhat disconcerting, you can display a "meter bridge" for the TDAT16 inputs and outputs that shows signals present at the inputs, regardless of Record mode. This meter bridge can be accessed via the system tray icon for the TDAT16, so it's available at any time.

Once you have completed recording, you can either drop all samples recorded on their predetermined destination tracks via a global Drop button, or you can drop individual samples using the Drop buttons for each input track. Need another take? Simply press Play again, and the system resets and begins recording at the starting point. You can also opt to save all takes as you go and choose the best one later.

On my Pentium Pro 200, with 64 MB of RAM and SCSI Ultrawide drives, I could easily record three minutes of eight new tracks while playing eight existing tracks. I also had no problem recording 12 new tracks in a single pass. In this test, while the display did not smoothly track the recording time, the software correctly applied the computer's resources to the

recording rather than to updating the graphics. In both cases, the system was able to keep up for the duration of the three-minute recording test. With a properly optimized P200 MMX or faster CPU with 64 MB RAM and UW SCSI drives, there would no problem handling 16 tracks of simultaneous recording.

Once a Region is recorded into the Arranger, you can manipulate it easily. The default display shows the Regions as blocks without the waveform displayed, but you can select waveform display with a couple of keystrokes. Hot keys or shortcut keys are available in TripleDAT; keys and their functions are listed at the back of the manual.

In the default configuration, newly recorded Regions are "frozen" in place, and you can edit the length of the Region (i.e. trim the silence from the beginning, shorten the Region to end at the desired point), but they remain locked into place relative to time. When the cursor is moved onto a frozen Region, it turns into an icon of a snowman. Left-click and select Melt from the pop-up menu, and the snowman "melts" away, leaving the Region able to be moved in time as well. As with other operations, you can Freeze or Melt multiple Regions by selecting them using the Shift-Left-click combination.

Three buttons in the control panel engage Snap modes, so that Regions can be located exactly to the beginning of another sample, to markers or to a grid that can be adjusted in size.

Markers are easily established by double-clicking in the Arranger or the Cutter, and they can be given labels that appear at the top of the Arranger. Markers can also be frozen in place if desired (and can be set to send remote-control signals to a connected DAT recorder if there is a TripleBoard in the system).

EDITING IN THE CUTTER WINDOW

Double-clicking on a region in the Arranger opens that sample in the Cutter. The Cutter allows detailed editing of the individual sample, including volume profiling, pan automation, looping and the same full range of signal processing that can be applied to a track in the Arranger. In the Cutter, however, it is applied to the individual sample (so, for instance, if you needed to apply compression to one portion of a vocal track at a different level than to the rest of the track, you could do so). Processing is still nondestructive in the Cutter, though you can merge the effects into a new sample if desired and replace the original sample in the Arranger with the new merged sample.

The Cutter is a very powerful tool, allowing easy modification of the sample by looping (still nondestructive) "blocks" of sound within the sample or establishment of new regions for the Arranger by selection within the Cutter. Modifications made in the Cutter are instantly reflected in the Arranger, and fades applied in the Arranger are shown in the waveform within the Cutter, as well.

The ease of setting up sample-based volume and pan profiles in the Cutter makes up for the lack of those functions in the Arranger, and the fact that the volume/pan changes are locked to the region rather than locked to a point in time is perhaps a plus, but I would still like to see volume and pan automation implemented within the Arranger, perhaps as an additional function for the Track-Mixer.

DSP AND OTHER FEATURES

Available in both the Arranger and the Cutter is a formidable array of signal processing power. The Effects Pool available in the standard TripleDAT package includes a Limiter, Compressor, Expander, Noise Gate, De-esser, 4-band Parametric EQ, Delay Processor, Room Simulator, Spectrum Analyzer, Phase Correlator, Time Stretch and Pitch Shifter. Purchasing the optional Fire Walkers package of FX plug-ins adds 8-band Parametric (with selectable filter curves for each band), complex Chorus (up to six delay lines and Amplitude Modulation for spatial effects and Tremolo), Flanger, a Signal Generator, VU Meter, FFT Analyzer and Dynamic Pitch Shifting/Transposing module. An optional Osiris package of sonic restoration tools adds a De-Clicking/Decrackling module and a Denoiser.

Last but definitely not least, TripleDAT includes fully featured CD-recording software, capable of producing Red Book and extended Red Book-compatible CDs, as well as Track-at-Once discs. (It is not currently capable of Mixed-Mode standard.) The CD-writing utility is used directly from the Arranger and can either produce a CD directly from a multitrack arrangement, or it can first produce an image file on your hard disk for transfer to your CD recorder. There is also an Emulate First, Then Write mode to see if there is a need to create the image file as an interim step.

REAL-WORLD TEST

I began using TripleDAT with some reservations. Initially, working with the original TripleBoard on a Pentium 100, I was surprised to see how well the real-time effects processing seemed to work, but with only the two analog inputs and two digital inputs, I didn't really feel like taking the time to learn the interface well enough to get over the difference from my usual editors. Then I switched to the Pentium Pro 200, and CreamWare shipped me the new TDAT16 card and A-16 interface. This was a huge difference: The program was much snappier on the PP-200, and suddenly having 16 in/out with the added capability to connect optically to various digital decks put the system in another category altogether.

Since that time, I've built two theatrical shows using the TDAT16 and TripleDAT, and I have to admit my initial reservations were misplaced. As I discovered the hot-key functions and explored the operations of the Cutter for producing loops and applying FX to portions of various samples, and added the Fire Walkers and Osiris packages, this system has become one that I turn to more and more for the majority of my projects.

CreamWare U.S. Inc., 446 Harrison St. Sumas, WA 98295, 604/435-0540; 800/899-1939, fax 604/435-9937. Web site: www.creamware.com. ■

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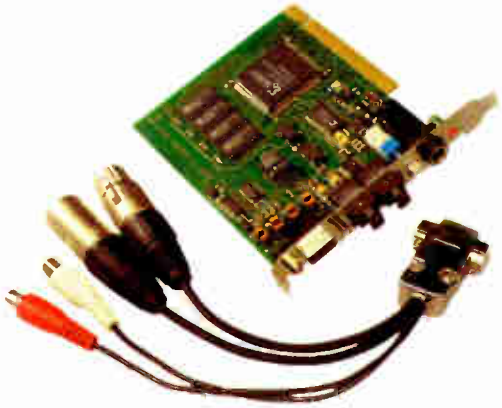

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KORG DL8000R/AM8000R

MULTI TAP DELAY, MULTI EFFECT PROCESSOR

After years of building guitar processors and onboard effects in its keyboard line, Korg has returned to the studio outboard market with the DL8000R Digital Multi Tap Delay ($600) and the AM8000R Ambience Multi Effect Processor ($600). The DL8000R is a dedicated digital delay line (DDL) with three stereo delay taps and a stereo feedback tap, with separate parameter adjustment for the left and right sides. The AM8000R is a multi-effects unit that also includes delay effects.

COMMON FEATURES

Both products are housed in a silver 1U rackmount enclosure, look almost identical, and feature 18-bit resolution and a sampling rate of 48 kHz with 128-times oversampling; both have a "lump-in-the-line" power supply, and are covered by one-year parts and labor warranties. There are 128 preset programs in ROM and a 128-program User area. One or all programs may be dumped to a MIDI device. Both units feature a pre-effect 3-band digital equalizer covering frequencies from 31.5 to 16k Hz, with high- and low-shelving and a fully parametric mid.

On the left front of both units is a ganged L/R input knob and an output knob (ganged L/R for the DDL, single for the FX unit). A Function knob is used to scroll through parameters in Program Edit and Utility modes; pushing the knob toggles between parameter and sub-parameter values. A Value knob changes parameter values in the editing modes and selects programs in the Program Select mode. Programs can change instantly or only when you press the Value knob. While editing, pushing the Value knob writes new presets and also activates the Compare function.

A large and attractive blue 12-character LED display can easily be seen from across the room and contains a five-segment L/R digital full-scale input level meter and various LED status indicators.

To the right of the Value knob is a WARP! knob, that can be assigned almost any parameter per program for real-time control. Turning the knob temporarily changes the value of the assigned parameter and thereby alters the sound, yet the original parameter value is not altered. Pushing the knob resets the parameter to its original value.

Both units have a cluster of four buttons and a power switch. On the DDL the buttons are Time/Tempo, Hold (the delayed sound continues to loop until you deactivate the function), Trigger and Bypass. On the FX unit the buttons are FX1, FX2, Delay/Reverb and Bypass. The DDL also has a Seamless mode, which determines whether the previous sound is cut off when you change programs.

On the back of each unit is an AC receptacle, MIDI In, Out, Thru jacks, and the following ¼-inch jacks: four miscellaneous jacks, L-R output jacks and L/MONO-R input jacks. The four miscellaneous jacks for the DDL are labeled Control, Trigger, Hold and Bypass. The jacks on the FX unit are marked Control 1, 2, 3 and Bypass. The Control jacks allow either unit's various parameters to be controlled in real time from a foot controller.

Over several months I used the DDL and FX units to process individual tape tracks from a DA-88 during recording and mixdown, occasionally using them on an entire mix. Material included male lead/background vocals, electric guitar, bass, keyboards and drums.

PARAMETERS GALORE

The 128 presets for the DDL consist mostly of multi-tap delays and echo, doubling, chorusing and flanging effects. I found the presets to be quite good, especially the chorus and doubling effects, which sounded very natural. The unit excelled when processing lead/background vocals and electric guitar. There are 205 editable parameters, and, by editing the presets, I was able to attain some very nice slapback echo, flanging and cross-delay effects, which worked well with keyboards and drums. The unit was very quiet in operation, and there was very

BY DOMINICK J. FONTANA

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little, if any, audible digital harshness or artifacts. I found the sound of the DDL outstanding.

The DDL has two modes for setting the tap times. In Time mode, you can set the delay times manually from 0.1 to 4,800 ms (4.8 secs). You can also set a pre-delay time of up to 400 ms. With a mono delay, you have a maximum delay time of ten seconds, which should suffice for most purposes. In Tempo mode, you can manually select from 50 to 208 beats per minute and use the Rhythm Pattern parameter, which takes note durations based on a quarter note to set the delay times and levels.

There are four ways to set delay times, regardless of which mode you are in: manually from the front panel, using MIDI clocks, using tap tempo (tap the Trigger key or a foot pedal connected to the Trigger jack), or using the Audio Trigger function, which detects an audio input signal in excess of a user-specified threshold and uses the time interval between two such signals to determine the delay time. Audio Trigger allows tremendous flexibility in setting the proper delay times to match the tempo of a song. You can get a ballpark delay time using one of the latter three methods and then tweak the time manually.

Other features include real-time control (eight parameters per program) using MIDI Continuous Controllers, Aftertouch, Pitch Bend, Velocity, Note Number, the LFO or the input signal envelope. A mixer section allows you to adjust the level and pan of each tap and of the overall delayed and direct sound, as well as adjust the direct/effect balance of all programs globally. The unit supports MIDI program change, control change, SysEx messages and MIDI mapping. Finally, there are options for the LED display and for changing L-R parameter values simultaneously.

40 EFFECTS ALGORITHMS

Turning to the FX unit, there are 40 effect algorithms, and up to three effects may be used at the same time; however, there are some restrictions. The effects are grouped into 29 general effects and 11 delay/reverb effects. Besides the Direct Signal bus, there are three effects buses referred to as FX1, FX2 and Delay/Reverb FX (D/R FX). You can only select a general effect type for FX1 and FX2 and a delay/reverb effect type for D/R FX. For FX1 and FX2, you can choose from the following: chorus/flanger, two delays (modulation, tape), phaser, pitch shifter, ensemble, Doppler, two simulators (horn, rotor), tremolo, two modulators (ring, talking), resonance filter, "wah," comp/limiter, gate, early reflection, saturator, 3-band EQ and ducker. The effects that can be assigned to D/R FX are six delays (long, tempo, stereo, cross, L/C/R, multi-tap) and three reverbs (room, hall, plate).

Each effect has one of four possible I/O routings as an integral part. The routings are mono in/mono out, mono in/stereo out, stereo in/stereo out and dual in/dual out (stereo I/O, but you can set the parameters for the L and R channels independently). So, for example, the phaser effect can have mono, stereo or dual I/O, but it represents three out of the 40 effects. The three effects are basically the same, differing only in their preconfigured I/O routing. If you don't count the different routings, there are actually 29 effect types to choose from.

For each FX bus you can select an effect type and a source. You are given some flexibility, but not total control, over the order of the effects

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and the source. FX1 is always first, and it's necessary to set the signal path parameter to determine whether FX2 or D/R FX comes next in the chain. Plus, the direct input signal can be processed with the built-in pre-effect digital EQ. For instance, you can treat vocals with EQ, send it to a compressor (FX1), then a chorus (FX2), and then to a reverb (D/R FX), but you can't use one of the six delays with the reverb at the same time. The Mixer parameters allow you to set the output level and pan of each bus individually as well as globally, and the three front panel buttons allow you to turn each effect on or off.

The presets sounded good, but to achieve the best results you have to tweak some of the 477 parameters. The horn and rotor simulators did a pretty good job of emulating a Leslie speaker cabinet, and the 3-band EQ and resonance filter are very versatile and allow for many variations of high-cut, low-cut and bandpass filters. There are also some very handy but less common types of effects, such as Doppler, Ducker and Ensemble (three internal chorus units). The reverbs sounded very good; I just wish there were more of them. And while the 12 delays don't offer as much flexibility as the dedicated DDL, they were still very versatile and sounded great. The pitch shifter was just average, and the distortion effects were not very effective with electric guitar. But the unit was very effective for treating vocals.

All of the real-time control features of the DDL also apply to the FX unit, except you can't select LFO or the input signal envelope as a global controller. However, some of the effects do use the input signal and LFO as part of their algorithms.

WISH LIST

My complaints are few and relatively minor. I wish there were dedicated buttons to enter the Program Edit and Utility modes so that you could switch back to the Program Select mode by pushing one button. Instead, you have to turn the Function knob to scroll through the parameters and then scroll back to return to Program Select mode. I also found that occasionally when I pressed the Function knob to get to a sub-parameter, the knob would turn a bit first (thereby selecting the next main parameter) and present me with the wrong set of sub-parameters. A dedicated Compare button and separate program number display would have been nice. Also, some of the characters used as note graphics in the editing display were difficult to decipher.

However, my biggest complaint concerns the manuals for both units. They are very sketchy, and it is assumed that the user already knows how delay lines and multi-effects work. They just give you a block diagram and the basics of operation/connection and then go right to the Appendix, which contains all of the editable parameters. And many of the parameter descriptions are not very thorough. So it takes a bit of work and trial and error to edit the presets. A Preset Program List sheet is included with both units, but they simply list the Preset number and name. A listing of the effects and parameter settings that make up each preset would have been a welcome addition.

COMPLEMENTARY UNITS?

I give both units a thumbs up. They sound great, are quiet, have impressive features, tons of parameters, a nice interface and are good value for the money. And the WARP! knob is a nice touch. However, I was surprised there were only three reverb algorithms but 12 delay effects in the FX unit. If there were 12 reverbs and three delays, then I think this unit would have made a better companion for Korg's delay unit: If you buy both units, you'll be loaded with delay effects but only have three reverb effects. Then again, that might be just what you need. But if you're looking for reverb variety, the FX unit would probably not be my first choice for a primary reverb. And since there is some redundancy between the units, they should probably be thought of less as complementing one another and more as two distinct products.

You'll find many uses for the dedicated DDL, even if you already own a number of multi-effects units. And if you already have a primary reverb, then the FX unit will provide you with many other types of useful effects.

Korg USA Inc., 316 S. Service Road, Melville, NY 11747. 516/333-9100. Web site: www.korg.com. ■

Dominick J. Fontana is an attorney in New York City. He moonlights as the owner/operator of "Studio di Fontana," a multitrack/MIDI recording studio. He can be reached at Fontana@cis.compuserve.com.

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dCS 904 AND 954

96/192KHZ A/D AND D/A CONVERTERS

With a growing number of workstations and hardware systems providing 24-bit/96kHz capability, the market for high-performance outboard converters is definitely on the rise. However, digital can be a dangerous investment. Buy into one format or technology, and pretty soon something new comes along and you're stuck with a doorstop. But one company has come up with some innovative approaches that deal with both the hardware upgrade problem and the dodgy problem of "How do I afford state of the art?"

Made by British company Data Conversion Systems, the dCS 904 and 954 (retailing at $7,500 each) are reference-quality, 24/96-compatible A/D and D/A converters for critical recording, playback and mastering applications. The dCS converters are largely software-driven, which means that updates may be loaded via simple chip swaps, and an assortment of daughter cards add new functionality. For example, the converters originally had no Sony/Philips Direct Stream Digital bitstream capabilities, but a simple update now provides DSD interfacing and 192kHz operation as standard. Price is another concern with digital purchases, but dCS's American distributor, Canorus, offers the 904 ADC or 954 DAC on a 36-month lease plan, which works out to $260 a month, including free updates.

Housed in single-rackspace chassis, these full 24-bit wordlength stereo converters have deceptively simple front panels that provide immediate access to numerous parameter settings and functions. These include sampling frequency selection (32/44.1/48/88.2/96/176.4/192 kHz), four user-selectable anti-imaging (DAC) or anti-aliasing (ADC) filters, and digital signal generator functions. The 904 ADC adds switches for signal muting, super noise-shaped (SNS) truncation (from 24 bits to 16 bits in single-bit steps) and overload level setting. Also on the 954 DAC's front panel are buttons for choosing any (or all) of the four AES/EBU input sources, and switches for mute, coarse lock, phase and de-emphasis. Video sampling frequencies—44.056 kHz, etc.—are optional.

A Last State memory stores the unit configuration during power down, and a Panel Lock function prevents accidental or unwanted changes to parameter settings. Both units can be used in a master/slave mode, in which the front panel of one unit controls the parameters of other units in multiple-converter applications, all synchronized to an AES/EBU or SDIF-2 word clock reference. For convenience, both units provide a serial port for connecting a PC for controlling the converters' functions via remote control. New software should be available around press time.

On the 954's rear panel, analog connectors are a set of unbalanced -10dB RCA output jacks and two balanced XLR outputs, with two recessed, 20-turn precision potentiometers for precisely calibrating the output levels. On the digital side, there are four XLR AES/EBU outputs, an AES reference digital out (mainly for synching other gear), as well as two BNC clock ports that are software-configurable to provide SDIF-2 word clock for sync or to TTL-level AES/EBU data (up to 196 kHz). The back of the 904 features balanced XLR inputs with input sensitivity trim pots, four AES/EBU outputs and a pair of AES/EBU reference I/Os on XLRs, as well as the configurable BNC pair.

Rather than the common ADC/DAC approach of merely placing some off-the-shelf chipset in a box, the attention to detail and quality of construction in the dCS units are impressive, resulting in low noise (-110 dB with 0 dBFS signals) and linearity to 29-bit precision. The converter is a proprietary dCS-designed 5-bit oversampled, discrete-component implementation using continuous time circuitry, rather than switched capacitors. Jitter is reduced to ultralow levels through voltage-controlled crystal oscillators (VCXOs) and a dual-bandwidth phase-locked loop combined with a proprietary clock recovery circuit. One nice touch on the 904 is that the main outs are electronically balanced using discrete components operating in Class A.

Products that are compatible with the dCS converters in both 24/96 and 24/192 mode include the Augan OMX24, Genex GX-8000, Nagra-D, Sonic Solutions DAWs and the SADiE Octavia. I tested the dCS units with a Nagra-D, equipped to handle both 96kHz and 192kHz recording/playback, but I started my critical listening tests with various sources (analog 2-track and live performances) routed through the 904 ADC fed directly into the 954 DAC.

No matter what tests you run, this is the ultimate: Make your direct A/B comparisons between the I/O pathways of a digital converter set and eight feet of Mogami cable. If you've

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never tried this before and have quality monitors (in my case I was using a recently recalibrated pair of Meyer HD-1s), the results can be quite revealing. This back-to-back ADC/DAC pairing at 24/96 sounded as close to a straight wire connection as I've ever heard from a digital datastream, with all the transparency and punch intact, both on tough transient sources and ultralow-level inklings of reverb tails from the decay of grand piano. Repeating the same tests using the converter sets in a pair of studio DATs was, well...less successful. The difference between the DAT chain and the Mogami wire was striking and obvious to anyone who listened, while the difference between the 24/96 dCS chain and the straight wire was subtle.

A more real-world test involved using these converters in 16-bit, 44.1kHz mode. On CDs ranging from Mozart to madrigals to Monk to metal, the 904 offered exquisite performance, with a spaciousness and clarity that are not typically part of the CD experience. And the results when recording an acoustic ensemble—guitars, cello and dulcimer—direct to DAT via the 954 were equally impressive, especially

Nagra-D V.2.0

NOT YOUR FATHER'S NAGRA...

Used as a storage medium for our dCS 96/192kHz converter tests, the Nagra-D 4-channel, reel-to-reel portable digital recorder was introduced in 1992, but recent developments have kept the deck not only up to date, but ready for the future. Interestingly, the machine's current $22,000 base price is $3,000 less than it cost six years ago, so while the Nagra-D is not cheap by anyone's standards, it is a Nagra, and it's hard to imagine a more robust, road-tough recorder for location use.

The new Version 2.0 software adds some impressive touches, such as support for using external converters for two tracks of 96kHz recording (or 192 kHz using the dCS 904/954), as well as the ability to lock two Nagra-Ds in sample-accurate sync for 8-channel applications. Other Nagra-D features remain the same, such as: 24-bit resolution (the stock onboard converters are 20-bit), support of 32/44.1/48/64/88.2/96kHz sampling, two AES/EBU I/Os (two channels each), four analog inputs (line/mic switchable with 12V, 48V or T-powering), four XLR analog outputs, confidence monitoring, SMPTE timecode in/out (with full chase sync), BNC video sync port, and four illuminated, microprocessor controlled meters. The four onboard mic preamps are high-quality and include switches for phase (polarity) invert and three-position highpass filtering.

The machine records on low-cost digital tape providing an hour of recording (4-channel/48kHz or 2-channel 96kHz) on a 5-inch reel of tape costing about $15. Alternatively, the deck can accommodate 7-inch reels, which dou-

—CONTINUED ON PAGE 164

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.

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- **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
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when paired with the 904 playback.

But the most illuminating part of the tests was recording and listening to 96 and 192 kHz by storing the stereo AES/EBU output signal on four channels of Nagra-D. Best of all, the Nagra D offers over an hour of high-bit/high-rate storage on a 5.25-inch reel of digital tape that costs about $15. Here, predictably, the difference between 48 and 96 kHz was more apparent than the 96 to 192 jump, but (as Fox Mulder would have you believe) "There *is* something out there." Even when reproducing an instrument as simple as a djembe—something not known for its sparkling highs—the drum just sounded more alive at 192 kHz, especially in the snap of fingers along the rim. Piano was more persuasive, but at both 96 and 192, there was an increase in the amount of midrange detail, more reality. Back to the acoustic ensemble (recorded at 24/192 this time), the soundstage imaging almost allowed me to hear where the cellist's hair was parted. Ooooo-we!

The bottom line here is that these dCS boxes are very cool, very versatile—and very expensive. Perhaps the leasing plan can help in getting over that hurdle. Mastering houses will always need no-compromise, pristine processing, but I also have a feeling that more and more workstation users will begin turning to external converters for their front-end/back-end processing, especially as new formats put higher-resolution playback systems into the hands of "average" consumers. Anyone who's been disappointed with the "sound" of digital and is looking for a workable solution should audition these. They might just change your mind.

Nagra products (for music production applications) and dCS gear are distributed in the U.S. by Canorus Inc., 240 Great Circle Road, Suite 326, Nashville, TN 37228; 615/252-8778; fax 615/252-8755. Web site: www.canorus.com. ■

—FROM PAGE 162, NAGRA-D V.2.0

bles the recording time.

One of the machine's most useful features is its extensive menu system for storing operational presets, allowing a high degree of customization to suit specific needs. Programmable parameters range from the utilitarian sampling and reference frequencies, tape speed, I/O source (analog or digital), frame rates, etc., to more esoteric tweaks such as the user determining the deck's tape winding speed. Beneath the Nagra's top plate, a DIP switch sets less frequently accessed functions such as record inhibit, menu lockout and auto play when TC lock occurs.

The Nagra-D's large degree of microprocessor control is taken one step further by the optional NADCOM software, which runs on any DOS-compatible PC. NADCOM turns the host PC into an intelligent autolocator for the Nagra-D, with fingertip transport control, along with fault diagnosis, tape directory management and the ability to store take numbers, session notes, running times, etc., on the head of the tape. The best thing about NADCOM is that it gives the Nagra-D almost workstation-like operations with quick directory access to various takes, while retaining its flexibility as a rugged, great-sounding location deck. This is definitely *not* your father's Nagra. —*George Petersen*

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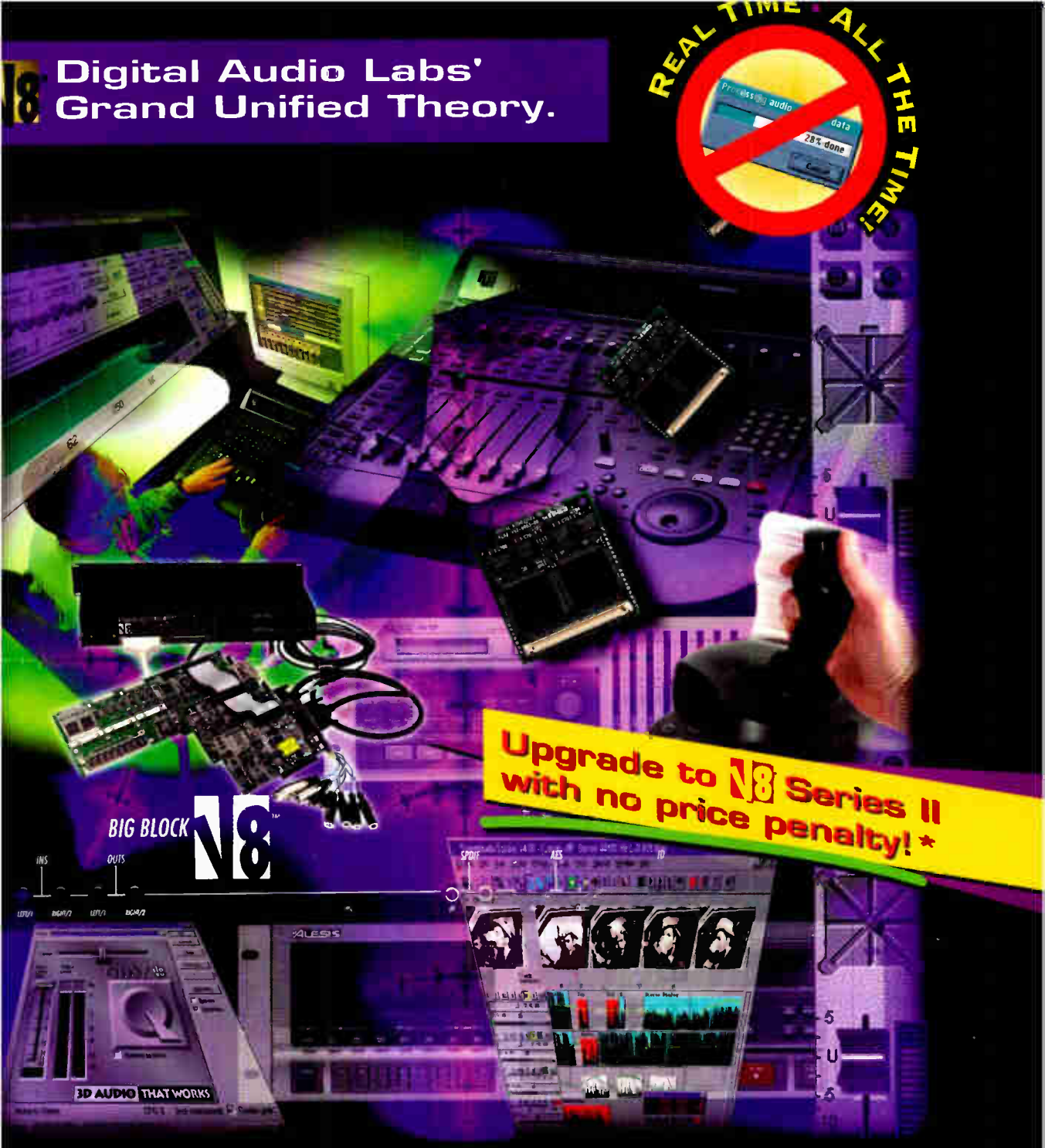

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APOGEE ELECTRONICS AD-8000

8-CHANNEL 24-BIT CONVERTER

Over the past few years, the Apogee AD-1000 has been an icon for high-quality digital audio. Its dual-channel, low-jitter, 20-bit A/D converters come loaded with Apogee's acclaimed Soft Limit® circuitry and UV22® processing, numerous interconnection and synchronization facilities, and a host of options including a 20-bit PaqRat mode. In my mind, there are only two drawbacks to the AD-1000: It's pricey ($3,790 for the basic unit plus power supply), and it is doomed for eventual obsolescence in a world careening towards 24-bit audio.

Apogee's AD-8000 8-channel converter inherits most of the AD-1000's features, but arrives at a drastically reduced per-channel price (around $750). The converters have also been upgraded to 24-bit, metering has been drastically improved, and monitoring facilities have been added.

CONNECTING TO THE OUTSIDE WORLD

The AD-8000 is two-rackspace, but when I tried to install the unit the front face measured *exactly* 19 inches across, and not a millimeter less. This proved too tight a fit to squeeze into either of my two Four Designs 20-space FX Racks, but no problem for the rails in my Omnirax MixStation/02R. Apogee has since reduced the chassis width by 1mm.

Except for the front panel headphone jack, all connections are made on the unit's rear panel. Eight XLRs route line-level analog to the eight 24-bit A/D converters, and the connections accept balanced or unbalanced sources. Digital I/O options are numerous, including four AES/EBU XLR outputs, coaxial S/PDIF I/O on RCAs and options for up to four AMBus cards. AMBus stands for Apogee Multimedia Bus, and five flavors are currently available: ADAT 8 (8-channel Alesis lightpipe I/O, $495), TDIF 8 (8-channel Tascam I/O, $495), DIGI 8 (8-channel Pro Tools I/O, $495), AES 8 (eight channels of AES I/O and bit-splitting, $795), and Fiber DX (AT&T true glass, fiber-optical I/O, for long-distance transmission over more than three miles, $495). You can install up to four AMBus cards in the rear of the unit, mix or match to your heart's content and the cards perform automatic format conversion and reclocking. Cables are not provided with the cards.

Options are not limited to AMBus cards, however. My review unit was loaded with an ADAT 8 card and the optional DAC VIII 8-channel, 24-bit D/A card ($1,595). The DAC VIII uses a cable fitted with a DB25 connector on one end and an 8-XLR fanout on the other, wired to Tascam DA-88 pin-out. Other options include the DAC II stereo 24-bit D/A ($495), and a video sync module ($395) for ±0.1% pull up/down control. The video sync module, DAC II and DAC VIII mount internally, and don't require AMBus slots. SDIF and Sonic Solutions cards will probably be available by the end of the year. A sample rate converter may also be offered in the future.

Rounding out the AD-8000's rear panel are BNC connectors for word clock I/O and video (PAL, NTSC, Mono) sync input, an IEC detachable AC cord, and ten DIP switches. The latter perform a variety of functions: selecting +4dBu or -10dBV line levels, UV22'ing to 16 or 20 bits, setting the number of full-scale samples (from one to four) to trigger the front panel Over indicators, analog/digital DC removal, pin 2/3 hot and enabling Autosync, which automatically syncs the AD-8000 to any digital input that's active; word clock or video sync users should flip this DIP switch off.

GETTING YOUR BEARINGS

Navigating your way around the AD-8000's front panel is a breeze once you get to know the unit, but this takes a good three hours or more of study if you're approaching the unit "cold." The front panel screening is a bit confusing, and related controls are not always grouped together. The new user would greatly benefit from the addition of a couple of screened boxes dividing closely grouped, unrelated controls, and more consistent identification of buttons in the owner's manual. None of the front panel buttons has titles directly on it—if they had, a new user would be up and running in a fraction of the time it now takes. But once you

BY MICHAEL COOPER

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Waves' famous L1 Ultramaximizer software plug-in has been used on thousands of CD masters and records, and on millions of game and movie sound-effects all over the world. Now it's twice as good featuring 48-bit and 96kHz-capable signal processing. Plus it comes in a box! The new L2 hardware rackmount can be taken with you and patched in wherever you go, to any world-class mastering house, live-sound venue, recording studio, broadcasting station or wherever else your ears may desire.

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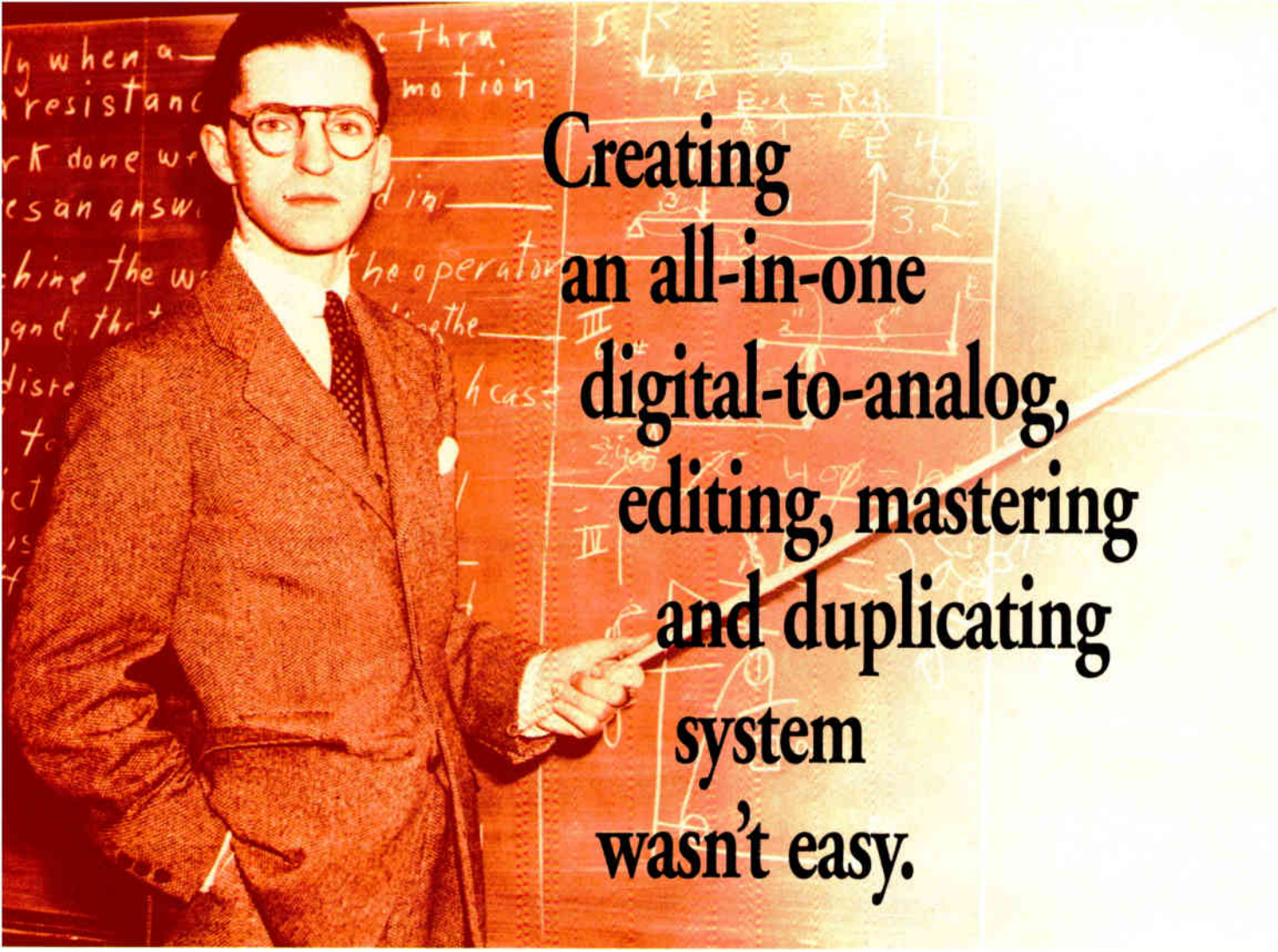

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sort everything out, operations are straightforward and fast.

Digital inputs are always assigned in pairs to adjacent channels; you specify whether AES/EBU, S/PDIF or any of the four AMBus card slots serve as the source. Presently, you can only select one digital source to feed any (or all) of the channel inputs. A promised future firmware upgrade should enable up to four different digital sources (e.g., AES/EBU plus three AMBus cards) to be routed at once. Three front panel LEDs indicate the bit depth (16-, 20- or 24-bit) of the active digital input.

Any channel that does not have a digital input assigned to it is automatically enabled to receive analog audio, unless it's muted. You can mute individual channels, even if their source is digital. This sends "digital black"—clock but no sound—to the selected channels. You can also assign a combination of analog and digital sources to the eight input channels, but each channel can receive only one source at a time (no summing allowed). Track bouncing is also not yet possible, so you can't route channels 1 and 2 of one AMBus card to channels 3 and 4 of another AMBus card, for instance.

An 8x7-LED matrix indicates what source (analog or any digital) is feeding each of the eight channels. The eight columns show the input channels and the seven rows show the possible sources. A ninth column shows destination outputs for all eight channels. As virtually all available output ports are simultaneously hot (and automatically perform format conversion as needed!), this display is mostly useful for reminding you which options you have installed. You can't route signal back to the same AMBus slot that you're monitoring via the front panel headphone output; that would be a recipe for a feedback loop to occur. Also, the S/PDIF output is not active when you're monitoring the AES input directly from the headphone's DAC (more on this in a bit).

Front panel settings are retained when you cycle the power on/off, unless your source is AES/EBU. In that case, an apparent bug resets the unit to its system defaults. Apogee informs us that this has been since corrected.

SYNCHRONIZATION

The AD-8000 can sync to its internal crystal, word clock, AES/EBU, S/PDIF, any of the four AMBus card slots, or—with the addition of the video sync module—to PAL, NTSC or black and white video sync. The unit can sync to 32 to 54kHz sample rates (and pull-up/down with the optional video sync module), and a lock indicator confirms when sync is achieved. A future upgrade path to 88.2 and 96 kHz is planned, though how it will be done has not yet been decided.

PROCESSING OPTIONS

Apogee's proprietary UV22® processing can be applied to the digital bitstream of any (or all) individual channel(s) that have an analog input source, or to pairs of channels fed by digital inputs. When recording to 16- or 20-bit devices from the AD-8000, adding UV22 processing "modulates" data from the least significant bits (that would otherwise be lost via truncation) onto higher bits in the word, reducing requantizing distortion and preserving high-resolution detail. The AD-8000 provides both normal and low UV22 settings, the latter setting for multiple passes. (Using the normal setting more than once can degrade signal-to-noise in the high frequencies.)

On full-scale recordings, the UV22

effect is extremely subtle but can be heard as an analog-like smoothing of the sound. The effect is a lot more dramatic on audio portions recorded at -40 dBFS and lower (e.g., reverb tails and program fade-outs), providing an airier, clearer and cleaner sound. Good stuff.

Each of the AD-8000's channels also have independent access to Apogee's proprietary SoftLimit® processing. The SoftLimit circuitry is an analog peak limiter, positioned before each of the ADCs (therefore not available to digital inputs). The threshold for each limiter can be adjusted with trim pots located on the analog circuit board. SoftLimit not only all but eliminates DAT "overs," but it's extremely transparent. The loudness, fullness and beefy punch that SoftLimit lends to drums, bass and stereo program material is downright awesome, tightening up the bottom end without pumping or unpleasant spectral smearing. Eight independent channels of SoftLimit processing is a serious asset.

METERING

The AD-8000's outstanding metering facilities consist of 21-segment, multicolored LED ladders and "over" indicators/counters for each channel. Six metering modes offer various ballistics in conjunction with peak metering: simultaneous peak and average with two-second peak hold, simultaneous peak and average with infinite peak hold, peak and average (no peak hold), instantaneous peaks along with two-second highest peak hold, instantaneous peaks with infinite highest peak hold and peak levels with no hold.

The AD-8000 not only indicates "overs" for each channel, it counts them! You can set the number of full-scale consecutive samples (from 1 to 4) required to increment each overs counter, and either manually or automatically clear the counters. Or turn the overs counters off, if you wish. Peak levels can also be cleared manually.

CALIBRATION

The AD-8000's analog front end incorporates a gain stage with 20 dB of gain, which can be trimmed to unity via front panel trim pots, accommodating very high input line levels (up to 27 dBu). The unit offers an analog input calibration mode in which the entire range of the meters becomes 2 dB and each LED ⅒ dB. You can tweak the trim pots for -12 to -20dBFS reference levels in 2dB steps. The hotter levels are useful for mixing/mastering applications, using the SoftLimit processing to prevent overs and to deliver in-your-face mixes.

Another switch activates a digital oscillator, which outputs a 1kHz sine wave (adjustable from -12 to -20 dBFS in 2dB steps) on all available digital outputs. This is useful for troubleshooting vanished connections and for printing extremely accurate alignment tones.

MONITORING

The AD-8000 features a ¼-inch stereo headphone jack with output level control—fed by an 18-bit DAC—for monitoring any channel pair. The monitor select button cycles through channels 1/2, 3/4, 5/6 and 7/8, simultaneously routing those channels to the S/PDIF output and optional stereo 24-bit DAC II card. Only one pair of channels can be heard at a time. But happily, you can also route the onboard AES input directly to the headphones and DACs, allowing you to bypass the stock converters on your DAT machine.

Destination mode provides confidence monitoring. In this mode, the

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meters always reflect input levels but what you hear is actually monitoring the returns. Listening via the headphones jack, you simultaneously hear previously recorded tracks and new tracks being laid down on your MDM or Pro Tools system. You can cycle through all four AMBus slots to monitor all channel pairs—one at a time—in your 32-track setup. The audio is simultaneously routed to all available outputs: AES/EBU, S/PDIF, DAC VIII, DAC II and all AMBus cards except the one you're monitoring with the headphones.

BIT-SPLITTING MODES

If your setup includes 16-bit MDMs, use the AD-8000's bit-splitting modes to record six channels of 20-bit audio or four channels of 24-bit audio onto eight tape tracks. The 24-bit mode sounds absolutely incredible. I had my first experience recording 24-bit audio around a year ago and have not recorded a single 16-bit track since. Yes, the clarity and transient detail are enhanced in 24-bit mode. But what I find most compelling is the increase in depth and nuance. The 24-bit tracks sound more 3-dimensional and *real*. It's uncanny. You'll be addicted, I guarantee it.

CRITICAL CONVERTER COMPARISONS

I made an A/B/C comparison of the AD-8000's converters with those in the Alesis XT20 and my Yamaha 02R console. For my tests, I recorded male lead vocals with a Lawson L47MP tube condenser microphone patched through a Millennia Media HV-3 preamp (a dynamite combo, by the way). The vocals were recorded via the three converter sets to a 20-bit ADAT XT20. Eight ASC Studio Traps™ were arranged around the singer to even out the tracking room's frequency response. Control room monitoring used an ASC ATTACK Wall.

Playback of the A/D tests were via the same converters: the 02R's 20-bit D/As. The AD-8000's A/D converters won hands-down, producing vocals with more midrange clarity, transient detail, nuance and depth than the competition. (FYI: The 02R's 20-bit converters slightly outperformed the XT20's 24-bit converters in the same categories.)

D/A comparisons were made by playing back a 20-bit track that was recorded with the AD-8000's converters. Here, the AD-8000's DAC VIII converters proved superior, once again offering the most clarity, detail, nuance and depth (but the XT20's D/As edged out the 02R's).

CONCLUSIONS

In this MDM-dominated world, it's no coincidence that the Apogee AD-8000 is an 8-channel unit. If you're looking to upgrade the front end of your signal chain to a world-class standard, the AD-8000 will take you there. $5,995 (for the basic system) is not chump change, and the various options add up quickly, but look at what you get: eight premium-quality, 24-bit converters; eight world-class, analog peak limiters; eight channels of cutting-edge UV22® processing; 24-bit and 20-bit recording capabilities, with support for 16- and 20-bit recorders; automatic format conversion between AES/EBU, S/PDIF and sundry multitrack formats; synchronization facilities for any application from music production to post; extremely comprehensive and accurate metering; useful onboard monitoring; and enough interface/interconnection options to handle almost anything. This is one situation where you *won't* hear the Taco Bell dog say "I theenk I need a beeger box."

Apogee Electronics, 3145 Donald Douglas Loop South, Santa Monica, CA 90405; 310/915-1000; fax 310/391-6262; Web site: www.apogeedigital.com. ■

Michael Cooper is a recording engineer, producer and owner of Michael Cooper Recording, which recently relocated to the resort town of Sisters, Oregon.

The very name evokes a sense of power and control normally associated with high-performance automobiles. And rightfully so, as KRK's latest incarnation of the active studio monitor strikes the necessary balance—much like a fine-tuned engine—between the power and control you need in today's studio environment.

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CAD VX2

DUAL VALVE CONDENSER MICROPHONE

If there were a beauty contest for microphones, the CAD VX2 would take first prize. But behind the striking blue, painted finish and gleaming nickel-plated trim, there's a lot going on. With its dual vacuum tube electronics and interchangeable capsules, the VX2 breaks new ground in mic design. This is a serious studio tool and deserves serious attention.

From the outside, the VX2 is simple enough. Switches on the mic body select polar pattern (figure-8, cardioid or omni), 80Hz bass roll-off in/out, and -8/-16dB (non-capacitive) pads. The mic ships with a large, locking shipping case, a 30-foot, 7-conductor tube mic cable (with gold-plated Neutrik XLRs and Gotham cable), external power supply and a high-quality custom shock mount.

The Optema™ series OS-125 capsule that ships with all VX2s is a true condenser design and features two hand-tensioned, gold-sputtered, large-diameter, 3-micron polymer film diaphragms. While some may debate over what size really denotes a "large diaphragm" design, the OS-125 diaphragm has a whopping 1.25-inch diameter—*inside* the tensioning ring!

Access to the inside of the mic is simple: Remove the switch bezel and two screws at the bottom of the mic body. Inside, the electronics are cleanly laid out. The shock-mounted tube PCB and two large nickel core transformers are appreciated touches and indicate that this mic is here for the long haul.

The VX2 name is an abbreviation of valve-times-two. According to CAD, the two-tube approach allows a 12AX7 used as the head tube to be optimized for low noise, while a 12AU7 output tube is optimized for driving the transformers and cables. (The mic I tested used an equivalent tube, the mil-spec JAN 5814A in place of the 12AU7.) The dual-tube concept also avoids the necessity for a solid-state output section. The net result is a mic design that offers a relatively flat, wide-ranging response and an EIN spec that's an impressive 13 dB (cardioid, A-weighted).

The blue, aluminum mic cover has vents cut into the back surface, and the mic remains fairly cool, even after hours of use. The external power supply contains the mic input and XLR output jacks, along with an AC power switch, 115/230 VAC selector and a card slot for a 24-bit A/D converter option, slated to be available this fall. The power supply is half-rack-sized but, with no threaded inserts on the bottom of the chassis, can't easily be attached into a generic rack shelf; also, there are no rubber feet on the PS bottom, so the unit can slide around if the input or output cable is moved. A few inexpensive stick-on rubber feet would be a real improvement—perhaps CAD could include them in future VX2 shipments.

The shock mount is a massive affair, but given the VX2's 30-ounce heft, the shock mount had better be substantial. There is no way to mount the mic without the shock mount, so I liked the fact that the mic is stored in the case with the shock mount attached. In session use, the shock mount handled its duties effectively and did not transmit foot stomps or stage/floor vibrations to the capsule.

INTERCHANGEABLE CAPSULES

The VX2 is among those few tube mics that offer a choice of interchangeable capsules. The model ships with the Optema™ series OS-125 described above, but CAD has just released the OS-110 ($595) as an alternative capsule option, and the company is looking into other interchangeable capsules. The phrase "interchangeable capsule" is somewhat of a misnomer, as these are complete head assemblies, including capsule and grille. Changing the capsule requires little more than removing three screws, removing one head assembly and replacing it with another. Under the head assembly, three spring-loaded gold pins make a secure connection as soon as the capsule is in place.

In session, the VX2 requires little more than placing the mic on a sturdy stand, connecting the mic to the power supply, choosing the pattern and/or any desired filter/pad settings, and starting tracking after a few minutes of warm-up time (five or ten minutes will suffice). I had a pair of mics, so I began my tests with the OS-110 on one mic and the stock capsule on the other. After recording a variety of instruments—percussion, grand piano, vocals, acoustic and electric guitars, and drums—the differences between the two capsules were evident.

Compared to the OS-110, the stock OS-125 capsule has a

BY GEORGE PETERSEN

on – At the world famous
y Road Studios. "Our GX8000s
between the studios and on
ion for use on a wide range of
cts." Neil Aldridge, Chief Engineer.

ashville – Mastering the new George Strait album at
ryetown Masters. "Everyone was astounded when
y heard it at 88.2kHz compared to 44.1kHz. Its
iability has also been amazing." Denny Purcell.

Montreal – Major multinational TV production company
CINAR uses its GX8000s in a variety of applications.
"By recording at the maximum possible dynamic range, we're
preparing for new formats as they become available."
François Deschamps, VP of Studios.

London – Digital Audio Technology supplied its 48 track Genex
system for 20-bit location recording at the Glyndebourne Opera
Festival. "The ability to access remote drives made the continuous
recording of a two and half hour performance possible. It
couldn't have been done with tape." Ian Silvester, Owner.

Hollywood – Recording the new 20th
Century Fox fanfare at the Newman Scoring
Stage. "We liked the sound of the live mix
so much that we didn't remix it at all." John
Kurlander, Grammy award winning Scoring Mixer.

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smoother overall sound, with ample bottom end (going *way* down, below 20 Hz) and a nice, round proximity effect in cardioid that added fullness, warmth and a bigger-than-life quality to close-in vocals. The top end goes out to 20 kHz with a 4dB peak around 16 kHz that provided a sheen to triangle, finger cymbals and hi-hat without edginess. And though not as fast as you'd expect from a DPA or B&K model, the transient response on both VX2 mics was excellent—even on difficult-to-reproduce sources such as small orchestral triangles—which was somewhat surprising, given the VX2's combination of a very large capsule with tube electronics.

The optional OS-110 capsule has a more aggressive, in-your-face sound, which was particularly apparent on electric guitars, where it excelled. The degree of proximity effect in cardioid was far less pronounced than in the OS-125, but the OS-110 definitely has more presence in the upper mids, which made certain instruments stand out in the mix without the need to EQ or add gain. For example, the OS-125 had a natural sound that was ideal for solo grand piano, while I preferred the OS-110 tracking that same piano for a rock tune where it needed a little more bite to compete with guitars and synth lines in that same midrange band.

Similar observations applied to lead vocals: I preferred the OS-125 on female vocals, hands down. In almost every case when tracking male vocals, the OS-110 added just enough spark to bring the vocal out, unless I was looking for that creamy Barry White effect. Given a choice between the two capsules, I would choose the stock OS-125 model, but having the option of changing the mic's sound via a $595 accessory is one of the VX2's strong points.

CONSISTENT FREQUENCY RESPONSE

The VX2's frequency response is remarkably consistent between the cardioid, figure-8 and omni settings, an impressive accomplishment. Typically, figure-8 settings are rarely used in studio mics, but I really liked the VX2 at this polar pattern, where it was warm and smooth, much like the cardioid setting. The grilles on both mics provide an open sound, with protection from vocal pops, as long as the vocalist is at least four to six inches away from the grille.

I also had the opportunity to try two VX2s (using OS-125 capsules) in stereo miking applications. Due to the size of the mics, placing the capsules in a tight near-coincident arrangement can be tricky but well worth the effort. On a guitar duet (with hand percussion), recording to 20-bit/48kHz ADAT M20 via Millennia HV-3 preamps, the results were excellent, spotlighting the mics' low 13dB noise floor, while offering a chance to really hear minuscule details and harmonics, even from 10-feet back. Sweet!

At a retail price of $2.295 (including case, power supply, cable and shock mount), the CAD VX2 is a superb studio mic that compares to competing models costing twice as much. By combining its great sound, innovative dual tube design, alternate capsule choices, 24-bit A/D converter option and low-noise performance, the VX2 may just become *the* hip mic in the years to come.

CAD Professional Microphones, 250 Corporate Ninety, 2550 S.O.M. Center Road, Willoughby Hills, OH 44094; 440/943-0110; fax 440/943-0104. Web site: www.cadmics.com ■

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LOCATION RECORDING IN THE MDM AGE

LIVE, WITHOUT A TRUCK

ILLUSTRATION: PAUL MOCH

At the beginning of the modern studio era, George Martin seriously considered recording The Beatles' first LP "live" at the Cavern Club. As it turned out, the album's 14 songs were all recorded at Abbey Road Studios, ten of them in a single day (February 11, 1963). The Beatles went on to write the book on modern studio recording techniques, and, perhaps in consequence, most rock and pop music recordings of the '70s and '80s were anything but live. True, unexpectedly successful live recordings have boosted some stalled careers—Procol Harum, John Mayall and Peter Frampton come to mind—and a few artists (Frank Zappa in particular) began using live recordings as basic materials for further sonic experimentation. But the "in concert" recording method has always been fraught with difficulties and is rarely a first choice among producers and artists.

Economics and technology have changed the recording picture; whether by necessity or by choice, location recording of music is now more viable than ever. Economic pressures have always encouraged bands to come up with alternatives to booking a full-service studio for months at a time, and the relatively low cost of MDMs has provided a viable alternative to the relatively expensive remote recording truck. Several touring artists now record each and every performance on a rack of ADATs; a slew of live albums compiled from a complete tour's worth of digital multitrack recordings cannot be far behind.

BY MARK FRINK

RECORDING LIVE WITHOUT A TRUCK

One engineer with extensive experience of live recording sans truck is Nate Kunkel, who has engineered live albums for James Taylor, Lyle Lovett and Little Feat. Kunkel's equipment list includes a Sony 3348 and 48 channels of GML mic preamps, which he places right next to the monitor mixer in order to minimize buzz and hum. Essentially, the microphone snake goes straight to tape. "There is no busing, and no EQ or compression on any tracks except vocals, which get EQ and compression to get them to

—CONTINUED ON PAGE 188

BONNIE RAITT

Live From Portland's River Queen

Bonnie Raitt, the first lady of the blues, is one of those rare performers whose trademark sound just keeps getting better. Her generous spirit, wry sense of humor and dedication to her craft have made her popular with audiences and musicians alike. Touring this summer in support of her new Mitchell Froom-produced album, *Fundamental*, Raitt has appeared on East Coast Lilith Fair dates and has shared the stage on shows with Little Feat and Jackson Browne.

Mix caught Raitt, with Keb Mo supporting, at Portland's River Queen. Now that the old sternwheeler once used for backstage dressing rooms is gone, the River Queen venue is basically a parking lot downtown on the bank of the Willamette River, with folding chairs and bleachers at the back. However, this funky urban setting proved a perfect fit for Raitt's classic pop-blues performance.

For the past dozen years, Paul "Pappy" Middleton has been trusted with Raitt's live sound mix. He's spent much of that time mixing on Dirk Schubert's Gamble EX 56 console (SN #19), which he adorns with pictures of loved ones, a rubber duckie and a pair of Yamaha NS-10 near-field speakers. Middleton's mixing resume includes an unprecedented four-and-a-half years with Julio Iglesias, stints with Kenny G and Chris Isaak, and last year's Steven Curtis Chapman tour, for which he also used the Gamble #19.

Ever since the Audix OM-5 microphone was released four years ago, Middleton has been using it for all the vocals, including Raitt's. "As a matter of fact, she has one at her home," Middleton adds. He also uses an AKG D-112 on the kick drum and 414 condensers for overhead mics. "A lot of engineers I know like to roll off the low end on the overheads, but I like to get a full-range sound," he explains. "The overheads are as much a part of the snare sound as the two mics on it, and I'll EQ the overheads for the snare." The classic sound of Raitt playing slide blues on her Strat is captured by miking her custom Demeter tube amp's double-12 Celestion cabinets with a Sennheiser MD-421.

PHOTOS: STEVE JENNINGS

Monitor engineer Doug Gherna (left) and FOH engineer Paul "Pappy" Middleton

Middleton inserts a Summit TLA-100 compressor on each of Raitt's vocal inputs with Schubert 6-band parametric EQs inserted ahead of the Summits. "I can EQ frequencies before they get to the Summits, and then I've got the 4-band on the Gamble to readjust after the compression," he explains. Other inserts include a Drawmer 1960 on the two bass channels and DS-201 gates for drum inputs.

Middleton's vocal effects choices include an AMS RMX-16 set on the ambience program, an Eventide H3000 with a few cents of shift and a Lexicon PCM 70 on the concert hall setting. "For body I have the AMS, and when I want reverb, I have an extended decay time on the PCM," Middleton explains. "I love the fullness I get from the AMS, and much of the material is fairly dry to stay true to the sound on the

BY MARK FRINK

—CONTINUED ON PAGE 186

ALL ACCESS

SHANIA TWAIN

TEXT AND PHOTOS BY STEVE JENNINGS

Shania Twain's first tour is confirmed to the end of this year. Twain has been playing to packed houses in sheds and arenas, and there is already talk about extending the tour until late 1999. *Mix* caught the show at The Pond Arena in Anaheim, Calif.

Audio Analysts (Colorado Springs, Colo.) was picked to supply P.A. for the tour by Twain's husband and record producer, Mutt Lange. FOH engineer John Kerns has used AA's equipment on many past tours. "I have a good working relationship with them," he says. "If I ever need something, it's there the next day."

The P.A. is driven in stereo from the main L/R bus, and there are an additional four mono sends. Underhangs are used in all the arenas, angled straight down to cover the first few rows. "The dead center section never seems to have any P.A. hitting it," says Kerns. "So I've got the little Double-A center-fill boxes across the front of the stage, and then I have a couple of subs a side to just warm up the center-fills—they're not really for the P.A.

"For the arena's rear fills we have another 16 Alto cabinets behind the stage, two different grids, eight cabinets on each, two deep," adds Kerns. "I can get four different angles off each grid on the main P.A. We're two grids a side, so we're actually getting 150-degree wrap on each side from the one cluster. It's a real flexible system—you just have to pay attention to how you pair the cabinets." Kerns uses the Crown IQ to tailor the system response and control every amplifier channel.

FOH engineers Mike Dumas (L) and John Kerns mix on two Midas XL4s, both equipped with full automation. Kerns says it's a very cue-intensive show, and he calls the moving faders "a godsend—resetting this number of things between every song on a conventional console would be pretty hairy. There would be no way—even with two engineers—that we could get the cues right and the instrumentation right, as quickly as the songs go by, without the automation." Kerns is also using Midas XL42 rackmount preamp/EQs. "I've used them before on Springsteen tours for vocals," he says.

Dumas, primarily a studio engineer, was added to the tour to help Kerns with Twain's vocals, which are processed through a BSS DPR901 and a Drawmer limiter, and to create submixes for fiddles and keyboards. All vocal reverbs (every bandmember except the drummer sings) are generated with a pair of TC Electronic M2000s; additional reverbs include a PCM 80 and a PCM 70.

Monitor engineer Monty Carlo uses a Yamaha PM4000. "I've got nine people in the band, so I'm pretty maxed out," he says. "I'm using 52 inputs and all 22 outputs." All the mixes are for in-ear monitors, except for a single wedge for the choir on one song. Twain uses Westone UE5 ear monitors, and her ear transmitters and wireless microphones are Shure models. "On Shania's main microphone, a Shure SM58 Beta, we've got a whole rack built for her using GML EQs, PCM 90s on her voice and a Millennia preamp," explains Carlo. Bandmembers use Crown headset mics. Carlo is economical with effects. "I've got some SPX90s inserted on all the vocals for a little ambience, and I'm using a Yamaha REV 500 on the snare for a little reverb."

Keyboard tech and programmer Don Goldstein is responsible for seven keyboards, including three Korg Trinity models, a Korg SG Pro X, a Korg Z1 and a Roland PK7. Offstage racks contain a couple of Roland JD-1080s, an Akai S760 sampler and a Yamaha P50M piano module.

DIGITAL CONSOLES

A VIEW FROM THE ROAD

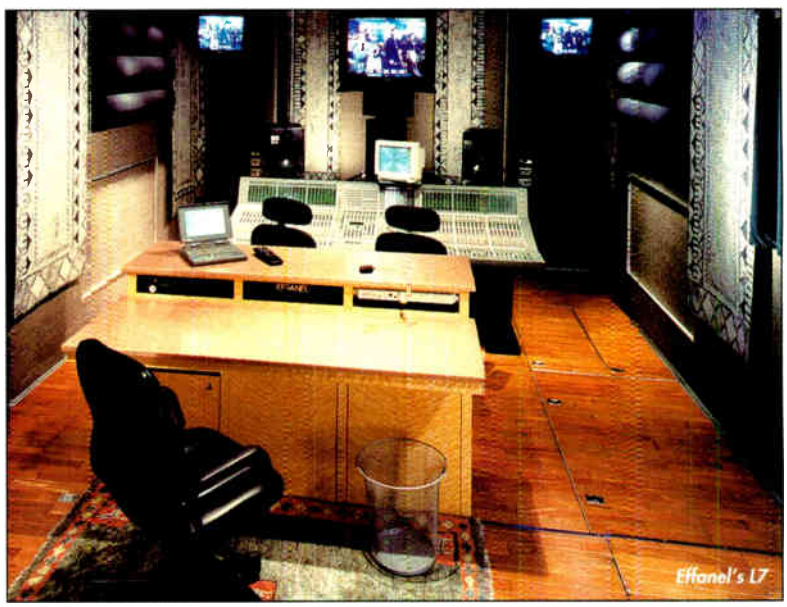
BY RANDY EZRATTY

It's been about a year-and-a-half since my company, Effanel Music (www.effanel.com), installed a digital console in our mobile recording studio. Because we were the first Americans to do it, there was no telling how this move would be received. So, although I sometimes find myself swelling with pioneer pride, the fact is, I negotiated an extraordinary "test drive" with the console's manufacturer. In other words, if this console wasn't all that we thought it would be, we still had our tried-and-true analog board, ready to resume its role on a week's notice. It only took a few projects to convince us that, if we were willing to be on the (sometimes precarious) front line of an emerging technology, we could do our best work ever. The digital console had found a home.

Personally, the ongoing trials and triumphs associated with this decision have served to re-invigorate and galvanize my philosophical view of my company and my profession. Effanel is a New York City-based, analog and digital music-recording company. We have one conventional tracking room, numerous portable systems, a control room at MTV's Times Square studios, and one mobile recording studio dubbed "L7."

L7 is a custom-built, 48-foot trailer with hydraulically operated expanding side walls. Its spacious, 14x26x10-foot mixing area (unique in mobile recording) has earned Effanel's flagship a good deal of notoriety since it came online two-and-a-half years ago.

In its first year, L7's recording system, which featured a wonderful SSL G Plus analog console, was typical of other high-end remote facilities, circa 1995. But the writing was on the wall: The technological developments and trends that shook the studio business—chiefly the MDM revolution—were taking their toll on the remote recording front, as well. Our rolling stone was gathering some moss.


Effanel's L7

High-powered digital consoles held the promise of increased productivity and a significant improvement in the state of the art, the two things I perceived as necessary to prosper in these changing times. In late 1996, Effanel took delivery of an AMS Neve Capricorn 24-bit, 5.1 surround, digital mixing system, customized for the road.

L7's Capricorn premiered at the 1997 Grammys telecast from New York's Madison Square Garden. For me, the payoff was immediate. We were in the middle of a soundcheck for one of the show's performers when a short meal break was called. The show's producer told us that another performer, Tracy Chapman, who had rehearsed earlier in the day, was concerned about her sound. We invited her out to the truck. With the push of a button, we saved what we were working on, recalled Tracy's console settings from a few hours earlier and allowed her to make some mix adjustments while listening to her rehearsal tracks. We showed her how those adjustments would be precisely recalled moments before she was to perform. She left the truck a happy and confident artist with one less thing to worry about, and her performance on the Grammys that night showed it. A few days later, we were informed that the untouched air mix was to be released on CD by her record label. This sequence of events could not have happened in years past.

The instant reset-ability of a digital console has had a positive effect on Effanel's bottom line as well. The ability to effortlessly return to any phase of any project allows us to work simultaneously on various jobs. We can be recording or mixing at our home base, hit the road for a remote, then return to the project at home without missing a beat. Clients, impressed with the sound quality and efficiency of our system, are opting to keep their live recording projects in our domain from inception to completion. Some of them don't really understand the vast technological difference between what we were doing two years ago and what we are doing now; they only know that it sounds better and it gets mixed quicker.

John Harris, Effanel's lead engineer, has experienced remarkable career growth and personal satisfaction by being in a position to follow-through many of his location recordings to the mixdown stage. His new set of tools has allowed him to spend more time practicing and honing his craft. The tedium of "starting from scratch" numerous times on the same project is a thing of the past.

Although most Effanel recordings are engineered by Harris, some great work has also been done at the hands of guest mixers, usually the artist's studio engineer. And while a lot of engineers have had little or no experience with digital consoles, a remote can be a great opportunity to experience this new world in a real-life setting. Most high-end digital consoles are surprisingly user-friendly and can be configured to emulate the surface of an analog console with a guest engineer's layout. With the support of a staff engineer (essential in remote recording anyway), this trial by fire can be remarkably productive. Household names like Kevin Killen, Ed Cherney, Dave Thoener, Mark Miller, Brendan O'Brien, Mark Howard, Jay Vicari and Elliot Scheiner all had their first major digital console experiences on the air, live, with Effanel.

Most live recordings these days are recorded digitally, regardless of the type of console used. Even artists who prefer analog recording in the studio will often defer to the efficiency and track capacity of digital storage for their location recordings. Given this, we at Effanel have concluded that the best digital recordings (dare I say "proper" digital recordings) are made using the onboard converters and processing power of a high-resolution digital console. Analog-to-digital conversion should only happen once: at the microphone. Common analog/digital "hybrid" recording techniques result in numerous signal-degrading conversions at the tape decks. Our Capricorn's MADI digital output stream bypasses the converters on our Sony 3348 (DASH) and Tascam DA-88 (TDIF) recorders. The signal (16- or 24-bit) stored on these two formats is identical.

For us to realize the full sonic potential of a digital console in the field, a few custom enhancements were necessary. These included remote-controlled mic preamps and A/D converters that are placed inside the recording venue, as close to the microphones as possible.

Fiber-optic lines to the truck (1,600 feet) provide 100% electrical isolation between L7 and the stage. We are no longer tethered to venues by noise-inducing 250-foot copper microphone snakes that behave as highly efficient antennae for any EMI/RFI glitch, pop or buzz that happens to be in the neighborhood. Other custom L7 features include redundant console power supplies with status indicators and alarms.

Our console's "virtual" work surface has allowed us to overcome the size/channel limitations of a mobile control room. We can now handle 176 channels in the same space that our 52-channel analog mixer occupied, and the channel capacity can be increased even more (permanently or temporarily) without affecting the console's footprint.

Reliability is the buzz word concerning digital boards in live applications. Alas, a digital audio console is a computer. A wonderful, powerful, musical computer, but a computer all the same. And as we all know, computers hiccup, burp, freeze, fail and crash. This can be dealt with (to a certain degree) in a studio situation, but it's no fun (to say the least) when you're broadcasting live or recording a live performance. The good news is that the state of digital console technology is such that the creative and sonic advantages far outweigh the relatively minute chance of failure. The scale is tipped even further when you factor in a digital console's ability to aid in the reduction of human error, a major, unpredictable reliability issue. And, unlike human beings, digital console technology is rapidly and constantly improving. That being said, it should be noted that some reported failures attributed to digital consoles were caused, at least in part, by pilot error (including some Effanel pilots).

(L to R) Adam Blackburn, John Bates, Randy Ezratty, John Harris, Hardi Kamsani, Doug Mountain (honorary crew member)

Since we went digital, Effanel has been on the air, live, for 100 hours. We've recorded more than 300 hours of concert performances. The quality of our work has improved drastically...

Except for that one time when the system crashed on the air.

The infamous crash. Last November, after three days of flawless rehearsals, the control surface of our console "froze" during the live broadcast of Macy's Thanksgiving Day Parade on NBC. After an excruciating 25 seconds of "dead air" necessitated by a re-boot, the console finished the three-hour telecast without incident. (As luck would have it, a software revision arrived the next week that solved the fatal bug.) Although I was devastated, the client was gracious.

We've all seen and heard stuff go down on live broadcasts. The video and lighting industries have accepted, embraced and demanded the power of digital processing, in spite of its foibles, for a number of years. But in the wake of Effanel's first digital mishap, many in the audio community were not so quick to forgive, and a line was drawn between two camps. Our supporters were mostly producers and musicians, those who actually have the most to lose in the event of failure. They had heard our work (and the work of others with similar systems) and concluded that the power and the potential of digital technology were overwhelmingly worth the "risk." Our detractors (what I call "digital nay-sayers"), those who would adamantly accept the status quo in the name of "dependability," were primarily audio and technical types. These are the people who I would have expected to be at the forefront of the effort to empower themselves, and encourage their colleagues, to serve the arts more faithfully.

Perhaps a healthy discipline results from the "certainty" of failure when using computer-based technology. It is sadly ironic that the only time Effanel has ever gone live without some form of back-up was during the Macy's parade. On all projects, before and since, a number of simple but prudent back-up paths have been designed into our live broadcasts (see signal flow chart). But Effanel's humbled reverence for Murphy's law should be words of wisdom to anyone, analog or digital. Overconfidence in traditional analog systems on live productions has been the root of failures more disastrous than Effanel's Thanksgiving mishap. Things fail and people screw up in all domains, so be prepared at all times.

Meanwhile, the power and fidelity of digital consoles is allowing us to do work that we could never do before. And, in my opinion, live music sounds better as a result. This technology is not

AN INTERVIEW WITH EFFANEL'S JOHN HARRIS

Effanel's "house engineer," John Harris, is one of the few engineers in the U.S. who has extensive experience on a digital console, in his case the Neve Capricorn installed in Effanel's L7 remote recording truck. Though admittedly partisan, Harris feels that it is lack of exposure to an all-digital system that is responsible for any negative reaction to the medium.

"A lot of people have worked on a digital console once and thought 'Yeah, that's pretty cool,' but they haven't really got to dig into it the way I do and work on it every day," Harris says. "And I think that's why people just haven't gotten it yet—how good this sounds."

Harris notes that an all-digital signal chain—from the microphone A/D converters to the final release medium—eliminates multiple A/D and D/A conversions, a common cause of sonic

—CONTINUED ON PAGE 187

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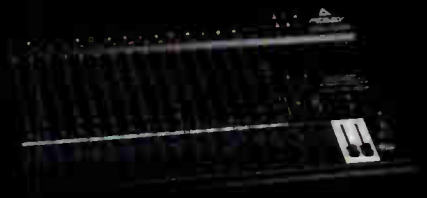

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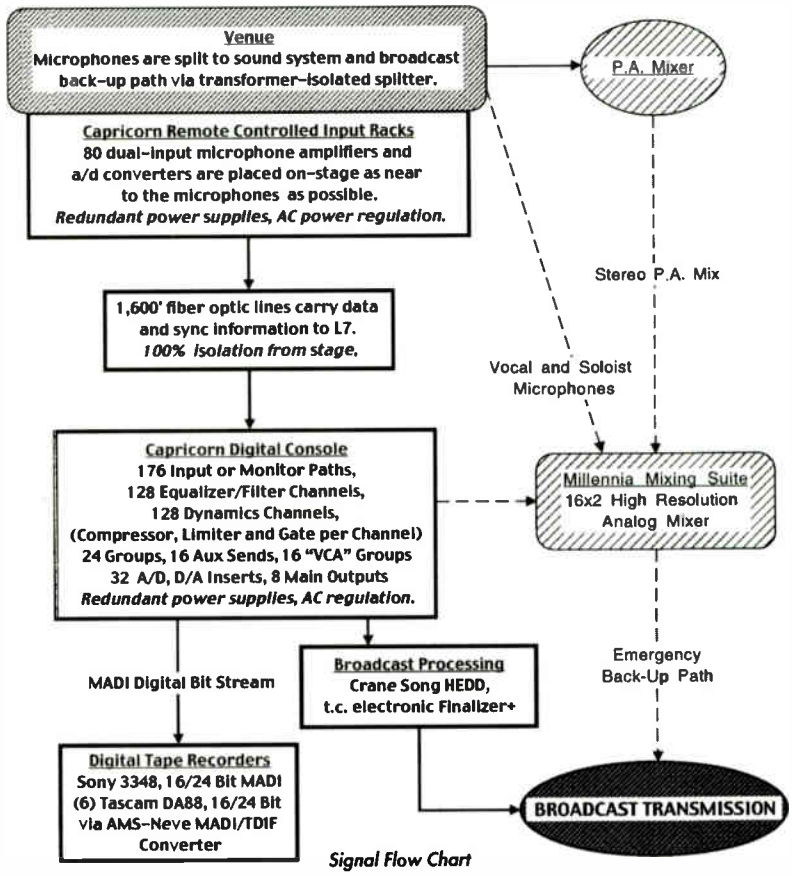

Signal Flow Chart

"easy," and it's not perfect, especially when you take it on the road. But the creative, technical and sonic potential are worth the effort in spades.

As I write this article, Frank Filipetti is putting the finishing touches on the 5.1 DVD mix of John Harris' 24-bit recording of James Taylor's recent concert from New York's Beacon Theater. This project is the sonic embodiment of the views expressed in this article. The producers have faithfully kept the digital integrity of the signal, from its conversion at the microphone throughout all phases of production, including its original live broadcast on PBS. Check it out. I rest my case. ■

The author thanks the following people for contributing to the success of Effanel's digital adventure: John Bates, Steve Morris, Gregory Davis, Doug Mountain, Mark Repp, Adrian Weidmann and everyone at AMS Neve.

—FROM PAGE 179, BONNIE RAITT

album." A TC Electronic 2290 delay is used sparingly for a couple of effects on the vocals, but the mix, like the new album, is organic and natural-sounding. A Yamaha REV5 with its Percussion Plate preset lightly fills out the snare drum with a short decay, and an SPX-900 on its Hall setting is used as an extra reverb for occasional special effects. "Sometimes the return of the H3000, which has been shortened quite a bit so you hardly hear it, gets sent to the SPX to fatten it up without sounding like an effect," comments Middleton.

A Tech-21 rackmount SansAmp PSA-1 was also used for several tracks on the new album. Middleton has one in his rack to duplicate its effect on the Leslie cabinet, producing a sustaining Marshall guitar amp sound, and at one point in the show the lead on the Hammond beautifully morphs into Raitt's guitar.

On top of Middleton's effects rack is an Apple Powerbook 165 running Buford Jones' Tour Stack application. "I've had it since '91, and, like a set of automated 3x5 cards, it cues me about each song," says Middleton. "It also changes my MIDI effects for me," he adds, demonstrating with a flick of the wrist. "Every engineer I've shown it to has been very interested, and it runs on just about any old Mac with 8 megs or more of memory."

—FROM PAGE 184, JOHN HARRIS

degradation. "The great thing about digital is that when you make an entirely digital system, you convert the signal the way you want it, with the converters you like, as opposed to having to rely on the converters in the multitrack or the converters in the stereo master machine," Harris explains. "Otherwise, you have such a wide range of conversions and reconversions going on that it's not surprising that digital got a bad name among some artists and engineers. It was a lot of trouble, and there was an undependability and inconsistency that they didn't like."

But digital is here to stay. "No matter who you are, and however much you want to embrace the emotion of analog recording, the fact is that your product is going to wind up as a CD or a DVD," Harris points out. "The optimum way to work is to convert the signal to digital right out of the box, at the end of the mic cable. First make it digital and then work with it—the compression, the equalization, all of the things you're going to do—but within the digital technology. Sonically, that's something that few people have heard, because so far only a few people have a Capricorn, or a Sony Oxford, or one of these new large-format digital consoles that are coming out."

Harris is particularly pleased with the all-digital system's fidelity. "Things appear at your destination exactly how you want them to," he says. "When you're listening to playback on a digital console, the return from a DAT or PCM machine is exactly the same signal that you sent. In fact, I've had to unplug the output of the DAT machine in order to make sure that I was really listening to it. That's something to get used to!"

Harris also recommends an all-digital system for live recording. "In my opinion, this is really the only way to do live recording on a large scale," he says. "The signal losses that we're used to—and are accepted—when you're running copper into venues and concerts and television shows are problematic at best. But until now there was no other practical way to do it."

Typically, Effanel runs five 16-channel, fiber-optic cables from truck to stage, for a total of 80 mic inputs. The mic amps and A/D converters sit on the stage right next to the performer. "The fiber-optic signal line to the trailer can run as far as 2,000 feet, over any kind of terrain and electrical scenario you want to throw at it," says Harris. "It doesn't care—it's light. Now that we've taken all of that copper out of the chain, we can make pristine recordings from any place that you can name."

One unanticipated drawback to the all-digital, high-resolution system that Harris used on the James Taylor recording was its ability to reveal sonic blemishes. "I kept thinking I was hearing clicks and noises on the tape," recalls Harris. "I was drawn to the right speaker because I kept hearing a tick, and I thought 'What is it that's distracting me?' It turned out that the percussionist was trying to put his hand on the cabasa and pick it up without making any sound, and he couldn't—it just made the slightest little tick. And I heard it. I not only heard it, but I could place it absolutely accurately in the stereo picture."

Harris reckons that it took him about two weeks to become familiar enough with the Capricorn "to run it by myself and get what I wanted out of it. But once you learn it, you can be creative with it, and that's the best part—you can make it look like you want it to look, you can make equalizers and compressors in chains exactly the way you want them. You can make the lead vocal and the kick drum always appear under the two fingers of your left hand. You can personalize it so much, whereas other digital consoles are fixed.

"We always try to take the barriers to live recording away," says Harris. "Every piece of equipment that we have is conceived and built for what we have to do on location."

—Chris Michie

SCHUBERT FOUR-WAY P.A.

As usual for most of the past decade, Raitt's sound services are supplied by Schubert Systems, and system engineer Steve Kallos assists with all phases of the setup and strike. The proprietary Schubert four-way P.A., which was stacked on the Tomcat stage's ample wings, comprises JBL-loaded double-18 subs and full-range three-way enclosures with JBL double-15s, a 2450 on a bi-radial horn and four 2402 bullet tweeters per cabinet. Crest 8001 amps power the subs and 15s, and the compression drivers and tweeters are powered with Bryston 4B-ST amps, which

contribute to the system's sweet, open high end. The P.A. is completely analog all the way to the JBL drivers, which is one more reason for the transparent sound of Middleton's mix. There are also four front-fill cabinets loaded with a pair of JBL eights and a 2404 "baby cheeks" tweeter across the lip of the stage, and above, a cluster of three small two-way JBL Array series trapezoids are hung from the down-stage lighting truss for center fill. These fill speakers get a predominantly vocal mix, and both zones are EQ'd with another pair of SSG 6-band parametrics.

In addition to a pair of Klark-Teknik DN-300 graphics for system EQ, the P.A. relies on Schubert's beautifully crafted proprietary SSG four-way crossovers, which have a convenient all-on/all-off switch that overrides the individual mutes. Middleton uses Jackson Browne's "Everywhere I Go" from *I'm Alive* to set the system EQ and checks it with Seal's "Crazy." "Jackson has always been a stickler for EQ, and that track has a lot of good sounds that sit on their own shelf," says Middleton. "The Seal album is real bright in the 6 and 8k region, and I use it to quickly tell me how my horns and tweeters are working."

COMPACT SYSTEMS MONITORS

Doug Gherna, who has also been with Raitt and Middleton for eight years, relies on a monitor package supplied by Compact Systems. The proprietary floor monitors are loaded with JBL 15s, 2482 compression drivers and bullet tweeters, and tri-amped with custom BGW GTA amplifiers. The sidefills are simply trapezoid versions of the wedges, and a double-15 version of the wedge is used on the drum riser. Mixing on a Ramsa 840, with ten channels of KT DN-360 EQs, Gherna also has Drawmer gates, a Roland SDE-3000 and yet another SSG 6-band parametric inserted on Raitt's acoustic guitar.

As the sun set on a sold-out audience of enthusiastic fans, many of whom have followed Raitt her entire career, the boats on the river pulled close for some tasty licks. Even the mournful Amtrak locomotive across the street played in tune with her delightful set. ■

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

—FROM PAGE 178, LOCATION RECORDING

tape better," says Kunkel. "I end up with extremely well-documented and consistent captures of the mic snake, which allows me to edit between different nights." For ambience mics, Kunkel positions a couple of B&K omni mics at the FOH mix position. "If I have multiple venues, I'll just find the room predelay that works the best, so I can cut from different nights," he comments. "It works brilliantly."

As Kunkel points out, weekly rates on rental equipment are often based on four-day daily rates, so it is relatively cheap to record for a week or more. "The longer you go out, the more you save," Kunkel explains. "And there's only a crew of one—me." Transportation costs are also minimal, since the extra gear typically travels on the dance floor of the band gear truck. However, as Kunkel points out, any money saved may well be spent on post-production. "You need a little more time in post-production because you're not generating rough mixes as you go," he says.

Kunkel notes that a problem with some otherwise very good mic preamps is the metering; often there are only signal present and overload LEDs, so the tech responsible does not have enough information to make intelligent adjustments. With good metering, adjustments can be made to mic preamps onstage to optimize the input levels. In club situations, there's often little space available onstage for the mic preamps, but having them close to the microphones makes a big difference in the sound quality.

NEW JOB DESCRIPTIONS

Not everyone can afford the services of a specialized recording engineer, and on some tours it may fall to the P.A. system tech to roll tape at FOH while the artist's engineer is mixing the live show. Such a setup will allow the mix engineer to play back the previous show before, or even instead of, soundcheck, but there are a couple of sonic compromises. First, placing the recording decks at FOH means that the mics are at the other end of hundreds of feet of copper, and the direct record feeds will likely be driven from the P.A. console preamps and buses. Arranging for a dedicated transformerless recording split and putting good preamps as close to the mics as possible are obvious improvements. Another possible upgrade is to bypass the A/D converters in the MDMs with specialized outboard converters. And, if there is a final project in

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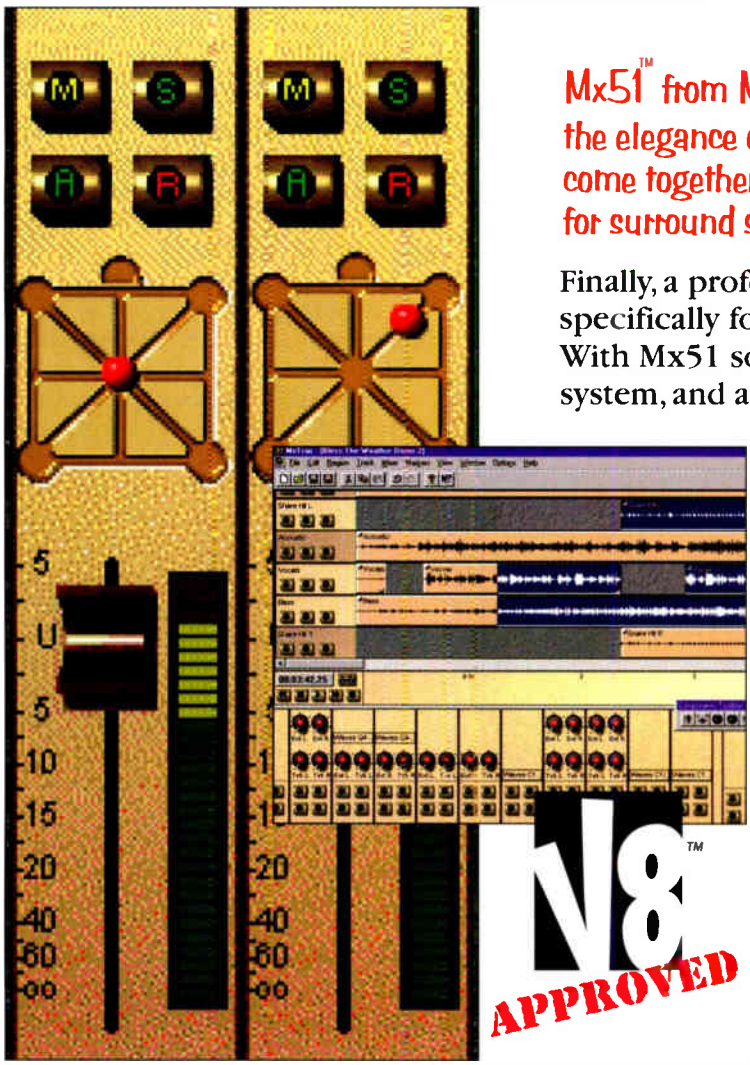

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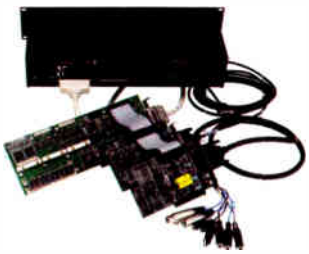

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mind, be sure to get the recording mix engineer involved in the choice of mics.

A potential pitfall to this bare-bones approach is that, since a portable recording system must rely on house power, an inordinate amount of time can be spent buzz-busting the by-products of a dirty neutral from the local grid. An isolation transformer specifically for the recording system can prevent an entire night's recordings from being trashed by dirty electricity, which will inevitably be encountered in older venues with unfiltered lighting dimmers. Be sure to check the quality of the first shows to confirm that the tracks are all sounding good.

Finally, it is worth considering the fact that a crew member whose primary responsibilities are elsewhere may not be super-diligent at monitoring tape levels and accurately documenting the tapes and/or performances. Accurate documentation will save time in post-production, so a dedicated assistant engineer whose job is to take notes and log the show can prove invaluable.

Occasionally there are situations in which it is necessary to monitor the recording in an acoustically isolated environment. Though a portable recording package in road cases can offer studio-quality gear, the lack of an acoustically designed control room can lower one's confidence in the mix. However, improvisation and attention to room surfaces can make a dressing room or locker room into a temporary control room. Effanel's John Harris recommends packing blankets on the walls, with Fiberglas behind, and a carpet for the floor. When possible, orienting the monitors so that they project from the same direction as the P.A. can reduce the distracting effects of sound leakage from the venue. Listening to familiar recordings can help one adjust to the sound of the temporary control room.

Given the problems outlined above, it may be better to bite the bullet and rent a full-on remote recording service. In addition to speed of setup and ease of use, any properly equipped remote truck offers a real listening environment that is otherwise unavailable. Whether at Carnegie Hall or a farm in Vermont, a large trailer allows the engineer to bring a genuine control room to places where artists can give a great performance, combining the best of both worlds. ■

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

New Sound Reinforcement Products

EAW POWERED SPEAKERS

Eastern Acoustic Works (Whitinsville, MA) offers the KF400a, the company's first powered full-range loudspeaker. The active three-way KF400a has a 15-inch woofer, an 8-inch cone-loaded mid and a 1.4-inch exit compression driver on a CD horn, driven by an amp created specifically to match the components. Called The Close Coupled Power® Module and manufactured for EAW by Cyberlogic, the amplifier is a state-of-the-art Class H design featuring a linear power supply and vertical N-channel MOSFET output devices. It incorporates several levels of amplifier and driver protection circuitry, including a Soft Clip feature that dramatically lessens clipping impact and operates on 95V-250VAC. Frequency response is 62-20k Hz (1W @ 1m, +3dB), with full-range, long-term maximum output of 122 dB and peaks of 126 dB. Housed in a trapezoidal Baltic birch cabinet, the KF400a features three three-position flytracks, measures 35x20.7x19.5 inches (HxWxD) and weighs 163 lbs. Retail: $2,700.

Circle 314 on Product Info Card

COMMUNITY HORN-LOADED SUB

The new XLT54 horn-loaded subwoofer from Community Professional Loudspeakers (Chester, PA) features four Ferrofluid-cooled 15-inch woofers and provides output in excess of 132 dB SPL from 30-300 Hz. The rectangular cabinet includes recessed 3-inch wheels and a built-in grab bar, plus two recessed steel bar-handles. Additional features include dual Neutrik and ¼-inch input connectors, PowerSense™ Dynamic Driver Protection and a 16-gauge perforated steel grille. Retail: $1,232.

Circle 315 on Product Info Card

VEGA EMP SERIES UHF

Vega's (El Monte, CA) EMP Series UHF wireless mic system includes the R-672 frequency-agile receiver, T-690 and T-691 handheld transmitters and T-772 bodypack transmitter. Controlled by Embedded MicroProcessor (EMP) technology, the R-672 offers 16 programmable frequencies in the 12-20MHz range, dual-mode squelch, Vega's Dynex III®

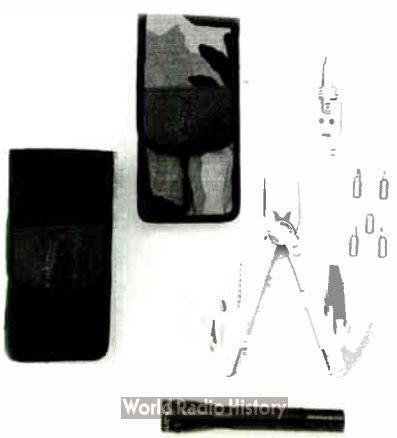
audio companding and an automated shut-off facility. Front panel LEDs indicate key function status, and the output features mic/line, polarity reverse and ground lift switches. The T-690 handheld transmitter has an EV N/D857 dynamic element; the T-691 includes an EV RE500 condenser element. The T-772 bodypack transmitter accommodates a variety of lavalier mics.

Circle 316 on Product Info Card

JENSEN MULTI-TOOL KIT III

The Multi-Tool Kit III from Jensen Tools Inc. (Phoenix, AZ) includes a Leatherman® Super Tool and Mini Maglite flashlight in a black or camouflage belt holster. The Super Tool includes needle-nose and regular pliers, wire cutter and stripper, can/bottle opener, four screwdriver blades, plus a tool adapter for ¼-inch drive bits and six hex drive bits. Retail: $109.

Circle 317 on Product Info Card



AMEK DEBUTS RECALL RN

The Recall RN from Amek (Burbank, CA) features new input modules based on the 9098 studio mixing console inputs, designed by Rupert Neve. The new mic/line input modules are fully retrofittable in existing Recalls and offer improved dynamic capability and extra trim control. Now, 18 dB of cut and boost is available on all four frequency controls, and Q is continuously variable on the two mid-bands. The Recall RN may be ordered with Amek's Supertrue studio automation package, in addition to the Showtime live automation system available for standard Recalls.

Circle 318 on Product Info Card

AMAZING BASS SELF-POWERED SUBS

The Amazing Bass Company (Elkhart, IN) offers the AB215 ($1,895) and AB115 ($1,395) compact powered subwoofer systems. The AB215 has two 15-inch woofers, an 1,100-watt amplifier, active crossover and system protection in a compact cabinet (36x24x24 inches) weighing only 123 lbs. Frequency response is 38-100 Hz (±3 dB); maximum output is 127 dB SPL. The AB115 contains a single 15-inch woofer and a 550-watt amp, plus crossover and protection circuitry. Cabinet weighs 81 lbs. and measures 19x24x24 inches. Frequency response is 38-100 Hz (±3 dB); maximum output is 121dB SPL. Both units feature Neutrik Combo input connectors, line level outputs, adjustable low-pass filter, switch-selectable highpass filter and polarity reverse. Cabinets are constructed from ¾-inch 7-ply Birch.

Circle 319 on Product Info Card

SERVODRIVE SUBWOOFER UPDATE

ServoDrive Inc. (Glenview, IL) has updated its Contra Bass Subwoofer, which includes a high-speed servomotor and belt-drive system rather than a traditional voice coil/magnet. ServoDrive has re-engineered the transfer coupling to increase cone excursion and optimize acoustic alignment, resulting in a frequency response of 16 to 125 Hz at high SPLs.

Circle 320 on Product Info Card

BY BLAIR JACKSON

RECORDING NOTES

PHOTO: MICHAEL WILSON

JOE ELY

THE ROAD GOES ON FOREVER

by Blair Jackson

The first time I saw Joe Ely perform live, in a San Francisco nightclub in the late '70s, I was so knocked out I fully assumed I had seen music's next superstar. He had the power and energy of Bruce Springsteen, fantastic tunes that ranged from moving story-songs to howling honky-tonk numbers and rock rave-ups, and a dynamite performing personality. But a funny thing happened with Joe Ely: He never quite found his niche. He was too country for rock 'n' roll radio, too rock 'n' roll for country radio, too Texas for the Nashville folks.

The great news is that he's always sold enough albums to keep making more of them, and he continues to tour and slay audiences everywhere he goes; he's still one of music's great unsung heroes and a true *good guy*—beloved by critics, musicians and audiences. His songwriting has only gotten better through the years as his uniquely Southwest vision has matured. With each studio outing, the fascinating characters who populate his songs are painted in richer hues, and their stories become more compelling.

Ely's last three albums are easily among his best: *Love and Danger* was a passionate country-tinged rock and honky-tonk album with several tracks that deserved triple-A airplay, and both *Letters to Laredo* and his latest, *Twistin' in the Wind*, serve up a blend of folk/country "Texican" flavors for some of the best stories Ely has ever written. I caught up with Austin-based Ely just as he'd returned from a wildly successful European tour. Perhaps one of these days America will embrace this supremely talented singer/songwriter the way England, Norway, Germany and Italy have!

You've recorded your last two albums at home, and both recorded and mixed the new one entirely there. What can you tell me about your studio?

I've been working on it on and off for about the last ten years, and in the last couple of years I've gotten to where I feel really good about it. I've done several soundtrack things in there—for the new Robert Redford movie [*The Horse Whisperer*] and for the new Sandra Bullock movie [*Hope Floats*], so I'm feeling more and more confident I can do everything here except mastering. Ever since I got this new Yamaha 02R board and a bunch of Neve preamps, I've been really happy with how my music's been sounding. Using those preamps and going through that board, it goes straight to digital and stays there—I use two ADATs as my main recorders.

How much of a tech-head are you?

I engineer a lot of my own stuff, so I keep up a fair amount. I don't have time to be a full-time tech-head because I'm too busy writing songs and playing and all. But I try to keep my studio to where everything is easy to get to and it all sounds good.

—CONTINUED ON PAGE 202

CYPRESS HILL TURN UP THE HEAT

by Chris J. Walker

They're ba-a-a-ack! The always controversial, pot-advocating, street-jiving provocateurs Cypress Hill—rap's first Latino superstars—have returned to the music wars after a three-year lay-off from recording. Since their initial splash in the late '80s—which seems like a millennium ago in the fickle and transient world of rhymes and beats—Cypress Hill has amassed a huge, cross-cultural following both in the U.S. and around the world. But it's now been long enough since their last release that rumors of the group's demise have, not surprisingly, preceded them.

"Usually we have two years between CDs," explains B-Real (Louis Freese), co-leader/founder of CH, while taking a break from mixing at American Studios in North Hollywood. "But being that Muggs [Lawrence Muggerud, the other co-leader/founder of CH] put out the *Soul Assassins* album, and I put out *Psycho Realm*, we still had shit out there with our stamp on it."

Muggs adds, "We've also been touring our asses off. We did Lollapalooza and two Smokin' Grooves tours since the last album. With our solo things there was shit we wanted to get off our chest on the side, you know. So now we're getting back together to do the Cypress thing.

"One of the things we did with this album was before we started, we listened to everybody else's shit, to see where the [rap/hip hop] game is at right now, Muggs continues." "And then we went the other way. There's a lot of m*th*rf*cking East

—CONTINUED ON PAGE 204

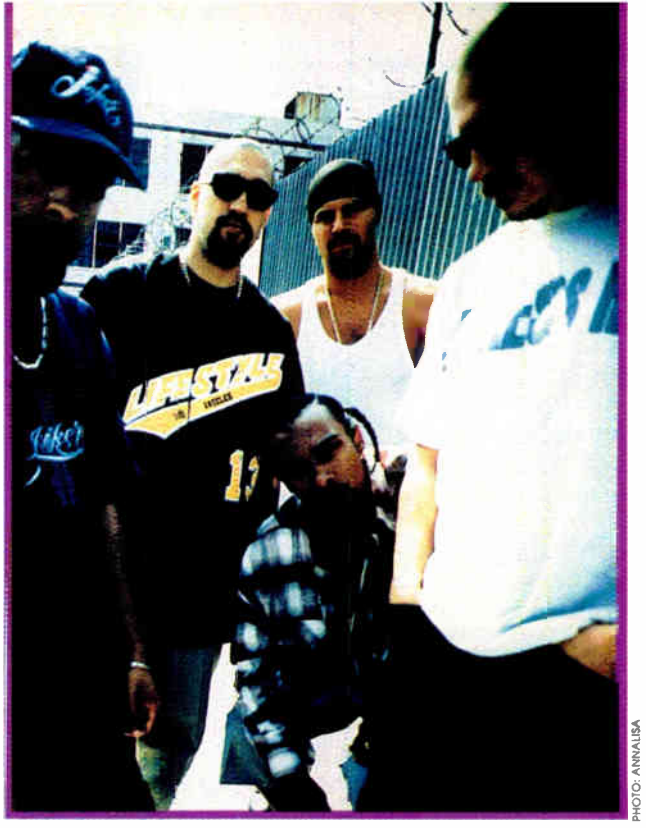


PHOTO: ANNALISA

L to R: Bobo, B-Real, Shag, Muggs and DJ Scandalous

Cool Spins

Some Current Favorite CDs of the Mix Editors

Cowboy Junkies: *Miles From Our Home* (Geffen)

If you still picture the Cowboy Junkies as the dour Canadian band that slowed down "Sweet Jane" to a crawl and played almost everything else at the same dirge-like tempo, you've missed the group's progression into an outfit that can be relied on for tuneful and often uplifting songs (written primarily by leader/guitarist Michael Timmins). "New Dawn Coming," the leadoff track of their fine new album, is an infectious and optimistic bit of pop that showcases singer Margo Timmins' pleasing vocal style and the group's always-tasteful accompaniment. Certainly, there are darker regions explored on the disc, but there is a shimmering lightness to the arrangements that keeps matters from getting too heavy. The excellent "Blue Guitar" is a collaboration between Michael Timmins and the late Townes van Zandt. A beautiful-sounding record from beginning to end.

Producer/tracking engineer: John Leckie. Additional engineering: Robert Cobban, Chris Brown (strings). Mixing engineers: Chris Lord-Alge (seven songs), John Leckie (three songs). Studios: McClear Pathé Studios (Toronto); Maiden's Mill (Warkworth, Ontario); Studio 306 (Toronto); Abbey Road (London); Image Recording (LA., mixing). Mastering: Greg Calbi, Masterdisk (NY).

—*Blair Jackson*

Ted Hawkins: *The Ted Hawkins Story: Suffer No More* (Rhino) and *The Final Tour* (Evidence)

Ted Hawkins' recordings have been criticized for being overproduced. That's because Hawkins was basically a street musician—one who sounded like a grittier Sam

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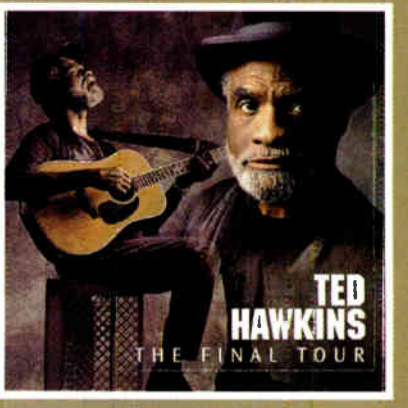


FRANK ZAPPA'S "WATERMELON IN EASTER HAY"

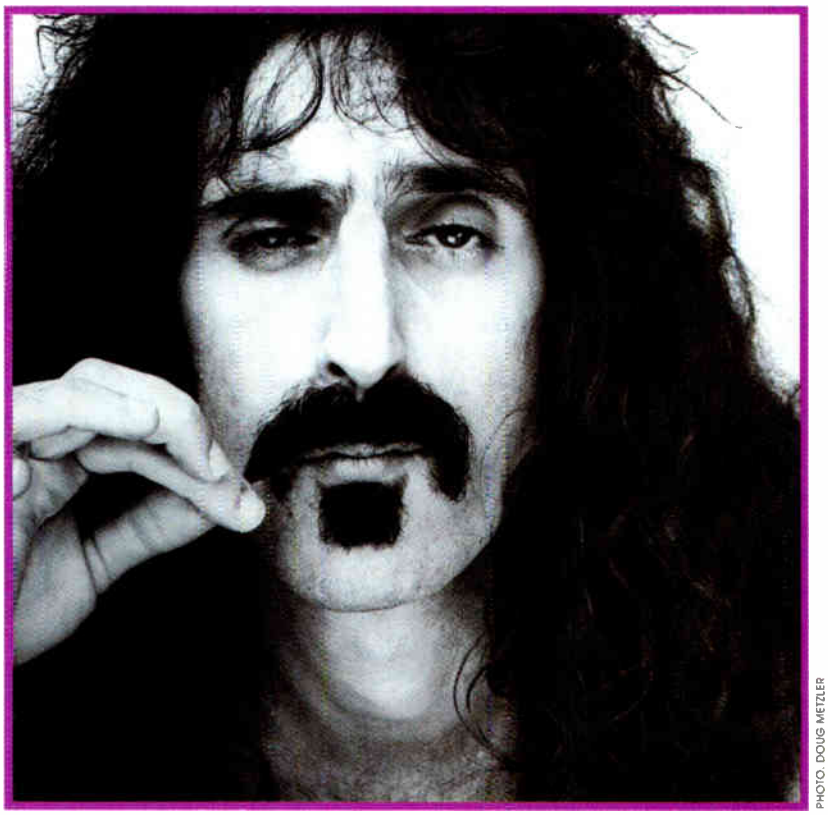
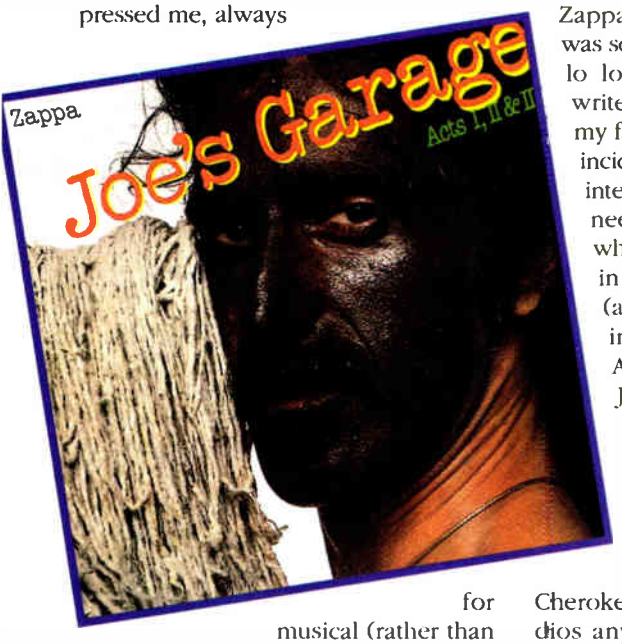


PHOTO: DOUG METZLER

by Blair Jackson

Okay, Zappatistas, let me get my prejudices out on the table right from the get-go. I have never been a huge Frank Zappa fan. Like most progressively inclined music lovers in the late '60s, I dutifully listened to every record Zappa and his Mothers of Invention put out, giggling at parts of most of them, admiring the music on some of them, but not really *liking* any of them very much. The humor always struck me as stupid and puerile, snotty without being particularly clever, and it seemed as though the music was so scattershot all over the map—doo-wop here, *avant* there—that it never really took its time developing into much. The first record of his that really knocked me out was *Hot Rats* in 1969; it's probably still my favorite of his albums (and "Peaches in Regalia" from that album is certainly a worthy candidate for a future Classic Track). Then, through the years, there have been albums here and there that have impressed me, always



for musical (rather than lyrical) reasons. I was one of those guys who always wished Zappa would "shut up and play yer guitar"—indeed, he put out a series of discs with that name, and I loved them. The guy had serious chops, and he put together some extraordinary bands, from the funky George Duke-dominated unit that recorded *Roxy and Elsewhere* to the dynamite group that cut *Joe's Garage Vols. I-III*, source of this month's Classic Track, the semi-obscure but beautiful and atypically emotional instrumental, "Watermelon in Easter Hay." Truth be told, there are entire periods of Zappa's music I've never heard; he was so prolific he makes Elvis Costello look like the poster child for writer's block. So I simply picked my favorite Zappa track, which, coincidentally, is also a favorite of my interview subject this month, engineer/producer Joe Chiccarelli, who worked on six Zappa albums in the late '70s and early '80s, (and whose extensive credits also include Shawn Colvin, U2, American Music Club, Etta James, Beck, Hole and many others).

Originally a musician and engineer in Boston, Chiccarelli moved to L.A. in the late '70s and landed a job working as an assistant at Cherokee, then one of the hottest studios anywhere. "Bowie would be in one room," Chiccarelli remembers, "the Bee Gees in another, lots of big names all the time."

Then, one day in 1978, "Frank booked in and I was sort of low man on the totem pole, so they'd give me the artists and producers everyone found sort of 'difficult,' because I was pretty tolerant and I didn't mind working insane hours in those days. Well, it turns out in this case I was really, really fortunate—I got a lucky break. When Frank came in, he got a call from his regular engineer saying he was stuck in London with visa problems and couldn't make the sessions. I think Frank was only booked in for three days or a week, nothing much. So I was *it*, and we spent a week doing guitar overdubs and vocals [for the album that would become *Sheik Yer Bouti*] and then at the end of the week he said, 'Look, I've got to finish this record and we're out of time here, so why don't you come over and work with me at the Record Plant.' So we did that and then we ended up at the Village for months, finishing that record, and I did a lot of work with him over the next couple of years."

By the late '70s, Zappa, a native of Southern California, had amassed a loyal fan base that faithfully followed every bizarre musical turn he took—from jazz/rock fusion to modern classical to *musique concrete* and almost every other style imaginable—and allowed him to buck the traditional record companies and start his own label, Barking Pumpkin. Since the first satirical Mothers of Invention album was released in 1966, he had put out more than 20 albums. He became justly famous (or infamous) for his daring,

bizarre and patently outrageous humor, which ran to the sexual and scatalogical, as well as the political, and was widely considered one of music's true independent rogues, a thorn in the side of the record industry. Occasionally, one of his tunes would be catchy and mainstream enough to make it onto the radio and cause a commercial stir—*Sheik Yer Bouti* contained the bona fide hit "Dancin' Fool," for example—but for the most part, Zappa's records were consumed by the already converted, a big enough group that he became a fairly wealthy man despite his perennial outsider status. He cranked out one album after another and, remarkably, each found an audience.

"I believe the *Joe's Garage* record came up in the spring of '79," Chiccarelli recalls. "Frank had done this song on *Sheik Yer Bouti* called 'Jewish Princess' which received a lot of attention, so he came in the studio and said, 'I've written the follow-up for that song: 'Catholic Girls.' I want to record it right away.' He had one other song, too, but I can't remember what that one was. The plan was to just record two tracks at that time.

"Now, up until that time for the past few years, Frank had not done a lot of studio recording. What he did for a while is record tracks live, onstage, and then strip them down in the studio and overdub on top of them, because he felt that the band's vibe was better live than in the studio. The whole *Sheik Yer Bouti* album was live tracks recorded around the country, then stripped down and overdubbed. But this time he wanted to try an experiment and cut these two songs with the band in the studio. So we did that in a week or two at Village Studio B, which at that time was one of the hottest studios around. Supertramp and Fleetwood Mac had worked in that room, though it was not my favorite of the Village rooms. It had a Harrison 4032, which was fine, but Frank hated the monitors in that room so much that he brought in a pair of these giant UREI Time-Aligns [813s] with the two 15s in them, and put them on the bridge of the console and made the whole record with those—it was like the world's largest headphone system! There were also a couple of Ampex 1200s in the room.

"Anyway, he had such a good time in the studio cutting these two tracks that he kept extending the studio time week after week. He'd say to the band, 'Hey, you know that song we do live that we never finished?' or 'Remember that song we rehearsed but never developed?' and he dug up all this old material and we'd record it live in the studio, and within a couple of months we went from two tracks to something like 23 tracks."

Chiccarelli continues, "I remember saying to him one night, 'What are you going to do with all this? How does it tie together? This was supposed to be one single!' He said, 'Just watch!' and then literally the next day he comes in with this script that he had written which was designed to tie all the tracks together—it was this little mini-opera, or whatever you want to call it, about a guy in a rock band in Cucamonga or wherever; I think it was a little bit autobiographical."

"*Joe's Garage* is a stupid story about how the government is going to try to do away with music (a prime cause of unwanted behavior)," Zappa wrote in the album's libretto. "It's sort of like a really cheap kind of high school play—the way it might have been done 20 years ago, with all the sets made out of cardboard boxes and poster paint..." The story follows the band from garage rehearsals to a CYO dance ("Catholic Girls") to getting busted by the police and thrown in jail because rock 'n' roll

has been made illegal. Along the way there are charming musical vignettes about groupies ("Crew Slut"), VD ("Why Does It Hurt When I Pee?"), gay sex ("A Token of My Extreme"), prison gangbangs ("Keep It Greasy") and much more, with Zappa's bandmembers cast in different roles and Frank himself tying it all together with his ominous whispering character, the evil Central Scrutinizer. It's high concept, low comedy, with many interesting instrumental interludes.

"He came in and recorded the dialog in about a day," Chiccarelli says admiringly, "talking through a megaphone, miked off-axis and at weird angles so it would sound really strange. He pieced this whole thing together and it worked! He really was a genius," he adds, echoing a common view among Zappa loyalists.

Zappa's band at the time was one of his best: Frank played lead guitar, and lots of it; Warren Cucurullo, who went on to greater fame in Missing Persons and Duran Duran, was the rhythm guitarist; Denny Walley played slide guitar; Arthur Barrow was the bassist; Peter Wolf and Tommy Mars shared keyboard duties; Ed Mann played percussion; Ike Willis was one of the principal singers; and Vinnie Colaiuta was the latest in a long line of extraordinary drummers Zappa found.

"He was very hard on the players in the sense that he demanded a lot," Chiccarelli says. "He would write all these parts out and he always knew how he wanted something played, and he expected it to be done that way. But everyone respected him and he respected his musicians, too. He treated them well. The most difficult thing about working with Frank is that he worked long hours, but that was the only thing; he wasn't a 'difficult' personality. He was the most down-to-earth, focused guy you would ever want to meet. Obviously, he was a fountain of ideas.

"Usually, the tracking dates were Arthur Barrow on bass, Vinnie on drums, Peter Wolf would usually be playing a Fender Rhodes or a Wurlitzer or his Oberheim synths. Frank might play a guide guitar through a Boogie amp on the tracking date. So four or five pieces, and then he'd put guitars, vocals, horns if he wanted them and other synth stuff on top of that. He gave Vinnie a lot of space, whereas with Peter Wolf, who is an absolutely brilliant keyboard player—his vocabulary of chords and inversions is unbelievable—he asked him to play more simple roots and fifths kind of parts [on *Joe's Garage*], which I know was a little frustrating to Peter, because he's so brilliant, but he got through it."

Like a number of tunes on *Joe's Garage*, "Watermelon in Easter Hay" began its life as a jam from a Zappa live show which was then further developed in the studio. In the album's story (such as it is) it appears near the end of Act III as a dream of Joe's in prison.

"Often, when Frank got in the studio to play solos, he'd get uptight and feel like he was kind of stiff," Chiccarelli says. "So I said, 'Frank, why don't you record your guitar solos live onstage?' So he took that idea and got a Nagra and put two microphones right up against the speaker cabinets and he recorded all his guitar solos onto the Nagra and then later he'd come into the studio with hours of guitar noodling. Then he'd bring Vinnie in, and he'd just say, 'Vinnie, this one is in this time signature,' and he wouldn't tell him what song it came from or what key it was in. A lot of them were from free-form jams they'd done on the road, or some of them came from solo guitar things Frank would do from time to time during the show, where he was the only one playing. So Vinnie would key off the stuff Frank was playing, and songs or themes might develop that way."

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Zappa was quite knowledgeable technically; he knew his way around the studio, knew the equipment and what it could do, and was always heavily involved in making suggestions about sonic matters. At the same time, he gave Chiccarelli (and other engineers he worked with) a tremendous amount of freedom. His guitar setup, both live and in the studio, was very sophisticated for the late '70s: "Frank had this entire rack of effects with Eventide's Harmonizer and Kepex Gain Brains and all kinds of flangers," Chiccarelli says. "Also, somebody had taken a bunch of Electro-Harmonix stomp boxes and put them in the rack, so he had a giant pedal board that allowed him to switch all this stuff, and that was fed into a stereo Marshall rig, or sometimes he'd have a couple of amps going on in stereo, so it would be two channels of a kind of clean sound, which sounded almost like a direct sound [miked with an SM57] and two channels of a processed sound [usually captured with an RE-20].

The only direction I can really remember from Zappa is, 'Make it sound stupid. It sounds too good. It's too hi-fi.'

—Joe Chiccarelli

"'Watermelon in Easter Hay' was done with Frank sitting in the control room right at the console, playing guitar direct into the console. On that album he used a lot of Les Paul; he had an SG that he used from time to time, and then he had one of Jimi Hendrix's Strats—I believe it was one of the ones Jimi burned up at Monterey, because it was all charred. As I remember it, initially that song was done with a darker, dirtier-sounding Les Paul, and then he came in the control room and it was either a Strat or the SG with a lot of compression on it—probably either 1176 or an Inovonics 201, which I used a lot back then." Zappa's tone on much of the track is startlingly clean and clear, then other parts sound more effected.

Though he loved to record live in the studio, Zappa was also a huge fan of razor blade editing to create certain effects in his music. "We used to do tons of 2-inch edits," Chiccarelli says, "and I remember him telling me where he wanted to cut the tape, and I'd say, 'Frank I don't think you want to cut there because one's an upbeat and the other's a downbeat, and I don't think it's gonna work.' He'd say, 'Well, let's try it,' and it would work every time. He had that picture in his mind of how he wanted everything to be. He loved to make weird time changes in things, so we'd do a lot of edits that weren't your typical bar one to bar one of another take edits; it was deliberate jerks to come up with more interesting rhythms. I think it was on 'Watermelon in Easter Hay' that he asked me to erase the kick drum from the entire track. Then we added this big, 26-inch orchestral bass drum on the track with Vinnie flailing over it. So the standard one-three kick drum pattern was gone, replaced with this big bass drum on the downbeat that lasted forever.

"He was so beyond pop music it was like a joke to him. So for him it became a game of pushing the limits in every way he could. He never wanted anything to sound ordinary. He was really great with me in terms of giving me creative freedom. The only direction I can really remember from him is, 'Make it sound stupid. It sounds too good. It's too hi-fi.' So we'd tweeze it—that was his expression. We'd process stuff or do things like put guitar amps in toilets or the shower. He did a lot of the lead and background vocals with him and the group standing inside the live echo chamber at Village B. It was this funky, musty chamber, but it sounded great. There weren't a whole lot of effects boxes at the time. We were definitely married to the Marshall Time Modulator—that was used on a lot of guitar stuff. The Ursa Major Space Station was used on a lot of Frank's vocals for echo; it made this sort of stepped, zippered sound, this boingy delay that Frank loved. I remember using the Inovonics 201 limiters on vocals and bass and a bunch of things."

The tracking sessions at Village went on for more than two months at a pace even the super-energetic Chiccarelli admits was grueling. Typically, sessions went from 10 or 11 in the morning until 3 or 4 the next morning, and this being the virulently anti-drug Zappa's band, there wasn't a line of cocaine to be seen—a real rarity in an L.A. session in the '70s (and '80s, for that matter). "Frank's drug was coffee," Chiccarelli says with a laugh. "He used to carry

around these big pots of Turkish coffee that was so thick it was like syrup. Usually the session would wind down when Frank ran out of coffee, so after a few weeks of working at this insane pace we started to drink Frank's coffee when he wasn't around so he'd start running out at 11 o'clock instead of 2 a.m."

In the end, Zappa and band had recorded way too much material for one record, so *Joe's Garage* came out in two parts during 1980, *Joe's Garage, Act I* and *Joe's Garage, Acts II and III*. Mick Glossop, a British engineer who worked at Townhouse Studios (London) and who'd engineered some Zappa sessions in England with Van Morrison ("Dead Girls of London") and L. Shankar, was brought to L.A. to mix the records on Kendun Studio D's relatively new SSL console. Steve Nye was also in on the mix sessions, which went relatively quickly, by Zappa standards.

Shortly after those records came out, Zappa built his own state-of-the-art studio in his home—the famed Utility Muffin Research Kitchen studio—equipped with a Harrison console (later he bought a Neve V) and Ampex tape machines. That became Ground Zero for Zappa recordings for the rest of his career.

Zappa barely let up for a second throughout the '80s and early '90s, turning out a staggering number of works, even after he was diagnosed with prostate cancer. He died in 1993, but there has been a steady stream of CDs authorized by his estate, with many more in the offing. "Some of his stuff still isn't ready for these times," says Chiccarelli. "But in 25 or 50 years people will be saying, 'My god, this guy was so far ahead of his times.' Before he died, he was mixing all his current projects—and even going back and mixing some of his past titles—in discrete 6-channel stereo, because he really believed that was going to be the future. He was only one channel off," Chiccarelli chuckles.

"For me, the best thing about the whole experience is that he taught me that you didn't have to take the conventional route to survive. That often, doing things in a way that's passionate and right for you is the best way. Frank was a guy who was indie before there was indie music. He went and said, 'Screw the major labels. Screw convention. I have a fan base that loves me and this is what I want to do and I'm going to go do it.' And he did and he made millions of dollars and had a long, long career that would still be going strong if he were alive." ■

—FROM PAGE 193, COOL SPINS

Cooke—and over his long and checkered career, producers struggled to capture that street rawness to tape. *The Ted Hawkins Story* (Rhino) is a career retrospective with selections from different-sounding productions: Early songs sound rough and soulful, while later recordings are more mellow, with keyboards and strings accompanying Hawkins' poignant and artful strumming. For those who feel that "live" was the only true way to hear Hawkins, Evidence has released *The Final Tour*. The basic and very moving solo performances were recorded at two concerts shortly before Hawkins' died of a stroke on New Year's Day 1995.

Suffer No More—Original producers: Al Scott, Bruce Bromberg, Dennis Walker, Dale Wilson, H. Thorp Minister III, Ted Hawkins with Michael Messer, Tony Berg. Original engineers: John Cevetello, Bill Dashiell, Gary Denton, Hollis Halford, Will Gosling, Eddie Freeman, Mike Drianis, John Paterno, Susan Rogers, Pat McCarthy. Original studios: El Dorado, Music Lab, Gary Denton Studio, Audio Media Recorders, Rak, Zeitgeist, The Complex. Compilation producers: Jimmy Guterman with co-producer Nancy Meyer. Compilation mastering: Bill Inglot and Dan Hersh. Mastering Studio: Digiprep. Compilation remastering: David Schultz.

The Final Tour—Producer: Jerry Gordon. Recording engineers: Wayne Griffith (tracks 1-16) and Phil Garfinkel. Mastering engineer: Roger Seibel. Mastering studio: SAE Mastering. —*Barbara Schultz*

Liz Phair: *whitechocolatespaceegg* (Matador)

After a four-year hiatus, Liz Phair has returned with her third and (by far) most "produced" recording to date. *Whitechocolatespaceegg* is the result of a long effort to create a new, perhaps more commercial, sound for this critically acclaimed artist (since her last release, there have been rumors of many recording sessions ventured and abandoned). In the end, Phair and her chief collaborators (producers Scott Litt and Brad Wood) have forged a fairly successful departure, translating her music from its original, more singer/songwriter style to a pop and ensemble-oriented sound. Though some of the quirkiness and spark of her earlier, more tossed-off efforts has been lost, the record retains much of Phair's charm and thoughtfulness, thanks in large part to a great, natural vocal sound and presence (such as on the single "Polyester Bride"). If there really is no going back, this ain't a bad way to go.

Producers: Liz Phair, Scott Litt, Brad Wood, Jason Chasko. Engineers: Ed Tinley, Brad Wood, John Hiler, Blaise Barton. Mix engineer: Tom Lord-Alge. Tracking studios: Velvet Shirt, Louie's Clubhouse, Ocean Way, Chicago Trax, Chicago Recording Co. Mixing studio: South Beach. —*Adam Beyda*

Bob Mould: *The Last Dog and Pony Show*

Bob Mould's latest release is full of the wondrous sounds fans have come to expect from the former Husker Du front man: stirring layers of powerful strumming at about the same volume as his harmoniously multitracked vocals. The first track, "New #1," is especially powerful, with Peter Murphy-esque keyboards and cello bolstering the soaring music. Mould plays almost all of the instruments on the self-produced album (except for Matt Hammon, drums; Alison Chesley, cello; Jim Wilson, samples). He also experiments with sampling in ways that blend surprisingly well with his strong rock 'n' roll sound and literate and introspective lyrics.

Producer: Bob Mould. Engineer: Jim Wilson. Tracking studios: Cedar Creek (Austin, TX) and Meridian (Boerne, TX). Mixing studio: Carriage House (Stamford, CT). Mastering engineer: Howie Weinberg. Mastering studio: Masterdisk (NYC). —*Barbara Schultz*

Jules Shear: *Between Us* (High Street)

Shear has never made a huge commercial splash as a solo artist, but he is widely regarded one of the finest songwriters working today and is tremendously respected by his peers. *Between Us* pairs Shear with a number of other fine singers and songwriters on what are essentially duets, with spare but always superb instrumental accompaniment from David Mansfield, Mark Egan, Jay Bellerose and others. Shear harmonizes wonderfully with the likes of Paula Cole, Rosanne Cash, Ron Sexsmith, Susan Cowsill, Suzzy Roche, Margo

Timmins, Carole King and several others over the course of 15 songs, each a little gem. Few writers tackle matters of the heart so perceptively; he even makes love-gone-wrong sound beautiful. A great album, full of adult emotions, that reveals more on each listening.

Producers: Stewart Lerman and Jules Shear. Engineer: Stewart Lerman. Studios: Bronx Science Recording (NYC); Shelter Island Sound (NYC); Chez Stivie (Woodstock, NY). Mastering: Greg Calbi, Masterdisk.

—*Blair Jackson*

Solex: *Solex Vs. the Hitmeister* (Matador)

Working under the name Solex, Amsterdam used record store owner Elisabeth Esselink has raided her inventory to create this unique collection of sample and keyboard-based, beat-heavy experimental pop. But unlike much sample-driven material, *Hitmeister* has a real musicality and warm quality, thanks to Esselink's sweet-to-piercing vocals and the addition of some live instrumentation: Esselink wisely chose to go into the studio to add live drum tracks, creating a raw, driving feel that makes for a wonderful contrast with the mechanoid atmospherics and rhythms of the loops and samples. The record's homemade sound is of a piece with the songs.

Producers: Frans Hagenaars and Solex. Engineer: Frans Hagenaars. Tracking studio: Home, and S.S.E. (Weesp, The Netherlands). Mixing studio: The Galaxy (Moll, Belgium). Mastering studio: Jules (Hilversum, The Netherlands).

—*Adam Beyda*

Oscar Aleman: *Swing Guitar Masterpieces, 1938-1957* (Acoustic Disc)

Listening to this incredible two-disc set, it's hard to believe that this is the first compilation of works by the great Argentine guitarist (1909-1980) to be released in the United States—how could he have been overlooked so long? Stylistically, Aleman's fleet-fingered playing and arrangements recall Django Reinhardt somewhat: the two were friends and both worked in Paris during the '30s. Both played mainly jazzy and energetic versions of American pop tunes of their day. Django went on to (posthumous) jazz immortality in Europe and America; Aleman returned to Argentina in 1940 and had a long, rich career that made him a big star in South America, but not in the U.S. Aleman was well-versed in styles ranging from Hawaiian to Brazilian to gypsy to American swing, and all of that comes through over the course of the two hours and 25 inspired minutes (52 songs!) presented on this collection. A must for swing guitar fans! And kudos to Dexter Johnson for his highly informative liner notes.

No studio/producer/engineer information provided, but sessions come from Copenhagen (1938), Paris (1939) and Buenos Aires (1941-47, 1951-54). Compilation producer: David Grisman. Mastering: Paul Stubblebine, Rocket Lab.

—*Blair Jackson*

—FROM PAGE 192, JOE ELY

What's the physical setup like? It's in a house near a creek?

Yeah, it's outside of Austin on a nice spread. I've got a real good drum room that's made out of nice old Texas rock—it's completely rock all the way around. It's about 30 by 20 by 20, so it's

a real nice live room, or I can bring in baffles and deaden it.

Do you have an isolated control room?

Yes. The control room is about the same width. Then I've got three rooms for isolation. One is a great old stone bathroom that was built at the same time as the house a long time ago. I call that the Bobby Keyes Memorial room. [Laughs] Bobby played in my band for a couple of years in the late '80s while the Stones were off the road, and he just loved that room. He'd say, "Just park me in here, give me a case of beer and shut the door!" He loved the sound of his sax in that room. I've found that for certain instruments, where you really want them to cut through, I'll put 'em in that little rock bathroom.

Do you have some favorite mics?

I've been really liking these new Earthworks mics, which I've been using as overheads and on acoustic guitar and various other things. Lloyd Maines

I love the stories from out in the desert, and I've tried to combine the sounds of Texas and Mexico.

swears his dobro has never sounded more live and in-your-face as when I mic his dobro [with an Earthworks mic] in one of these rooms. They pick up the instrument and the environment really well.

This studio is part of your house?

It's about 100 yards from the house.

Is it tempting to spend all your time there, or to walk there at two in the morning to make a fix on something?

I don't know. [Laughs] I like having the studio. You know, I was a rambling man and homeless for the longest time. Until I was 28, I never made more than $600 a year and never even thought about recording. I was too busy gathering songs together. In my late 20s is when I really got a band together.

I rambled so much, and then later I recorded quite a bit on the road. Like one time I found myself in Seattle in the middle of December, and it was raining every day, and the band got depressed, and we were all wishing we were back someplace where there was a little sun. So now, when I get a song or a group of songs together, I know a bunch of my guitarslinger friends live here in Austin, and I can pretty much call 'em up and they'll come down at the spur of the moment, or on a two- or three-day notice, and everyone comes out and it's like a clubhouse. If we don't want to record, we don't have to. We can tell jokes or whatever. But when we get fired up we catch stuff quickly.

It seems like you've always been very prolific. The songs just seem to flow out of you.

I write all the time, and I used to try to put out an album every year, but now it's more like every two years. I try to keep that nice flow on the road and then back home in the studio. I write on the road, but I never seem to finish anything because there are so many distractions. Then when I get home, I sort of collect everything and pull it together and go into the studio when the mood hits me. It's a nice way to work, actually.

Your last two records in particular seem to have something in common, whether it's more of a Spanish or Mexican influence or more of the acoustic feeling on some tracks. They sort of seem to be of a piece—more so than

Love and Danger, ***which was more of a rock album.***

Letter to Laredo started out as a pure acoustic album with no drums or anything—just acoustic guitars. I met a flamenco guitar player, a guy named Teye, who'd been in Spain studying with the gypsy guitarists. I played him a couple of songs, and he added a real different, sort of mysterious element to it that ended up influencing the direction that album went. And some of that feeling spilled onto the new record, too. I place both of them in the desert in the Southwest, between Texas and Mexico, and the high Mexican plane. I've sort of rediscovered that area.

It's interesting that even though you travel so much your work is still so influenced by Texas.

There was a time when I was traveling around in the '80s I almost never came home and my writing turned more urban. The guitars got harder-edged, and I was working with Bobby Keyes. We were playing out a lot in big cities, and the band was two electrics and a saxophone. The last couple of records I rediscovered the place I was writing about on my first couple of records. I love the stories from out in the desert, and I've tried to combine the sounds of Texas and Mexico, so it's been a real fun period for me.

With strong storytellers such as you or the late Townes van Zandt, it's sometimes hard for listeners to determine where the storyteller ends and where the writer begins. How revealing do feel you are in your songs, in terms of your personal autobiography?

I try to never write anything that's completely true. [Laugh] Because it would be a very boring song.

"We did a soundcheck, I traveled in a bus...."

[Laughs] Right. "I ate at Taco Bell last night, and then I threw up." No, I try to tell about true feelings and sometimes true experiences, but I put it through some other character's mouth. I've literally lived on the road all my life, so I've gathered a lot of stories, and I'll use those at different times. But I think the song is important, not what I have to say, so I try to let myself flow with the song and get into it. Because all I can really do is influence it by the experiences I've had, but the song itself always takes over in the end.

So you're still drawing on experiences you had 20 and 30 years ago.

Sure. You know, I'll be in Austin talking to guys from some young band: "Hey, we're 18 years old and we've been together for two months and we're ready to make a record!" And I think, "Go out and live awhile!" Don't get caught up in the music world at that age, because it won't be kind to you. Go ahead and live some so you've got some stories to tell.

PHOTO MICHAEL WILSON

When you wrote these 12 songs on* Twistin' in the Wind*, did you make demos of them before you started recording?

I never consider anything a demo, really. I set up everything as if it's going to be a record. A lot of times I don't get it when I first try to record a song, so a lot of times we'll record something just to get it down and then come back and re-record it as many times as necessary. We might do that three or four or five times, ten times if it's necessary. My view of songs keeps changing, so I try to stay open to new ideas and possibilities.

A lot of times I'll write the song one night, bring the band in the next day and when we start I don't have any idea really of what the song is supposed to eventually be. But something takes over once you get the other guys in there and all of a sudden you've got a finished track. I have a lot of faith in the people I play with, and over the years I've developed a core of people who are good at different things and bring different things to the kinds of songs I write.

Do you think about airplay much? You're one of those artists who people like me have always predicted great things for—"This next album is going to be BIG!"

[Laughs] Yeah, I've heard that for years. I gave up many years ago trying to even think about the radio. I think purely from the song point of view. And I get to keep making records, so I'm successful in that sense. I'm not out there trying to sell a million records. Don't get me wrong—it would be wonderful if it happened. But I love to just put a record together. It's like writing a little book every couple of years.

There's a real cinematic quality to your writing. You can almost feel the breezes and smell the aromas.

I look at a song almost like it's a short movie. I try not to whine too much as if it's my personal problems. I'd rather that people be able to see the characters. I guess that comes from the way I like to hear a story told. I'd rather see a story unfold from having two characters interacting, rather than everything being from the "me" point of view.

Who do you listen to?

Mostly songwriters. I might get on a kick and listen to everything Miles Davis ever recorded, or I'll dig into Lightnin' Hopkins for a while. I guess I like to focus in on one person at a time. When I'm writing an album I tend not to listen to anything, because it tends to confuse me. [Laughs] I'll be writing a melody and I'll think, "Now wait a minute, did I just hear this yesterday?" It's easy to be influenced by a clever melody. So I go for months without listening to anything, so I can see better what's really rattling around inside of me and pull that out. That's still the most important thing to me—finding those songs. ■

—FROM PAGE 193, CYPRESS HILL

Coast shit that sounds like two or three different groups. A lot of the West Coast groups are trying to sound like nobody. When you pick our record, it'll be like, 'This don't sound like nothing. It ain't North, South, it's just Cypress Hill again.' Definitely, we stand alone. We strive to be different."

In some respects, the new CD, *IV*, is a return to a harder-hitting style of hip hop that faded out in the mid-'90s,

which may or may not have been a risky move; time will tell. The band is typically forthright about their decision, however: "On this record, we're feeding our fans," says DJ Muggs. "We're not trying to run out and get new fans or trying to please the trends that are going on right now. We're bringing it back to '88 when beats were fast. You had Public Enemy and Big Daddy Kane doing high-tempo, high-fire shit.

"We're bringing a lot more up-tempo back into the rap game," he continues. "Everything out now is kind of down-

We always touched on the rock element with guitars, and there's a lot more of that on this record. Rockers are going to feel and relate to that.

—Muggs

tempo. We're coming with shit like 110 to 112 [beats per minute]; lots of heat. I'm telling you, a year from now everybody's going to be at 110 again."

B-Real adds, "The last album [*Cypress Hill III: Temples of Boom*] we did had a real gloomy feeling, and so did the one before it [*Black Sunday*]. But this one is touching every emotion and has lots of variety and elements."

"We got a couple tracks with some percussion going," Muggs elaborates. "We always touched on the rock element with guitars, and there's a lot more of that on this record. Especially with the uptempo shit, rockers are going to feel and relate to that."

Rounding out the current Cypress Hill lineup are original member Sen Dog (Senen Reyes, who lately has scaled down his touring activities and has shown a preference to working with the group in the studio) and Eric Bobo, son of the legendary jazz percussionist/singer Willie Bobo and an enthusiastic percussionist himself. "He brings a lot of energy to a live show," says B-Real.

Muggs runs down the roles of the different bandmembers: "I'm basically the music guy. B-Real is the lyric per-

son. Sen Dog does lyrics and backgrounds, too."

"Bobo does things for Muggs here and there," B-Real points out. "Sometimes he comes with ideas we can elaborate on. He's part of the creative process, when he's here. He's been working on the Beastie Boys album, playing stuff in their sessions. And with the Black Crowes, too."

Muggs handled most of the production chores on the new album, while "Big" Troy Staton did the engineering. A well-seasoned hip hop veteran, as well as a live sound mixer of some repute (he did the first two Lollapalooza tours), Staton had never worked with Cypress Hill before, "though I've known them for a while," he says. "I used to run into them while I was working for other people like Wutang and Rage." Assembling the disc took about a month of 12- to 14-hour sessions, before mixing began. But contrary to the group's image as hard-partying libertines, CH was mostly all-business in the studio, diligently building their tracks from samples and live tracks (supplied by a number of musician friends), polishing lyrics and laying down vocals.

Muggs admits that occasionally things were not as effortless as he'd like. "Sometimes I'd sit there and I couldn't catch a vibe for three or four hours," he says. "But then, once we did the tracks, it would be knocked out in an hour." Staton adds, "We'd track one day and mix the next day. Flipping it like that, we got a lot done. It was working out real good." Alternating between months in and out of the studio, CH worked on their fourth release for a total of six months.

Working locales were their home setup and American Studios in North Hollywood. Running down their own equipment, Muggs says, "I been using the same shit for years. I know it and my way around it with eyes closed. We use an ASR 10. They [ASR] sponsor us basically. We got an SP 1200, a MPC 3000 and a few keyboards here and there.

"We do pre-production and record some songs at home, but the shit here at American is very professional, bigger speakers. We don't have all the equipment that they have. They have all the outboard gear, the automation. Also, we get bored working at home a lot, and we need a different environment. At home, I have to do everything. Here I have engineers and assistants. Home is like making a blueprint."

Staton is amenable to the band's way of working and is happy to go with the

flow, Cypress Hill-style. "They know what they want, and I know what I'm doing," Staton says. "They know how I operate and vice versa; I'm definitely familiar with their needs. I've done Ice Cube, Ice T, Tupac, and I've worked with Dre amongst many others. For hip hop, you have to know how to keep it real and capture what they want. It could be raw or digital, but really that's the engineering aspect of any music."

As for Cypress Hill's preferences, "It's just straight analog for them," Staton says, "using an SSL 4000 board, which I prefer, and EQ'ing while getting it raw off the samplers. For filters I got some Manleys and NTIs. We use some compressors here and there, usually more in the final stages. For decks it's Studers all the way. We also got this 32 Mitsubishi, which is great. Once we link that up, we can lay more tracks.

"For these guys, you're capturing this stuff raw, but you want it to sound sonically right—a lot of bass, drums, sample loops, crackles, whatever. They might want the crackle, they might not want it. They may want to filter it or loop-filter it. We might use separate vocal effects for four different vocals. That's when my technical stuff comes into play, and that makes them more creative, too."

Cypress Hill is one of the few rap acts that consistently tours. Flamboyant and energetic onstage, they come across as larger than life, a fact that has made them a popular draw and given them staying power where other rap acts have faded. Comparing the band's approach to recording with their live show, B-real says, "You put a certain amount of energy and polish into doing the vocals in the studio, but when you're in front of thousands of people and everybody is going nuts, you tend to put a little more raw energy into it and forego the quality. I like both situations."

"They're both *the shit* for us," Muggs notes. "We could tour our asses off and have 8,000 to 10,000 kids come out every night. The studio stuff is gratifying, too, cause we get in there and play around."

"It's two forms of satisfaction," B-Real says. "After you finish the song in the studio, if it's a dope [good] song, you're satisfied behind it. Then, when you play the song to thousands of people and they're going nuts to it, that's the second half of the satisfaction you get behind it."

Adds engineer/CH-convert Staton, "When Cypress Hill puts something down, it's definitely original. They're not recapturing something from somebody else." ■

MEDIA & MASTERING NEWS

CRYSTAL BALL GAZING FOR CD, DVD MARKETS

Two new reports by industry prognosticators show continued growth for optical media and offer predictions on the future of CD and DVD. Infotech's "DVD Assessment, Third Edition," projects worldwide DVD-Video player sales of 1.2 million units in 1998, up 140% over 1997. DVD-ROM drive sales, meanwhile, are forecast to exceed 6.5 million units. With OEM prices moving toward $100 for a complete DVD solution (drive plus audio/video playback acceleration), DVD drives are increasingly likely to replace CD-ROM drives as original equipment on midrange personal computers by year's end. Infotech expects to see DVD hit entry-level, sub-$1,000 computers by some time in 1999. The worldwide installed base of DVD drives is forecast at almost 70 million by the year 2000. As for DVD titles, Infotech (www.infotechresearch.com) anticipates more than 3,000 DVD-Video titles in print by year's end, up from 732 in 1997. Interactive DVD-ROM titles will lag behind, with fewer than 500 by the end of the year.

In terms of numbers of DVD titles sold, figures compiled by Cambridge Associates for the International Recording Media Association (formerly the ITA) show the market to be in an extended "inventory build-up" phase. As reported in IRMA's "Optical Media Market Intelligence Report," combined U.S./Japan replication of DVD-Video totaled 16 million, but estimated sell-through for the format came to only 5 million. IRMA also reported a 10% increase in the overall optical replication market in 1997 over 1996, from 5.84 billion to 6.42 billion units. Most of the growth is attributed to a 25% increase in CD-ROMs, with CD-Audio growing only 4%. IRMA expects continued increases in replication through 1999, followed by a leveling in units as larger-capacity DVD-ROMs replace multiple-disc CD-ROM sets.

With the 1-inch, 2-track "Monster Machine" from JRF Magnetics are engineer Hideo Takada (seated) and Masamichi Ohashi of rental company Nippon Sogo Seisaku

AUDIO-FOR-DVD OFFERINGS

High-end DAW rivals Sonic Solutions and Studio Audio (manufacturers of the SADiE DAW) each announced new offerings targeted toward audio-for-DVD applications. Sonic is bowing the "Audio for DVD Workstation," intended as a complete design and production platform for high-resolution audio for DVD-Video and the forthcoming DVD-Audio format, as well as for CD premastering. The package includes Sonic's DVD authoring and proofing software modules, Dolby Digital surround encoding, NoNoise, the High Density Suite for multichannel 24-bit 88.2/96kHz audio, the new HDSP Plug-In Processor, and various other processing and interfacing components.

Studio Audio, meanwhile, continues its collaborative approach to DVD, concentrating on audio while leaving authoring and proofing to Daikin Comtec. SADiE supports direct transfer to Daikin's Scenarist via a high-speed SASCiA ATM network. Studio Audio announced new DVD-oriented SADiE capabilities, including 24-bit/96kHz surround sound and 192kHz editing. The company also introduced a new Mastering Limiter plug-in for SADiE Version 3.04, designed for CD premastering applications, and a "try as you buy" program for previewing three SADiE plug-ins.

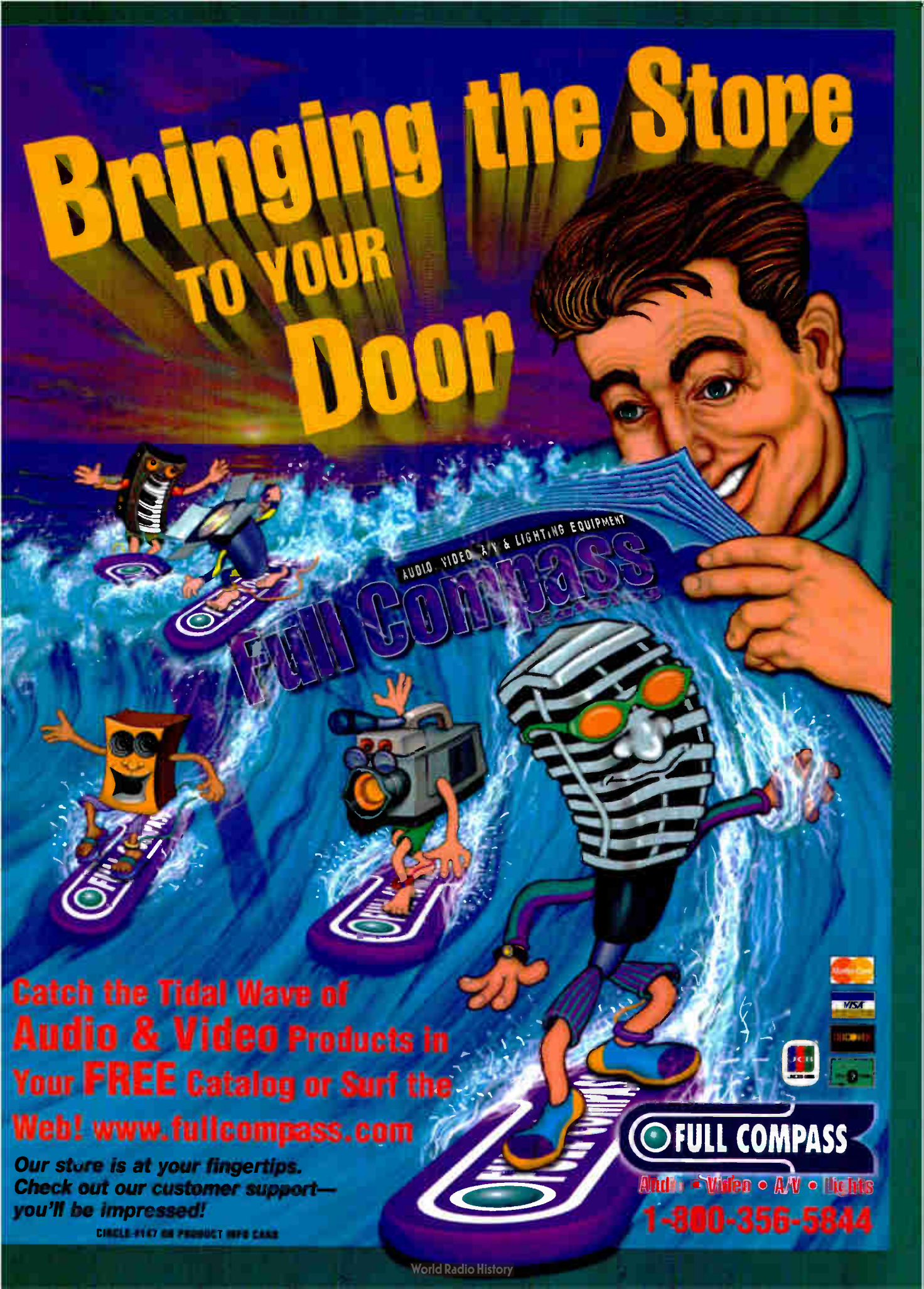
BY PHILIP DE LANCIE

1-INCH, 2-TRACK FROM JRF MAGNETICS

Proving that analog recording is holding its own at the high end in an increasingly digital world, a 1-inch, 2-track "Monster Machine" has been delivered to Nippon Sogo Seisaku, a studio equipment rental company in Tokyo. Built on a Studer chassis, the machine was created by John French and Noel Mackisoc of JRF Magnetic Sciences with the collaboration of Greg Orton of Flux Magnetics. According to Nippon's Masamichi Ohashi, the machine's noise floor is 8 to 10 dB lower than that of comparable Studer ½-inch machines. French, who says he was "blown away" by the final sound, measured a signal-to-noise ratio of 78 dB and frequency response of 25 to 25k Hz. The machine has been in use at JVC's Aoyama Studios, where, Ohashi says, the engineers have been "astonished."

STEINBERG LICENSES APOGEE'S MASTERTOOLS

Steinberg North America and Apogee Electronics announced that Steinberg has licensed Apogee's MasterTools software with UV22 digital word-length reduction. The agreement calls for Steinberg to take over development of the existing MasterTools plug-in for Pro Tools TDM, and to release new versions for VST, WaveLab and Microsoft's DirectX plug-in platform.



TELEX SELLS GAUSS TO M2

Leading cassette duplication equipment manufacturer Gauss has been sold by Telex Communications to Swedish optical replication equipment vendor M2. Gauss, renamed Gauss-M2 Corporation, will continue to make and market slaves, loaders, and digital and analog master reproducers ("bins") under the Gauss and Electro Sound brands. The company also will build and sell M2 gear for CD and DVD replication.

MASTERING NOTES

A new mastering facility operated by engineer/producer **Dave Donnelly**, former head of recording for Geffen Records, has opened in the Quadim Corporation complex in Westlake Village, CA. The room, already in use for projects by Shawn Colvin, Chicago and Aerosmith, was designed by Pelonis Acoustics (Santa Barbara, CA)...Palmdale, CA's **Paradoxx Sound** is the first U.S. site to install the new NR-3 Noise Reduction module from CEDAR (Portland, ME). Paradoxx (see story, page 129) expects to use the software in conjunction with its SADiE-based mastering operations...**Super Digital Mastering** (Portland, OR) has added engineer "Mo" Morales, late of Hollywood studios Cherokee and Paramount...A new EDAT digital master and editing and duplication system is in use at **KABA Research & Development** in Novato, CA, where it is interfaced with KABA's own in-cassette duplication system...Boulder, CO's **Airshow Mastering** announced that it has become the only mastering facility between the West Coast and Nashville to offer HDCD processing. A recent HDCD seminar at Airshow introduced the process to Denver-area engineers...HDCD has also made its debut in the Boston area


PHOTO: DAVID GOGGIN

Joni Mitchell and Bernie Grundman during sessions for Taming the Tiger *(Reprise).*

Recording artist Master P (right) and Kris Solem, mastering engineer for Future Disc.

at Cambridge, MA's **MWorks**. MWorks has been using the process on recent projects for Geffen and Rounder Records... The upcoming release on Reprise Records of her new album, *Taming the Tiger*, brought Joni Mitchell to Hollywood's **Bernie Grundman Mastering**...Future Disc (Hollywood, CA) reports work on four new HDCD releases, including a Depeche Mode tribute album on A&M and a double-album set from Master P on No Limit/Priority...Grammy nominees Burning Spear, Claire Lynch and Jo-El Sonnier mastered at **Northeastern Digital Recording** (Southborough, MA) with Toby Mountain, who also worked on new Rykodisc/MGM soundtracks, including *Some Like It Hot* and Duke Ellington's score for *Paris Blues*. NDR also upgraded Studio B with a new Sonic System, Genelec monitors and NTP analog compressors...Deep Purple alum Ian Gillan was in at **Digital Domain** (Altamonte Springs, FL) to master a new solo album with engineer Bob Katz, where he may or may not have rubbed elbows with Badfinger alum Mike Gibbin, also working with Katz. Katz also mastered a new one from jazz piano great Ahmad Jamal...Trevor

Rumbo flomenco guitarist Jesse Cook (left) and mastering engineer Trevor Sadler at Narada Records' studio in Milwaukee, Wis.

Sadler of **Narada Records** in Milwaukee, WI, mastered the latest from rumba flamenco artist Jesse Cook. ■

COAST TO

L.A. GRAPEVINE

by Maureen Droney

Over at Track Record the Goo Goo Dolls, riding high on the Top 10 success of the single "Iris" from the *City of Angels* soundtrack, were in recording with producer Rob Cavallo and engineer Ken Allardyce. Although core bandmembers Johnny Rzeznik (guitar) and Robby Takac (bass) have been together 11 years and have made five albums, this is the first time the Buffalo, N.Y., natives have actually recorded in L.A. With drummer Mike Malinin and Cavallo, they've been working on tracks for the follow-up to 1995's double-Platinum *A Boy Named Goo*.

Cavallo, best known for his production work on Green Day's multi-Platinum *Dookie*, hooked up with the band way back in 1990. "I was a young A&R guy at Warner Bros.," he recalls, "and my assignment was to find a metal label to sign. I found Metal

—CONTINUED ON PAGE 214

Ruthless Records (Los Angeles) celebrated its tenth anniversary this year by installing a pair of Westlake Audio BB-10SWP subwoofer systems in its main demo control room. In the studio is Ruthless producer/director of A&R L.T. Hutton.

PHOTO: MAUREEN DRONEY

Goo Goo Dolls at Track Record (L to R): producer Rob Cavallo, Robby Takoc (bass), Johnny Rzeznik (guitar), assistant engineer Darrell Thorpe and engineer Ken Allardyce.

NY METRO REPORT

by Gary Eskow

Producer Jack Douglas (John Lennon, Cheap Trick, Patty Smythe) was back in the studio recently with longtime client Aerosmith. Douglas was mixing a new live album with Jay Messina at Manhattan Center Studios. Live, but with a twist.

The failed quad experiment still lingers in the minds of the many producers and engineers who wonder if the public will embrace the audio-only possibilities of DVD technology. Not Douglas. The new Aerosmith album is being mixed to take advantage of the DVD format. "We're having a ball with the live project," Douglas says, "which will be released in both straight CD/cassette 2-track form and as a DVD release." Douglas culled performances from the last two years of Aerosmith tours and transferred the DA-88 masters to a Sony 3348 through a Beyer SPL Charisma processor. "The Charisma really helped take away some of the digital clatter in the DA-88 masters, and it gave the drums and bass in particular some chutzpah.

"DVD sounds amazing," Douglas continues. "The A-to-D converters in general are much better than what you find on CD players. Plus, with the mixes we did, you can select the original stereo mix from the

—CONTINUED ON PAGE 218

COAST

NASHVILLE SKYLINE

by Dan Daley

In an acquisition that reflects the growth and changes in Nashville's studio business, guitar-maker **Gibson Musical Instruments** purchased **music software and MIDI hardware developer Opcode Systems** in early July. The purchase moves Gibson (which has been headquartered in Nashville for several years, and which moved its electric guitar manufacturing division here, as well) even further into the electronic side of music technology. Opcode, which Gibson had maintained an investment stake in since 1995, joins other Gibson holdings including keyboard maker Oberheim and drum manufacturer Slingerland. Gibson's presence as a manufacturer of musical instruments in a city that probably uses more of them per capita than anywhere else in the world has certainly made sense. This acquistion also makes sense in that it's indicative of the changes in Nashville: While the conventional studio industry has expanded, so has the personal studio sector, a large proportion of Opcode's market.

The day the NAMM Show opened in Nashville, so did the 12th Music and

—CONTINUED ON PAGE 219

Social Distortion mixed for their new live record at Los Angeles studio King Sound & Pictures. At the studio's vintage API 3208 (recently fitted with Flying Faders automation) were (L to R) producer/engineer James Saez, band frontman Mike Ness and studio owner Jimmy Sloan.

PHOTO: JACKSON GOFF

Owners John Elefante (L) and Dino Elefante at the AMS Neve VR72 Legend in their studio, The Sound Kitchen (Franklin, Tenn.). The brothers are completing expansion work on the studio, adding four rooms to increase the facility from 8,000 to 27,000 square feet. The new 5,000-square-foot room will house a 60-input Neve Legend.

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

Record Plant (Los Angeles) had **Seal** in, tracking and overdubbing in the SSL4 room with producer **Danny Saber** and engineer **Tim Widner**. In SSL3, Saber produced for **Cheap Trick**, with engineer **Rick Costey**. **Stu Brawley** assisted on both sessions... At **Pacifique Studios** in North Hollywood, **Rob Chiarelli** mixed the song "Unstoppable" for River North's **Taylor Dayne** and remixed "Always You" for Hollywood Records artist **Jennifer Paige**, co-producing the latter with **Andy Goldmark**...

NORTHEAST

Ritchie Blackmore produced an upcoming album for his band, **Blackmore's Night**, at **Apres midi** (Paramus, NJ). **Roy McDonald** co-produced and **Nelson Ayres** engineered... **Bebe Winans** overdubbed with producing team **Masters at Work** ("Little" **Louie Vega** and **Kenny "Dope" Gonzalez**) at their **M.A.W. Studios** in New York City.

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—FROM PAGE 212, L.A. GRAPEVINE

Blade Records just kind of down the street, but it turned out that the best band they had, by far, was the unmetal Goo Goo Dolls."

Cavallo looked out for the band during their Warner/Metal Blade releases, became more involved with *A Boy Named Goo* and was asked to produce "Iris" for the *City of Angels* soundtrack album. With that song now a smash, the rest, everyone hopes, will be history.

With those five albums and all those years of touring behind them, the Dolls are the quintessential dues-paying band. "We got lucky that this success happened before our next album came out," says Rzeznik, "because there was a pretty big chunk of time when we had to go out and support ourselves and our business and our legal costs by touring. We stayed out for a long time, and the burnout from that was pretty extensive. Also, we had had our first real hit with "Name" [on *A Boy Named Goo*], and things were changing all around us, for better and for worse. It's kind of strange, but I found that to deal with it you just have to ignore everything and everybody. I became so burnt out and turned off to the whole record business that I didn't even pick up a guitar for nine months. I didn't want to look at it, I didn't want to think about it."

Now having had some success, Goo Goo Dolls are taking time for a bit more of a relaxed and experimental way of making a record. Asked how this record was different, Rzeznik laughs and says, "Well, we're having a pretty good time!"

"For one thing," adds Takac, "we did a lot of preproduction work together with Rob—he's a much more song-oriented producer than an engineer type, and it was a new way for us to work, to spend like a month-and-a-half getting material together."

Although he engineered at The Complex under George Massenburg, Cavallo prefers to leave knob twiddling to others these days. "I work with a few engineers who I think are great, like Ken Allardyce, who's with us on this project. It makes it much easier for me to think about the song and how to translate it, because it's easy to get bogged down in the sound side, and then the song can become almost secondary."

"Yeah, secondary to your science project," laughs Rzeznik. "Sometimes you can forget that the sound has to follow the arrangement and content and hooks of the song. That's one reason we like working with Rob: He's a musician, and a producer in more of the classical sense—he understands the whole process. I don't want to kiss his ass here, but it's nice to have that part tended to, to be nurtured as a songwriter."

"Actually," says Takac with a laugh, "we only really like him because he's got a great pile of guitars and amps. And he knows great people. The best guitar tech, the string arranger, the guy who plays Chinese mandolin. Before, we've always locked ourselves up somewhere to make our records; this time we're being sort of social."

"We've always had to make sort of an assembly line kind of record before," explains Rzeznik, "because we never had any money. It was like you'd get one good guitar sound, and boom—we'd lay it on ten songs. Then you'd get your overdub sound, and boom—lay that on the ten songs. This time we got to play with it a little and found we didn't have to fill everything up with parts. We're building cool little musical sculptures rather than just slamming down the cinderblocks. On this album, every song has its own little personality and identity; it's becoming a collection that's not one-dimensional at all."

As well as spending time on different guitar sounds, the team set up two drum kits facing each other in the same room for tracking, dubbing them the "big, luxurious hi-fi kit" and the "trashier Gretsch with more of a garage stink to it."

At press time, the plan was for Jack Joseph Puig (who mixed "Iris") to mix the album, which is set for release this month. In their spare time, the band is searching garage sales for a '50s-type basement bar to set up in Puig's Ocean Way Studios lair for the mix sessions (?!). "You'll have to come back and interview us during the mix," says Takac, "but make sure you have a ride home."

Rzeznik enlightens us. "It's going to be fun to work with Jack again. When we first met him and worked with him on 'Iris,' we didn't understand each other at all. It wasn't that we butted heads so much as that he was on Mars and we were on Venus, so we decided to compromise by meeting on Earth. It turned out great and we have a hit. It'll be even better now—this time around we plan to torture him mercilessly." Hang in there Jack...

Stopped in over at Ocean Way's Studio B for a visit with blues artist Keb' Mo', who, along with engineer Ross Hogarth, was putting the finishing touches on his new Sony 550 Records release titled *Slow Down*.

As Hogarth was mixing in the control room on the custom API console, singer/guitarist/blues harp player Kevin "Keb' Mo'" Moore worked on the fine art of sequencing out in the studio with two tape decks and a large collection of

PHOTO: BOB KRASNER

Jewish roots band The Klezmatics recorded a new album in collaboration with Israeli singer/songwriter Chava Alberstein (seated, right). Out this month on the Xenophile label, the record was tracked at Avatar Studios (New York City) by producer Ben Mink (standing, right). Marc Ramaer engineered, assisted by Rory Romano.

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cassettes. "It's hard to put together diversity," he laughs. "I could do it by category, I suppose, but some of these songs have no categories—I just call them 'feel good.'"

As we listened, the "ghost" of Keb' Mo' kept us company—Hogarth is a fan of re-miking tracks in the mix and was sending Mo's harmonica and various other instruments into different iso rooms for re-amping, creating an eerie effect out in the studio. "I re-amp a lot of things," Hogarth explains, "harmonica, piano, and for this record it worked really well on bass. When we were cutting basic tracks, we made the decision to forgo the bass amp because of space limitations and leakage. But sometimes you need more air and more character than you'll get with just the DI, and sending it back out through an amp will do the trick. It's a lot easier to do than it used to be because of an amazingly simple little box called Reamp that impedence-matches so you don't have to go back through a DI. Before, you'd have to take the signal out into a DI, through the tielines and into another DI, and you were constantly dealing with impedance. This little box has level controls and impedance-matches to the amp—you just drive a line to the box and to the amp."

The tracks for the album were cut live, including most of Moore's vocals and guitars. "You're creating a moment when you're recording," says Moore, "and when you're overdubbing, you're trying to recapture a moment that's already happened. So, usually I'm not a fan of overdubbing."

"I think that for me, that's one of the most refreshing things about this record," adds Hogarth. "The basic tracks were so happening that we had to be really careful with the overdubs—it was like fitting in pieces of a puzzle. And because so much of the basics were keeper, we left a lot of rough stuff on this record that I think people will really dig. A lot of the other producers I've worked with would have made me lose some of the juice—ad libs, talking on the tracks, lots of spontaneous, cool stuff that we've kept."

Hogarth chose Ocean Way's Studio B for mixing mainly because of its unique console. "There's something about having that vintage sound without the coloration of a Neve. It's a hybrid board; the API modules are totally separated from the console in a rack, and the onboard EQ modules are completely passive filters that Ocean Way built—you choose whether to insert them or

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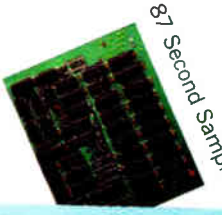

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not—and when you put them in, it really changes the sound. We listened carefully to each track and sometimes decided we didn't want that transformer in line. With this board, you can really fine-tune EQ—you can add just a touch, or you can add the iron with the APIs."

Hogarth brought in a Mike Spitz-modified ½-inch ATR to mix to. "Nate Kunkel owns it. He's a friend, and I was able to talk him into renting it to us for this project," Hogarth says. "It has extended heads that are flat from 30 to 20k Hz and it sounds great—when the tape plays back, you can really feel that 30 cycles. We mastered with Joe Gastwirt at Oceanview Digital, who fortunately has a machine with the same mods, so I didn't have to bring this one over there."

Despite all the thought he put into the equipment used on *Slow Down*, Hogarth maintains firmly that the recording and mixing process stayed way secondary to the artistry of the musicians. "This record is a little different than a lot of records out there," he says, "in that Kevin really only cares about feel. He's the litmus test, and emotion, dynamics and how the musicians played are what this record is all about. To that end, for mixing I found myself using very little compression, because the minute you start compressing all that down, you can change it too much. Some records become an engineer's statement about their own aggressive use of compression, instead of being the musician's statement of how the music was played. So the challenge on this record was to get everything in its proper place without much compression, and I do think the Ocean Way console, which has incredibly high slew rate and transient response, helped.

"But really, I don't think there's been any alchemy involved here," Hogarth concludes. "Sometimes engineers want to keep the outside world thinking some incredible transition happens in the mix. But hopefully you did your work in recording—you put up a good microphone and let it do its job—because if you're in a decent room with a good microphone, and it goes to tape okay, you haven't gotten in the way yet! Then you need to just keep getting out of the way of the music. As a matter of fact, that's probably a good theme for this album—getting out of the way of the music!" ■

Got L.A. news? Fax Los Angeles editor Maureen Droney at 818/346-3062 or e-mail msmdk@aol.com.

—FROM PAGE 212, NY METRO REPORT

menu, or the 5.1 mix." The surround mixes take advantage of crowd ambience, which is strategically placed around the field to give the home listener the sense of being enveloped by the audience as well as the music. "The feeling of being at the show is amazing," Douglas notes. He adds that lots of film and video footage from the last several years of Aerosmith tours is available, should the band and label decide to take advantage of the full DVD spectrum and add picture to the audio portion of the disc at a later date.

When *Mix* spoke with him, Douglas was having a lot of fun dealing with the audio possibilities of DVD. "Okay," he says, "so you have a straight stereo mix that comes up on your DVD menu, right? Many of the home receivers have effects settings, and I imagine that lots of people will have fun calling up a rock concert preset and applying that to the disc. If you have a subwoofer, the effect below the 80Hz level is great, in terms of the toms and kick in particular." Douglas says that Aerosmith was excited to mix this project in the new format. "We like the karaoke possibilities as well," he comments. "The guy at home can take the vocals out of the middle speaker and have a lot of fun singing with the band!"

All of the material is being mixed for 5.1 surround using a Genex GX8000A magneto-optical recorder, a 20-bit, 48kHz, 8-channel unit. "We're using six of the Genex's channels for our 5.1 mix," Douglas says, "and the last pair for a stereo mix. We're sending eight channels at a time through the Beyer Charisma, from the 3348, which we mix off of. The Genex is used strictly for the DVD mixes. The stereo mix we'll use for the CD/cassette release will come from a Studer 2-track. I love working with the Genex unit, it's amazing—I prefer it over any 16-bit system, and without a doubt this represents the future. Does it sound like 1-inch? No. There's a sound that you can only get by running 1-inch tape at 15 ips. When that kind of bottom is apropos, that's the way to go."

ISDN Dolby Fax lines were installed between Manhattan Center Studios and guitarist Joe Perry's Massachusetts home studio so that Perry could be involved with the mix without leaving his place. "There seemed to be a learning curve with the ISDN experiment," Douglas says, "but at the end of the process we experienced no delays in transmission. You need a huge bandwidth to send this material down the lines, and there's

always a bit of a problem calling during peak times. Later at night, things got much easier."

In order to minimize the "digital" quality of the recording, Douglas and Messina used a ton of vintage outboard gear, including an old CBS Dynamic Presence Model 4500 equalizer that dates back to about 1960, and API 560 graphic equalizers. "We pulled in a dbx 120XT subharmonic synthesizer for that super low end," Douglas says. "We also relied heavily on a pair of Altec filters that have been converted into equalizers. I have 24 bands of EQ in each one, and I use a pair of UREI 3As to drive them. The Altecs can operate at very specific frequencies, so that when you run a guitar through them, you can tailor the sound in great detail.

"I'd be lost executing these 5.1 mixes without the Otari Pic Mix we used," Douglas continues. "It lets you adjust each channel separately. I like to monitor through lots of speakers. We used Genelecs, and I love the little speakers that Alesis puts out—so does [singer] Steven [Tyler]. They give you the truth, and it comes right out of a single-ported 6-inch speaker. I have the upgraded tweeter package in them, so that they're not so bright. They tell me the truth, and they're pleasant to listen to."

Would Douglas bet on the long-term viability of mixing audio to the DVD format? "Absolutely," he says. "The possibilities are tremendous. Everyone knows that you can take advantage of the disc space to include lyrics and interviews. But the things you can do with the audio portion of the program alone are fantastic. We look forward to the public's response to the DVD version of this Aerosmith recording."

Earlier this year, this space had the sad task of reporting the untimely death of composer/producer/studio owner **Ned Liben**, just as his new recording facility on Broadway was about to open. Since his death, Liben's widow, Sally, has been nearly overwhelmed by the costs of maintaining the facility pending its sale or other disposition. The single-room facility, designed by John Storyk, is available complete with ownership of the space in an artist-qualified building. In addition, a trust fund has been started in the name of the couple's 2-year-old son. Please forward any donations, which are not tax-deductible, to the care of Max Liben Education Fund, 476 Broadway, #11-R, New York, NY 10013-2642. ■

E-mail your New York news to New York editor Gary Eskow at scribeny@aol.com.

—FROM PAGE 213, NASHVILLE SKYLINE

Recording Superstore MI and pro audio retail store. The 35,000-square-foot MARS puts company founder and owner Mark Begelman (who headed Office Depot for five years and built it from $626 million in sales in 1991 to $5.3 billion in 1995) just past the halfway mark in his quest to create a 22-store chain of musical equipment and instrument discount outlets. Three years ago, Begelman had used $8 million from the sale of his Office Depot stock to buy Florida-based Ace Music Center and build it into a player in the superstore game populated by large retailers like Guitar Center.

The store will also be the first to offer pro audio education seminars and courses operated by Full Sail. (See the lead feature in next month's "Mix Business Quarterly.") The store boasts a John Storyk-designed studio, which will also serve as a classroom. MARS has enlisted engineer Eddie Kramer to serve on its advisory board. According to MARS Nashville Learning Center director Lee Garner, initial courses will be geared to basic recording techniques and simple technology. "This is a songwriting market down here, and you've got people who are intimidated by 4-track decks," he says. "So we're gearing the educational program to the market. We're not pushing anyone off the deep end. This is also going to promote people going on to Full Sail for more extensive degree courses."

On the one hand, these moves reflect Nashville's influence as a music center, a position that, as the MARS opening underscores, is out of proportion to the city's size: Nashville is the smallest city to get a MARS outlet. At the same time, MARS—which bills itself as "The Musician's Planet"—brings the superstore concept more into Nashville, which already has a Thoroughbred Music center and other large MI/pro audio retailers. MARS also joins a spate of other mass-market consumer chains, such as Planet Hollywood and Hard Rock Cafe, that have McDonald's-ized Nashville's once-unique downtown into yet another anonymous urban strip mall infested with a dwindling tourist base and shunned by the locals. MARS and other retailers don't pretend to be purveyors of culture; but they are very accurate reflections of it. Add to that the fact that Gibson has decided to turn its funky and pleasant little Gibson Cafe on Broadway into a 50-city chain and

the trend is complete. Welcome to the world of commodities.

NAMM had other moments of note, including a very classy do at **Ocean Way Studios** for Audio-Technica featuring Larry Carlton playing with some of Nashville's best A-Teamers, including Matt Rollings. It also featured a very smooth and informational keynote delivered by the Georgie Jessel of pro audio, Phil Ramone. Also at Ocean Way, local producer Jonel Polansky staked a claim to the first 24-bit/48-track recording in Nashville history—a four-song session for artist Brian Eckert using the studio's Sony Oxford digital console and Sony 3348HR 24-bit multitrack deck, mixed via a TC Electronic Finalizer Plus in 24-bit mode to a Sony PCM 9000 24-bit 2-track. Editing was on a Pro Tools system, also 24-bit, and mastering was done using an HDCD Model One encoder.

What had been October Studios is now **Whistler's Music**, a base of operations for IV Records and related companies owned by Chris Parker, who started Whistler's several years ago as a commercial music production company. That core business remains, complementing the record company, a publishing company and related entities that Parker hopes will ultimately make the studio self-sustaining. The label's first artist, alt/pop Wes Cunningham, is signed to Warner's Los Angeles and has a project due out this month. In the meantime, according to staff producer Steve Keller, the studio is being rented out on occasion, but for-hire work is not being aggressively advertised or solicited.

The studio retains its main room designed by Steven Durr, who once operated his own studio there. It is equipped with a D&R console. Two smaller studios hold Yamaha 02R desks and were outfitted with new iso booths and reinforced walls. Storage is ADAT, DA-88, RADAR and Otari MTR-90, as well as two Pro Tools systems. Keller acknowledges that the D&R is an eccentric choice for Nashville. "It's a great tracking console, but the automation is pretty limited. So we're considering other console options at the moment, including SSL and Euphonix." ■

Send Nashville news to Dan Daley at danwriter@aol.com or fax 615/646-0102.

—FROM PAGE 213, SESSIONS & STUDIO NEWS

Steve Barkan engineered, assisted by **Oscar Ramirez**...Blue Note artist **James Hurt** mixed his new release in the B room at **EastSide Sound** (NYC) with producer **Dana Murry** and engineers **Lou Holtzman** and **Federico Panero**... At **Trod Nossel Recording** (Wallingford, CT), **Thomas "Doc" Cavalier** co-produced, mixed and mastered a Howlin' Wolf tribute CD featuring basic tracks by core members of Wolf's band (including Hubert Sumlin and James Cotton) and a range of singers including Lucinda Williams and Ronnie Hawkins...Vibrosoul recorded their Mercury debut with producer/engineer **Michael Barbiero** and assistants **Steve Regina** and **Tony DiCarlo** at **Bear Tracks Recording** (Suffern, NY)...Mad Pan recording artists The Bus mixed their debut at **Prism Sound** (Acton, MA) with producer **Matthew Libman**, engineer **Michael Farquharson** and assistants **Nicholas Lee** and **John Ellis**... **Emory Swank** finished up their new album with producer **Michael Musmanno** and engineer **Shelly Yakus** at **Tongue & Groove** in Philadelphia... Sony artist **Alicia Keys** mixed her self-produced new release in the K2 room at **Battery Studios** (NYC) with engineer

Gerry Brown and assistant Daniel Boom...

NORTHWEST

Mercury artist Laura Love mixed her second release with producer Joe Chiccarelli and assistant engineer Daniel Mendez at Stepping Stone Studios (Seattle)...Mike Ailes mixed his self-produced Badman Recording debut, *Sisyphus Quits*, at the label's studio in San Francisco with co-producer/engineer Dylan Magierek...Xtreme Studios' Seattle-based remote truck recorded guitarist Robin Trower for a forthcoming CD release, as well as the Concert of the Cross gospel event, featuring a 110-member choir, for Sonojack Records. The latter was recorded and mixed by Steve Smith...

NORTH CENTRAL

While on tour in Detroit, Jimmy Page and Robert Plant stopped in at Pearl Sound (Canton, MI) to record "Gonna Shoot You Right Down," their contribution to the upcoming Jimmy Rogers tribute album on Atlantic Records, with producer John Koenig. Jimmy Romeo engineered the sessions...Whiteline completed work on their sixth release with producer/engineer Cal Moore at his Immortal Productions (Canal Fulton, OH)...

SOUTHEAST

At American Holly Studios in Charleston, SC, Susan Ormond tracked a new release with producer/engineer John Uhrig...New York-based guitarist/vocalist Bob Kissell recently recorded, mixed and mastered his first solo effort, *Real Music*, at Grooveland (Orlando, FL) with engineer Terry Bourcy...At Atlanta's Doppler Studios, Def Jam artist Richie Rich recorded and mixed for an upcoming release with producer Sam Sneed, engineer Ralph Cacciurri and assistant Jason Rome...Monte Warden tracked for Asylum with producer Joe Thomas and engineer Frank Pappalardo at Masterfonics in Nashville...Mexican superstar Jose Jose completed his next BMG release at Miami's Criteria Recording with producer Roberto Livi, engineer Mike Couzzi and assistant AJ Bosco...At Sound Emporium (Nashville), Billy Dean overdubbed on a self-produced project for Capitol Nashville with co-producer David Gates and engineer Matt Andrews...The Catalinas mixed their upcoming live release for Ripete Records at JLR Productions (Lincolnton, NC) with owner/engineer Jeffrey Lynn Reid. The studio recently

added a TC Electronic Finalizer and a Fostex D160 16-track hard disk recorder...Jonny Lang mixed with producer David Z. at the Memphis House of Blues Studios. Kevin Page assisted. Also in was new Atlantic artist Mars Electric, recording with producer/engineer Greg Archilla...Atlanta's Wateree Studio relocated to larger facilities. The first session in the new rooms was Marshall Cadence, produced by Stan Smith and engineered by Eliott James...

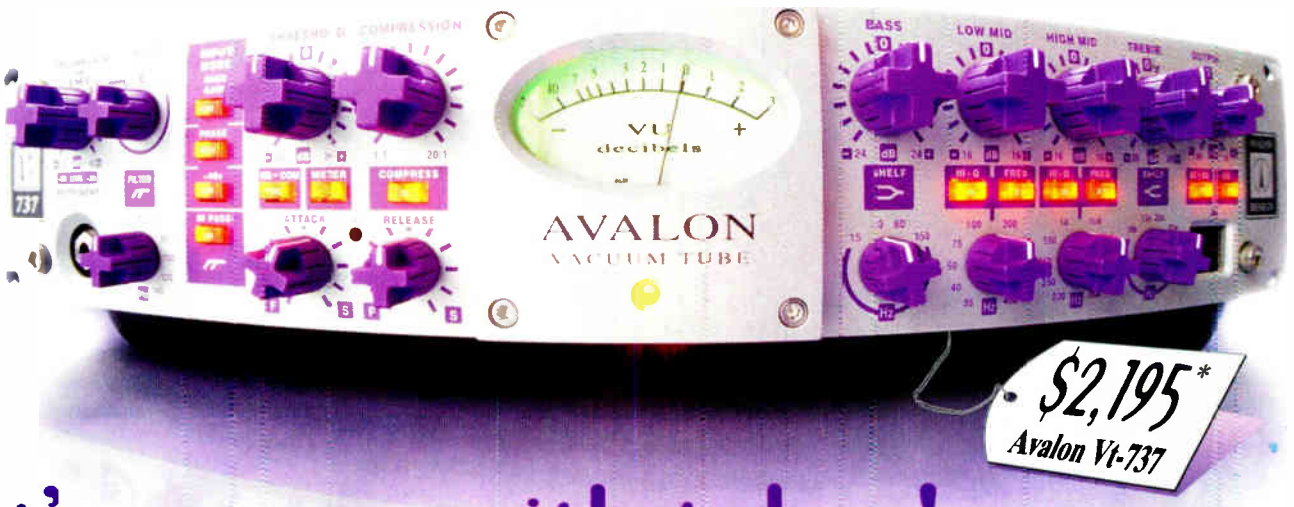
SOUTHWEST

At Colorado Sound Studios (Westminster, CO), WAR? Records artists The Samples finished work on their new release, *Here and Somewhere Else*. Kevin Clock engineered and co-produced with the band. Also in was Sugar Hill Records artist Mollie O'Brie, mixing her latest with Clock and producer Charles Sawtelle...

STUDIO NEWS

Omega Recording (Rockville, MD) is celebrating 30 years in business with a recent upgrade of Studio A, including the installation of a 60-channel Neve VR console. Recently in was arranger Robert Vuono, laying tracks for a classic big band CD with engineer Dave Cannon...Pedernales Studio (Spicewood, TX), co-owned by Willie Nelson and his nephew Freddie Fletcher, installed a 48-channel SSL 4000 G+ console with Total Recall automation...Also adding a new SSL was Manhattan studio Sound on Sound, which installed a 72-channel 9000 J board as the centerpiece of its recently upgraded Studio B...Sony Music Studios (NYC) added a pair of Martech MSS-10 mic preamps. Also purchasing an MSS-10 was The Grey Area studio in Orlando, FL...Sugarhill Studios (Houston, TX) installed 40 channels of Audiomate moving fader automation into its Neotek Series IIIC console... John Keane added 40 channels of Audiomate to the Trident 80B in his Athens, GA, studio; the automation was put to work immediately on sessions for R.E.M...Writer/producer Stuart Matthewmann recently purchased an HHB CDR800 CD recorder from Dale Pro Audio for reference at home and at his recording studio, Cottonbelly...The Eastman School of Music (Rochester, NY) added a SADiE 24•96 workstation to complement its Genex GX8000 digital 8-track recorders...The Woodshed in Memphis, TN, purchased a 40-channel Otari Status with moving faders and dynamics. ■

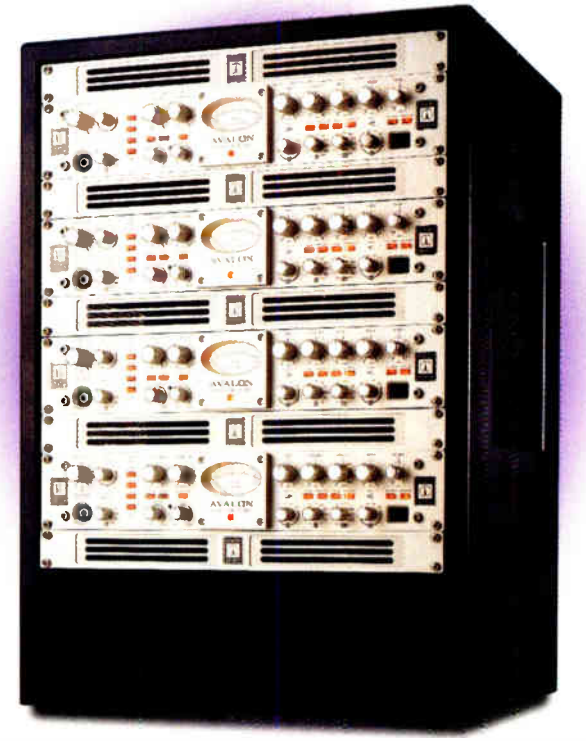
fat sound?



it's easy... with tubes!

Our continued quest for new sounds has evolved into the Vt-737. A vacuum tube direct-signal-path with unlimited rich, full and transparent sound.

The Vt-737 combines an all vacuum tube dual triode microphone-instrument-line preamplifier with a tube opto-compressor and a discrete Class A four band equalizer. The Vt-737 is an amazing 2U powerhouse, loaded with sonic character and a range of features and technology limited only by your imagination!



Vt-737SP ($2,495.00*) with VP-1 vent panels

Avalon Vt-737 Features:

- Four dual triode vacuum tubes
- Transformer balanced mic input
- High-voltage circuits for +30dB
- Headroom, low noise -92dB
- Stereo link
- All discrete Class A equalizer with musical passive filter design
- 22 sealed silver relays for direct signal routing
- Conductive plastic pots for all audio controls
- Professional VU meter and more...
- Vt-737SP features improved performance microphone input transformer and aluminum knobs

*U.S. list price

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▪ 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.

American Holly Studios

American Holly On the Park

139 Calhoun Street
Charleston, SC 29401
(843) 577-0780; Fax (843) 577-0067
e-mail: a.holly@Dyncon.com
http://www.americanholly.com

Three brand-new studios with 56-ch Cadac & 24-ch MCI consoles, 48-tk/96-tk hard disk (Akai) and linear digital (ADAT), plus 2-inch 24/16-tk, all formats. Also, outboard by Avalon, TC, Bellari, Aneus Melcor, ADM, Neve, ART, dbx; monitors by JBL, Altec, UREI, Yamaha (Crown, Audio Techniques amps); Korg Trinity, Kawai EP 308, Weber grand. Downtown, beaches, entertainment, hotels, restaurants. Control rooms A&B linked to mix studios and mix room via fiber optics. Liquid Audio uplink.

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QUAD Recording Studios

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 twentieth 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.

UMC Ultimate music corporation

Ultimate music corporation

40 Lopez Ave.
Cambridge, MA 02141
(617) 576-2855; Fax (617) 576-8094
e-mail: info@U-music.com
http://www.U-music.com

A two-room digital music production facility located near Boston, featuring Otari and Tactile Technology consoles. We offer up to 96 tracks of tape- and disk-based multitrack recorders including Sony 3324, RADAR, ADAT, DA-88 and Pro Tools. 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.

Wildstyle Studios

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.

▪ STUDIO SHOWCASE ▪

Triad Studios

4572 150th Ave. NE
Redmond, WA 98052
(425)-881-9322; Fax (425) 881-3645
e-mail: info@triadstudios.com
http://www.triadstudios.com

From solo piano to 30-piece strings, we've been recording music for more than 16 years. We have everything you need: Custom Neve 5106 48-channel console w/ automation, Mitsubishi Westar 52-channel console w/ automation, scads of great outboard gear including Joemeck, Lexicon and SSL. 24 tracks of analog 2-inch, Sony PCM 3324, DA-88s and ADATs. Sonic Solutions Digital Audio Editing. On-site, one-off CDs available.

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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.

Showplace Studios

347 South Salem St.
Dover, NJ 07801
(973) 328-4400; Fax (973) 328-4933
http://www.shawplacestudios.com

48-track analog recording, featuring Studer A800. One of the largest collections of awesome vintage gear anywhere. Mixdown Studer A820 1-inch 2-track and automated Amek console featuring all Neve modules. Top-quality sound and staff at reasonable rates. Large live room, stone area and iso booths. Great vibe, gear and experience brings your music to its full potential. Showplace Studios—where the past meets the future. Neve, Pultec, RCA, Teletronix, UREI, Neumann, Helios, EMT, Lexicon, Tubetech, Langevin, etc.

Troposphere Studios

One Naylon Place
Livingston, NJ 07039
(973) 994-2990; Fax (973)994-2965
e-mail: troposphere@garden.net
http://www.garden.net/users/troposphere

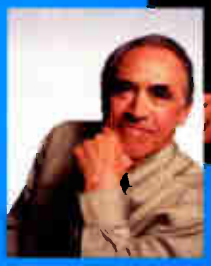
Conveniently located in northeast N.J., just 20 miles outside of NYC, Troposphere Studios offers its clients a huge, 7,000-sq.-ft., acoustically tuned facility designed for tracking, mixing, and film or video lockup. We feature an SSL 4048 G+ Series console with Total Recall, an Otari MTR 90II 2-inch 24-track, and a large selection of microphones and outboard gear. Our spacious iso booths and 38x40-foot live room also offer comfort to the performer. In short, Troposphere Studios is one of a kind.

Coast Recorders

665 Harrison Street
(2 Blocks from AES)
San Francisco, CA 94107
(415) 546-0200; Fax: (415) 546-9411

Classic expanded 72-input discrete NEVE with GML automation; 75+ pieces of modern and vintage outboard gear; large assortment of tube microphones; huge 40x45-foot recording space plus four iso booths. Clients include: Counting Crows, Green Day, Live, Journey, Joe Satriani, Chris Isaak, The Breeders, Tower of Power, Soul Coughing and Faith No More. Visit us during the AES show! 12-6 p.m. We have lots of gear for sale too!

Who WANTS technical training in audio?



"I'm in sales. I've never been an engineer, probably never will be. It isn't necessary for me to know the product technology inside and out, but it sure would help to know what a decibel is, or peak current, or directivity. Is there an efficient way for me to pick up the basics?"

"I assemble the systems, wire them up, and turn them on. I've learned skills on the job, but never spent a day in a classroom. I know how to pull wire and solder connectors, but not enough about simple circuits, nor how to predict sound projection. I'll need those things to advance my career. Where can I get that?"

"I'm self-taught in audio engineering. It has been awhile since I studied the basics. Adding and subtracting decibels sometimes brings me up short. A good review of the most important ideas would benefit me. Where can I get a quick refresher that won't take too much time or money?"

"My contracting company has always taught new employees on the job. We're good at teaching the manual skills needed to install. Our vendors are good at teaching their specific products. There's a gap, though. Some things, like Ohm's law, decibels, and reverberation, would be better taught in a classroom setting. How can I provide something practical that is focused on my business?"

Who PROVIDES technical training in audio?

Technical Fundamentals of Audio.

To order a registration form and find out more, call NSCA at 1-800-446-6722.

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Whether you're a technician, installer, project manager or designer, the TFA seminar series can help you get a better grip on the basics of your craft. This three-day program is presented by Ted Uzzle, Director of Instructional Development for NSCA. You know him as the driving force behind S&VC, the technical bible of pro-audio magazines. Now, he's ready to relaunch this classic S&VC seminar series with NSCA, working with you in person to develop your skills and ensure your success.

TFA will be presented in:
Toronto, ON - Sept. 24-26
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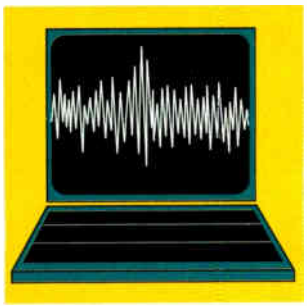
Indianapolis, IN - Oct. 22-24
Phoenix, AZ (at LDI) - Nov. 10-12
Detroit, MI - Nov. 19-21
Boston, MA - Dec. 3-5
Los Angeles, CA - Jan. 14-16
Kansas City, KS- Jan. 28-30
Miami, FL - Feb. 11-15

We also offer group discounts and customized TFA programs. For additional information call NSCA today!



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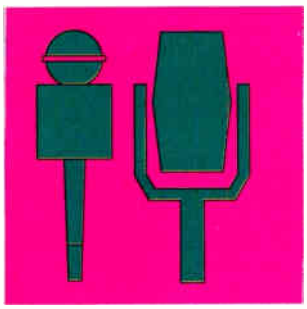
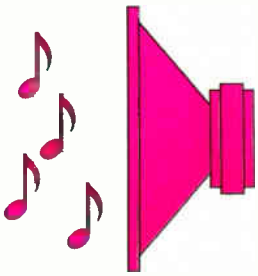
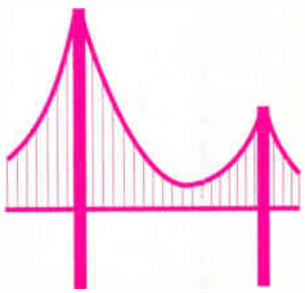
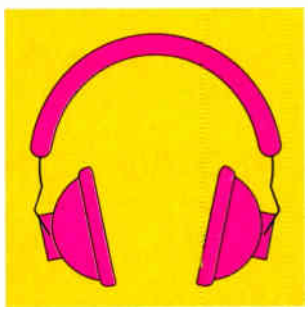
The AES looks to the next 50 years . . .

SFO 1998 AES









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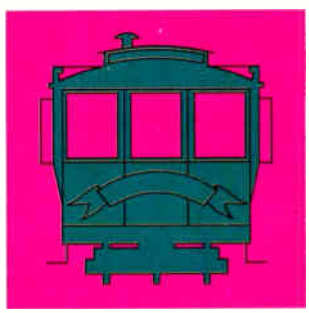

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Info: 212-661-8528 or http://www.aes.org
800-541-7299 (North America except NY)

DIGITAL MIXERS

MACKIE.

Digital 8 Bus Mixing Console

New

Everything you've been waiting for and more!!! The new digital 8 bus from Mackie features great sound quality, full recording and mixdown capabilities, motorized faders and an array of digital features geared to take you flying into the next century. See for yourself what the entire industry is raving about.

FEATURES-

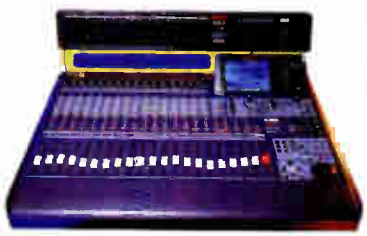
- 48 channels of automated compression, gating, EQ and delay
- Built in 3-way meter display keeps you on top of your mix.
- Built-in meter bridge.
- Ultramix II automation for complete control, hook up an S-VGA monitor and you'll feel like you spent a lot more money.
- All functions can be automated, 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

WR-DA7 Digital Mixing Console

New

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-

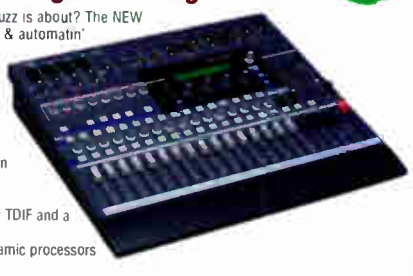
- 32 Inputs/6 AUX send/returns
- 24-bit converters
- Large backlit LCD screen displays EQ, bus and aux assignments, and dynamic/delay settings.
- 4-band parametric EQ
- Choice of Gate/Compressor/Limiter or Expander on each channel
- 5.1 channel surround sound in three modes on the bus outputs
- Output MMC
- Optional MIDI joystick

TASCAM

TMD1000 Digital Mixing Console

New

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-TO1000** 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

Green 3 "Voicebox MKII"

New

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 -96dBu

EFFECTS PROCESSING

t.c. electronic

ULTIMATE SOUND MACHINES

Finalizer Plus

New

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 fader 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

Green 2 "Focus EQ"

New

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/DverEasy switchable.

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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 genlock, ADAT sync, word clock sync, and even Digidesign superclock!

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 1x 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-88's, 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 unlimiting 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–
Pop, Orchestral, Piano, Vintage Synths, World, Super Sound Set, Keys of the 60's & 70's, Session, Bass & Drums, Techno & Hip-Hop Collection.

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, 80,00 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

New

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

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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—FROM PAGE 20, 96 BOTTLES OF BEER

way for you, okay?" Or a little later in racing school: "Jeez, Skip! I just can't seem to keep this squirrely little car on the track." "No problem, Mister Steve Racer! We'll just have the racing commission widen the whole damn thing for ya. Would, oh, say...*twice as wide* be enough for you and your powerful Mach 5—and your little chimp, too?" Or later, in CCW qualifying: "What's the matter, Island Boy? Target too small for you?" "Sir! Yes, sir! I believe it just may be, Sir!" "Well, then, allrighty. You and everyone else put your weapons down and step away from the line. We are going to have new targets printed up immediately. Just for you. All of you stand and wait for them to be delivered, and thank Mr. Saint Cry for your next five days here. Let's hope that someday he will find a home for his sarcastic views in the *private* sector!"

TWO WRONGS DON'T MAKE A RIGHT

16/44.1 *is* pretty lame. I agree with that generally accepted opinion. But *not* for the reasons that are floating around today. And 24/96 certainly isn't the answer, *not* for the reasons that are floating around today.

No, the way to improve accuracy is not to widen the road. The answer lies in better cars, not a wider track. Fix the problem, don't use precious resources to modify standards to *accommodate* it! A Band-Aid applied to an infected wound now will only hide it while it festers and worsens until it finally kills you. A stitch in time...Wait, I guess I've dipped more than deep enough into the mixed-metaphor stew. You get it, right?

SLEIGHT OF HAND, AIN'T IT GRAND?

The problem with the trendy 16/44.1 topic is that sample depth (word length) and clock rate have been lumped together into one buzz-term, as if it is assumed and accepted to be the standard. Oh, wait. It *is* the standard. We all hear certain problems with 16/44.1, but it *is* today's standard. CDs are released 16/44.1. Damn it, Jim, they just are!

To get a real handle on this, we must first separate the 16-bit word issue from the 44.1kHz clocking issue. And just to keep the velocity up, here is that separation for you: 16 bits are not enough, 44.1kHz delta-sigma *is*. Years ago, converters were linear. They clocked at 44.1 and had real nasty brickwall filters at 22 kHz or so to make sure that no aliasing could occur. Fine. These setups didn't alias much, but the damned filters had so much phase shift (from being so sharp) that the high end was a mess—slurred, delayed, dazed and confused.

Then the newer oversampled noise-shaped converters began to appear. These things started off oversampling at twice the real sample rate, then four times, and then eight. Each time the oversample rate was doubled, the guard filter could be relaxed more. Softer filter slopes mean less phase shift and ringing, flatter pass band and less of a dozen other nasty artifacts. Oversampling also allowed noise shaping, a method of actually moving conversion noise out of the area where we hear it most into a range where we really don't seem too aware of it at all. Successive approximation converters became part of life (now they are 128 times over), and life is better.

16/44.1 is pretty lame. But not for the reasons that are floating around today.

KNOW WHEN TO SAY NO

But now certain manufacturers apparently see a golden opportunity to come back and make us all give them our money again. This time, we all need new converters, and new everything else that goes along with them, so that we can have digital audio that is "twice the resolution of that tired old 44.1 stuff." Or in the case of 16/44.1 vs. 24/96, 3.26 times the resolution!

But this is all sleight of hand, all a diversionary tactic. Manufacturers will make more money for less work by getting us all to buy new 96kHz converters than they would if they had to finish the needed improvements on existing 44.1 conversion hardware. But we, the users, would pay for that mistake over and over. Here is how it *should* go:

- The chip houses should work on actually getting high-quality, low-jitter, fully linear, *real* 16-bit words out of their 16-bit converters. Not 16 bits of dynamic range with 14 or 15 bits of data, like most of today's chips. You ain't heard nothing until you have heard *real* 16-bit data—and I know it's hard to believe, but many of you probably haven't yet!
- Certain chip houses should get honest about decimation filters and design real 16-bit ones to replace the 12- to 14-bit ones *still* hiding in their 16-bit converters. This and other filter architecture cleanup would go a long, long way to smoothing out the high end.
- Hardware manufacturers should go for the cleanest, most honest approach to their glue (the parts used around and with the converter chips on the circuit board). I can name two DAW manufacturers who use the same converter chips, but one sounds *much* better than the other—due entirely to PCB layout and glue! In fact, I will go so far as to say that in many *real world* cases, lesser converters with good glue are producing cleaner, more accurate and more detailed audio than much more expensive higher-spec'd ones are with mediocre glue. You heard it here.
- 24-bit conversion should stay—and effort should be put into getting more than 20 bits of data. We need 24 bits more and more for headroom as

we equalize, splice, squeeze, stretch and crush our digital audio streams with reckless abandon. Each of these tricks throws data away, and you want to be sure to have an end result that has a few bits left for dithering reference when it is finally forced into the 16-bit holes in CDs.

• 48 kHz should be thrown out for audio CD targets. It only came to be in an effort to soften those original horrid brick walls needed for 44.1. But today those walls are gone. The damage done by sample rate converting 48 to today's standard of 44.1 far outweighs any theoretical gain delivered by a slightly softer filter slope.

Gearboxing from 96 to 44.1 is insane and sounds far worse than just staying at 44.1 the whole time.

And here is what the 96 perps plan for you:

• Buy all new converters (very easy for them to design and make).

• Buy all new drives, because you are going to need between 2 and 3.27 times more room for every damned track you print!

• Buy all new DSP, all new DAWs and all new computers for that matter, because the bus data width and raw DSP crunching horsepower will need to increase by *at least 2.2 times*!

• Repeat the step above three or four more times over the next year or two, until computers get fast enough to give you the same performance you once enjoyed on your 44.1kHz data.

• Sample-rate convert every one of your 96kHz mixes down to the industry standard 44.1. Now this will be nice, won't it? We're not talking a (relatively) clean gearbox of 2:1 like we would use for 88.2 to 44.1, but a sickening ratio of 2.1768707! Nobody's sample rate conversion algorithm sounds as good as avoiding the conversion altogether, and 2.1768707 ain't exactly the 12th root of 2! Let me be a bit more clear. Gearboxing from 96 to 44.1 is insane and sounds far worse than just staying at 44.1 the whole time.

SO WHAT?

So what do we get for their change to 96? Well, I don't get anything. Any theoretical improvement in resolution for having a data stream with twice as many points in it is surely more than lost by gearboxing alone.

Ah, but the 96ers also tout the wonders of the "super harmonics" preserved only in their world.

Yup! I could actually hear 22 k when I was 18 years old, but years of nitromethane dragster and motorcycle racing, scuba and sky diving, high-powered handgun practice, decades of playing too live too loud too many, and worst of all, driving with the window down has brought that 22 k down to a much more reasonable 2.2 k or so.

Well, the truth is I do all these things, but I am downright anal when it comes to protecting my hearing. The bikers I ride with think I am very zen and understated (something all of you know is laughable), because I rarely respond to conversation. The truth is that I shove so much ear protection into my head before I even go to the garage to start the bike that I just don't hear them talking to me. And I have been doing this for decades. A sadder truth is that HF loss has happened to all of us. It is part of life in society, part of aging in reality. Nobody over the age of 20 needs these bullshit "super harmonics," even if they do in fact exist.

THE CLIFF NOTES SYNOPSIS

The resolution increase you get by changing from 16 to 17 bits is *twice*—and that's certainly much more audible than leaving 44.1 for 96 (and changing back to 44.1 again in the end).

So back to that road—the stupid answer is to lay down twice as much asphalt and use twice the resources, while the smart answer is to improve the car so that it is capable of precision performance, so that it *can* stay on the narrow road at full speed. This has not yet been accomplished for digital audio conversion. Increasing word length from 16 to 24 bits uses 50% more disk space—and is definitely worth it—*you get 256 times the resolution*! But increasing sample rate from 44.1 kHz to 96 kHz uses *another* 2.1768707 *times* as much disk space, all for a theoretical two times the time resolution for suspect super harmonics and the joy of gearboxing back down. No, I just don't get it. ■

SSC expects trouble from the views expressed herein, and requests that any verbal responses be sent at 44.1 kHz.

—FROM PAGE 33, IN MEMORIAM

section, which let me know which experimental composers had just gotten their works recorded, and which of my favorite bands had new albums out. Often, stores would have new records in stock a month or two before they appeared in Schwann, but sometimes, when the record labels were able to release the information well enough in advance of the actual disc, the catalog got it first, and it was with the greatest of pleasure that I could point to a listing in the catalog and say to the clerk, "You really should get this."

Schwann sold the catalog to ABC Leisure publications (which also published the late, lamented *High Fidelity* and *Musical America*) in the mid-'70s, with the proviso that he stay on as publisher for ten years. ABC came close to killing the goose when they started selling ads in the catalog to record dealers, some of whom used the space to advertise cut-rate prices. Other dealers, naturally enough, were furious and stopped selling the publication. In response, ABC started making the catalog available by mail subscription, but they couldn't make up for the loss of dealer sales, and even after they stopped selling the offending ads, according to a source who worked for Schwann at the time, the catalog never fully recovered from the debacle.

Schwann's contributions to the music industry did not go unnoticed: He was twice commissioned by the RIAA to create and catalog a "White House Record Collection," with the express purpose of promoting the best American performers and composers in all genres.

He retired from the publication that bore his name in 1985. After that, the catalog was kicked around among several owners (one, the former publisher of *Soap Opera Digest*, flipped it after only three months), and in 1991 it was bought by *Stereophile* magazine. A couple of years later the Boston office was shut down and the catalog moved in with its parent company in Santa Fe, N.M. *Stereophile* put a lot of energy into the catalog, adding to the listings reviews and feature articles by its staff, and they divided it into two volumes: *Schwann Opus*, for classical records, and *Schwann Spectrum* for jazz and pop.

In 1996, the publication was bought by Valley Media in Woodlands, Calif., the largest independent CD distributor in the country. Since Valley took over, only the classical catalog has been published, although the non-classical catalog, according to a staff member, is due to return sometime in the next year. (The editorial offices are still in Santa Fe.) *Schwann Opus* is now in a large 8x11 format, with over 1,000 pages, and comes out quarterly. The Artist issue, which lists records by performer as opposed to composer, and which in past years was issued at almost random intervals (the time between issues could range from 18 months to four years) is now promised to be an annual project.

As for Bill, he remained a well-known figure in the Boston classical music scene, serving as an adviser and board member for numerous musical organizations and schools. He was also an avid mountain climber, conquering most of the 4,000-foot peaks in New Hampshire's White Mountains, and an ardent supporter of environmental causes.

What always blew me away about the Schwann catalog was not just that it was an invaluable compendium of musical knowledge, it was that this little book was the absolute paragon of how information of the highest quality, dense and ever-changing, could be organized and presented. Accuracy was paramount, but so was space—what today we would call bandwidth. Spend some time with the catalog and you'll see what I mean. The amount of information presented is staggering, and the clarity and efficiency of the formatting are nothing short of brilliant. "Space was always a concern," Schwann told me. "Unlike a newspaper, when you run out of space, you can't just cut some copy. I'm always looking for new abbreviations, different ways to organize the listings. Sometimes I'll go away on vacation and spend the whole time thinking about space problems."

There are many lessons to be learned by us today from a man who cared deeply not only about the information he was conveying, but also about how it was conveyed. Bill Schwann died on June 7, at the age of 85. All of us who work with music owe him our thanks. ■

Paul Lehrman, editorial director of Mix Online (www.mixonline.com), played some pieces by Alexander Tcherepnin in his first piano recital at age 8. When he was 12, he built a Theremin, but it didn't work very well. Today, he owns several thousand LPs, tapes and CDs, all very carefully organized.

—FROM PAGE 74, BUCK OWENS

get me in bad," because none of the country charts...if they thought that you were trying to get a record played on a rock station, they resented it something terrible. That's why when I had a song like this, [sings in a rock 'n' roll voice] "Hot dog, she's my baby..." I put it out under a different name, Corky Jones.

Alvin: There was an aggressive side to your records. I don't mean hard rock, but in the guitar solos—in the fact that at the same time Nashville was doing the strings and the choruses, you guys were basically a rock 'n' roll band.

Owens: We were rockin', yeah. But the Nashville people didn't want me to say I was a Little Richard fan. They wanted me to say I was an Ernest Tubb fan. And I was an Ernest Tubb fan. But my influences weren't all country. I worked at this club over here for almost eight years called the Blackboard. It held 500 people. It was a big old club; they built onto it three or four times, and the way I kept that job was I learned [sings part of "Long Tall Sally"] and things like that, because I got requests for it. I learned all those songs that people wanted to hear. And the Bob Wills things, I knew most of those before I came here, but [I'd take] the Bob Wills thing and put a Little Richard drive to it. That's where that came from, the aggressive guitar licks and solos.

Alvin: Well, and even when you used Mel Taylor on drums.

Owens: Yeah, Mel Taylor, what a guy. Well, at that time I didn't have a drummer, and I knew The Ventures because I'd spent two years up in Washington, and a couple of those boys were from up there. So I called him up and asked him. He did the little thing like on "My heart... [sings a drum roll] skips a beat..."

Alvin: That was pretty controversial, that one drum lick.

Owens: Yeah, that one little simple thing. I remember I got a note from a guy who said the guitar and the drums were too loud on my records. He wasn't buying any more till I got it right. I even wrote the guy a letter. I was very conscientious about wanting to do the right thing with the fans, because I've been in a cotton field. I knew what it was like.

Alvin: I'm curious about the different styles of country music: Obviously, there are differences between the West Coast/Bakersfield country sound and the Nashville sound. Nashville seems like a monolithic town that people like you and Merle and Lefty Frizzell and some other people have always had problems with. What do you think of Nashville and the shape of country music now?

Owens: How much time have you got? [Laughs] I tell you what, I'll tell you this little story about a manager going in to the record company and saying, "I got a boy that you're going to like." The guy at the record company will say, "Well, what's he look like? Good looking boy?" "Yeah, he's a good looking boy." "How tall is he?" "Oh, he's 6 foot." "Does he wear a hat and boots?" "Oh, he looks great in them." "Is he married?" "No." "How old is he?" "He's 23." "Well, okay, you got a deal," and they shake hands, and the manager goes over to the door, and the guy says, "Oh, wait, by the way, can he sing?" That's the last thing they ask.

Alvin: Well, it kind of brings us back full-circle to what we started off talking about. You were saying you're in the advertising business when you talk about the radio side of your career, and it seems like it's so much easier to sell things that all sound the same. But in the '60s/early '70s, Buck Owens and Merle Haggard were the Bakersfield sound, and you didn't sound alike, and neither of you sounded anything like Nashville country.

Owens: I have a reason for that, and that is, see, out here, you couldn't make a nickel if you couldn't play for a dance. So we had drums in our groups, and we used to play more of a dance sound than they did, because down there in the South, it's too much of a sin to be dancing and rubbing your body up against some gal's body. That's sinful.

Alvin: You know, I never thought of that. That is the biggest difference between the Eastern style of country music and the Western. You're right.

Owens: Yeah. Dancing is always a bit more aggressive. I never liked the syrupy sickening feeling of some of those songs. Though I recognize the talent of some of those people that came from there, I would have like to have heard them with a different sound. I just wonder what would have happened—if they thought I was pretty raw—what if Steve Earle had come along about that time? ■

Dave Alvin is now on tour supporting his latest release, Blackjack David.

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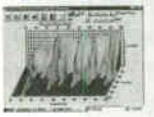

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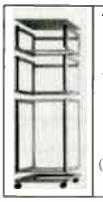

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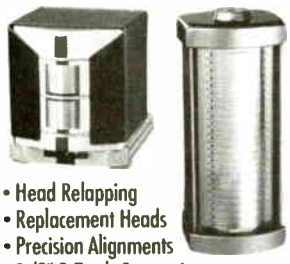

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QuickTime On the Web

—FROM PAGE 62

QuickTime Movie as the target format, you press the Options button to get to the Movie Settings dialog (see Fig. 3). Check "fast start for the Internet" and "compress movie header," then click the Settings button to get to the Sound Settings dialog (see Fig. 4), where you select the QDesign encoder and specify the sample rate, bit depth (must be 16) and number of channels (stereo or mono). Finally, clicking the Options button takes you to the QDesign encoder dialog.

Figure 3

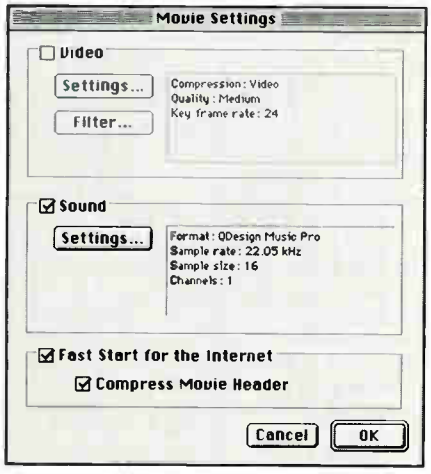

Figure 4

The encoder dialog (see Fig. 5) is the heart of the Pro Edition, offering a nice range of controls for encoding parameters, several factory presets for typical applications, and the ability to save your own settings in user-defined presets. The bit rate is normally set for the target connection speed, less a little allowance for overhead (24 kilobits per second for a 28.8 modem, for instance). Roll-off points may be set for high- and lowpass filters, allowing the codec to allocate more bits to achieving better quality in the middle range of the audio spectrum. The encoder also features a clip detection option for alerting you to source file peaks that can cause distortion in the encoded file, and a limiting option to keep borderline peaks from causing clipping.

Three encoding parameters deal with tradeoffs in the accuracy of reproduction. With Attack Sensitivity, high is supposed to give you better transients while low gives you smoother long tones. Spectral Emphasis deals with the balance between time and frequency resolution, which manifests itself as a continuum between blurry and warbly. Finally, Spectral Spread offers a choice between greater clarity, risking a metallic quality, or greater warmth, risking greater noise. The settings are adjusted with horizontal sliders.

In preparing files for encoding, QDesign recommends that dynamic compression be used "very sparingly," and that files be normalized to only 70% before encoding (there is no built-in normalization). Following these guidelines, I tried some of the presets (28.8 Pop and 28.8 Jazz) on material that I had encoded in the past using Shockwave. When I compared the results, I found the QDesign files to be cleaner but (not surprisingly) low in level; it would appear that the recommendations are somewhat overly conservative.

Figures 3 & 4: The next Pro Edition will allow users to export audio directly into a QuickTime movie file.

Figure 5: The Pro Edition's Music Encoder offers a range of controls for encoding parameters as well as factory presets for typical applications.

Figure 5

Aside from the volume, I found that QDesign's Pop preset yielded a slightly swishy but otherwise quite acceptable sound. Of course, considering that a one-minute, 40-second stereo Red Book file (16.9 MB) was reduced to 387 KB, we're not expecting high fidelity; with a 28.8 codec, it's not a matter of whether the fidelity is degraded but how much and in what way. But I was favorably impressed with how QDesign left the lead vocals relatively unscathed.

The Jazz setting, which I tried on a jazz ballad, also sounded relatively clear overall, but an "underwater" warble was evident on the lead sax. With enough time to experiment, I might have mitigated the effect by adjusting the spectral emphasis. But because it is simply a codec designed for use in other applications, the Pro Edition currently offers no ability to preview different settings before fully encoding a file. The company says previewing will be supported in its forthcoming standalone application, and that other applications which include previewing, such as Gallery TurboMorph, are expected to support QuickTime 3 in the future. In the meantime, however, the Pro Edition's potential for optimizing encoding is undermined by the tedium one faces in trying to use the tool to its full advantage without previewing.

Overall, the QuickTime/QDesign combination has great potential, but also limitations that threaten to hold it back. If support for netcasting, true interactivity and encode previewing were available now, and QDesign were playable on older platforms (Windows 3.1 and 68K Macs) as well as new, the package would be a superb tool for Web audio. Some of these issues are supposed to be addressed by the time you read this; we'll have to wait and see how well tools developers implement these new capabilities. But platform support will remain problematic for those who want as many people as possible to hear their posted music (isn't that why the music gets posted in the first place?). For now, then, QuickTime 3 adds to the choices for Web audio delivery, but fails to sweep the field. ■

Philip De Lancie is Mix's Media & Mastering editor.

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My experience with Sony DASH machines began shortly after their introduction in 1980. At that time I was asked to assemble and mix multitrack information recorded in a 24-track analog format for the Talking Heads film *Stop Making Sense*. I transferred the analog to 24-track digital and began what was a painstaking process of SMPTE offsets and track-by-track, bar-by-bar, 24-to-24 insanity to create a new multitrack master. After subsequent overdubs and mixing, no one would ever guess.

Enter the PCM-3348 in 1988, and DASH lock technology. Being old enough to remember the single-sided razor blade and its former stature as an editing tool, I was constantly searching for a better way. I have always been a bit of an assembly snob, wanting my premixed multitrack to be the final edit version. The continuity of the mix process and the technical advantage of allowing reverbs and effects to carry over edits have always been my choice over 2-track surgery. Using DASH lock with two PCM-3348s is fast, precise and, most importantly, musical.

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Set your two decks so that the Master/Record machine is monitored for playback. While it's in Auto Input, you will be able to monitor the information from it or your source reels.

Place the first piece to be assembled on the Slave/Playback machine and locate to a few seconds before the start of music. Hit the Slave button on the Slave/Playback machine, locking the decks. Begin recording on the Master/Record machine. Record several seconds past the first edit point.

Play back the new transfer to make sure everything is patched and recording properly. Then, using the Locate down arrow mark as precisely as you can on-the-fly, set the In Point for your next edit. Hit the Store button and then the In button. Locate and park the Master/Record machine at the In Point. Set a Rec Out point several minutes past the length of the total song time using the Store and Out buttons. (The Out Point can remain constant during the assembly.)

With the second source piece playing on the Slave/Playback machine, use the locate down arrow to mark the new edit point. Locate and park the machine to this mark.

Hit the Slave button on the Slave/Playback machine and then the Auto Punch button on the Master/Record machine. The machines will rewind to the pre-roll setting and Preview this rough edit.

Here's where your musicality comes in handy. If you have a click track, you can solo it to determine the timing of your edit. Or you can solo various instruments or vocals to see how they sound and feel. If your marks were close, the edit should be in the ballpark. To make adjustments, change the Offset on the slave machine using the Trim buttons. Make sure you're reading frames or your trims will be off by seconds! Increasing (+) the Offset time brings the edit piece closer in time to the master; decreasing (-) it moves the new material further back on the beat. You may also need to adjust your Rec In point. And the 3348 offers the useful option of using a crossfade of up to 350 ms. After some initial experimentation, you'll develop quick techniques for making all these adjustments. (I've done 150 edits in a day.)

Keep testing your adjustments with the Auto Punch button. When you're satisfied with your settings, hit the Auto Punch and Rec buttons simultaneously to record your edit automatically.

Document everything! Today's perfect edit may sound nightmarish later on. I keep track of everything from the In/Out points and crossfades on the Master/Record machine, to offsets used on the Slave machine, as well as the take and reel numbers for each edit piece. I like to work from control track location numbers, but you can use SMPTE as well. Be careful not to mix and match.

Remember that you're working in a multitrack format. Edits don't always have to line up across all tracks. You can stagger In points, change crossfades and even steal tracks from other takes when the music and leakage allow. Using the correct timings and crossfades, you'll be amazed at how many miracles you can create. And if you add in the 3348's internal sampling and internal track-to-track digital transfer capabilities, there are even more possibilities for creative production. ■

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Joel Moss has worked with dozens of top artists, including the Beach Boys, Harry Connick Jr., Toots Thielemans, Bette Midler, Santana and The Eagles, as well as many orchestral and film projects. Recent CDs include Tony Bennett's The Playground, *the Broadway cast recording of* Titanic *and* New York Voices Sing the Songs of Paul Simon.

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