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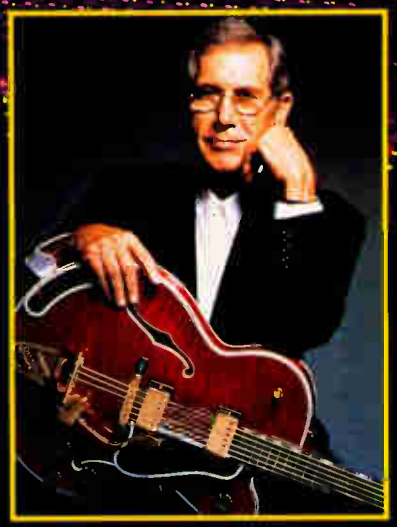

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1995

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Bottoms Up

A universal truth about all small near-field monitors is that they are not capable of accurately reproducing the bottom octave. Unfortunately, even near-field monitors utilizing active low frequency equalization compromise between increased low frequency extension and distortion caused by group delay.

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DEPARTMENTS

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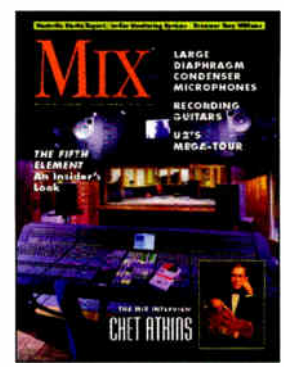
Cover: Curb Records. the hot country label, opened Curb Studios in one of its three Music Row buildings in October 1996. Designed by Dave Mattingly of Sound Construction, the room features a 104-fader Euphonix CS2000M board, digital 32-track and 24-track analog recorders, and JBL 4435 monitors. The large tracking room includes a large vocal booth and a Yamaha C7 grand piano. **Photo:** Tom Gatlin. **Inset:** Courtesy of Sony Music.



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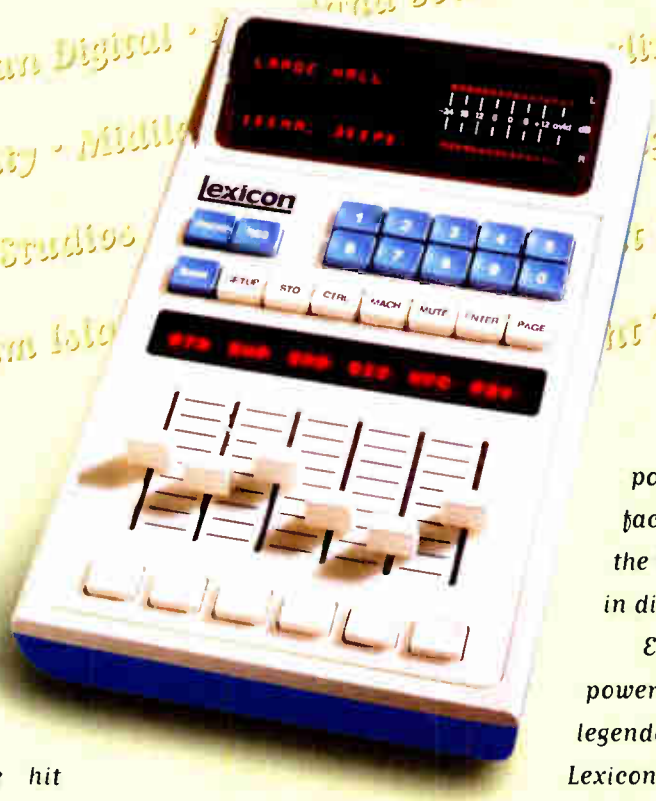

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FROM THE EDITOR

QUEST FOR (GUITAR) FIRE

In 1962, upon turning down a record deal with The Beatles, Decca A&R executive Dick Rowe reportedly said, "I'm sorry, Mr. Epstein, but guitar groups are on their way out." Today, it's easy to point fingers at the guy who passed on The Beatles, but an objective listener would conclude that the Decca audition tape (consisting mainly of covers that the Fab Four played at Hamburg gigs) was nothing special. Of course, Rowe's prediction about guitar groups was pretty far off-base, as wailing electric guitars have dominated pop music since the mid-1960s and show no sign of cooling off.

Today, in-studio or onstage, there are dozens of ways to capture the sound of guitars, and with no industry-established procedures for the task, new and innovative techniques are being formulated every day. In fact, as MDMs, 48-track recorders, virtual tracking systems and zillion-input consoles become more commonplace, the excuse of "not enough channels" is no longer a limitation.

Even the most basic "dynamic in front of cabinet" setup offers endless possibilities when variations in placement—such as "center/middle/edge of cone," "on/off-axis?" and "close-in/far-field"—are considered. With dozens of dynamic mics to choose from, this simple exercise yields vast permutations. Combining a distant and a close mic brings new creative directions. And what about using condenser mics, rear-miking an open-back cabinet, delaying a close mic to coincide with a distant mic or stereo room mics (XY, MS, spaced pair?), combining mics with a direct box/guitar preamp feed, or esoteric approaches such as attaching a miniature mic on an electric guitar to record pick noise?

Life in the studio lane can become *really* interesting, *really* fast, with techniques as basic as swapping a Marshall for a Bandmaster head, substituting a PRS for a Les Paul, or going from a 2x12 to a 4x10 cabinet. Throw in a palette of equalizers, signal processing and panning options, and the quest for guitar fire becomes a lifelong study.

So in conjunction with our annual look at the recording scene in Nashville (a guitar town if there ever was one), we also spotlight the art and science of getting the ultimate guitar sound, talking to top practitioners about their craft. And speaking of guitar bands, Mark Frink checks out the spectacle of U2's Pop Mart tour. Also in this issue, we begin a new feature, known as "The Mix Interview," showcasing in-depth conversations with some of the leading creative voices in our industry. Nashville writer Rick Clark opens the column with The Country Gentleman himself, Chet Atkins, who as artist, producer, label executive—and occasional guitar designer—has influenced nearly every genre of music.

We've got many more surprises in the months to come.

Stay tuned,

George Petersen

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SUMMER NAMM IS HERE!

This month, thousands of music retailers once again descend upon Nashville to attend the Summer NAMM show. Summer Session 97 takes place on July 11-13. One of the major show events is NAMM University, a training program designed for the music products industry. This year the University is offering a full schedule of more than 20 complementary seminars during the show, and $99, full-day courses on the days before and after the show. Topics covered include employee training, product merchandising, advertising and Personal Internet 101. Call 760/438-8001 or visit www.namm.com for more information.

CHANGES AT EVI

Greenwich Street Capital Partners announced major organizational changes at EVI Audio: Chief executive officer Bob Pabst, vice president of operations Ron Graham and vice president of finance John Bolstetter left EVI in mid-May. Paul McGuire, president of EVI Audio Americas, was appointed interim chief executive officer; a search for position replacements is under way.

"As CEO, Bob Pabst supervised a period of unprecedented growth and diversification," says McGuire. "His contributions to the company cannot be overstated. However, these changes demonstrate the strength of Greenwich Street's commitment to the growth of our business, and for a new direction and a new era for our company."

These corporate changes come less than six months after Greenwich agreed to buy the company formerly known as Mark IV Audio from Mark IV Industries in Buchanan, Mich. Replacements are expected to be found within 90 days.

DVD MUSIC DISC SPECS BEING DRAFTED; TESTING UNDER WAY

According to the Recording Industry Association of America, the International Steering Committee, which represents the recording industry in DVD matters, announced last month that it expects to have a final draft specification for a DVD music disc by December 1997, enabling a new DVD audio system to be released in the marketplace within two years. The committee has been working in collaboration with consumer electronics industries over the past year to establish a high-quality audio standard for DVD, and plans to conduct studio listening tests on proposed DVD audio standards to determine the system with the highest sound quality. The tests, which will begin as soon as systems are presented to the committee, will take place at numerous major recording facilities worldwide.

"Clearly, the worldwide recording industry is vigorously campaigning for the highest-quality sound standard for the music of tomorrow," says Hillary Rosen, RIAA president. "We are working diligently and cooperatively with the DVD Audio Working Group to communicate our requirements on sound quality, format, copyright, connectivity and other important concerns."

NARAS ANNOUNCEMENTS

Various reforms were the priority at the annual week-long meeting held by the Trustees of the National Academy of Recording Arts and Sciences in May. "Our agenda for the future of NARAS ensures that the Recording Academy remains positioned to meet the growing challenges faced by our diverse and dynamic music community," says NARAS president and CEO Michael Greene. "Toward that end, we are increasing professional and community service, broadening outreach efforts, and ensuring that the Grammy® process remains both inclusive and relevant."

The Trustees approved several revisions to the Grammy Awards and Nominations process, including adding new categories for Best Dance Recording, Re-Mixer of the Year and Best Latin Rock/Alternative Album. In addition, the Album of the Year category was expanded to allow all artists and producers on a various soundtrack album to receive Grammy Awards. (The award was previously awarded only to artists/producers performing on 51% or more of the album's playing time.) Also, in the classical field, the Best Instrumental Soloist(s) Performance (With Orchestra) category was amended so that the award will now be given to the conductor in addition to the artist(s).

In other meeting news, the Recording Academy elected new national officers: Phil Ramone is chairman of the board, Leslie Ann Jones is national vice-chairman and former *Mix* publisher Hillel Resner is national secretary.

APPS DEBUTS

The first meeting of the Audio Post Production Studios (APPS) group took place last March, at De Lane Lea studios in London. APPS, a division of the Association of Professional Recording Services Ltd., was formed to address the needs of the UK's audio post-production industry. Items on the agenda included establishing minimum criteria for applicant admission, forming an e-mail listing network to provide a permanent link between all APPS locations, and addressing general concerns regarding training in the post-production sector.

Any UK companies specializing in sound for film and television, including commercial and jingle production, are welcome to apply for membership in the APPS group. For more information, contact Philip Vaughan at 44/118/975-6218, or e-mail info@aprs.co.uk.

MUSIC COUNTERFEITERS GET MAXIMUM SENTENCES

Three individuals received the longest combined federal prison terms ever handed down in a single case for music piracy, according to the Recording Industry Association of America. In May, Basem, Yaser and Osama Allan were sentenced to 12 years and seven months, 11 years, and four years, respectively; the siblings were among 17 people from New Jersey, Pennsylvania, Indiana and Ohio who were indicted in October 1995 for their involvement in two major tape counterfeiting rings accountable for $96 million in displaced earnings—nearly a third of the legitimate music industry's piracy losses in a given year. "As the largest music industry piracy case in terms of retail value ever investigated in the United States, this sentencing sets a

—CONTINUED ON PAGE 12

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INDUSTRY NOTES

Piers Plaskitt stepped down from his post as president of **Solid State Logic**'s U.S. sales and service operations, after 15 years in the New York offices. No replacement was announced...**Jörg Wuttke** was appointed second partner of **Schalltechnik Dr.-Ing. Schoeps GmbH** (U.S. offices in New York City). Wuttke previously served as technical director, and has been active at Schoeps for 27 years...**Rockford Corp.** (Tempe, AZ) brought onboard **Will Lewis** as director of the **Hafler Professional** division. Lewis will be responsible for international sales and marketing efforts as well as OEM sales...**Ron Franklin**, formerly of Sonic Solutions, was named director of marketing at **TimeLine**, in Vista, CA...**Robert Hawco** is the new Eastern sales manager and **Mike Lynch** is the new Western regional sales manager at Lakewood, NJ-based **Neutrik USA**...**Harris Corp.**, headquartered in Quincy, IL, appointed **Rick Funk** as a radio district sales manager. Funk will be based in Richmond, IN...**Switchcraft Inc.** (Chicago) named **Mark Wilson** as Central region sales manager and **Jim Hoffman** as manager of new product sales...**Denis Labrecque** joined the newly expanded business development group at **E-mu Systems** in Scotts Valley, CA...Nashville-based **AKG Acoustics** brought onboard three new sales representative firms: **Sound Sales Inc.**, in Columbia, MD; **Excellence Marketing** of Eden Prairie, MN; and **Applied Audio Marketing**, based in Asheville, NC...**HHB** news: The company relocated its U.S. distribution office from Portland, ME, to 626 Santa Monica Blvd. Suite 110, Santa Monica, CA. Phone 310/319-1111; fax 310/319-1311. Also announced was the formation of **HHB Communications Canada Ltd.**, based in Toronto. In addition, **Bay Roads** in Sharon, MA, was appointed as HHB's East Coast manufacturer's rep firm...**The Rank Group** (Los Angeles) appointed Alan **Hammersley** to the position of senior vice president, DVD development...**The National Association of Music Merchants** has moved. The new address is 5790 Armada Drive, Carlsbad, CA 92008. Phone 760/438-8001; fax 760/438-7327...**Mary March** was named vice president of graphic services at **Jesse Walsh Communications**, headquartered in Buchanan, MI...Los Angeles-based **Todd-AO Studios** brought onboard **Steve Mullinix** as vice president of sales and marketing...**Oram Consulting Ltd.** (Kent, UK) and **Sweetwater Sound Inc.** (Ft. Wayne, IN) announced an agreement to allow Sweetwater a sole distributorship of Oram Professional Products in the United States, Canada and Mexico...**EVI Pro Audio** is now offering a one-stop e-mail address for the sales and service departments of **Midas**, **DDA** and **Klark Teknik**. All messages should be sent to 106761.3240 @compuserve.com, with the specific department listed in the subject header...**Karen McDermott** was promoted to vice president of production and **Hal Jackson** was appointed executive producer at **OneMusic Library**, based in Nashville...**Pinnacle Micro Inc.**, headquartered in Irvine, CA, announced an OEM relationship with **MicroNet Technology** for the Apex 4.6 GB optical hard drive...Carlsbad, CA-based **Professional Audio Systems** named **Bencsik Associates Inc.** in Ocala, FL, as its Florida territory representative for distribution and sales...**Randy Wade** is the new director of entertainment sales and operations at **The Magnum Companies Ltd.**, headquartered in Atlanta...**Nissho Electronics** (Santa Clara, CA) was chosen by **Ono Sokki** as its exclusive distributor in the U.S., Canada and Mexico, and started delivery of Ono Sokki's DVD analyzers in North America...**David Gentry** was named sales and marketing vice president at **Current Technology** in Irving, TX. ■

—FROM PAGE 10, CURRENT

precedent," says Frank Creighton, RIAA vice president and associate director of anti-piracy.

SHOW AND SEMINAR NEWS

Upcoming Synergetic Audio Concepts seminars include a Grounding and Shielding Workshop on July 9-11 in southern Indiana, and various Week of Audio Education seminars. For more information, call 800/796-2831 or visit www.synaudcon.com.

PALA (Pro Audio and Light Asia), Asia's largest show for the professional lighting and audio industries, will be emphasizing its practical applications in 1997. The show takes place at Singapore's World Trade Centre from July 14-16; call 65/227-0688 for registration information.

Edirol Corp., a division of the Roland Group, is hosting the GS Developers Conference for North America, an event for developers and designers of computer music. The conference will meet July 29 in Seattle and August 1 in Orlando, Fla. Admission is free, but registration is required; call 888/233-4765 for details.

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Above: 24•E 24-ch. expander with optional MB•E meter bridge and stand.

Above: 32•8 with optional MB•32 meter bridge and stand.

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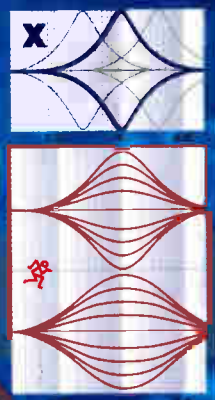
UltraMix™ includes the Ultra-34 Interface, UltraPilot Controller and software for $2797 suggested U.S.. retail. Macintosh® or Windows® 95-compatible PC not included.

8-BUS CONSOLE... AND 2 TIPS ON HOW EFFICIENTLY AND, WELL, MORE FUNLY.*

5 PROFESSIONALS REALLY USE THEM. *The members of Boyz II Men could have afforded any console they wanted for their studio's second room. They chose an 80-input 8•Bus setup with 102 channels of UltraMix™ automation. In the studios of artists as diverse as k.d. lang[1], Yes, Queensryche, Aerosmith, Lee Roy Parnell, Bryan Adams, Carlos Santana, Whitney Houston, Eric Clapton & U2, our consoles really are used to make great music.*

6 WIDE MID RANGE EQ. *Whether you're tracking or mixing, equalization is one of your most important creative tools. Mackie's 8•Bus consoles feature extremely-wide-bandwidth peaking EQ that can be used to achieve effects that simply aren't possible with narrower EQ. Most Brand X midrange EQs have a fixed bandwidth of about 2 octaves (blue graph at right). You can sweep it up & down the frequency spectrum, but the "sharpness" of the EQ curve is always the same. This kind of EQ is good for some purposes... but if you've worked with it before, you know it's too drastic and localized for gentle changes in overall tonal coloration.*



The 8•Bus' true parametric Hi Mid lets you spread the bandwidth out to as much as 3 octaves (red curves above). That extra octave of "width" gives you a whole new creative palette.

Above: 24•E 24-ch. expander with optional MB•E meter bridge and stand.

Above: The SideCar, matching 8•Bus equipment rack.

8 WHAT ULTRAMIX AUTOMATION CAN DO FOR YOU:

- *Hone a complicated mix one track at a time with every fader move recorded*
- *Clone your best fader moves and use them in other places in the mix*
- *Automute unused sections of your tape tracks or noisy MIDI sound modules*
- *Via automated mute or fader cuts, make a composite mix ("comp track") from the best moments of several tracks of the same vocal or instrument*
- *Save mixes for recall and editing at any time (great for mixes with music beds or "donuts")*
- *Make six voice-over versions of a jingle mix – and then easily make the inevitable nitpicky client changes three days later*
- *Step up to big-league automation without breaking the bank!*

9 LEGENDARY RELIABILITY. *One of those factors you probably don't think much about – until your console goes down in the middle of a critical late-night session. Built with pride in Woodinville, WA USA, Mackie 8•Bus consoles have an enviable three-year track record for enduring continuous, round-the-clock use and abuse.*

* Poetic license applied for.

[1] Mention in this ad denotes usage only, as reported to Mackie Designs, and is in no way intended to constitute official endorsement by the artists or groups listed.

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CIRCLE AD NUMBER ON PRODUCT INFO CARD

SICK, SICK, SICK

HOW LOW CAN YOU GO?

Lo-fi. No, not really lo-fi, but downright anti-fi. Yeah, that's it. The 666 of audio, the lowest fi you can get, and then lower; reach down deep under the surface of the earth-fi. *That* is what I am going to tell you about this month. The worst-sounding speaker I have ever heard. The one with the lousiest frequency response, the stupidest dispersion pattern, the most useless imaging I have ever experienced under *any* conditions. Yes, friends, this speaker is so sensitive to its environment that the manufacturer doesn't even *try* to publish frequency response or distortion figures for it. And I agree. Why bother? It would truly be a meaningless joke. This speaker is so bad that the instructions suggest that you might possibly want to put it in a different room than you are in!

And to add insult to what I assure you can be real injury, it's been done before. Many times before in fact, by many companies. The idea has always been stupid, and has never worked—until now. Now you can go out and buy one of these Ed Wood flying saucers and happily turn your brain (and various other internal organs) into puree.

Oh, did I mention that I have already gotten two, and will probably get at least four more?

BE HONEST, NOW

Have I piqued your interest? Oh, come on—have you never turned your head when driving past an accident scene? Not hoping to see carnage, but out of an almost automatic subconscious need to satisfy some kind of embarrassing, slightly sick, uh—"technical" curiosity?

Well, then read on. This is sort of like that. These things have actually made me sick on more than one occasion, scared the hell out of me on 20 others, and drawn me from other tasks to go and play with them out of that same morbid curiosity on more occasions than I will admit to here.

BREATHE IN, BREATHE OUT

What do subwoofers and the limbo have in common? Well, both share the same challenge: to

—CONTINUED ON PAGE 226

BY STEPHEN ST.CROIX

ILLUSTRATION ANDREW SHACHAT

RADAR VIEW™ Highlights

Fully self-contained, no external computer

Zoom-in, Zoom-out and locate to project names

Random access, non-destructive, playlist editing

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RADAR's Point of View

Replacing your analog 24 track can be a tough decision. All these formats, multiple units, synchronization and computers with mice. We at Otari feel that we have a far more simple solution. The RADAR with RADAR VIEW™.

The RADAR acts just like your multitrack. Punch in and punch out, no scrolling through menus. Just hit play or record on its familiar feeling, dedicated remote. You won't even know you are using a hard disk recorder, unless of course, you want to edit. Even then the RADAR is a pleasure to use. And the RADAR VIEW screen gives you all the information you need to know about your session, in large, easy to read graphics.

We invite you to contact your local RADAR dealer or call us, at Otari, for a free demonstration video. *We're certain you'll see things our way.*

CIRCLE AD NUMBER ON PRODUCT INFO CARD

RETRO THIS, BUDDY!

DISTORTING THE TRUTH

ILLUSTRATION CHARLIE POWELL

One day back in the '50s, in the *Peanuts* comic strip, Lucy announced she had a "hi-fi" jump rope. Charlie Brown silently took this in, but a couple of panels later bawled, "How can a jump rope be hi-fi!?" Several years later, Lucy showed up with a "stereo" jump rope. Charlie Brown, of course, had exactly the same reaction. If creator Charles Schulz had kept this up, in subsequent years Charlie Brown would have been befuddled by a "digital" jump rope, a "MIDI" one, an "interactive" one, and this year, no doubt, a "retro" jump rope. And then Schulz could start all over again.

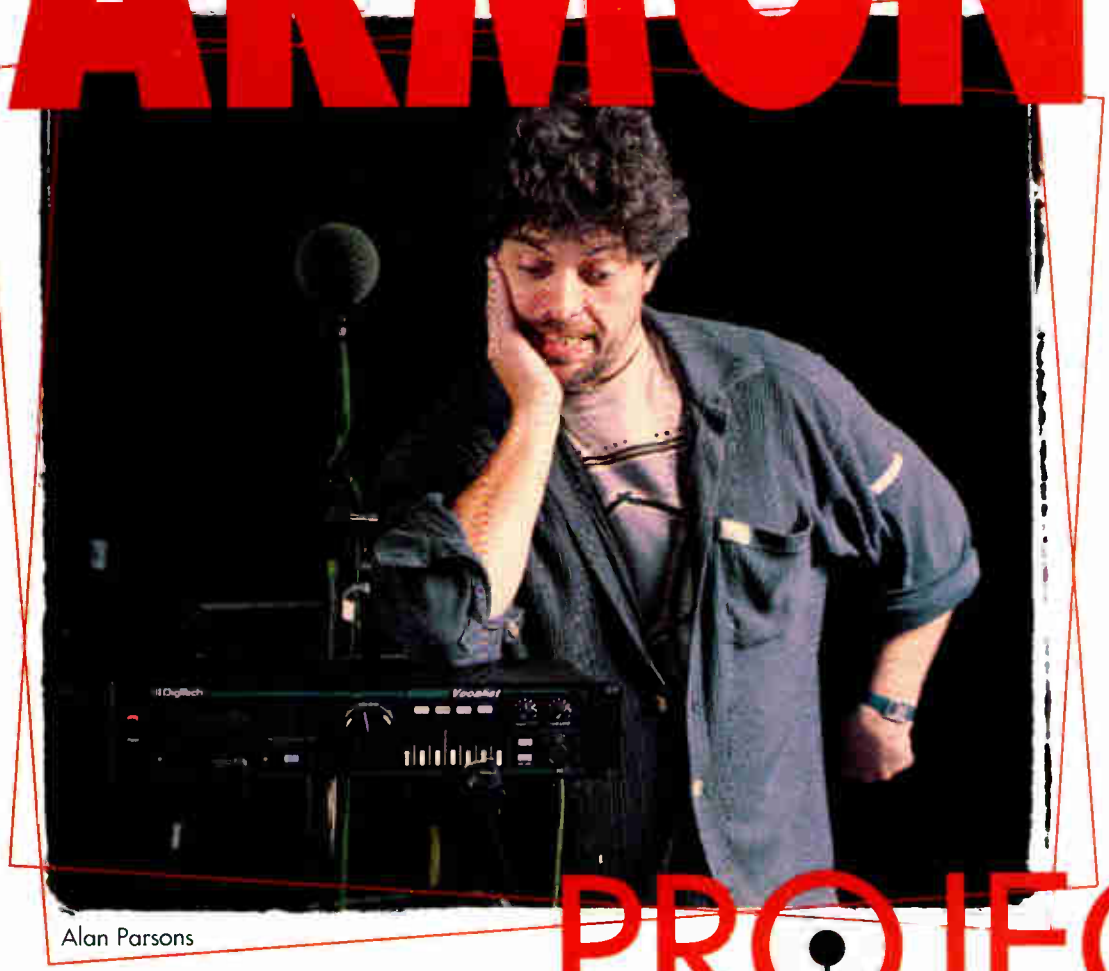
The retro thing is approaching ridiculous proportions in our field—it seems that no product is going to get out any manufacturer's door today without a tube, or an analog VU meter, or a set of knobs straight off a Fender guitar amp, or a burnished steel front panel (or if it's software, then a picture of one). Every new electronic music instrument looks like 1979, every new signal processor looks like it was made in 1959 (and if you don't "get" it, it'll have a model number that drives home the point), every microphone looks like 1939. Even the most modern digital editing and processing systems, no matter that they couldn't possibly have existed even five years ago, are showing up with user interfaces out of a Buck Rogers serial.

BY PAUL D. LEHRMAN

Real vintage gear, like Pultec equalizers and Fairchild limiters, is going for astronomical prices, and I've heard more than one story about people planning to put their kids through college by digging their old Micromoogs out of the attic and shipping them to Japan. I'm told there's even a huge market for early *digital* processing gear, like the foot-operated phaser I have gathering dust in my closet. The damn thing put out so much hum on stage that I had to put my volume pedal *after* it in the chain, manually gating it so it wouldn't drown out the singer when I wasn't playing—but, hey, the first $500 takes it!

What is it about old equipment that captivates us so? Was there re-

HARMONY PROJECT



Alan Parsons

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Whether it's your project or Alan Parsons' the Studio Vocalist is an essential tool for creating vocal harmonies. Our patented technologies and unique 'Gender Bender' features produce four realistic vocal harmonies giving you more flexibility than you've ever had in the past. See what a Studio Vocalist can do for your project... check one out at an authorized retailer today.

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ally something magical about the gear 10, 20, 30 years ago that caused hit records to spew forth from it? Is today's equipment so cold, lifeless and inhuman that no matter how much talent we push through it, the results are guaranteed to be less than wonderful (translated: won't sell a zillion copies)?

Allow me to propose that, as so often happens in an industry as based on fad and fashion as ours, most of what's driving the retro movement is utter hype and nonsense. There are lots of reasons why today's acts don't have the impact and the staying power of the groups of the '60s and '70s, but I, for one, believe that the fact that most limiters don't contain tubes is not among them.

The retro movement conveniently forgets that once upon a time, as the great Mel Brooks said, things were rotten. But in America (and now, thanks to MTV and other instruments of cultural imperialism, the world), no matter how good we've got it in any generation, there is always this streak of nostalgia for previous ones. In World War II, they sang World War I songs (now *that* was a fun time!). The TV generation's parents listened to Glenn Miller, the Broadway hit of the '70s was *Grease*, and the most successful new radio format of the last decade is classic rock. (In my town, that market is segmented even further: we have stations that play only '60s, only '70s or only '80s. Choose the time capsule you want to bury yourself in.) And now we're seeing nostalgia *for* nostalgia: witness the bizarre resurgence in popularity of the *Happy Days* TV show, a '90s audience for a '70s show featuring a mythical '50s reality.

People had to work damn hard to get the sounds they did in those days, and it was largely *in spite* of the equipment, not because of it.

Just like our esteemed politicians who advocate returning to an idyllic Norman Rockwell-esque America that never existed in the first place, those who lament that the golden age of recording ended when we left behind tubes and discrete transistors are lying to you. People had to work damn hard to get the sounds they did in those days, and it was largely *in spite* of the equipment, not because of it.

What constitutes retro gear? I see it breaking down essentially into four categories: analog tape, tube electronics, analog synthesizers and old guitar amps. Analog tape fans value the soft clipping and high-frequency compression that occur when you saturate those iron filings, the "virtual dithering" of being able to record a signal below the hiss level, and the relatively gentle roll-off of the frequency response. Tube fanatics swear that the sound caused by the wobbles in the transfer characteristic you get when you shoot electrons through a near-vacuum from one piece of metal to another is more musical than a straight wire with gain. Analog synth jockeys live for the inconsisten-

cies, inaccuracies and drift inherent in those ancient oscillators and filters, which they somehow think make the sound more exciting. Vintage guitar-amp aficionados get all goose-bumpy from the impedance mismatches between grossly overdriven output stages and tank-like speakers whose frequency response limits and THD figures would make even a car stereo salesman run for cover.

What's going on here? In a word, distortion. Coloration of the sound so that what comes out is not what went in. But interestingly enough, except for the ubiquitous post-"Satisfaction" fuzz boxes, most of today's valued old audio devices weren't *designed* to do the things we value them for, and in fact engineers forced to deal with these limitations when they were new cursed them roundly. The Nazi forefathers of the tape recorder would have laughed if you told them that overdriving the tape would one day be considered a great artistic tool—they just wanted a gadget that would make it sound like Hitler never needed sleep. Microphone manufacturers wanted something that reproduced Bing Crosby accurately—he didn't need any added "warmth," he just wanted to sound as good on the radio as he did in person.

Bob Moog, Don Buchla, Serge Tcherepnin, and the other early synth designers hated the fact that their oscillators couldn't be counted on to stay in tune. They included crummy spring reverbs not because they contributed so delightfully to the sound, but because most of their customers couldn't afford EMT plates. When I was in bands playing clubs in the '60s and '70s, we didn't use Sears Silvertone, Ampeg Rocket, and Fender Princeton amps cranked up to 11 because we loved the sound—we used them because we couldn't afford the Dual Showmans that we *really* wanted, which would let us play nice and loud, and *clean*.

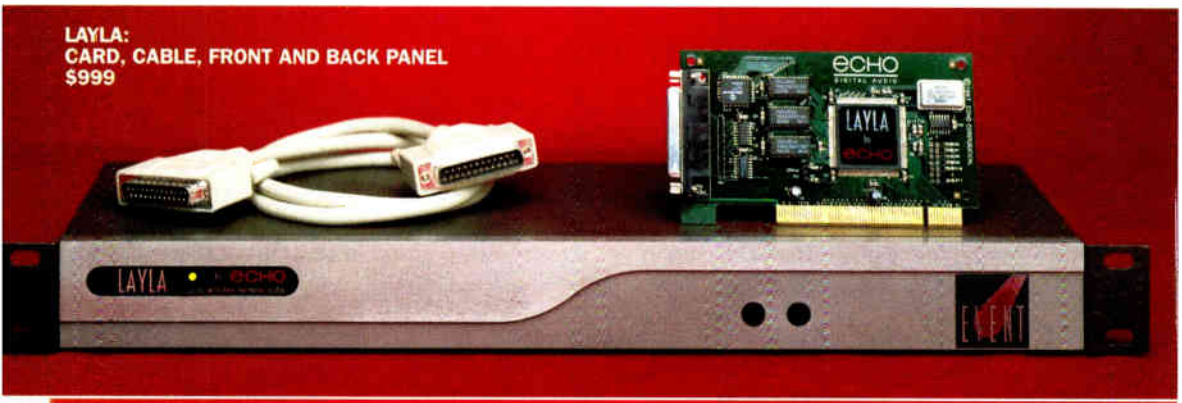
Of course, finding defects in a tool and turning them into virtues is an age-old practice, and much of the music of the early rock era is defined by this. And perhaps that is what people are *really* missing in today's gear: the serendipity of finding something weird and figuring out how to exploit it artistically. A piece of modern digital equipment is its own self-contained universe; you can't, as Dutch pioneer Michel Waiswisz used to do with analog synthesizers, stick your fingers into the guts of a digital synth and literally poke around until you come up with something you like.

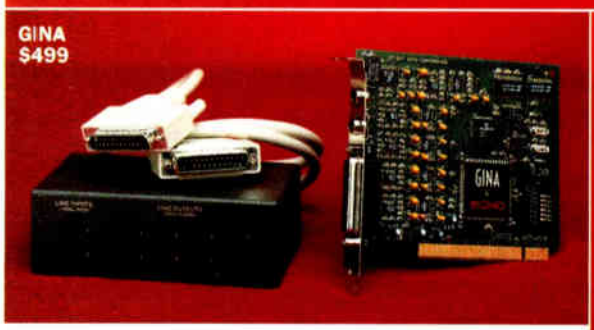
But what we've gained, in terms of accuracy, repeatability and simple ability to get things *done*, in my opinion far outweighs what we've lost. Next month, I'll take you on a *real* retro journey, back to a famous studio where I got my first formal instruction in how to make electronic music. And we'll see just how much fun retro can be. We'll also see what real lessons—if any—there are to be learned from the retro movement.

P.S. In May's review of *Electric Sound* by Joel Chadabe, I neglected to mention that this fine book is available directly from the author through the Electronic Music Foundation, 116 North Lake Avenue, Albany NY 12206; 518/434-4110, fax 518/434-0308, e-mail EMF@emf.org. The author will sign all copies bought through EMF, unless you specifically tell him you don't want him to. ■

Paul D. Lehrman constantly looks back, but so far can't tell if anything is gaining on him.

...the EVENT you've been





Affordable Digital Recording Hardware

Introducing our new family of cross-platform PCI-based multitrack audio recording systems, designed by digital audio gurus and Event's strategic partner, ECHO Corporation. Our proudest offering: **Layla by ECHO™**, a rack-mount audio interface with eight balanced analog inputs, ten balanced analog outputs (ins and outs are all simultaneously accessible), digital I/O, a 24-bit signal path, massive on-board DSP, word clock (for sync and expansion), MIDI, and much, much more—all for an amazingly low $999.

Or meet **Gina by ECHO™**: two analog inputs and eight analog outputs (all 20-bit, of course), digital I/O, and on-board 24-bit DSP. Appreciate clean design? So do we. That's why all of the audio connections on *Gina* are pro-quality 1/4" jacks mounted in a rugged breakout box. Appreciate reasonable pricing? *Gina*'s $499 tag is sure to make you smile.

If you only need two analog inputs and eight analog outputs (again, all 20-bit!), on-board DSP, and a breakout box loaded with RCA audio connectors, then say hello to **Darla by ECHO™**—priced to fit just about anyone's budget at only $349. (No, that's not a misprint.)

All three systems are compatible with audio recording and editing software applications that "talk to" the Microsoft Windows 95 .WAV device driver—which means you don't have to give up your favorite software in order to take advantage of the fantastic sound quality that Layla, Gina, and Darla offer. You can, for example (with full apologies to all of the fine software programs we're unintentionally leaving out), run Cakewalk Software's Cakewalk Pro Audio™. Or Steinberg's Cubase Audio™ and WaveLab™. Or Emagic's Logic Audio™. Or Innovative Quality Software's SAW Plus™. Or Sonic Foundry's Sound Forge™. Or Syntrillium Software's Cool Edit Pro™. (In fact, a custom version of Cool Edit Pro comes with each Layla, Gina, and Darla system, so you can be up and running even if you don't already own multitrack recording software.) Plug-ins? You bet. Including perennial favorites from Waves and Arboretum Systems.

And since getting up and running is half the battle (a battle we firmly believe you shouldn't have to fight) all three systems are true Plug and Play™ compliant. We even give you a utilities disk that examines your system before installation, so you know exactly what performance you'll be able to achieve.

Don't worry. We haven't forgotten our Mac-based friends. Our PowerPC-compatible systems (same hardware, new drivers) are coming this summer. Prepare to be stunned.

Precision Monitoring Systems

Building on the technological innovations that arose from the 20/20*bas* development, our intrepid engineers, messieurs Kelly and Dick, set out to create an active monitoring system that would be a perfect complement to the digital audio workstation environment. Requirements: small footprint, reference-quality frequency response, non-fatiguing to the ears over long periods of use, magnetically shielded, and *way* cool looks (!). The result: the **Tria™ Triamplified Workstation Monitoring System**. This integrated three-piece system comprises a floor-mounted VLF (Very Low Frequency) driver housed in a cabinet that is also home to five separate power amplifiers, active crossovers, and a full set of calibrated trim and level controls, plus

RØDE™ NT1

Large Diaphragm Condenser Microphone

Hot on the heels of the awesomely successful NT2 comes the **NT1**, a true large diaphragm condenser microphone. Like its predecessor, the NT1 boasts low-noise transformerless FET circuitry, and features the highest quality components. With a 1" gold-sputtered diaphragm inside a proprietary shock-mounting system, a unique head design that provides both durability and pop filtering (while remaining acoustically transparent), and a wide dynamic range that makes the mic ideal for use in a wide variety of applications, the NT1 is destined to become a fixture in the modern project and professional studio. And at only $499, it's just plain scary.

waiting for.

two biamplified satellite speakers, each with a 5-1/4" poly-propylene driver and 1" neodymium soft dome high frequency driver.

What's truly remarkable is that the biamplified satellite speakers reproduce frequencies down to an incredible 55Hz, so the listener experiences full-range sound when positioned in the near field environment (that is, sitting in front of a computer screen). With the addition of the VLF, the system response reaches down to 35Hz, resulting in full bandwidth audio reproduction that is as accurate, precise, and pleasing to the ear as our award-winning 20/20*bas* system. You simply must hear **Tria** to believe it. Even then, you may not believe the price: $849. (Yes, that's for the *entire* system.)

The **20/20p**™ is a direct field monitor designed to provide an affordable pathway into the world of powered speakers. Utilizing the proven 20/20 design, the system comprises a 20/20 cabinet with two full-range 100 watt power amplifiers—one of the amps drives the powered cabinet, the other drives a passive 20/20 satellite. The resulting sonic clarity is exactly what you'd expect from a system bearing the 20/20 name: extended low frequency response, exceptionally clear midrange, and sparkling high end. What does this kind of audio quality cost? A low, low $599 per pair.

As with all of our active monitoring systems, the **Tria** and **20/20p** offer continuously variable high and low frequency trim controls, input gain controls, balanced inputs with combination 1/4"/XLR connectors, and full magnetic shielding.

SW-1 Speaker Switcher

Bet you were almost going to pass over this part. After all, a speaker switcher isn't exactly the most exciting product in the world. But the **SW-1™ Speaker Switcher** delivers breakthrough performance and functionality, thanks to the clever engineering of Peter Madnick, who has long been a fixture in high-end audio equipment design. (He's actually pretty scary, possessing serious chops in both the analog and digital domains.)

What makes the **SW-1** unique among switchers is its ability to simultaneously handle both active and passive monitoring systems. Of the six pairs of speakers that can be connected, up to three sets can be active. Switching among them is as easy as pressing a front-panel button. Or use the included remote control so you never have to leave the sweet spot when switching. Naturally, the audio path is beautifully transparent and the switching noiseless. There is one thing about the SW-1 that we haven't quite figured out: If you own a pair of Event monitors, why would you have any other speakers that you needed to switch to?

EMP-1 Microphone Preamplifier

What better to complement a RØDE Classic, NT2, or NT1, than a custom microphone preamp that combines superior sonic performance with the features demanded by today's studio professionals? (Okay, we admit the thing sounds pretty amazing with other brands of mics as well.) First off, you should know that the **EMP-1™ Microphone Preamplifier** was designed by engineering wizard Peter Madnick. Why is that important? Because, in Peter's own inimitable words, it means that the unit features a transformerless design utilizing a common-mode choke input *[translation: RF interference is virtually eliminated]*, a superior differential input *[translation: EM interference is suppressed]*, and servo-controlled DC to maintain zero DC offset *[translation: There are no distortion-inducing capacitors]*. Ahem. Thank you for those fascinating explanations, Peter.

Put in terms the rest of might have a chance relating to: The EMP-1 offers ultra low noise operation, selectable phase, low cut filtering, phantom power, a line output (for running directly into *Layla*, perhaps?), and an internal power supply—all in a downright sexy little box. Now, what does all that mean? It means that the EMP-1 is a mic pre worthy of your finest microphones. (Don't let its low $299 price tag fool you. This preamp is the real thing.)

EVENT ELECTRONICS

We're Event Electronics. Thanks for taking the time to see what we're about. We hope you like what we're doing; please let us know. We'd love to hear from you.

For more detailed information on any of our products—and for amusing photos of prominent members of our industry caught in embarrassing situations—visit our Web site, **www.event1.com.** Or e-mail us directly at **info@event1.com.** Literature on specific products may be obtained by calling **805-566-7777, ext. 555.**

Specifications and features are subject to change.

CIRCLE AD NUMBER ON PRODUCT INFO CARD

CHET ATKINS

A CAREER IN COUNTRY MUSIC

It is impossible to look at Nashville's evolution into a world-class music industry and recording center without acknowledging Chet Atkins' role in it. As a guitarist, Atkins infused his elemental understanding of country music with a virtuosic command of jazz and classical techniques. There are legions of guitarists who have been influenced by Atkins' lyrical stylings. He also pioneered many important developments in the palette of sounds available to the electric guitar, particularly with reverb delays, slapback and the creation of what has come to be known as the wah-wah pedal.

As a producer, Atkins understood the value of planting ideas and then standing out of the way so artists could flower. His A&R instincts for finding important talent and material speak for themselves. Among the artists who have benefited from Atkins' touch (whether as a guitarist, producer or label exec) are Eddy Arnold, Bobby Bare, Suzy Boguss, The Browns, the Carter Sisters, Ray Charles, Skeeter Davis, Jimmy Driftwood, the Everly Brothers, Red Foley, Larry Gatlin, Don Gibson, Merle Haggard, Homer & Jethro, Waylon Jennings, George Jones, Garrison Keillor, Doug Kershaw, the Louvin Brothers, Ronnie Milsap, Mickey Newbury, Mark O'Connor, Dolly Parton, Elvis Presley, Charlie Pride, Pure Prairie League, Jerry Reed, Jim Reeves, Junior Samples, Hank Snow, Sons of the Pioneers, Red Sovine, Ray Stevens, Ernest Tubb, Steve Wariner, Dottie West, Slim Whitman, Roger Whittaker, Hank Williams Sr. and Faron Young.

Born June 20, 1924, near the northeast Tennessee town of Lutrell, Chester Burton Atkins embraced music very early on, thanks to the influence of his father, who was a music and voice teacher, as well as a piano tuner. Atkins also had an older half-brother, named Jim, who went on to enjoy his own success, at one time even playing in a group with Les Paul in the late '30s.

While Atkins learned some rudimentary theory from his father, he primarily developed his chops from listening to radio performances and from radio recordings his half-brother would send from New York, some featuring Les Paul. Another major discovery for Atkins was the percussive finger-picking style of Merle Travis. Later on, Atkins would also embrace the style of the great Belgian hot jazz guitarist Django Reinhardt. Interestingly, Atkins' first exposure on radio was as a fiddle player on Knoxville's KNOX station. But in time, it became apparent that his real strength was as a guitarist.

By the mid-'50s Atkins' notoriety on guitar was such that the Gretsch guitar company enlisted his input to market guitars to his specifications. Over the years, the Gretsch Chet Atkins Country Gentleman guitar has graced thousands of recordings, from Duane Eddy to The Beatles. Atkins began consulting on a new line of his guitars through Gibson 15 years ago—those are played by everyone from Sting to Mark Knopfler.

In the late '70s, Atkins felt that he had done all he wanted to do as a producer and RCA label executive, and he scaled back his busy work regimen somewhat. Bouts with cancer also sent a signal that it was time to redefine things so he could enjoy life more. Today, Atkins continues to play prestige orchestra dates, and he enjoys regular gigs every Monday in the Nashville club Caffe Milano, where guest artists frequently come down to play with this living legend of country music.

As you might imagine, an interview with Atkins could run in feature installments for months. There are so many great stories that se-

BY RICK CLARK

Night & Day

Putting together a complete professional studio used to be complicated and expensive. Until now.

PARIS™ is everything you need to record, edit and mix 24-bit digital audio in an easy to use and affordable package.

PARIS integrates massive DSP power, expandable interface options, a dedicated control surface, and fast, intuitive software into a complete 128 track recording studio.

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PARIS features:

- Plays 128 Tracks
- 24-Bit System
- Dedicated Control Surface
- Cross Platform Compatibility
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- Open Plug-In Architecture
- Expandable I/O

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lecting what to omit was quite a task. This discussion, for example, was distilled from 65 pages of transcripts from one interview. Friendly, funny and plain-spoken, Chet Atkins at 72 has quite a lifetime of memories to share.

You spent many years performing on radio, before you became a recording artist.

I got fired all over the country, in many time zones. I was shy, and I didn't get acquainted with the bosses of the radio stations or anything. They thought I was stuck up. I didn't draw a lot of mail from listeners because I sounded like two bad guitar players. [Laughs]

Yet, it was a transcription of one of your radio performances that opened the door for you at RCA.

I had worked at KWTO in Springfield, Missouri, which was on Route 66. Les Paul opened a station there and worked there. It was a good jumping-off place in those days, and a lot of people who worked there went on to better things. KWTO syndicated these shows around the country. A guy in Chicago heard me playing guitar on KWTO, and he sent a transcription to Steve Sholes at RCA in New York. I had already been fired from KWTO while this was happening and was working with Shorty Thompson and his trio in Denver.

One day I was doing nothing, and the phone rang, and Mr. Sholes got on the line and said, "I've been searching for you. I heard you on that Springfield show. Would you like to record for RCA Victor?" I said, "Sure." He said, "Can you sing?" I said, "Yes." I told a little lie. [Laughs] Anyway, I went over and told Shorty, my boss, about the call, and I was all ecstatic. He asked, "Who is going to sing on your records?" I said, "I am." He said, "Hell, you can't sing!" I said, "I'm going to try." He said, "Let me sing on your records." I said, "No. Hell, I'm going to sing! It's my record!" So he came over to me about an hour later and said, "You're fired."

I had a baby at that time who was about three months old. So we packed up everything in the car and went to Chicago to record. I put some records out and there were no sales. None. I called Mr. Sholes in New York and said, "Can I come up and play guitar on some of your sessions?" He said, "Yes," and so I went up there and lived for one or two months. I recorded with RCA artists like Rosalee Allen, who was pretty big in those days, Elton Britt, who was a very famous yodeler, and the Beaver Valley Sweethearts. I played electric guitar. He hired a lot of New York musicians who couldn't cut it.

After I made those records I had no place to go, so I went back to Knoxville, a failure. I started working with Homer & Jethro again, when Mr. Sholes called me and said, "Meet me in Atlanta and bring some musicians." I took Homer & Jethro and some other people. I had been on RCA for two years when I did a tune called "Gallopin' Guitar." I used Homer & Jethro and a bass player. I released that damn thing and it became a hit with the disc jockeys. We recorded in a little studio at the Fox Theatre in Atlanta, Georgia.

What was the setup in the Fox studio?

In those days, they would take portable equipment. They had a radio station-type board. Jeff Miller, the engineer, would run a speaker down the elevator shaft in the back and put a microphone in the top and you would get a little echo that way. It was pretty bad.

Carl Perkins was a better guitar player, writer...everything, but Elvis had the damn looks.

We recorded down there a couple of times, and then he had me bring musicians to Chicago. Once in a while, we would go to New York. Mr. Sholes also brought in the Blue Sky Boys, who were very influential, as far as country duets go. He brought in Kitty Wells, who was not a star at that time, and others.

Next, Steve [Sholes] started talking about building a studio in Nashville and having me run it. That was beyond me having a dream come true. I never thought it would happen, but it happened, after I had moved to Nashville with the Carter Sisters.

He didn't have time to come here a lot, because he had gotten promoted in New York at RCA. He would call me and say, "Go ahead and record 'Sincerely' with Johnny and Jack. Make a country record out of that." It was one of the first tunes that I produced. It did pretty well. Then he would call and say, "Do 'Papa Loves Mambo' with Minnie Pearl and Grandpa Jones!" [Laughs] He eventually turned all of the artists over to me. Some of them didn't want to record with me, and they would go to New York and record with Steve. Eddy Arnold was one of those, but when we did, we started making big hits, like "Make the World Go Away" and things like that.

So that's how I became an A&R man. Mr. Sholes was a great man. He saved my life. Mr. Sholes did most all of the paperwork and contracts because it tore me up to drop artists. I could sign artists. I loved to do that! But when it came time for me to say, "You know, I've got to let you go; you're not selling records," that just broke my heart.

Steve Sholes was the one who signed Elvis.

Yeah, he bought his contract from Sam Phillips [owner of Memphis-based Sun Records], and Colonel Tom Parker [Elvis' manager] engineered that deal. Mr. Sholes was scared because everyone was telling him that he was crazy. Nobody had ever spent that much for an artist. Never! Around town, people were going, "Can you imagine that he spent that much money. Damn, he'll get fired!"

Then, right after he signed Elvis, along came Carl Perkins [another Sun Records artist] with "Blue Suede Shoes." It was a smash. Steve said, "Oh, my God. I bought the wrong artist!" He called Sam, and Sam said, "No, Steve, you bought the right one. Don't worry about it." It turned out to be right. I love Carl. Carl was a better guitar player, writer...everything, but Elvis had the damn looks, you know. The first time I ever saw him, I said, "Jesus, he's beautiful!" The first time I ever heard him, I couldn't figure out if he was bluegrass, or if he was black, or gospel. It was all in there.

You were involved with those first sessions with Elvis, which included recording the classic "Heartbreak Hotel."

Yes, with Mr. Sholes. I hired the extra people and kind of conducted the session, because I was always trying to tell people what to do...but not for long. Elvis started recording at night. He would come in and horse around for two or three hours, and he would start recording around eleven at night and record all night. That was too much for me. I never got acquainted with Elvis really close, because he would bring his pals. He hung around them all of the time in the studio. His sessions were the first I encountered where the singer took his time and did as he pleased. If he wanted to quit awhile and do a little karate or listen to the radio, he'd stop. The clock didn't mean anything to him because he was selling so many records. One night a boy named Red hurt his knee really, really badly doing

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karate with Elvis. You can get hurt doing that stuff, especially if Elvis is leading. You know you can't hurt Elvis too much, because he's paying you. [Laughs]

Of all the sessions that you've done, are there any that just stick out in your mind, either as a producer or player, where you say, "That was one of my greatest moments"?

Yeah. Like the first hits I ever made, "Oh, Lonesome Me" and "I Can't Stop Loving You" with Don Gibson. That stands out. He had been on three different labels and he couldn't get arrested. The minute I got the job at RCA, I said, "There is one guy I want to sign." They said, "Who is that?" I said, "Don Gibson." Mr. Sholes said, "We had him. Columbia had him. Capitol had him." I said, "Yeah, I know, but he's starting to write and he's writing beautiful songs." I had been on a session for a song that he had written called "Sweet Dreams." I thought, "Damn, that guy can write," because I thought that was the most different song I had heard up until that time. Patsy Cline did it. I think Faron Young did it first.

PHOTO: BRET LOPEZ

Don had written both of those songs in one afternoon, and he sent me a little demo tape of them that he recorded in a small room, with a drummer named Troy Hatcher. Troy had an old bass drum with a foot pedal on it, and he played that "baa-ba-ba baa-ba-ba" part on the bass drum for "Oh, Lonesome Me." I told Don, "Bring Troy with you!" I insisted that the engineer put a microphone on the bass drum, and we EQ'd it to work with the bass. The bass drum was really predominant on that song. That record was a smash all over the world.

Prior to that, almost everyone ganged around a single mic, and people moved around until there was a balance. I played a chorus on that song through an amp that Ray Butts built for me. It had a tape loop in the bottom and you could get echo effects, reverb, slapback. I got the second one Ray built. A boy in Kentucky got the first one and Scotty Moore [Elvis' guitar player] got the third one. You can hear it on some of Elvis' early records.

Floyd Cramer, the legendary piano player, was another significant find for you around that time.

Yes. I heard him play on a session out at Fred Rose's little garage studio. Some guy from Louisiana, from the Shreveport Hayride, came to record there. He brought Floyd Cramer with him, and a steel player named Jimmy Day. Floyd played clean as a pin, and he had all kinds of ideas with his right hand for fills that were different. I started trying to get him to Nashville to play on records here with me. So he came up and brought Jimmy Day, and I used him on everything I did.

You also did quite a bit of live performing with Floyd and saxophonist

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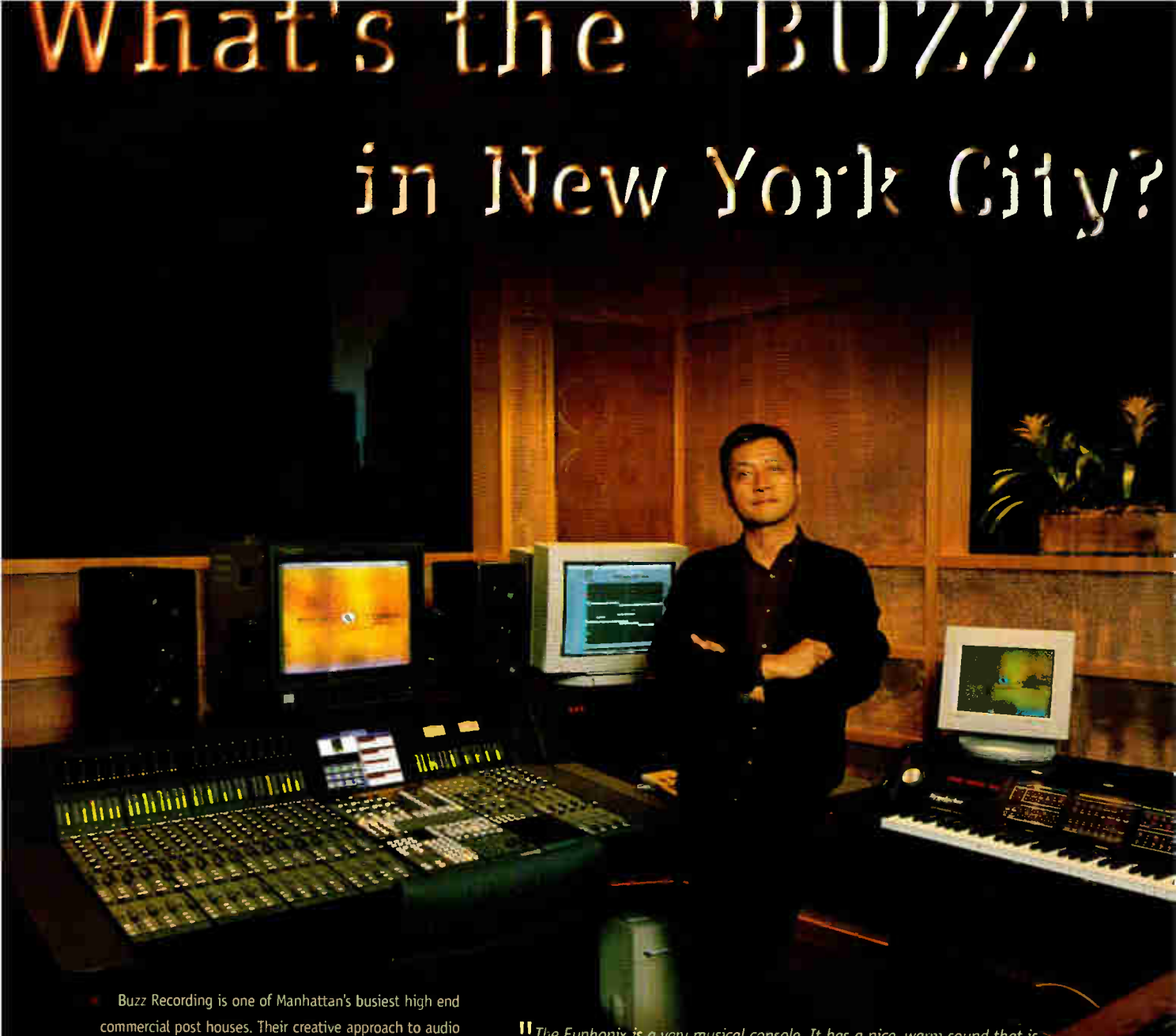

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Boots Randolph, another artist you discovered.

Floyd and Boots and I started doing shows called the Festival of Music. We would play big halls and have fun. I started doing that, and gradually I started trying to hire more people, so I could get out of producing. One day, I went to work and looked down and realized my shoes didn't match. So I said, "To heck with this. I've got to get out of this business." I don't produce anymore, but I still get tapes all the time. People want me to record them, and I say, "You've got to catch up. I don't do that anymore. I don't want to do that."

So you feel that, while you relished the creative input of developing other artists' careers, the compensation didn't match up with the toll it was taking on you personally?

My own records started selling back in the '50s, and I was making five times the amount of money in my royalties than I was working for RCA. At first, RCA paid me $7,500 a year. I got a telephone card and no credit cards. Eventually, I made a bunch of hits. I called up there to New York and told the boss at that time, "I want $30,000 a year!" They said, "Sorry" and sent a guy down to "reason" with me. He said, "Sorry we're going to lose you," and I said, "Yeah, I am, too! Damn, it is going to be awful, isn't it." [Laughs] They ended up paying me $30,000. I knew they would.

Hell, I was making those records for nothing. I never did get any points. All of those hits! They would come up with a plan every now and then, but it never did amount to anything. Mr. Sholes realized that, so he fixed it so I could own one-third of the RCA building that they built here in 1963. That has become a very valuable property. So Mr. Sholes took care of me every way he could.

At one time, I fought a little bit against Waylon [Jennings] and Willie [Nelson] and all of those guys who wanted to produce their own records. It was because I had a whole bunch of producers, and I knew that they would lose their jobs. I was thinking of them. But Waylon and Willie, of course, are some of my dearest friends, and they don't hold any of that against me, I'm sure.

In fact, you signed Waylon to RCA.

Waylon Jennings was one of the only guys I ever signed without ever seeing him first. All of my artists were telling me about this dude in Phoenix who worked in a joint out there. "You've got to sign him! He's great!" So I called him up on the phone and said, "Would you like to record for RCA?," and he said, "Yeah. I'm on A&M, but I can get off." So when he came in to see me, he was wearing all this leather and he was so handsome. He had that greasy kid stuff on his hair. I thought, "Damn, I've found me a star!" That was really memorable. That was before he got ugly, like Willie. Willie didn't start selling until he got ugly. I made some great records with Willie, I think. At that time, he looked like a banker.

After Waylon got funky, I told him, "You know, you should do something about your hair. Get it cut, or wash it." He hated me for years. [Laughs] Oh yes, he mentions it in his book. He also mentions that he loves me and says a lot of good stuff, too.

That whole "outlaws" movement was an effort to shake things up in Nashville and introduce a fresher sound.

Yeah, and it gave you guys something to write about. I made some of those sides. Waylon once said that, "Willie thinks that fighting the establishment in Nashville is double parking on Music

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Row." Waylon is a pretty funny guy. That is a J-O-A-K. [Laughs]

One of your classic productions was the Hank Snow song "I've Been Everywhere."

Oh yeah! That was an interesting record technically. The song had so many words in it. The guy that wrote it was an Australian, and he mentioned every town, I think, in Australia. So I would say, "Hank, just sing it, until you screw up, and we'll stop and splice." That's the way we did it. I would let the band go on after he screwed up, and then I would play it, and we would punch in and he would start singing until he screwed up, then we would stop and splice and go on. We did a good job splicing. I'm braggin' now. I taught a lot of good engineers in this town how to splice.

You signed Charlie Pride. That must've been a bold move in Nashville at the time, signing an African-American country artist.

I always realized that everything you do has got to be different, whether it's the Floyd Cramer piano style or Charlie Pride. I knew Charlie would be different, and he wasn't faking it. I asked him, "Why do you sing country music all the time?" He said, "My daddy would tune into the Grand Ole Opry, when I lived down in Sledge, Mississippi. I would work all day in the cotton field and come in at night and hear the Opry. I just liked it. I liked Hank Snow and all of those people. That's the way I sing." He couldn't do anything else. So it was an honest effort.

Now there are other people who tried this as a gimmick. The only problem Charlie ever had was with his own people. Once in a while, one of them would come to him and say, "What are you doing singing 'white man's music?'" He never had any problem with white people. They loved him. I hope, after I'm gone, it'll be regarded as one of my great social endeavors.

How did the famous Gretsch Chet Atkins guitars come about?

They came to me in 1955 and wanted me to design a guitar for them, and I did. It had innovative things on it that I wanted, things guitar companies had never done prior to that, like a metal bridge and vibrola that you could slur notes with.

You're talking about the Bigsby.

Yeah. Bigsby had originated the device years before, but I don't think any major company had used it. I had used a Rickenbacker Vibrola, which was a spring-operated device that didn't work nearly as well as the Bigsby. You had to pull it sideways to make it work, which was unfortunate. Paul Bigsby built the first vibrola. I call it vibrola, but it's called a Bigsby. Vibrola was a copyright name of Rickenbacker guitars.

In the meantime, Merle Travis had been using a Rickenbacker, too, in California. Merle got to thinking, "Maybe a string would sustain better on a solid piece of wood." So he talked Paul Bigsby into building a solid guitar, which was not the first one, but it was the first one that was seen on TV and everything. It was a Bigsby guitar. So Merle wanted a better vibrola, like I did, so Bigsby took a spring out of a motorcycle and used that to make the Bigsby Vibrato. That had to be in the late '40s.

People would go to Bigsby and say, "Build me a guitar like [Merle] Travis'." He would say, "Hell, I don't have time to do that. I'm working on motorcycles." Fender, of course, saw Bigsby's solid guitar. So people went to Fender,

—CONTINUED ON PAGE 225

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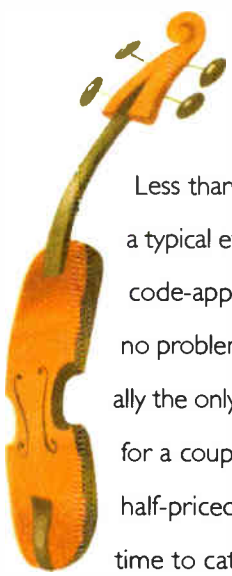
Nashville GROWS UP

Shakeout in the Studio Business

BY DAN DALEY



Less than a decade ago in the Nashville music business, a typical evening often consisted of hitting one of the few code-approved venues in town for a label showcase—no problem parking downtown, because you were virtually the only one there—then bopping over to Sunset Grill for a couple of cocktails in anticipation of the 10 o'clock half-priced menu, and finally heading home by 11:30, in time to catch Letterman's Top Ten List. If you had a session the next morning for one of the six or seven major labels, you'd navigate to one of seven or eight main studio facilities in and around Music Row to work on one of the area's handful of SSL E or G Series boards, or perhaps one of the many Trident and vintage APIs that had been in place for years. You could always ferret out a Neve, but you'd have to drive a bit farther. (No problem, really; there was no traffic to speak of.)

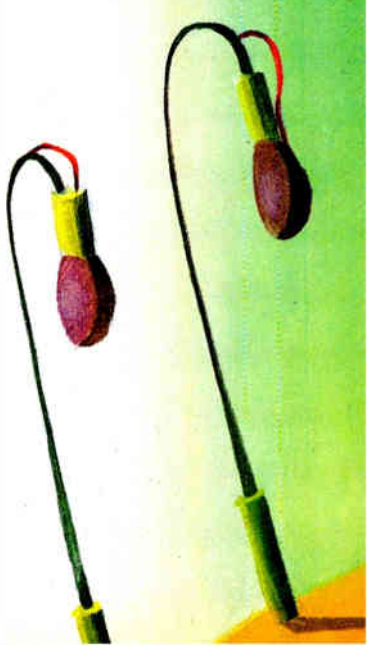


ILLUSTRATION: KITTY MEEK

How things have changed. You can't park downtown anymore, thanks to an explosion in the number of venues, everything from the tacky, entertainment-themed eateries like The Hard Rock Cafe and Planet Hollywood to unique places like Cafe Milano's, the club that managed to lure legendary picker Chet Atkins out of performance semi-retirement and back into a regular weekly gig. There's also a rather shapely new arena that will probably land a professional hockey or basketball expansion club to go along with the Houston Oilers' move to Nashville next year. And the growth of clubs has been paralleled by the appearance of new restaurants, spiced by the increased ethnic diversity—including Latino, Thai, Russian and Muslim—that the city has seen in the past few years. You can also drink later and more multifariously at local breweries. (And if you don't think that restaurants and bars are an important part of getting studio business to an area, you've probably been recording at home too long.)

If you still have a session the next morning, for one of the 30-plus major and independent record labels now calling Nashville home, it's a coin-toss as to whether you'd be working on an SSL G in someone's home, a vintage Neve or a digital Capricorn, one of four SSL 9000Js in town, or any of a number of other consoles in the cost and functionality spectrum. Also, your choices of media have broadened from the longtime Nashville standard of Studer analog 24-track and Mitsubishi PD to encompass Sony 3348, Studer D827 and hard disk systems from Otari and Fairlight. Oh, and Letterman is now on at 10:30. As if anybody's got time to watch.

Since 1991, Nashville has undergone a complete sine wave. The global success of Garth Brooks and the Platinum breakthroughs of artists such as Reba McEntire, Brooks & Dunn and others, combined with the rapid growth of country music's primary outlet—country radio—have put Nashville more solidly on the cultural map than the city has been since the days of *Urban Cowboy*. And in the wake of country's growth came the clubs and migration of L.A. and New York music industry refugees. Michael MacDonald, Peter Frampton, Janis Ian, Kim Carnes and others bought houses and tried to figure out the often opaque and clique-y Nashville music industry machine. This wave of immigration has meant that there is more locally bred non-country music developing in Nashville. And though the advent of other genres has not changed Nashville's country image, it has helped kick-start the delayed introduction of home recording to Nashville.

Meanwhile, the city's quickly growing base of new and upgraded studios, which stemmed from country's increasing success, was gaining attention. In the past 18 months, Nashville has seen three world-class facilities open—Masterfonics' The Tracking Room, designed by Tom Hidley and featuring the city's first SSL 9000Js; Starstruck Studios' two-room, Harris/Grant-designed complex with two 9000J consoles; and the three-room Ocean Way Nashville facility, with the first U.S. implementation of Sony's digital Oxford board, the world's largest Neve 8078, and a vintage API console. These five rooms—in a city that already had some extraordinary recording facilities—not only added to Nashville's reputation of having more studios per capita than any other place in the world, but at the same time brought the city's technical capabilities on a par with those of London, New York and L.A.

However, the expansion process was slow, and country's boom cycle was over—the genre dropped approximately 12% in sales last year—before Nashville had the opportunity to take its place as one of the world's premiere recording Meccas. In a nutshell, the Yellow Brick Road is still a few bricks short. And though the title Music City has a nice ring to it, things are a little uncomfortable in the trenches. Studios of all calibers are feeling the pressures of regressive rates and the demand to keep up with the Joneses.

MID-SIZED PRESSURES

One reflection of what's going on in Nashville is that growth among specialized midsized rooms has led some larger studios to counter with their own smaller, "budget" rooms. Emerald Recording, long one of the city's premier facilities that has sidestepped the upgrade struggle in recent years, added a B studio with an SSL 6048E console instead of upgrading its SSL G Series board to a 9000J and/or redesigning the studio. "The rates just don't justify the investments you have to make to keep up," explains studio manager Milan Bogdan. "There's not a year goes by that we're not spending $50,000 to $100,000 on new equipment—things like outboard, video lock-up equipment for our broadcast room, and computers. That's not enough to match what's been opened in Nashville recently, but it keeps us reasonably current. You've got to make a choice: Go for broke and hope it happens, or stay conservative and offer higher service with peripheral upgrades. To me, the choice was a clear one. Our main room rates are down from $1,900 a few years ago to between $1,500 and $1,600 a day now. [Studio B cards for $1,000 per day.] We even looked into the possibility of breaking Studio A up into two smaller rooms. Smaller rooms are the way to go."

At Soundstage, their "mid-rate" room, as studio manager Michael Koreiba calls it, was the result of an upgrade in the main room. The addition of an SSL 9000J in April 1996 gave them the choice to either sell the 4000 that was in the room or create a smaller-budget studio. They chose the latter, taking a $400-a-day, low-end room and making it into an under-$1,000-per-day, upper-end overdub studio. "It was a natural progression," says Koreiba. "And there's definitely a market for it. Also, it gives us a chance to keep more of the project in the studio. Three studios, three budget levels, one roof."

New facilities have brought the city's technical capabilities on a par with those of London, New York and L.A.

One of the mid-sized studios that precipitated this trend is October Studios. This facility opened in 1995 in leased space but now faces the possibility of eviction as the landlord contemplates selling the building, perhaps intent on cashing in on Nashville's real estate boom. "There were a lot of new mid-sized studios opening up that could handle the new independent labels' budgets in the last few years," explains October's manager Ron Bennett. "The larger facilities saw this happening, and they started putting in their own mid-sized rooms—places like Emerald, Soundstage. It was really get-

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ting competitive. When we opened, we were the cheapest SSL facility in town. But since the 9000s started arriving, there's been a flood of used SSLs on the market, and that lets a lot of people open rooms like this. Our rates, which were already pretty reasonable, are now down $200 to $300 per day from the $1,500 card rate we started with."

It's not easy to get studio owners to speak on the record about studio rates in Nashville. Sensitivity about the subject underscores the anxiety that many studio managers and owners will voice in private: too many studios, too much demand for expensive new equipment, and too few artists and record labels willing to pay rates that will let studios cover the additional capital investment. Starstruck Studios, owned by country singer Reba McEntire's Starstruck Enterprises, is one of the new generation of Nashville facilities. This facility instituted a tiered pricing program about six months after its opening; the program offers break points for 7-, 14-, 21- and 30-day lock-out block bookings. Longer blocks, with commensurate discounts, are available.

Studio director Robert De La Garza stresses that this scenario does not necessarily mean that rates are spiraling downward. He says it reflects the fact that country music budgets are static. So the plan appeals both to De La Garza's perception that producers want the consistency in their projects that a single facility can offer, and to the Nashville tradition of producers block-booking studios for several of their projects in a row. Unlike in pop, it's not unusual for a major country record producer's credit to appear on as many as a dozen albums a year. (This, along with the fact that Nashville studios rarely have staff engineers or seconds, or the time to learn various systems, contributes to the tendency for standardization of consoles and formats.)

Still, as the large studios and their deeper pockets become more of a force in the city, Nashville's middle class survives. Carl Tatz, owner of Recording Arts, repositioned his single-room studio several years ago as a mix room, looking to exploit a niche market. But the proliferation of studios in Nashville has caused him to focus his marketing efforts on distinguishing technological nuances from other mid-sized studios. "I have an SSL G Plus, one of two in Nashville," he says. (The other is at Sixteenth Avenue Sound.) "You have to educate people as to the differences between a G, of which there are plenty, and a G Plus. Also, I can offer people what larger studios that have added mid-sized rooms can't: privacy."

OUT OF TOWN

In a sense, country's decline helps shed the notion that Nashville is limited to a single genre. This is also supported by the fact that many of Nashville's recent arrivals have established their credentials on a broader scale. Guitarist Dann Huff, a former member of the L.A. rock band Mr. Big, returned to Nashville in the early 1990s and quickly established himself within the tightly knit cadre of Nashville session players. Earlier this year, Huff produced Megadeth's next album at The Tracking Room (he's also doing tracks on Faith Hill's next record). Queensryche also

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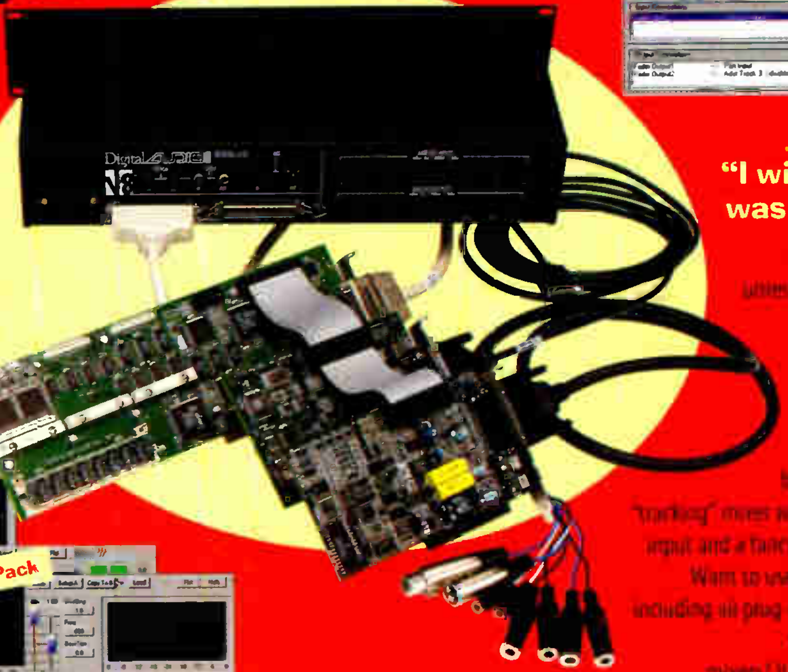

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did part of their next LP in Nashville.

Masterfonics owner Glenn Meadows says that recent visits by Megadeth, The Fugees and Bad Company, as well as increased inquiries from pop acts such as Celine Dion and Bon Jovi, indicate a heightened awareness that Nashville caters to rock and other genres. However, he notes that many of those calls tend to be last-minute bookings. This can pose a problem in Nashville, where country labels and producers tend to plan out their schedules months in advance. "We would never bump an act or producer because a big-name pop or rock artist wanted to book time," says Meadows. "But there's a difference in the way the different industry segments tend to schedule their projects."

Woodland Digital has long been a stop for out-of-town rockers, including Bob Seger, Daniel Lanois and Steve Lindsey. And owner Bob Solomon says he's noticed an increase in that sort of traffic in recent years. Whereas Lanois would come to Nashville to work with a specific country artist (Emmylou Harris), others, like Dallas Austin and Elliot Scheiner, have come to use the facilities and the musical and technical pool. Plus, the residency of more non-country artists in Nashville has cast the city's net wider; British producer Hugh Padgham recorded pop singer and Nashville resident Kami Lyle at Woodland this year.

Woodland's two Neves were once almost an oddity in Nashville, and Solomon says they're still a draw, even though Sound Kitchen now also has a pair of Neves and Javelina Studios has installed the city's first Capricorn. "For years, Nashville was an SSL or an off-brand town," observes Solomon. "That helped us, and still does. But as more people from out of town come here, they bring the demand for other types of technologies with them. That increases the variety here. We could have done a lot of what we're doing in Nashville now a few years ago. But the nice thing, and the thing that's changed, is people are finally starting to believe our press: If you record here, your record will not have a 'twang' to it. Seeing people other than country working in Nashville is what's changing that perception."

ORGANIZATION

Another development in Nashville during the past year or so was the creation of NAPRS—the Nashville Association of Professional Recording Studios—which celebrated its first anniversary last February. It was followed by the formation of a SPARS chapter—with links to AES—a year later.

NAPRS's mandate was to provide a forum for common issues, such as formulating consistent policies on technical compatibility, and business matters such as cancellations and bookings. But its primary accomplishment to date is that it was organized at all. It took the current business climate—more studios, declining rates, pressure to expand and upgrade, the need to change perceptions about Nashville, and the impending deceleration of the country music juggernaut—to unify this group of competitors. Just as HARP in Los Angeles needed the common menaces of home recording and taxes to rally that community's studios, NAPRS needed the threat of an industry shakeout to motivate it into being.

Jozef Nuyens, founding president of NAPRS and owner of Castle Recording, notes that NAPRS's 15 original members have grown to close to 60 now. Nuyens attributes part of that success to the fact that NAPRS offered fairly liberal parameters as to studio definitions, requiring

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primarily that potential members have business licenses. "We wanted to be a positive force, not a police force," he says.

Nuyens says that the successful establishment of a SPARS chapter, propelled initially by Masterfonics owner Glenn Meadows and Studio A agency owner Lisa Roy, was based on the success of NAPRS. "I like to believe that we were the inspiration for SPARS' arrival," he says. "But the only way all of these organizations will work is if they work together, not against each other."

Any sense of rivalry is muted, at least overtly. Several representatives now sit on the boards of both organizations. (Roy, for instance, was an early NAPRS proponent and member), and the organizations are jointly considering a program to offer membership in NAPRS, SPARS and AES as a reduced-cost package. It's also possible that each organization will grow according to specialization, with SPARS addressing more technical issues and NAPRS more business-oriented ones. NAPRS, however, wants to maintain a strong Nashville identity. "One thing that NAPRS is meant to do is preserve the soul of Nashville as a place to record," says Nuyens. "To keep what makes it special intact."

"We're trying to change the way Nashville is perceived, and it's working, but slowly," says Bob Solomon. "I remember that Jewel was supposed to come to Nashville to do work on her album, and it was the president of Atlantic Records that supposedly said she has too much country influence already; she'd only get more in Nashville. We wrote a letter trying to convince him that she would be coming to Nashville to use the facilities, which are as good or better than anywhere else, and that they are not 'country' studios. The letter didn't work, and she recorded in Bearsville. But it's incidents like that that made us work harder."

"What NAPRS has done is establish a level of communication between studios we've never had before," observes Milan Bogdan, who is on the organization's governors' board and technical standards committee. "That alone is a tremendous help to all the studios here in making Nashville a more attractive

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place to come and do your record." Meanwhile, SPARS is becoming more comprehensive by including local banks and the Chamber of Commerce, as well as pro audio manufacturers on its rolls.

A shakeout of some degree among recording studios is considered inevitable by many in Nashville's studio community, probably within the coming year-and-a-half. But that possibility is viewed clinically by those same observers—a natural result of the market's conditions, same as other major markets.

What is different about Nashville's situation is the studio community's size relative to the size of the city and the market. A loss of seven studios would effectively shut down a city like Boston, which has a population slightly larger than Nashville's half-million; in Nashville, that same loss would represent considerably less than 10% of current studio capacity. There are well over 100 facilities in the city's metropolitan area of varying size and capability, and the arrival of five new world-class rooms within the last 18 months puts additional stress on the competitive infrastructure, even as it broadens Nashville's capabilities and appeal.

So, it's notable that Nashville continues to appeal to potential studio ventures. Los Angeles-based Todd-A/O is reportedly surveying Nashville for a new post-production facility, possibly in conjunction with or in space owned by Speer Communications, a two-year-old broadcast and post venture in the north end of the city that has significantly reduced its staff and operations in recent months.

The key, most agree, is for Nashville to continue attracting non-Nashville projects, something that many believe the arrival of new rooms and the upgrading of existing ones will eventually accomplish. "Last year, I'd say that a full three months of bookings was from New York and L.A.," observes Soundstage's Koreiba. "It's a very different animal out there now than five years ago. It's scary, and it's challenging. There are more studios than ever before and not necessarily all that much more work yet. But I think it's all going to balance itself out." ■

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

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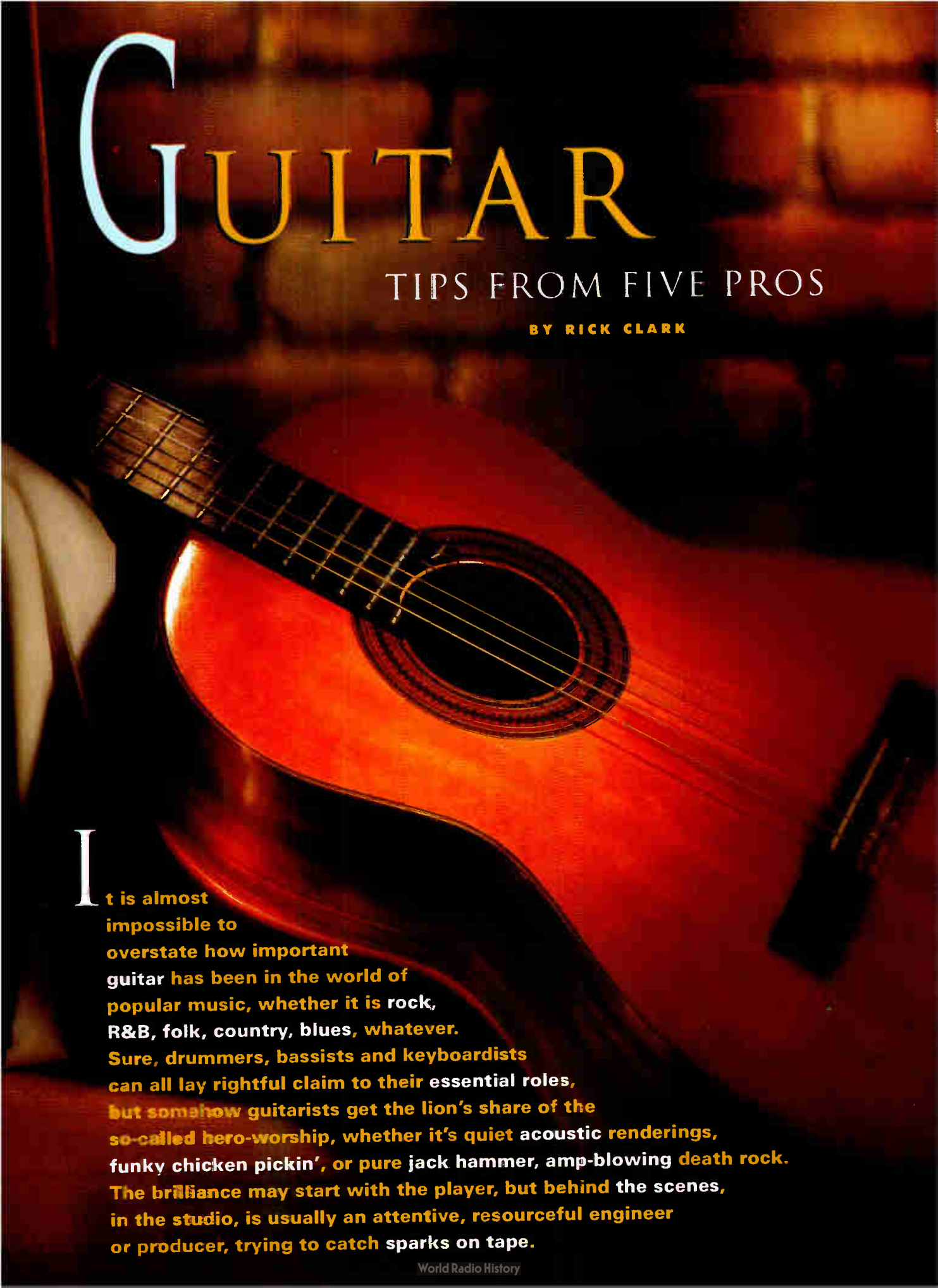

It is almost impossible to overstate how important guitar has been in the world of popular music, whether it is rock, R&B, folk, country, blues, whatever. Sure, drummers, bassists and keyboardists can all lay rightful claim to their essential roles, but somehow guitarists get the lion's share of the so-called hero-worship, whether it's quiet acoustic renderings, funky chicken pickin', or pure jack hammer, amp-blowing death rock. The brilliance may start with the player, but behind the scenes, in the studio, is usually an attentive, resourceful engineer or producer, trying to catch sparks on tape.

Mix spoke to a handful of notable producers, engineers and players who have excelled at capturing great guitar sounds. Thanks to Adrian Belew, John Jennings, Skidd Mills, Michael Wagener and David Z for their fine input.

MICHAEL WAGENER

Since the late '70s, Michael Wagener has earned a reputation as one of the masters of great-sounding rock recordings. Wagener, who has amassed more than 100 album credits, may be well-known for his work producing, engineering and/or mixing aggressive hard rock projects like Skid Row, Extreme, Ozzy Osbourne, Metallica, Megadeth and Alice Cooper, but he also has credits that range from Janet Jackson and Queen to The Plasmatics. Wagener is currently producing a video called *How to Really Record Guitar.*

"There is an important relationship between amp output and speaker wattage. I subscribe to the theory that you have to push air to get your point across. That means I will always try to use an amp with more power reserves than the RMS wattage of the speaker cab. Of course you have to be careful not to blow the cab to pieces. A tube amp of about 100 watts can have peaks around 250 watts, so make sure your cabinet can stand that occasional peak. Also, if you use a tube amp, that peak is liable to come smoother than or not as sudden as you would get from a transistor power amp. A tube power amp will probably give you a fatter, saturated sound, whereas a transistor amp will be cleaner with a bit of a harder attack.

There is an important relationship between amp output and speaker wattage. I subscribe to the theory that you have to push air to get your point across.
—Michael Wagener

"Another very important part of the power amp is the output transformer. The output transformer can make or break the sound of an amplifier. Once, I had to exchange a blown output transformer of a great-sounding Marshall 100-watt top. I never got the original sound back.

"The distortion doesn't always have to be generated in the preamp. Sometimes it's better to keep the preamp section fairly clean and get the distortion out of the power amp or the speaker. Speaker distortion is the smoothest distortion you can get. Unfortunately, because of the high volume, it also involves having a very good isolated studio, so the neighbors won't get distorted as well.

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there are a few considerations to be made. What kind of sound do you want to achieve? Are you looking for a clean sound or a distorted sound? Is the instrument going to be in the front or the back of the mix? Is it going to be doubled? Are you playing single notes or chords or both? How powerful is your amp? Can your speaker cabinet withstand the power output from the amp? Is your speaker cabinet too 'big' for the amp, so it won't push enough air? For example, a 4x30-watt cab would be a great, powerful cab for a 100-watt amp if you are looking for a fat, distorted sound. If you are going for a cleaner sound, you might want to try a 4x75-watt cabinet on the same amp. Make sure that the impedance of the cabinet and the amp match.

"Make sure not to download the guitar output by hooking up a bunch of amps without a splitter. If you combine amps, it is important to look at the amp input as a resistor or load on your guitar. When you put two resistors in parallel, their value halves—think about two 8-ohm speakers switched parallel, resulting in 4-ohms. The smaller the resistor value the more current [or power] gets drawn by it. Your guitar only has a very tiny amount of power available on its output, so if you simply Y-cord the guitar into two amps, you are liable to lose some of the pickup power of the guitar to the load of the two parallel amp inputs. The most noticeable side effect is probably a loss of high end or overall crunch.

"The input impedance of a normal tube amp is around 1 million ohms, and the output impedance of a guitar is normally around 250,000 ohms. That is a pretty healthy relationship. If you combine two amp inputs, the input impedance goes down to about 500,000 ohms, which is a much higher load on your guitar output.

"Sometimes, for creating sound options, it might be good to set up a few different amps and cabinets in different rooms—hard and soft, open and dampened. It also works well to have a certain amp just produce the upper frequencies and another one just for the low end. That way you can decide on the mix between the two from inside the control room. If you have enough tracks available, record them both separately and mix them later when you have a better idea about the whole sound of the song. If you record the [almost] same signal twice, you have to be careful not to get phase distortion."

SKIDD MILLS

Producer-engineer Skidd Mills has worked on projects ranging from ZZ Top's hard guitar skronk to Robert Cray's lyrical blues stylings. Mills, who primarily works out of the legendary Memphis studio Ardent Recording, has also worked with pop-rock wonders Big Star, Killjoys and Joe, Marc's Brother, as well as Spin Doctors and hard rockers Skillet and Audio Adrenilin.

"First off, to me the most important element is the player. That is where most of the tone comes from. As far as amps go, I really like Matchless amps. I think they are really cool. I have recorded them a few times, and they've turned out really cool. Some of my favorites are also old Marshalls, Hiwatts and old Fenders.

"I almost always mike amps the

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same. I usually use two [Shure] 57s on a cabinet, a little off-center from the cone, right up against the grille. Sometimes, I will use a [Sennheiser] 421 or a [AKG] 451 with a 57.

"I usually don't like to EQ my mics, especially separately, because when you're EQ'ing separate guitar mics, you can get weird phase problems happening. If I'm going to do compression, EQ or anything like that, it's almost always after the fact.

"I rely more on the actual sound. I will stand out by the amp before I start to EQ anything on the board. I'll go out and stand by the amp and just make sure that it sounds good. If I do any EQ adjustments, I start first on the guitar amp itself. I won't add board EQ while I'm going to tape, because I really just want to get the sound of the amp. Sometimes I'll compress the guitar to tape, if I'm looking for a real heavy sound. One of my favorites is the Valley People 440. It has a lot of versatility to it.

"For the most part, I don't like to slam guitars. When I'm standing in front of my monitors, I like to have the feel like I'm standing in front of the speaker cabinet. In other words, I'm pushing a lot of air.

"You have to be careful with compression because you can squeeze the life out of a guitar sound until it sounds paper-thin. At the same time, you don't want to have the guitarist just strumming along and have one section come bursting out at you. When I'm mixing, I would say that my all-time favorite guitar compressor is the SSL compressor that is sitting in the board.

"Initially, I work with the sound of the player and amp. I get all of that together before I start thinking about what mics and what compression I want to use. I listen to the playing and see if the guitar and amp are most complementary to that player's style. Experimenting with different amps, guitars and even picks can make a big difference. I usually like to have a lot of toys lying around, like a box full of distortion boxes and old vintage stuff. I like doing these things to achieve the best complementary tone for the player's style and the type of music, instead of having the guitarist merely plug in and mike it up and sit at the board EQ'ing all day till I'm blue in the face."

Experimenting with different amps, guitars and even picks can make a big difference. I usually like to have a lot of toys lying around, like a box full of distortion boxes and old vintage stuff.
— Skidd Mills

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DAVID Z

David Z is one of those producer/engineers who has had the good fortune of being able to successfully defy pigeonholing. Z's credits include dance music divas Jody Watley and Nenah Cherry, as well as work with Prince. He's also done blues rock up-and-comers Kenny Wayne Shepard and Kid Johnny Lang. Other credits include Fine Young Cannibals and the Freddy Jones Band. Most recently, Z has been working with the alternative insurgent country-rock scene, an arena in which he is very comfortable. After all, he was a friend of and co-songwriter with that movement's late icon, Gram Parsons.

"The role of a funk guitar is almost like that of another percussion instrument. It's playing a polyrhythm. Basically, in funk music, everything is a little more percussive. Everything is more a function of the beat than in many other styles of music.

"A lot of times, funk guitars are very clean, bright and often intensely compressed, because the way funk is played is like a slapping, hard picking technique to make it bite. It's usually a Fender guitar, because Fenders have a good short tone, meaning they have a quick attack and quick release on a note, as opposed to a smooth, long tone, like an acoustic or a Gibson or something.

"With Prince, we used a Hohner, which sounded like a Tele, but it was 20,000 times brighter. It would come off with that 'skanky' sound. There is also that Gibson or 335 sound for darker, funky chord sounds. Those are usually recorded pretty straight, with maybe a little chorus. They aren't real elaborate.

"For compressors, I love the LA-2As or ones that grab you a little bit more, such as a dbx OverEasy or an Inovonics. Those grab hard. Sometimes that is what you want. Usually, I will have it set with a slow attack, to get the head of the note, and then slam it. Then I have a fast release. I usually have it set at a 4-to-1 ratio, but it depends. It's totally by ear. That's just a usual setting I might use.

"Guitar amplifiers add some power, but they aren't a big part of the actual tone of funk guitars. You want to get that speaker tone, but the attack is a pretty clean tone. We are not looking for distortion. Recording blues guitar, on the other hand, is more a function of the guitar and the amplifier together because of the distortion factor. A lot of times, I will use a ribbon mic, like a Coles ribbon mic. A lot of times with blues guitar and also acoustic, I would take what I would call 'multiple sources.' For example, on the Big Head Todd & the Monsters record that I did, we had a lot of multiple sources. We ran through a Leslie and we ran through a little Marshall. We miked the strings and then out of his regular amp all at the same time. We then had four different sounds going for the same part. Depending on what you pick and choose, you can get some pretty cool textures doing that.

"Sometimes I will put what I call a 'kamikaze' microphone focused on the bridge of the electric guitar. Sometimes I'll put that mic on a stand, or hang it from a stand, placed as close as you can get it. I mainly use an ECM-50 or ECM-150 lavalier mic, or the kind of Sony that newscasters wear on their ties. I might use a 452, or [Neumann] KM84, a bright condenser mic, just to pick up the zing of the pick hitting the strings. You've got to roll off the bottom end. You're just trying to get some sort of high-end thing. Obviously, you

have to put the amp in another room from the player, or you won't get anything worth using.

"If you mix a little bit of that in with what he's playing, that adds a third dimension to it. You bring the sound into an even bigger arena, and you can spread it out. I like to do that, because in that way, you can actually make the guitar itself become much bigger-sounding. I may not use some of those elements, but I will usually try to take multiple sources.

"For Leo Kottke, we did a lot of multiple sourcing. We used a couple of mics, and we took a direct out of his pickup. We also used this guitar synthesizer that he had, a Roland VG-8. It added string sounds or other textures that played way underneath what he was playing. It gave the music a real eerie quality.

"On Leo, I used the DI to get a little support and clarity. I had one signal running through a little Fender Champ in another room. I miked him with two mics, a 452 up on the neck and a 49 over the hole. Both were placed two or three inches away.

"Acoustic guitars have some sort of a buildup in the lower-end areas, and it can really overwhelm you. I think the buildup is often around 150 Hz. You have to be kind of careful with compression and mic placement. A little roll-off and distancing of the mic helps. I tend not to compress very much.

"Actually, the big acoustic guitars can be deceiving because they can be great-sounding live, but then the microphone picks up all of this boom and it gets all screwed up. As a result, smaller guitars are sometimes the best. The player obviously can make a big difference."

ADRIAN BELEW

Since the '70s, Adrian Belew has earned the distinction of being one of the guitar world's most inventive practitioners. He has appeared on albums by Laurie Anderson, Joan Armatrading, David Bowie, Herbie Hancock, Mike Oldfield, Robert Palmer, Paul Simon, Talking Heads and Frank Zappa. Belew has been a member of King Crimson, one of rock's most adventurous ensembles, since the early '80s. During the last half of the '80s, Belew has recorded twisted pop rock with his group, The Bears. Belew has also recorded 11 solo album projects that have ranged from Beatles-influenced melodic pop-rock to the ambitious 1996 release *Experimental Guitar Series #1—The Guitar as Or-*

Most of the time I scientifically develop the sounds that I really want to use in a song in a way that allows me to reproduce them live.
—Adrian Belew

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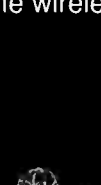

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chestra, in which he created an orchestra through sounds designed and executed through guitar and velocity-sensitive guitar synths.

"Before recording, I try to program most of my sounds into the multi-effects units the way that I want them heard, so there is little need for extra things to be done from the console, in terms of dynamic signal processing or EQ. Of course, there's always a certain amount of EQ'ing that you will do.

"There are always happy accidents or things that occur that I didn't plan on happening while recording. I always welcome those things, but most of the time it's important that I scientifically develop the sounds that I really want to use in a song in a way that allows me to reproduce them again live. I really concentrate more on my guitar setup and its abilities to generate those.

"I like to build a single guitar sound out of several different guitar sounds. I may overdub three different guitars that are playing exactly the same thing, but have different variations of sounds. It's important to me to create clean arrangements. In terms of sound, fewer parts are better.

"I have several choices of amplifiers that I use in several different rooms of my home studio. I use a DC-30 Matchless amp, which has an incredibly good tube sound. I keep it in my studio's maple floor room. I also have some other amps, like a Fender Twin, a couple of Jazz amps and a Roland Jazz Chorus 120.

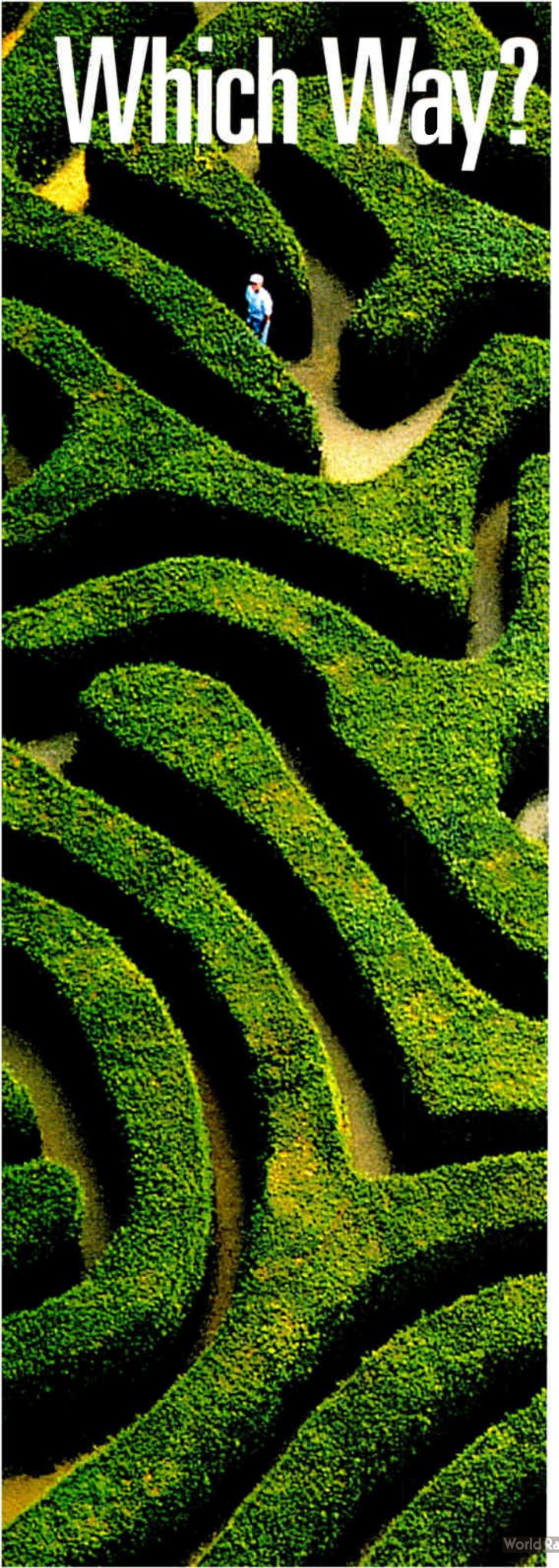
"I mainly like to play through 12-inch speakers. I'll put up a couple of AKG 414s on them and maybe have a room mic, like a C-24, so there is a combination of close mic and room sounds to choose from. It just depends on what kind of sounds I'm going for. Sometimes, I'll just plug into the board and play straight into the console. Most of the time, I like to go through speakers.

"If I'm recording guitar synthesizer stuff, I don't find that those sounds come out any better coming through a speaker and a microphone, so I generally just take the signal direct. I might go through a Tube-Tech to try to warm things up a little bit, if possible, and try to get the cleanest signal going right in to the board. If I'm going to go direct with a guitar, I particularly like the Eventide Harmonizers, because they have so many sounds.

"I have four different synthesizers. In my rack, I have two that I use for all of my live sounds—they're the Roland GR-1 and the Roland GR-50. I also have the older GR-700, which has a lot of really nice analog-based sounds. I probably have designed about 200 sounds with that unit. It's a little hard to give it up, so I leave it in the studio. I also leave a newer model in the studio called the VG-8. It's not actually a guitar synthesizer, but it's yet another thing that I find works better for me in the studio than in a live application.

"The VG-8 has some really nice properties. In particular, it allows you to use altered tunings. You can write in altered tunings and the guitar sound is very realistic. There are many available guitar sounds, and you can play harmonics and get string noises, and you can really think that you are playing through a pickup, but you are actually not. In fact, you could use a guitar that has no pickups on it, as long as you're using the MIDI controller, and you

—CONTINUED ON PAGE 89



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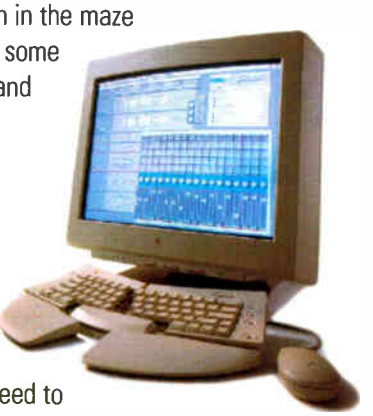

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Songs FROM THE FIELD

REMASTERING THE ALAN LOMAX COLLECTION

BY BARBARA SCHULTZ

These are the people who still sing the work songs, the cowboy songs, the sea songs, the lumberjack songs, the bad-man ballads, and other songs that have no occupation or special group to keep them alive. These are the people who are making new songs today. These are the people who go courting with their guitars, who make the music for their own dances, who make their own songs for their own religion. These are the story-tellers, because they are the people who are watching when things happen...
—John A. and Alan Lomax, 1941

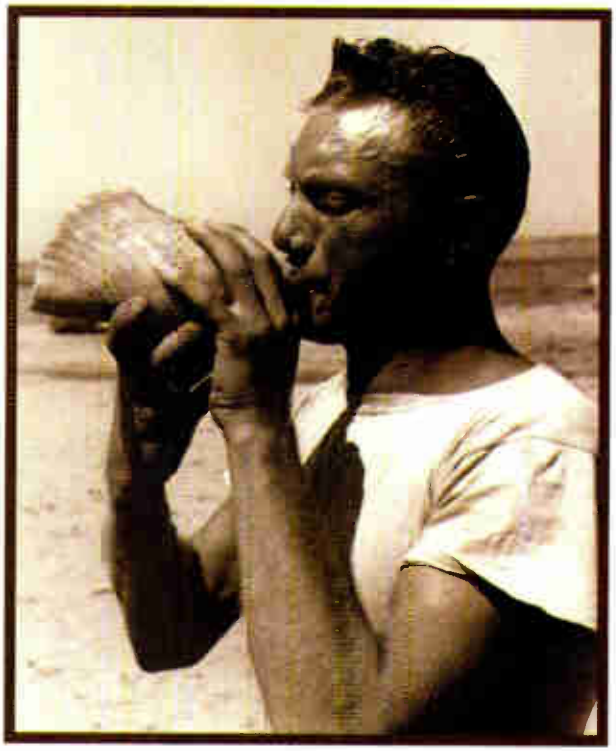
So begin the liner notes to the first volume of *The Alan Lomax Collection*, perhaps the most ambitious audio restoration/remastering project ever undertaken, and almost certainly one of the most important. The collection, the first six CDs of which were released by Rounder Records in April, promises to include 100 or more discs documenting the work of America's most significant and prolific field recordist.

Alan Lomax devoted his life to recording the folk music of the world. He learned about recording and about different cultures from his father, John Avery Lomax, whose pre-tape recordings of black American folk singers introduced the blues to white America. "Every time I took one of those big, black, glass-based platters out of its box," Alan Lomax wrote a few years ago, recalling those early sessions, "I felt that a magical moment was opening up in time...For me, the black discs spinning in the Mississippi night, spitting the chip centripetally toward the center of the table...heralded a new age of writing human history."

Engineer Phil Klum (left) and engineer/producer Steve Rosenthal at the Sonic Solutions system in The Master Cutting Room

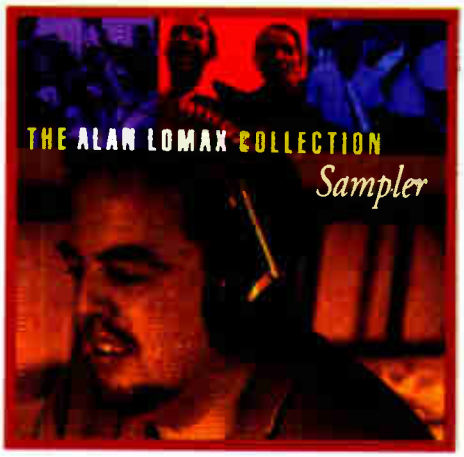
Alan Lomax continued his father's legacy with more than passion. With patience, affection and skill, and perhaps the finest pair of ears ever to enter the field, he spent decades recording American folk music and the songs that form the roots of that tradition. During a career that spanned more than 60 years and took him all over the world, Lomax recorded hundreds of albums' worth of material for the Library of Congress and various record labels.

Some famous facts that barely scratch the surface: In the '30s, Alan Lomax, with his father, made the first-ever recordings of Leadbelly: "In the summer of 1933, Thomas A. Edison's widow gave my father an old-fashioned Edison cylinder machine so that he might record Negro tunes for a forthcoming book of American ballads," Alan Lomax wrote for *Hi/Fi Stereo Review* in 1960. "For us, this instrument was a way of taking down tunes quickly



ALL FIELD PHOTOS BY ALAN LOMAX / COURTESY OF LOMAX ARCHIVES

(Clockwise from top left): Sicilian shepherd, Sicilian sailor, Mississippi Fred MacDowell and wife, The Alan Lomax Collection, banjo player Wade Ward listening to playback on Lomax's Ampex 601 machine, Lomax with the Pratcher Brothers



REMASTERING THE ALAN LOMAX COLLECTION

and accurately; but to the singers themselves, the squeaky, scratchy voice that emerged from the speaking tube meant that they had made communicative contact with a bigger world than their own. A Tennessee convict did some fancy drumming on the top of a little lardpail. When he listened to his record, he sighed and said, 'When that man in the White House hear how sweet I can drum, he sho' gonna send down here and turn me loose.' Leadbelly, then serving life in the Louisiana pen, recorded a pardon-appeal ballad to Governor O.K. Allen, persuaded my father to take the disc to the Governor and was, in fact, paroled within six months."

In 1942, while in Mississippi, Lomax interviewed and recorded 29-year-old McKinley Morganfield, later known as Muddy Waters. An album he recorded in 1946, *Blues in the Mississippi Night*, included music and interviews with Big Bill Broonzy, Memphis Slim and the first "Sonny Boy" Williamson (John Lee Williamson), in which the artists spoke candidly about lynchings and other vicious acts against African Americans in the South. The album was not released until 1959, and even then, the artists requested that their real names not be used. (The singers' real names are listed on Rykodisc's 1992 reissue of the album).

In the early and mid-'50s, Lomax traveled throughout Europe, working with regional scholars and musicians in Britain, Ireland, Spain and Italy, and searched out the most beautiful and most representative examples of the roots of American folk styles. An Italian story from the 1960 *Hi/Fi Stereo Review* article: "One day I set up the battered old Magnacord on a tuna-fishing barge, fifteen miles out on the glassy blue Mediterranean. No tuna had come into the underwater trap for months, and the fishermen had not been paid for almost a year. Yet, they bawled out their capstan shanties as if they were actually hauling in a rich catch, and at a certain point slapped their bare feet on the deck, simulating exactly the dying convulsions of a dozen tuna. Then, on hearing the playback, they applauded their own performance like so many opera singers."

In the late '50s and early '60s Lomax continued his work in the American South, and made a trip to the Caribbean, where he began to develop some of the theories that would become the basis for the dozens of books, articles and films he produced to describe what he learned about the global impact and intersection of folk styles.

Lomax's body of work is almost impossible to describe or to grasp, which may be why his recordings have been mostly out of print for years. Other than a few reissues, most of the masters have just been sitting in rows in the Alan Lomax Archives at Hunter College in Manhattan, a problem Lomax has wanted to correct since the '70s, when he began formulating the idea of a comprehensive series of his music recordings. "It's a vision he had for a long time because he was frustrated that he had lots of scattered projects with different labels," explains Jeff Greenberg, an entertainment lawyer who helped finalize Lomax's agreement with Rounder and who is now co-producer of the collection. "They would come in and out of print, and not always to the standards

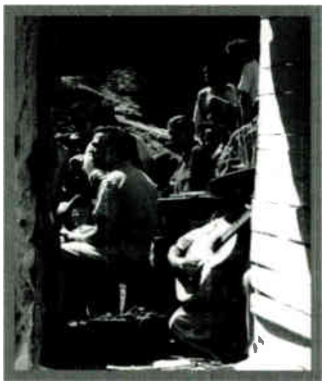
At a press event launching the collection: seated, L to R, are Alan Lomax, Pete Seeger, Bess Lomax Hawes; standing, L to R, are Matt Barton, Anna Lomax Chairetakis, Andrew Kaye, Jeff Greenberg, Marion Jacobson and Gideon D'Arcangelo.

PHOTO: STEVE BURTON

that he wanted. We had to find a partner in a record company that appreciated his vision and wanted to do it carefully, respectfully and high-end in terms of the audio, and comprehensively in scope."

Lomax and Greenberg found their partner in Rounder and signed an agreement in August of 1995. "On a Thursday we signed the contract," Greenberg recalls. "On Friday he had a stroke." This was the second stroke the 82-year-old Lomax had suffered, and it was extremely debilitating to his speech and movement in general. Since then, Lomax has recovered somewhat, but at the time, in addition to their concern for Lomax's health, Greenberg and Lomax's daughter, Anna Lomax Chairetakis, worried about how to follow through with Lomax's vision of *The Alan Lomax Collection.*

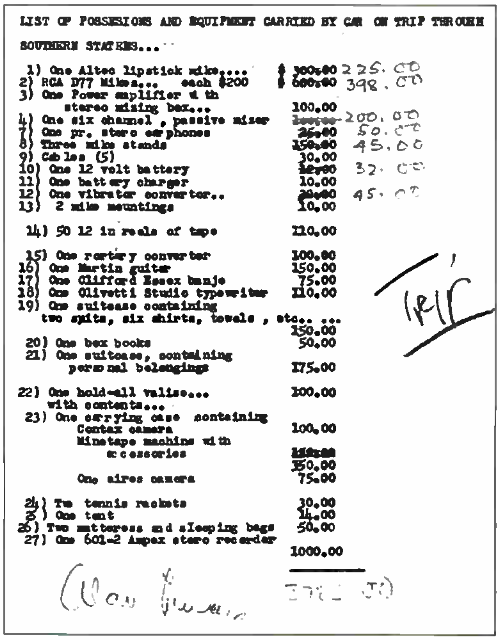
"I met with Jeff Greenberg and the Rounder people and my aunt [Bess Lomax Hawes], who is a longtime colleague of my father's, at his archives," says Chairetakis, "and we just decided that we would try to do it somehow. We all felt that it should have the Lomax imprimatur—really be as close as possible to the way my father would have done it. Because Dad wasn't just putting out books and records or going around collecting songs. He had a lot of things that he wanted to accomplish by doing these things, and he had a style of doing them that he'd developed, and my aunt and I were pretty well-versed and trained in that."



Lomax using a Magnacord machine in Granada, Spain, 1952

By phone from her home in Florida, Chairetakis speaks in a sweet voice and she laughs often, in a playfully conspiratorial way, which gives an added dimension to the special information she is sharing: Her manner reveals, perhaps, almost as much as her memories do about how Alan Lomax worked, how he made artists so comfortable performing for him. "I watched him many times," she says. "He would lean in toward people with his microphone, put his microphone right up into their face and just radiate a lot of warmth and geniality and ask them what often seemed like very low-key kinds of questions, like how did you all get started and where did you learn this song. But the point about him was that he really knew what he was doing. He knew the cultural terrain, and he made people very secure."

Greenberg and Chairetakis became collection co-producers and with the help of Rounder, assembled a team to help handle the work. Matthew Barton and Andrew Kaye, who had assisted Lomax on past projects, were brought in to research and organize the material for the first set of releases, the *Southern Journey* series. They would also write liner notes and select writings by Lomax to be included in the booklet that accompanies each of the first six releases.



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Barton had worked with Lomax on and off throughout the '80s and co-wrote the liner notes to the *Blues in the Mississippi Night* reissue by Rykodisc in 1992. He says that the master tapes in the archives were well-organized and had been stored carefully—tails out in a cool room, all in neat rows, along with well-kept documentation. But because so many of the tapes are quite old paper-backed tapes on old, warped reels, there was concern about the best way to audition the material and, then, transfer the selections to an editable format.

Steve Rosenthal, the owner of NYC's The Magic Shop, was hired to produce the remastering work. Rosenthal is a recording engineer/producer who has worked with high-profile acts such as Lou Reed, and he has remixed and remastered albums by Sam Cooke, Marianne Faithful and a number of Rounder artists. Recently, Rosenthal completed restoring and remixing the Rolling Stones' *Rock 'n' Roll Circus.* But most important, according to Barton, Rosenthal has the right idea about the meaning of the project.

"I've learned a tremendous amount about all of this in the process of doing it," Barton says. "I also learned when I'm being snowed. We had several people come over before Steve and we'd show them the tapes because back then we were really worried. Some of these tapes, especially from the '50s, were warped in really scary-looking ways. They looked like there's no way you could budge the tape without damaging it. And people would propose one extravagant solution after another: 'If they're stored tails out, you don't even want to rewind them. What you can do is

REMASTERING THE ALAN LOMAX COLLECTION

we've got a machine where you can play it backwards at a slow speed and in a computer, and the computer can play it back at the right speed and in the right direction for you...' for some ridiculous amount of money. Everybody made out as if we had ticking time bombs. Or we'd play them back earlier issues from LPs, and they'd say, 'Oh, we can take that tape hiss right out' or 'We can boost that bass,' but I was thinking to myself, 'Yeah, I know you can, but I'm looking for someone a little more sensitive...'

"When Steve came over, we played him one of the Southern recordings, and as soon as it started playing, he moved right up to the machine, sat down, grabbed the headphones, and covered his ears and started nodding his head going, 'Ah, this is deep. This is the shit.' He was responding to the music. That's the first thing."

"Everyone feels a sense of honor about being able to deal with the music," says Rosenthal. "There's so much music being made now for just money only. But this is totally the opposite. This music is historically irreplaceable and historically invaluable, and this is all just about the love of the music."

So, Rosenthal began examining the tapes to determine the best way to remaster them. "Most of them are quarter-inch tapes," he explains, "those are the ones recorded in the field from 1948 to 1967. Some of them were on 5-inch reels, some of them were on 7-inch reels. Some of it was recorded at 7.5 ips stereo, though most of it was in 15 ips mono. You can hear that the magic is in how his mic placement worked.

"About 80 of the reels were on paper-backed Magnaphone-brand tape, dated from '48 to '49. Some of them are on something called Soundcraft tape. Some of them are on something called Pyral. Some are on Irish 211 audio tape. In general, I would say they are in uneven shape, but my main opinion was that as soon as we could, we should transfer them.

PHOTO ALAN LOMAX

Prisoners at Parchman Farm, Miss., 1959

"I thought it was important to accurately reproduce the frequency response of Alan's tape machine," Rosenthal continues. "He used a lot of different tape machines, but at one point a lot of the recordings were done on an Ampex Model 601, and through a friend at the Wells amp company, I got a copy of the manual for the 601. That way, I could go back and check out the frequency response curves. The machine is in the library, and at one point I was thinking we should actually use that machine, but it was in too funky condition and we were afraid the tapes would snap if we played them on it. So I picked up an old Ampex ATR102 from Musicvalve Electronics in New York. It's a quarter-inch setup with a stereo head, and we bought a mono head as well."

For the transfer process, Rosenthal recommended the purchase of the Prism Electronics 20-bit noise-shaping system. He had used it a great deal on Lou Reed's most recent album and was impressed with its filters and flexibility. "They've figured out a way of sharing tracks with a DA-88," he explains. "You hook up the Prism system to a DA-88; you start with an 8-track machine, and when you go to 20-bit, it becomes a 4-track machine. So with the ATR102 going through the 20-bit noise-shaping to the DA-88, you're creating a 20-bit digital master tape.

"During Lou Reed's record, we did a big test here in my studio where we tested every filter you could buy at that point, and Prism was the hands-down winner. When you use the Prism system, the stereo image doesn't collapse the way it does when you use most others in mixdown."

Because of the sheer volume of material to be transferred, Rounder actually purchased the tape machines and the Prism system and had them installed at the archives. This way, the auditioning and conversion process can be continuous, and material is regularly sent out for remastering at The Master Cutting Room by staff engineer Phil Klum.

Klum, whose background includes years in music recording as well as mastering projects for Rounder and others, does his work on the Sonic Solutions system in the facility's Studio 3. For the first round of tapes, he worked closely with Rosenthal and Barton, discussing priorities and making judgment calls about what types of problems to fix and what to preserve, but Klum says they all quickly found they agreed about these artistic issues. In general, they all felt it was important to use the system's denoising capabilities to remove any hissing, crackling or, as Klum puts it, "clunking" that was the result of technical anomalies or limitations, but they wanted to preserve any natural sounds that were part of the field recordings' atmosphere, part of the music.

"Like with the wind, for example," Rosenthal says. "You're sitting in a sterile control room or whatever, and the wind comes blasting through the speakers, and at first you're thinking, 'Oh, my God. I've got to get rid of that wind. There can't be wind on this record!' But then you hit yourself on the head with a hammer that says, 'No. They're outside. Wind is good. Wind is okay.'"

At the beginning of the process, Klum and Rosenthal also AB'd a lot of the DA-88 tapes with the old records, comparing the sound of the original release to versions with different amounts of EQ. "We spent a lot of time, side by side, looking at the EQ'ing and the levels, the balance, trying to make sure that the voices were prevalent, unless it was an instrumental track, of course."

Now that Klum and the others have felt each other out somewhat, their system works like clockwork. Barton delivers DA-88 tapes to Klum, who loads them into the Sonic system. He gives a first listen on the studio's Genelec 1031A monitors, making detailed notes about what problems exist on the tape—everything from artists' false starts, nose blowing, level problems, dropouts, 60-cycle hum, print through, clicks, pops, etc.—and marking spots to return to. Then, on the next listen, he does the detailed fixes on each track.

"I did some complex filtering to take away 60-cycle hum," Klum explains, "but left in things like truck engine noises. You'll hear actual trucks driving by from right to left—true stereo. It's all part of being outside on the back porch or in the front yard.

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"There are also some electrical noises. We think it might have been electrical wires, but there's no way of really knowing; it could have been insects. There are also a lot of crickets, which we left, obviously, but at times there are high-frequency noises above the crickets, which we removed. There are a number of grunts; some we left, some we didn't. Coughs we mostly left. There are a couple of spits, too, kids screaming in the background. Basically, we all knew what this stuff was and how important it was, and we all knew that we wanted to make it the best-sounding it could possibly be, without having anything that might have been due to age of the tape or just lack of technology at that time take away from what it was."

Klum says that the excellent condition of the material and the strength of the signal have made his job a lot easier than he might have predicted, but there have been a few tracks so far that exhibited a significant amount of print through. "I spent quite a bit of time on those tracks," he says. "I'd take some room noise just prior to the print through and cut and paste it over. So I wasn't taking room noise from another session, but I was moving clean room noise over to take the place of print through.

"One of the other major problems was that I would find that within a track, it would be as if somebody just turned the level on the channel slowly, or at times, like they jerked it really quickly. Say you're going along in a song and then the right channel just comes up about 10 dB, and that lasted for about six seconds and then it was back down. So using the Sonic system I could go in on one side and basically create a manual limiter [to adjust it]."

"I'm also using a Valley Audio DynaMap 730 digital dynamics processor/compressor," Klum continues, "but I haven't used any compression on any of the tracks. I've just been using that for a very light limiter to hold down over levels when I go to 1630 tape, which is what we're mastering to. Other than that, we're using the Sonic System for all the EQ, all the editing, the NoNoise card for broadband de-noising and decrackling."

After Klum's first couple of passes at the tapes, he sends them to Rosenthal to play on a Sony DAT machine; Rosenthal makes a point of playing them on a variety of the monitors in his control room (Tannoy, Genelec, Yamaha, etc.). Then Rosenthal returns them with his comments, for Klum to do a final edit. Chairetakis and Greenberg have final approval of all of the work, including selections, sequencing, artwork, etc. Lomax, who is currently living with his daughter, also has input into the sequencing and the selection of some of the collection's previously unreleased material.

So far, audio restoration is complete on about 16 CDs, including a sampler produced by Gideon D'Arcangelo. At press time, Klum was working on a Fred MacDowell CD and a collection of Caribbean children's songs called *Brown Girl in the Ring*. He says he and his colleagues expect to continue working on The Alan Lomax Collection for at least a few more years.

"What moves me most about Alan's work," Klum says, "is that it comes from the heart. And that's what I hope people get out of this—what it does to the soul and the heart. And of course I hope people really enjoy listening to it. It's one thing to sit down and listen and go, 'Man, this old blues guy is great, but I wish I knew what he said. I'd love to hear the slide guitar part, I'd love to hear this fiddle part, but I just

Our customers' comments

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Geno Porfido, Boulevard Recording Co. New Milford, NJ

"Other consoles I've worked with in the past just couldn't deliver the levels of punch and clarity I felt the music deserved. I never have this problem with my Soundcraft Ghost. The Ghost gives me the flexibility I need over a wide range of frequencies and has the body and warmth to really bring my music to life."

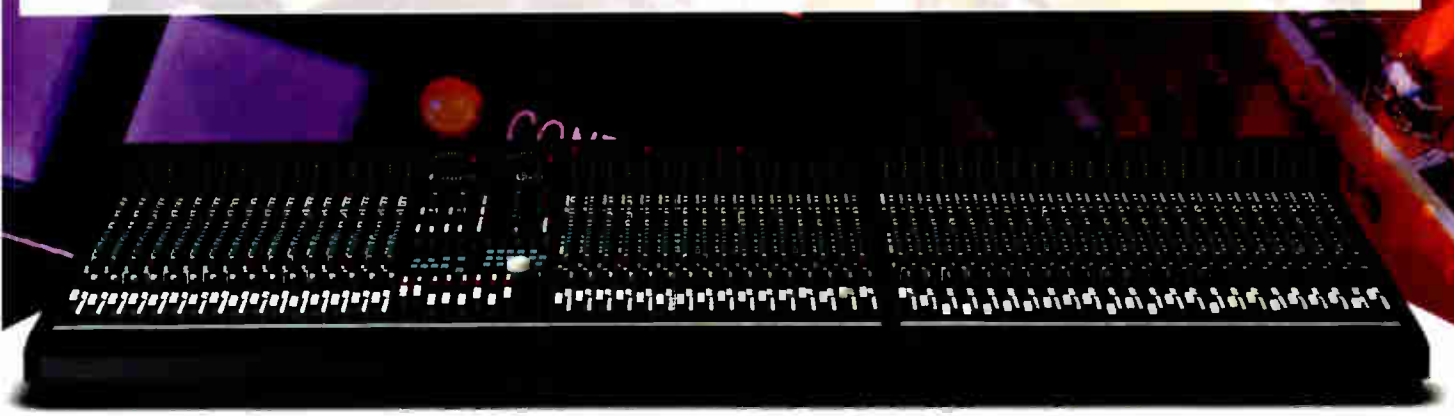
Johnathan Moffett, Drummer with Michael Jackson and Madonna

"After the first mix I did, I realised I was in a whole new league. This thing sounds beautiful. Very silky in the high end and full in the lows. The EQ is totally cool and the board has a quality feel to it. I know of nothing that touches it in its price range and I have been recommending Ghost for months to anybody who's looking for a console."

Garth Webber, Red Rooster Studio, Berkeley CA

"I've worked on many competing 8 bus consoles and none can compare to the Ghost in features, ergonomics and, most importantly, sound. The Ghost, simply put, sounds warm and musical - you don't have to work hard to get great sounding mixes on this board. The EQ is very flexible and we compared the mic preamps (using a Neumann U-47) to the Neve 1066s in our studio. We were very surprised at how favourably they compared to these megabuck classics."

Peter Thorn, What If? Productions.



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can't hear it, and because it sounds this way, I don't expect I'll ever listen to it again.' I want people to enjoy this for listening's sake, and that's what I have a hand in and what I'm so happy to do."

"This work is impressive," Rosenthal adds, "partly because field recording is so dangerous. Things don't work half the time, your tape machine doesn't work, your power supply is gone, your generator doesn't work, but it's a much purer form of recording in a sense. When you bring people into a recording studio—and this sounds a little nutty because I own a recording studio—it's very different. It's hard to get a vibe going. But this is in a pure setting, and for anyone who doesn't know about Alan or anyone who doesn't know anything about the music he recorded, now there's a great introduction to real music, as opposed to pop music."

"A story I like to tell about Alan," Matt Barton says," is about when he recorded a woman in Ireland, Elizabeth Cronin, who was quite old. This was the early '50s, and she was in her 80s. She was never a professional singer; most of these people weren't. But she sang for her children around the house, but she never had a big voice, and she was quite old, so the voice is that much weaker. He had to put the microphone only a few inches from her lips to get her voice to register a proper level, and the results are amazing. She sang 20 verses of a ballad called Lord Gregory; it's one of the classic ballad narratives. So, here's this woman in her 80s giving him 20 verses of just this epic of the woman of low station who's wronged by the lord, and she also gave him these songs called 'dandling songs,' little things that you sing to amuse a child.

"She'd start singing one in English, and it was called 'Dance to your Daddy-o,' and then her voice would trail off and she'd say, 'Oh, that reminds me of another one!' and she would start singing in Irish. People would sort of just open up, and here's this woman in her 80s, born well back in the 19th century, confronted with this technology, yet she's giving him all she's got, and I remember Alan commenting about that once to me. He said, 'A lot of people just couldn't understand why I would go to so much trouble to record someone like Mrs. Cronin, but I knew what I was doing and so did she.'" ■

Mix *associate editor Barbara Schultz thanks Rounder Records and all of the interviewees in this story for their time and help.*

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In much the same way that balanced audio lines can reduce the pickup of hum and other types of electromagnetic interference, the use of balanced AC power lines in sensitive audio, video, or computer installations can make an enormous difference in residual system noise. The Furman IT-1220 Balanced Power Isolation Transformer can supply your facility with 20 amps of 120/60V single-phase balanced AC power, using the well-known common-mode cancellation effect to drastically reduce hum and buzz caused both by ground currents from power supply filtering and by radiation from AC supply cables. In turn, this can reduce the need to adopt cumbersome and expensive star-ground systems or use massive bus bars or heavy ground rods. There is no need to "lift grounds" or compromise the integrity of safety ground wires to achieve hum reduction. Furthermore, balanced power for technical power applications is now recognized in the US National Electrical Code (Article 530).

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NAB '97

BY GEORGE PETERSEN

Technology Flourishes In Uncertain Times

If ever there was a convention that embodied the spirit of technology, it would have to be the annual gathering of the National Association of Broadcasters, held this year from April 5-10 in Las Vegas. In past years, NAB attendees have readily embraced new ideas, whether it was establishing a multimedia exposition section or accepting digital gear, such as visual effects, digital VTRs and disk-based editing into the production environment. In fact, while the audio industry is set in a "retro" movement, the state of the art in video from even a few years back is now considered passé. Today, there's little interest in once-hot items such as 1-inch VTRs or 3-tube cameras.

Yet, as fast as the video industry moves, there seems to be a growing feeling of uncertainty, particularly in terms of emerging technologies. And just as the industry got used to the reality of video rentals and low-cost home satellite systems, new delivery systems—whether Digital TV, HDTV or video transmission over the Internet—have left many unanswered questions in the minds of the broadcast community. At the same time, DVD's combination of digital pictures and instant access with 5.1-channel surround sound offers consumers new high-quality alternatives (meaning "competition") to the nation's airwaves or cable feeds. In terms of audio, how will today's—or yesterday's—products cope with the demands of tomorrow's multichannel 96kHz/24-bit world?

So there was little surprise that attendance at this year's NAB reached record levels, hovering near the 100,000 mark, and many of those attendees were carefully considering today's investments that could make or break their future. As proof of the interest in new technologies, the

AMS Neve Libra Live On-Air Console

Tascam DA-98

Fairlight DaD

360 Systems DigiCart II Plus

SGI Octane workstation

"Multimedia World" expo at the Sands Hotel had approximately the same number of booths as the Las Vegas Convention Center and featured major industry players such as Apple, IBM, Silicon Graphics and Digidesign.

From a new-product standpoint, NAB provided plenty to see and hear. Here are a few noteworthy examples that captured my attention.

Tascam (Montebello, Calif.) unveiled the DA-98, its third-generation modular digital multitrack, based on the 8-track, 16-bit DTRS format used in the DA-88 (compatible with other DTRS decks such as the Tascam DA-38 and Sony PCM-800), for 108 minutes of record time on a standard Hi-8mm videocassette. Designed with audio post users in mind, the DA-98 features high-performance converters, and built-in SMPTE/MIDI chase lock synchronizer, dither switching, jog/shuttle wheel, 0.1% "pull-up/down" sync adjust for film-chain applications, selectable sampling rates, individual delay on any track, a choice of three operating levels (EBU, SMPTE or TASCAM), several metering modes and a read-after-write confidence monitoring function.

The DA-98's front panel 4-line-by-20-character LCD screen simplifies use of the advanced digital track-bouncing/copying/routing feature, and it provides easy access to other function menus while offering operational status at a glance. One notable difference between the DA-88 and the DA-98 is that the new machine offers analog interfacing only via D-25 sub connectors (this time, thankfully, they've screened the pinout diagram on the rear panel), and the unbalanced -10dB RCA analog I/O jacks are gone. But like the DA-88, up to 16 decks (any combination of DA-98s, DA-88s or

DA-38s) can be interlocked for up to 128 tracks of recording. No word on a delivery date, but the four-rackspace unit is slated to be priced at $5,999.

In other MDM news, **Digital Audio Labs** (Plymouth, Minn.) showed a DA-88 (TDIF) format version of its MDM Custom digital converter card. Previously available only in the ADAT format, the card works with DAL's V8 digital system, allowing the transfer of eight channels of digital audio to/from a PC. DAL also announced Timing Gear ($1,495), a two-rackspace sync box that locks the V8's sample clock to any video reference, SMPTE (VITC or LTC) or MIDI Time Code. Word clock I/O and a TC window-burn video out are standard.

Last year, **Doremi Labs** (Los Angeles) turned heads with its $5,995 V1 disk-based video recorder, designed specifically for audio post applications. This year, Doremi is shipping its V1b, a $5,395 model that includes control software that runs on Mac- or Windows-based PCs and features compressed video (variable from 4:1 to 32:1) with two audio tracks, SMPTE timecode and two serial ports for Sony 9-pin control via video editors. An optional external remote, for controlling the V1b without a host PC, is optional.

By now everybody should know how indispensible the **Silicon Graphics** (Mountain View, Calif.) platform is in the world of creating visual effects. And over the years, the company has toyed with the idea of using SGI's enormous power for audio but never really put a serious marketing effort behind such applications. But that all may change with its new Octane workstation, which includes stereo analog inputs with 18-bit converters, an AES/EBU input pair and ADAT LightPipe ports capable of handling eight channels of 24-bit audio. The system can be expanded with up to 32 channels of ADAT I/O and ten channels of AES/EBU via optional cards. So far, **Steinberg** has reportedly ported over a version of its powerful VST software for SGI, and the company is talking to a number of third-party developers. So is SGI serious this time? Time will tell, but at the show, I saw 24 tracks of ADAT audio playing back with real-time HDTV (try that on your Mac or Pentium), which to me says that SGI-audio may be a real contender in the future.

Want to access the power of plug-in software in real-time/non-disk-based applications? The newly formed **Galim Ltd. Signal Processing** (Tel-Aviv) and **Waves** Ltd. (U.S. offices in Knoxville, Tenn.) announced the development of open hardware accelerated processing systems. The Galim Signal Processing Systems offer modular, computer-based multi-effects and real-time audio processing in a four-rackspace unit. Two systems debuted, a Pentium unit and a PowerPC. Both are equipped with DSP co-processors and are powered by WaveShell-OS; units can chain together the complete Waves DSP software line. They are slated to ship in September.

And as an alternative replacement for sprocketed mag reproducers and multitrack recorders, digital dubbers have arrived. **Akai** (Ft. Worth, Texas) is delivering its 8-channel, 16-bit DD8, priced around $5,000. **TimeLine** (Vista, Calif.) has finally started production of its under-$10,000, 20-bit MMR-8 dubber; and **Fairlight** (Culver City, Calif.) has released the $15,700 Fairlight DaD, the industry's only 24-track dubber, with L.A.'s Creative Cafe post-production house ordering 264 tracks.

Several years ago, **360 Systems** (Westlake Village, Calif.) took the broadcast industry by storm with its DigiCart series of cart replacements based on removable Bernoulli disks. This was followed up by DigiCart II, which added expanded disk-editing functions and combined the advantages of hard disk and removable media storage. The new DigiCart II/Plus supports a removable drive using low-cost Iomega Zip cartridges and two internal hard disks for up to 8/16/24 hours of recording time in AC-2 mode. AES/EBU digital I/O connects to DATs, CD players or workstations, while a proprietary interface allows high-speed transfers to other DigiCart II units or 360's Instant Replay machines. 360 will be marketing Zip retrofit kits, so owners of earlier systems can easily upgrade.

AMS Neve (Burnley, UK) introduced the AudioFile Prolog, an attractively priced 16-bit recording/editing workstation with a future upgrade option for 24-bit operation. Standard features include 24 virtual tracks, 16 independent outputs, up to eight inputs, 9-pin control port, several digital I/O options (AES/EBU, MADI and TDIF) and full compatibility with AMS's flagship S-Series 24-bit AudioFile.

AMS Neve also debuted Libra Live, a digital console for on-air applications based on the proven Libra architecture. Routing and recall functions are extensive, as is the ability to route any input to console outs, aux, mix-minus and subgroup buses. The desk connects to its I/O system and stage boxes via fiber-optic cables, making the console lighter,

more compact and cooler-running than conventional analog desks.

Otari (Foster City, Calif.) announced Elite Film, a digitally controlled analog recording console for motion picture mixing. Two separate five-way panning buses—independent from the main bus assign—are available as 2-channel stereo, 3-channel LCR, 4-channel LCRS, 4-channel L/R+stereo surround or 5-channel LCRSS. Moving faders and recall of all mono input settings (faders, EQs, panpots and switches) are standard, as is Otari's Eagle Automation, with up to 100 consolewide snapshots that can be triggered from timecode. The Elite Film is available in up to 96-channel frames, and dynamics processors, stereo modules and various monitoring/panning options are offered.

The Yamaha (Buena Park, Calif.) 02R digital recording console may never be the same, thanks to Version 2.0 software. Version 2.0 adds major new features for the recording and post user, including surround sound routing from any input and the ability to assign the 02R's I/O ports as digital-domain aux sends. Other enhancements are new automation mix editing features and the ability to control external signal processors and software-based mixers, such as those found on DAWs. The $200 upgrade requires the installation of a new ROM chip.

Even if you don't have a digital console, you can impress clients with D-K Audio's (distributed by TC Electronic, Westlake Village, Calif.) new electroluminescence stereo phase display. Similar to the company's MSD200 Master Stereo Display, but in a smaller package that neatly installs into most console meter bridges, this is an awesome tool for anybody who's really serious about tracking or mixing. I gotta have one of these for my board!

Graham-Patten Systems SoundPals

Good things sometimes come in small packages. One of the product lines that impressed me the most at NAB was Graham-Patten Systems' (Grass Valley, Calif.) SoundPals, a line of compact digital modules. The first five SoundPals include DMIX-41, a simple 4-channel digital mixer that combines up to four balanced AES inputs into one. DMIC-20 accepts two XLR mic-level inputs, amplifies the signals and converts to one AES (2-channel) output. DFADE-2, a stereo digital fader, accepts one AES input. The DAC-20 takes one AES input and converts to two analog outs, with support for headphone monitoring. The ADC-20 converts two line-level, analog inputs to one AES digital output. DATS converters allow longer, more robust AES transmission links by sending unbalanced, AES3ID-compatible signals over standard co-ax. Pricing ranges from $299 to $999, but the best part about SoundPals is that several modules can be combined to create a variety of problem-solving tools—without spending a fortune. I like that.

There were many more product hits at NAB '97, and we'll be covering these in our new product sections in the months to come. In the meantime, mark your calendars for NAB '98, April 5-9 in Las Vegas. See you there! ■

THE FIFTH

PHOTO: DIGITAL DOMAIN/COLUMBIA/TRISTAR

ELEMENT

An Insider's Take on Sound 300 Years in the Future

[Editor's Note: David Yewdall, who has worked on more than 200 films going back to his days with Roger Corman, was a sound effects editor on The Fifth Element *and was asked to provide an insider's account of the editorial phase at Weddington Productions, North Hollywood.]*

BY DAVID LEWIS YEWDALL, M.P.S.E.

Mark Mangini, supervising sound editor on *The Fifth Element,* treated his sound editorial team to a matinee showing of *Star Wars* on the Friday before the predub began. It may seem odd for him to have carved several hours out of the middle of an important work day, but Mangini sensed that his crew was in need of getting its second wind and perhaps "an injection of inspiration and tension relief."

After waiting in line for two hours, we were sitting amid a packed and enthusiastic crowd, enjoying

George Lucas' restored and improved 20-year-old space adventure, when Alec Guinness' voice echoed from the screen, "Use the Force, Luke." Without question, all of us are fans of and students of Ben Burtt's benchmark sound design achievements and especially the philosophies of the audio contributions to *Star*

Top left: David Whittaker, M.P.S.E.; Above: Geoff Rubay, working on the flying vehicles; Left: supervising sound editor Mark Mangini; Below left: Sonny Pettijohn carries hard drives holding the equivalent of hundreds of reels of 35mm effects; Below: Weddington chief engineer Mark Lindauer (right) and Jack Ford.

own right. I knew I didn't have to hold anyone's hand or check anyone's work before it went to the stage."

Twice nominated for an Academy Award (*Star Trek IV*, 1986, and *Aladdin*, 1992), Mangini is no stranger to the various philosophies and audio

THE CREW

(Weddington Productions)
Supervising Sound Editor:
Mark Mangini, M.P.S.E.
Dialog/ADR Supervisor:
Curt Schulkey
Sound Editors:
Dwayne Avery, M.P.S.E.;
Julia Evershade, M.P.S.E.;
Howell Gibbens, M.P.S.E.;
Geoff Rubay;
David Whittaker, M.P.S.E.;
David Lewis Yewdall, M.P.S.E.
Foley Supervisor:
Aaron Glascock
Foley Editor:
Solange Schwalbe, M.P.S.E.
Foley Artists: Ellen Heuer, Jimmy Moriana
Sound Designers:
John Pospisil; John Fassal
First Sound Assistant:
Sonny Pettijohn

THE MIXING CREW
(Todd-AO West)
Re-recording Mixing Crew:
Chris Jenkins, Ron Bartlett, Mark Smith
Additional Predubbing Mixers: Rick Ash, Brad Sherman, Gary Geagan

Wars (earning him his first Academy Award). I glanced down the row of the sound editing crew that was taking in the midday break from their own workstations—the veteran talent among us added up to nearly two centuries of theatrical sound experience.

"I felt I had my dream team," reflects Mangini. "Each is a supervisor in their

PHOTOS COURTESY OF JACK ENGLISH/COLUMBIA-TRISTAR

possibilities of the future and outer space. His personal style and taste in sound are infused into the projects he does in two very calculated ways. The first is his personal and detailed preparation of the "cut list," which Mangini delivers to the editor as the first body of material that he wants to have considered. The second is the way he carefully picks the members of the team, from the sound designers to the line editors.

"This movie had such a huge palette of sounds that needed to be created for all these elements," says Mangini, who studied director Luc Besson's body of work as a point of reference. "There are over 350 visual special effects shots in this picture, but

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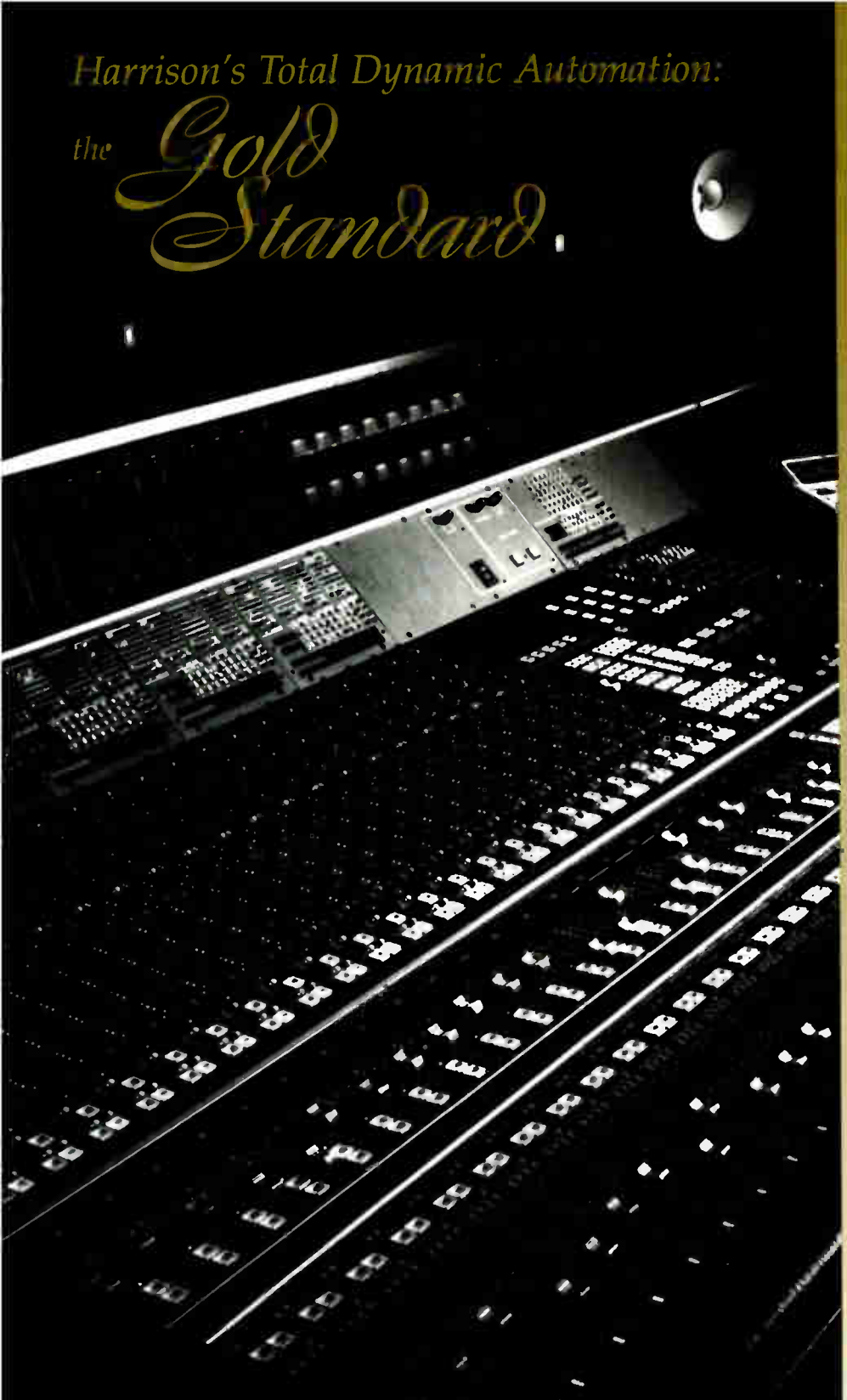

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he really didn't have anything for me to look at. He had some sketches, so I played a little delicate balancing act with Luc. I had to finish *Space Jam*, so I kind of intentionally laid low with regards to developing too much too soon.

"I'd nibble on a few things," he continues. "I started creating the Air Taxi sounds and the Mondashawan language—little bits and pieces of the sounds of Evil. I started making those elements just so I could leak it to him while I was on *Space Jam*, just to make him feel like I was on the show.

"There are two elements of Evil [in the film]—this big flaming *creme brulé* is what it looks like on camera—this round planet, and then there is the voice. So I started working on the sound of this big flaming ball. I knew what I wanted it to sound like, and I didn't think I needed to record anything. I knew it was going to be a mix of sounds that I already had—you know, screaming voices and legato-like wailing and rumble and flames."

Working from his extensive Weddington Productions library, Mangini did much of the hands-on sound design in his home studio. He also enlisted the help of John Pospisil, one of the industry's most respected sound designers. Pospisil started in the last weeks of August before joining the crew of *Starship Troopers*. But even that didn't get him off the hook, as Mangini supplied him with a workstation at home to do supplementary work during off-hours and weekends. "When we needed his special touch, we'd send him stuff," Mangini grins mischievously. "He's a very talented boy."

Mangini started by showing Pospisil, John Fassal and Geoff Rubay what images actually existed, often in crude fractal wire form, in addition to making sketches of the action as the director had described it. "In general, I'd show them what the thing is, visually. I described what I thought it sounded like and what I thought the director wanted it to sound like, and I'd give them hints as to the directions they might go and what materials to use as source. They'd go off and create, then I'd come back and review and fine-tune. That was the general process. And of course there were always times when those guys would come up with their own concepts as well."

VOICE PROCESSING

"Mangalores! Those evil dog-lookin' guys—but they ended up sounding really great!" laughs Mangini. "Not only did they ultimately sound great, but they really stole the show. But let's be honest, the Mangalores were stunt guys in rubber suits with radio-controlled faces! Their ears, their mouths, their eyebrows were really articulated—so, of course, the production track was useless and we had to post-sync all of their dialog. We had to create two things: We had to create them speaking in English, because there were times when they had to communicate with Earthlings, and we had to create Mangalore dialog—when they spoke to each other."

Curt Schulkey (dialog/ADR supervisor) and Mangini worked together to determine how to create the Mangalore speech. "It was a two-step process,"

OMF AND THE PRODUCTION TRACK

"One of the most wonderful aspects of *The Fifth Element* post-production experience was the amazing professionalism and cooperation that we had from picture editorial," says Sonny Pettijohn, Mark Mangini's sound assistant.

The picture-editing crew had meticulously transferred the original Nagra digital production recordings directly into the Avid instead of from some intermediate tape source, which is so often done, adding additional noise as well as sync errors. The people at Weddington had planned to convert their workstations from 29.97 to 30 fps as far back as October 1996 for *Daylight*, but they held off until *The Fifth Element* to do so.

"This made the OMF conversion so much easier," Pettijohn says. "Picture editorial would send over complete reels of media transfers and the edit decision list. On the smaller reels, they could send the material over on a Jaz drive, but most of the time we supplied them with one of our 2-gig drives, putting one reel on each drive. I performed the OMF process at Weddington, backed it up to a DLT and issued the drive to the sound editor for cutting."

The (hotly debated) practice of using OMF software to convert Avid media files into a format that can be used in Pro Tools automatically places the cuts (sample accurate) precisely where the picture editor cut the sync track. Like any technical discipline, the use of OMF depends on the proper attention to detail and preparation. Those sound editorial crews who have had chronic problems with OMF conversions can almost always trace the problems to a lack of technique and technical discipline during the original digitization of picture and sound at the picture editorial level.

Before converting the files the sound editorial assistant can determine how much of the original sound recording (before and after the actual audio material used) should be included in the conversion. This is strictly a question of hard drive space available for transfer. If you ask the dialog editor how much "pre" and "post" material he or she wants, the editor will always desire the entire sound take, but memory restrictions may determine otherwise. This is one reason why Weddington uses a single 2.0-gigabyte drive for each ten-minute reel, giving ample room to convert the entire recording of each sound take angle.

"We would never have made it without the OMF option," says Mangini. "Not only did it work extremely well, but we found that it was sample-accurate. Of course, like anything else, it is only as good as what you put in it, and a huge amount of credit has to be given to the production recordist, Daniel Brisseau. Most big special effects pictures I've worked on are basically recorded as guide tracks for mass ADR sessions later. Not on *The Fifth Element*. Boom operator Jean-Marie Blondel got in there tight and wouldn't give up. My dialog editors were able to salvage and use more of the production track on this picture than you might otherwise think possible, and it's really due to Brisseau's tenacious efforts." ■

Mangini says. "We had to cast the voice that would speak the English dialog, so there was a process of bringing in actors, taping auditions, giving them general guidelines of the kind of voice we were looking for—a gruff, growly, gravelly kind of voice. Then we'd send the cassette auditions to Luc. He'd pick the voices he wanted us to bring back into the studio for a proper recording session where we could direct them. Curt and I then began to develop a process for how we would alter the voice. We knew that it wouldn't be an out-of-the-box recording—a guy on an ADR stage. We knew we needed to embellish the voices with animal sounds of some kind, fore and aft and underneath, but we weren't sure technically how we were going to do it."

Mangini and Schulkey used some rough processing of the original voice audition cassettes for Besson to hear, culling down the best takes from the best auditions and then "preprocessing" them with pitch-shift and some animal embellishments. "We never sent Luc a raw voice recording," Mangini explains. "We wanted to give him a feel of where we were going. That gave him a better idea of whose voice worked with the process that we were using. The problem was that there could be a good voice in and of itself, without the processing.

"So Luc picked the final voices. Then Curt would ADR them on the stage, and the sound design team would employ a combination of pitch-shift and time domain-based processing on the voice itself. Then we used sound effects of animal grunts and groans and growls—camels, bears and pit bulls were the final selection of elements that were envelope-following the actual speech using VocAlign software."

Mangini is quick to point out that the benevolent aliens, the big roly-poly, brass-armored Mondashawan creatures, had an entirely different vocal design. "Their dialog was created using electronic-processed saxophones. When the aliens speak English, we wanted it to vaguely replicate what I had done as a sound effect when they spoke in their own language. So Dave Whittaker took the alien English ADR and, using Hyperprism software, worked in some of the sound effect dialog that I had made underneath it to give the Mondashawans their unique vocal signature."

GUNS AND CARS

His films *La Femme Nikita* and *The Professional* make it clear that Besson likes the "big sound" that Hollywood editors bring to the screen. But how would weaponry sound 300 years in the future? For a long time, Besson kept hedging on his desire for how the guns should really sound. "I had to beat Luc over the head, writing him letter after letter, call after call, until I finally dragged out of him that he wanted them to be essentially explosive—meaning bullets and projectiles," Mangini remembers. "He didn't want a beam of light or disintegrators. Something would pierce your skin if you were hit, so he wanted it terrestrially based, but with a futuristic feel. So our spin on it was that we took real machine guns and single-fire weaponry and added servo sounds to them, to make the audience believe that in the future there is some sort of motorized assisting on how one feeds the bullet from the magazine into the chamber, discharges it and spits it out as quickly and efficiently as possible. It gave the weapons this really cool, high-tech lethality, sort of a guuuzhtt-zzztt!"

In addition to the motorized gunfire, a variety of high-tech laser-sighting touches were added, along with subtle gun telemetry in certain sequences to sell the advanced development. My favorite was a sensor buzz constant that had an occasional, uneven modulation.

When you sync the uneven modulation with the screen visual of the barrel of the weapon bumping off center or passing by the axis of the lens, it tended to really sell the feeling that the laser sighting was moving off azimuth from being locked onto a target. It was especially effective when the mugger attempts to rob Bruce Willis in reel 2.

What action film would be complete without a high-speed car chase? *The Fifth Element* does not shirk its challenge to offer a new spin on the age-old flight through the crowded streets of New York City—in this case, in three dimensions, as all cars fly and traffic is "stacked" well over 80 stories high. Why aren't we surprised that Bruce Willis is a cab driver who maneuvers his hack more like an F-16 Strike Eagle than a public transport? This set of parameters led to obvious opportunities for Manhattan mayhem, such as diving straight down through cross-traffic as Willis tries outrunning the fleet of police cruisers pursuing him into the fog bank far below.

Geoff Rubay spent weeks working on the vehicles as he cut the complex and exciting air chase in reel 4. John Fassal developed entire series components, bringing the DAT masters by every few days to augment the flying car arsenal.

"We wanted a look-how-insane-New-York-has-become in the sound of the traffic that fit Luc's vision," says Mangini. "My model was a race course. We took sounds from Daytona cars and high-performance vehicles like that, sped them up, and pitch-shifted and harmonized them as needed. We made this sort of maniac vooom-vooom-vooom! It was literally cars and motorcycles flying by on a race course. We gave them a psychological resonance that says, 'If you think taxi drivers are crazy now, in the future it is going to be nuts!'"

Rubay spent weeks developing 5-channel stereo background "beds" for the city traffic. By taking speed-bys of various cars and trucks with an occasional motorcycle zing-by, he built a broad envelope of futuristic texture that surrounds the audience. There was a 5-channel bed with lighter activity and a 5-channel bed of rush-hour. Then he developed two separate beds of city sirens—as law enforcement activity is understandably busier than ever. On top of these beds, the sound effects editors then cut the single fly-by cars for the closer vehicles.

THE FOLEY CHALLENGE

Aaron Glascock cued and prepared many of the materials needed by Foley artist Ellen Heuer and her partner, Jimmy Moriana, who tackled the immense scope of sync-to-picture sound effects development at the Todd-AO West facility in West Los Angeles.

Glascock remembers Mangini's briefing and expectations: "Mark did not want to inhibit the potential Foley contributions by telling us what we should or should not do, but I was afraid that I would cue all this stuff and it would get dumped because there were better variations in the cut sound effects. I wanted Foley to work in a collaborative way, to complement the cut sound effects, so we focused on developing Foley cues that would augment and enrich."

Pulling from years of experience in Weddington's vast sound effects library, Glascock knew very well the character and taste that the editors had and were probably going to implement. That experience with the crew came in handy, as he didn't have time to build anything new for the Foley artists the way he had on a few previous projects. To help accomplish the brass-suit movements for the Mondashawans in the first reels, for example, Glascock had pulled a couple of articulated metallic prop mechanisms that he had manufactured for *Robocop* years ago. He dusted them off and played with them until he could derive a characterization that felt just right.

Heuer, meanwhile, found herself deluged by a diverse range of Foley styles and taste, from 1914 Egyptology to fabrics and weaponry 300 years into the future. What does the handling of a non-metallic, polymer-based Ziff gun sound like when snapped open and handled? "It was a monumental challenge to accomplish so much in only four weeks of stage time," remembers Heuer. "For as much as we did, we still could have used more time. The nice thing was that Luc Besson came by to listen to playback of each reel as we finished it. This is extremely rare! Hardly any director does this. It gave us a tremendous advantage to have his input and guidance right then and there."

At first they tried recording the Foley cues straight into a Pro Tools session but decided very early on that it was not yielding the desired richness and texture. "The sound was a little edgy, and we decided that we could not afford the time and money to experiment," recalls Glascock. The stage switched back to the standard 2-inch, 24-track tape method, using Dolby-SR noise reduction. These tapes were then shipped across town to the Weddington transfer department, where they were downloaded into Pro Tools hard drives for editing.

"Solange Schwalbe then jumped in like a trooper," Glascock says. "She is an awesome tower of talent and know-how, which was invaluable in making it possible to complete the editing process on schedule for predubbing."

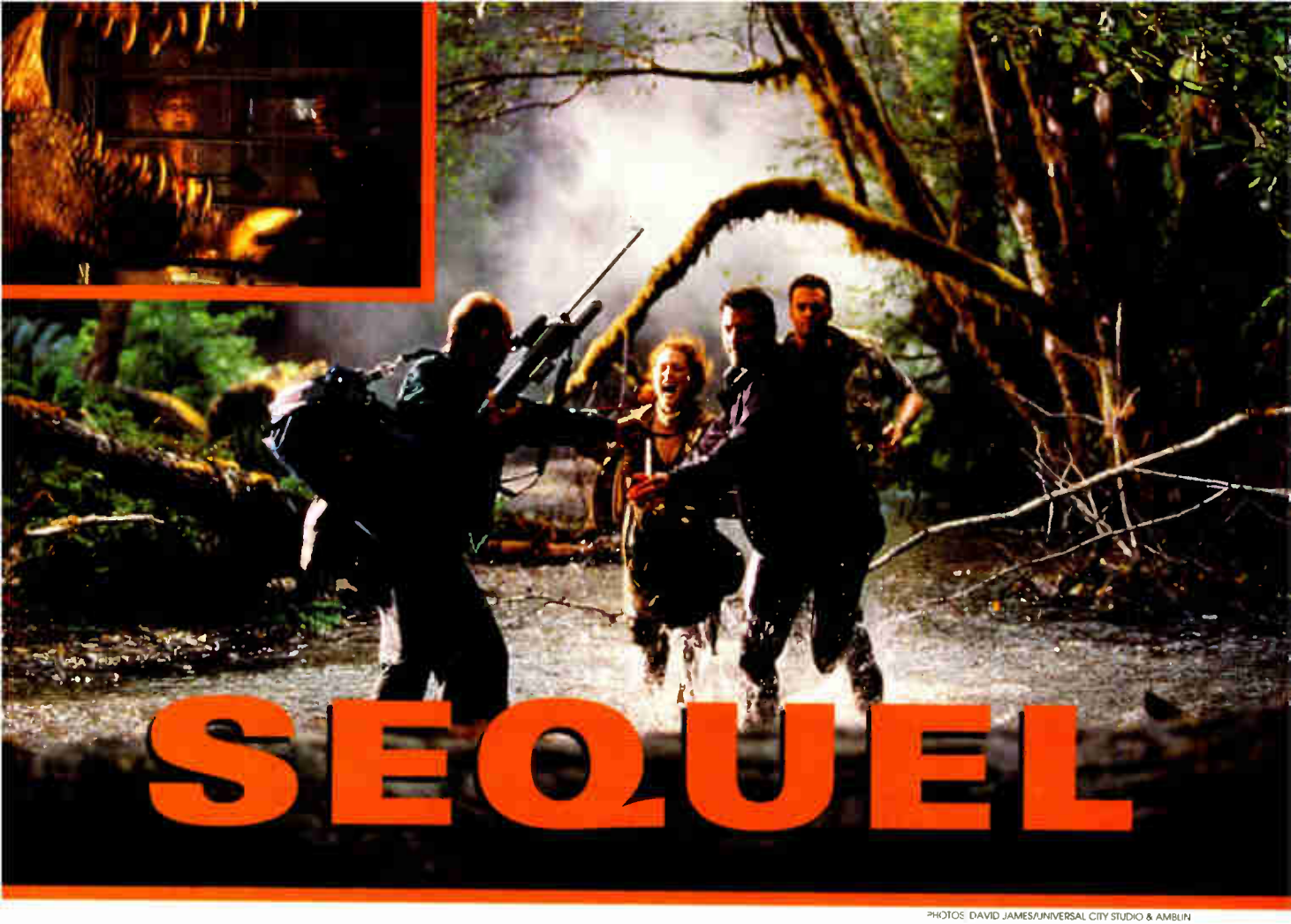
DETAILS, DETAILS

Mangini's cut lists were enormous, with reel 11 alone at 68 pages! I hadn't seen that much paper since reel 7 of *Dante's Peak*! But before cutting anything on my own reels, I'd spend days going through each and every sound effect that I would be working with and do a thorough and definitely anal preparation. In the case of *Dante's Peak*, I spent three weeks reworking and preparing the vehicle sound effect groups before I would cut anything. For lack of a better term, I call it dynamic-expansion. Of course, we use Hyperprism and VocAlign as important digital processing tools when appropriate, and often they are the only solution to a particular problem, but I prefer to do my initial preparations by using the strengths of both digital and analog technologies in a grass-roots, common-sense approach. I do not like to over-process, but I do not like to cut raw material either.

If I am downloading the sound effect cues myself, I use a Night Technologies EQ3 equalizer in tandem with a Klark-Teknik 30-band graphic just prior to digitizing into the computer. This allows tremendous flexibility in a virtually non-phase-shift environment to manipulate the range of frequencies that I may wish to emphasize or eliminate. As wonderful and convenient as digital processing is, the equalization functions are still very basic and "cheesy," lending an edginess to the sound that I do not care for. I do not record into the computer via a Pro Tools session unless I am downloading multichannel cues. I prefer to digitally record and pre-prep audio files in Digidesign's Sound Designer II.

Because work takes place within the boundaries of hard drive storage space, the utilization of each byte is vital. At Weddington, the typical workstation uses a quad array of front-access Micropolis removable drives. The Pro Tools software we were using demonstrates fewer tendencies to crash when

—CONTINUED ON PAGE 228



SEQUEL

PHOTOS: DAVID JAMES/UNIVERSAL CITY STUDIO & AMBLIN

THE LOST WORLD

The summer film season is once again packed with action, and this year there are more than the usual share of high-profile sequels. Besides *Speed 2* and *Alien IV*, sequels to two of the Top 10 grossing films of all time went head to head at the box office last month—*The Lost World* and *Batman and Robin*. *Mix* asked the supervising sound editors on the two films to give a sense of what makes these versions unique, and what we should listen for.

GARY RYDSTROM

Gary Rydstrom is a busy man. This summer alone, he served as supervising sound editor/mixer on The Lost World, *followed by* Hercules, *followed by* Titanic. *And smack dab in the middle of all this, Skywalker Sound was installing a Capricorn digital console into the facility's new dub stage. He called in during lunch near the end of the final on* The Lost World *to tell us what we might hear that's different. (For the story on* Jurassic Park, *see* Mix, *July 1993.)*

We pulled some sounds from *Jurassic* just because I had to. It's material that worked, and I wanted to have the dinosaurs be recognizable. *—CONTINUED ON PAGE 87*

Christopher Boyes of Skywalker Sound captured some of the jungle ambiences in Costa Rica, using an HHB PortaDat.

PHOTOS: CHRISTINE LOSS/TMS & DC COMICS

BATMAN AND ROBIN

JOHN LEVEQUE

John Leveque and Bruce Stambler (1997 Academy Award winner for sound editing for Ghost and the Darkness*) of SoundStorm, Burbank, could be considered the dynamic duo of sound design, having worked previously on* Batman Forever *(see* Mix, *July 1995). Here, Leveque tells of the lengths some editors will go to in order to provide that essential dose of reality in an otherwise unreal genre.*

Mr. Freeze (Arnold Schwarzenegger) is the main bad guy in the new *Batman and Robin*, and he freezes everything with his Freezegun. It became obvious that we would need to come up with a variety of "cool" sounds for freezing and thawing. We started by filling a giant freezer with all types of ice: crushed, cubed, slabbed, sliced and blocked. We froze everything we could think of: various articles of clothing, even a garden hose filled with water. We did everything we could to get the sounds of cracking, scraping, shattering, popping, crazing and crunching. We brought in a huge flask of liquid nitrogen (looking something like R2D2's older brother), which would freeze anything on contact—water, aluminum foil, Saran Wrap, glass. We poured it onto and into various objects and got sizzling, popping, cracking, spitting and frothing.

Co-supervising sound editor John Leveque recorded many of the "icy" sounds on a frozen lake at 6,000 feet, near Big Bear.

These were all great sounds. But the size and scope that we wanted was not there. We needed something big. If we were to come up with a realistic sound for the entire city of Gotham freezing, we would need a sound to match that expanse and power.

I drove up to Big Bear Lake. Parts of it were frozen, but there was a lot of traffic noise. It also happened to be against the law to go out onto the ice. A forest ranger recommended that I go up to this private lake about 2,000 feet higher in the mountains. My four-wheel drive vehicle slipped and slid

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through the slush, snow and mud but eventually made it. It was just before dawn, and the small, shallow lake glistened in the distance. The snow was fresh from the night before. As I hiked to the lake, carrying all of my recording gear, I felt sad to be spoiling the virgin beauty with my footprints.

The conditions were perfect: silence. It was as if I were alone on a giant soundstage. The lake was completely frozen, and the ice varied in thickness depending on how deep the water was. I stepped out onto the ice and found that if I slowly shifted my weight, it would craze in various spiraling patterns, creating a complex sound of long, continuous cracking—perfect for the freezing Gotham. In the deeper parts of the lake, if I put all of my weight down, the ice would crack a large section all at once—a huge, thundering moment of sound—perfect for the Freeze-gun impact.

PHOTOS: CHRISTINE LOSS/TMS & DC COMICS

For the rest of the morning, as the sun began to warm the frozen lake, I recorded all types of various ice sounds. I used a sledge hammer, a saw, a crow bar—manipulating the ice to create different and often spectacular sounds. I scraped and prodded, banged and crunched, jumped and cracked.

Slowly, I ventured out onto the deeper sections of the lake, finding that as the sun warmed the air, the ice changed quality and began to give me a squeaking, squishy sound that would be a perfect element for the thawing of Gotham. But the best sound of all was that of a supervising sound editor falling through the ice and into the freezing water, while trying to save his [Fostex] PD-2 and Sennheisers, and at the same time, trying not to spoil that sound moment with a scream of terror. ■

—*FROM PAGE 84,* THE LOST WORLD

But we also wanted to get as much new material to make them unique. I don't mind going to libraries and grabbing whatever's good, but a lot of those recordings have been sifted through over the years. To me, all sound ideas come from the real world. For organic sounds, for vocals, I've tried every once in a while to create something synthetic or take a nonorganic sound—scraping metal or foghorns or God knows what—and make that a voice, but it never feels like an animal. So for these dinosaurs, I find what works best is me doing as little as possible and just getting good, original recordings of interesting animals and maybe processing them a tiny bit or pitching them a little bit. But it's essentially those raw sounds and how you choose them and in what combinations you play them. The better that original recording, the better the sound design. You can't put lipstick on a pig, so to speak.

So we started out by getting as much new material as we could. Chris Boyes, my assistant on the first one and on the second, went to Costa Rica and recorded ambiences and interesting animals. There was this one animal—he doesn't know the name of it, but it's become the most used for the compys, these tiny little dinosaurs that chirp like birds. It's

some weird Costa Rican mammal, and we have no idea what it is. Chris, of course, saw it and said it was a raccoon-like mammal. We just call it compys.

There's a lot more dinosaurs, and there's a lot more *of* the dinosaurs. T-Rex is onscreen more this time, and there's a mom and a dad, so how do you distinguish mom from dad? And they also have different emotions—T-Rexes aren't always vicious; they're sometimes paternal or maternal, so what does that sound like? I used a lot of material from the first movie for mom because in the first movie, the T-Rex is female. Then Steven [Spielberg] wanted some of the T-Rex stuff in this movie to be even more vicious and more aggressive. So I'd save the new material—more panthers and real deep elephant growls and screeches—I'd save that for the dad as much as possible and let mom be more of harkening back to the first movie.

Then there's a baby T-Rex. One of my favorite things to record was actually heartbreaking. In the movie, the baby T-Rex has to cry out because it's been removed, taken away from its parents. So I had to make this call, this sad little cry that would echo through the jungle and make you scared just by thinking that mom and dad must hear that somewhere off in the distance, and be heartbreaking at the same time because it's this little kid torn away from its mother. There happened to be a new baby camel born at Marine World—we recorded a lot of sounds there—so I hung out with the baby camel and Chris hung out with the mom camel while the handlers took mom away for a walk, separating them, which they do regularly. This baby just went on and on with the most heart-wrenching, heartbreaking squeals that I've ever heard. They were great for baby T-Rex.

Camels make for great sound effects, a classic sound effect that a lot of editors have used—Ben Burtt used them to sweeten Tie fighters [on *Star Wars*] and things like that. But this was the first time we recorded baby camels. With babies of any animal, you get a different, distinct quality from the adult. A baby camel doesn't really sound like an adult camel; it has its own feeling. We've recorded baby macaws, which make really good sounds for little dinosaurs. And baby lions and tigers make fantastic sounds. One of the tricks you find out is that often the bigger the animal or the bigger the sound source, it doesn't necessarily translate as big in the movie. We used a lot of koala bear growls for the T-Rexes, and koala bears are tiny. But recording them in a big, echo-y room at the San Francisco Zoo, adding a little pitch-shifting, they sound like T-Rexes growling through the forest. That's what makes for fun sound work, or sound design—taking sounds and juxtaposing them with what you wouldn't expect.

The first *Jurassic* was cut on mag in '93, one of our last films on mag. In this one, we cut the effects on Pro Tools. I would create dinosaur sounds on a Synclavier and essentially premix them onto Pro Tools. I made a lot of use of volume graphing within Pro Tools to come up with the balances that I liked. It's a wonderful way to see how things are balancing out. In the old days, you had to guess; now the editors can do a lot of mixing in the workstation. But you don't want to mix it so that you're tying things together—it's just relative volumes so that when you get to the mixing stage, you put your faders up to zero.

There are a couple of complicated editorial sections in this movie. There's a scene where a woman is hanging

over a cliff in a trailer. She's sitting on a pane of glass on the end of the trailer, looking down into the ocean below. Every time she moves, the glass cracks and spider-webs out, then cracks again. So she has to be careful about how she gets off the glass. It's a great moment. Each of those glass cracks were cut and placed. Ken Fisher, the editor, spent a lot of time making those work volume-wise related to each other, panning them and everything else. I put the faders straight across and it was pretty much done for the mix. That kind of thing is happening more and more and is a real time-saver. It's a great action scene in which everyone is perfectly still. I love scenes that are not what you expect—a tense scene in which everything is suspended and the slightest movement causes more danger. Those are great moments. ■

—FROM PAGE 60, RECORDING GUITARS

would never know that you're not playing through pickups. Again, it's an excellent way to utilize a lot of different tunings, and that is one of the things that I mainly use it for."

JOHN JENNINGS

As a producer, guitarist and songwriter, John Jennings has worked with such top artists as Mary Chapin Carpenter—with whom he has made several albums that have yielded 11 Top 10 singles, 13 Grammy nominations and five Grammy Awards—Indigo Girls, Iris DeMent, Janis Ian, Lyle Lovett and Bill Morrissey. Jennings' most recent solo album is *Buddy*, recorded at Bias Recording in Springfield, Va., where he has cut all of Chapin Carpenter's records.

"For better or worse, I do have several 'default' locations for placing mics. I like to think of them as good starting points, rather than rules. They work for me and may not work for you.

"Go out on the floor and listen to what you're going to record. Don't just throw up a couple of mics and do your inspection from the control room. Mics and monitors can lie to you. If you're recording an acoustic guitar, listen with your face parallel to the face of the instrument. You'll want to be a few feet back from the guitar, and you'll want to move around a bit, mostly from side to side. You'll find the 'sweet' spot, where all the elements of the sound are apparent and fairly well-balanced. Regardless of whether you're recording in stereo or mono, this is the 'zone' you want to try to capture.

"Once you have found a sound that you like, walk around the room a bit. Listen from behind the guitarist, from the side, and all over. There might also be another place you can add a mic that will help the sound overall. Sometimes you have to try fairly unconventional things to compensate for an instrument that is lacking in a particular area, or to find a sound that fits a particular track. There are folks who will try to convince you, before you even try, that trying some unusual mic placement may not work. Having been guilty of this a time or two myself, I have reformed. I now say, 'Whatever!' It only takes a few minutes to find out.

"I personally prefer to record acoustic guitars in stereo, as I like wide images. I like to use matching pairs of mics and have a particular fondness for KM84s. Point one toward the middle of the lower bout and the other at the 15th (or so) fret. Put them a foot or so from the guitar, with the capsule roughly parallel to the face, and adjust the distance to taste. You get that nice bottom end from the bridge and the articulation from the neck.

"If you're recording direct, try to have a few options for DIs. It's always best to be able to tailor a sound to a particular track. As for recording electric guitars, I'm always searching for better ways to do it. I've become a proponent of the 'multiple mic' method. I really like to try several different mics on different speakers and move them around a good bit. Do yourself a favor: Buy a Sennheiser MD409 and use it in conjunction with an SM57. I place the 409 about a foot from one of the speakers and point it toward the outer edge of the cone. I find the 57 useful in adding definition to the sound if the 409 seems a bit too 'soft.' Nevertheless, there are *many* mics; try as many as you can. There are really useful microphones that are not very expensive, like Radio Shack PZMs.

"When recording electric guitars, listen to the amp close up and at different points in the room. If the amp has multiple speakers, each may have its own character, no matter how subtle. Ask the guitarist where the spot is in the room that sounds good to him or her. If the guitarist is standing and has dialed in a tone that works from head height, try to make a provision for that. In other words, put up another mic!" ■

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JUSTIN NIEBANK

AT HOME IN NASHVILLE

Justin Niebank is one of Nashville's most highly regarded producer/engineers. His impressive career has included work with country acts such as Marty Stuart and Le Roy Parnell, plus blues and R&B legends Etta James and Johnny Winter, triple-A rockers the Freddy Jones Band, blues rocker Ian Moore, Latin/Caribbean influenced roots artists The Iguanas, and mainstream AOR performers such as Bob Seger and Stir. One of Niebank's most successful productions was Blues Traveler's Platinum self-titled debut, which featured the hit "But Anyway."

Like many producers and engineers, Niebank started off as a musician, and his first studio experiences recording with one of his bands convinced him that he had found his calling.

By the early '80s Niebank was engineering numerous jingle sessions in Chicago, where he met Bruce Iglauer, owner of Alligator Records. It was the beginning of a relationship that would provide Niebank with close to 30 album credits, including Koko Taylor and Albert Collins, among others. Niebank left Alligator and moved to Nashville in 1989, where he discovered that R&B and blues were an essential influence on many great Music City players.

To outsiders, Nashville looks like it's only about country music, and sometimes it is so much of a closed shop that it encourages that stereotype. Nevertheless, Niebank (as well as a handful of other Nashvillians such as Richard Bennett, Richard Dodd, RS Field, Dan Huff, Brad Jones and Csaba Petocz) has done much to expand the perception of what really happens in Nashville—where more than 300 studios and thousands of musicians and songwriters thrive doing every kind of music imaginable.

Mix paid Niebank a visit at his home studio, where he took time from his latest major-label project, Mighty Joe Plum (Atlantic Records), to share his enthusiasm for production and engineering. Thanks to Middle Tennessee State University and Lacy Privette for their assistance in helping this interview come together.

These days, it seems that Nashville has an incredibly vital non-country scene of artists, songwriters, engineers and producers. What are your feelings about the evolution of this community?

There are so many exciting things going on in this town, and there are a lot of phenomenal people in Nashville that I hope start getting credit. There is a great pop and rock community here. I'm personally convinced that Nashville is the best place to make records in this country right now, if not the world. It's a great vibe.

When I first started working in Nashville in 1989 there was a lot of resistance in the pop world concerning recording there. It was like "I don't know if we should be doing it in Nashville and have it connected to Nashville." Then there was sort of a change that took place where people were thinking, "Nashville's cool. Nashville's where songs are about."

Recently, some people have gotten a little scared of recording in Nashville again, because the sound of '80s L.A. seems to be alive and well in mainstream country, and that is real hard to listen to for those who listen to pop or rock records. That has put a little bit of a crimp on people's view of what's actually going on in Nashville, because it is really a very inaccurate picture. There are great things happening in rock and pop in this town.

You already had quite a career working on numerous blues albums with Alligator Records' Bruce Iglauer, before you moved to Nashville. How'd that come about?

Let's just say that I went down the long rocky road of bands and relationships, being signed, getting screwed and having your heart broke. The great thing that came out of that was I discovered the studio. The moment that I walked into the studio it was like, "This is it, this is what I want to do."

The thing that really got me in was doing demos for our band's records and then going into studios and never hearing what it was that I liked on our demos. So while I was doing session work as a player, I began engineering at a studio called Streeterville [in Chicago]. I did a lot of jingles for them, which was a phenomenal experience for me.

BY RICK CLARK

You show up at 8:45 in the morning and you would have a room with a full rhythm section, full strings, full brass, full woodwinds and usually a singer, and you had to get those sounds out in the second run through. At 9:00 there was the downbeat, and at 9:05 you got the track. Within the course of that day, you might be cutting three or four different kinds of music, from a full orchestral setup, to four-part barbershop, to an attempt at doing something rock 'n' roll. It was great for chops, and all engineers should have the opportunity to do something like that.

Someone recommended me to Bruce, when he was doing his first record with Johnny Winter, who I think is one of the best slide players in the world. It was a phenomenal experience. We then did the Lonnie Mack and Stevie Ray records, which did real well. We went through an era where Alligator was selling a bunch of records. We had three or four records that charted on Billboard's Top 200. It was a lot of fun. I would do jingles from 8:00 in the morning to 6:00 at night, and then Bruce Iglauer and I would lock ourselves in the studio from 6:00 until 1:00 every day. I did that six or seven days a week for five years.

Bruce opened up the door for me, and it was the greatest thing that could have ever happened to me. Bruce has such an unbelievable passion and personal commitment to the people and the music that it's inspirational to me. He's a no compromise.

Why'd you leave Chicago?

As much as I loved Bruce's action, I wanted to do pop and rock 'n' roll records. At that time, I had a lucky break, working with Barry Beckett in Muscle Shoals on a Lonnie Mack record. That was the first record that we did together. In Muscle Shoals, I started realizing how important the whole Memphis/Muscle Shoals/New Orleans triangle of music was to me. Being able to be in the room with people like Barry Beckett and Roger Hawkins and all those cats was like, "This is what I need."

I came to realize that people always equate Nashville to country, but if you scratch off the surface of most of the session players here, and get them away from the day to day work, great southern R&B is absolutely essential to the fabric of what they are about. That's what they're all based on. Nashville was the closest I could get to hanging out in Muscle Shoals and still be able to make a living.

There is nothing in the world like the vibe of a top-notch band of Nashville players, with Barry Beckett sitting in the middle, getting down inside a groove of a song. There's nothing like it. Its one of the most magical things I've ever seen. So Barry started hiring me to do all these pop records, while he had Scott Hendricks do his country records. Like Bruce [Iglauer], I owe much to Barry. Tony Brown is another one who has helped me out a lot in this town.

What inspired you about recording the blues?

The blues artists I've worked with, particularly Albert Collins, were always so fearless in the studio. It was always so inspiring to me. The problem with a lot of pop is that everyone is wanting to be such huge successes, they aren't able to exist in the creative moment enough for something fearlessly vulnerable to happen. There's very little real spontaneity. Albert Collins, on the other hand, lived for that moment. When he dug in and hit that vibrato coming out of that Quad Reverb, that was it. Every guitar player

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in the world should spend a month with Albert Collins records and realize that one true note with emotion means more than anything else.

What do you do to help a band transcend the red light fear?

A great headphone mix is everything. You have to be able to have people "hear the record" in the phones. It's important to set up a room with great eye contact in an environment that feels natural to the band or artist.

I haven't forgotten what it's like to be in a band that plays live three days a week, for a year or two, and all of a sudden walk in to a studio where the guitar player can't see the drummer and the bass player is down the hall and the singer is in the next building. I think that's nuts. You can't do that to players.

You've worked at many of the large studios in Nashville, but recently you've been doing quite a bit of major-label work out of your home studio. What was the catalyst for putting this room together?

When we originally built our house, we built this barn with an apartment space upstairs. We thought we'd have our animals downstairs, but of course we eventually realized that was stupid. So here I had all this room with 12-foot ceilings. I initially thought I could use the space for overdubs, because on every record, there's that week or so when you wish you could save some money while you're tweaking overdubs or doing vocals. I ended up cutting a couple of tracks in that barn space, and I couldn't believe how good the tracks sounded.

A year ago, I produced this band called Stir in that space. That album got picked up by Capitol. I did the project through two Yamaha Pro1 mixers, which is the predecessor to the 02R. I ended up mixing the whole record on those, and right now I've got a Top 5 hit from the album called "Looking For." As a matter of fact, we did the whole album on that setup. Obviously, the thing that was exciting about that record is that we spent no money on it, and now the band is making money off of their careers as musicians, which is a wonderful thing.

While recording, I strictly use the 02R for monitoring purposes. I think the 02R's A/D converters and mic pre's sound pretty good, but right now it's not what I'm looking for. I still like old Neve and API stuff, and that's the sound I want.

Here's the major plus for me, con-

cerning the Yamaha: When I'm working with bands, the 02R allows me to cut a track and do an instant snapshot recall of where I am in that intense moment, when you're trying to get your sounds together and the room is vibrating from the tune, and everyone is focused on the song. In my opinion, that is usually when an engineer, myself included, intuitively comes up with his best mix. With the Yamaha, you are able to hit a button and have it store everything on the console at that point. When you are ready to come back and overdub, you hit one button and it's exactly where you were that day you tracked it. It's a real positive thing, and as you do overdubs you can store everything. By the time you roll around to the mix, you kind of have your killer mix built up and almost put together. You can store three or four different versions of it, too. Initially, I was very cautious about mixing on the 02R, because I'm used to working on Neves and SSLs, but it just sounds great. As a result, I'm committing to mixing major-label records on the 02R.

Besides an Otari analog 24-track, you also have a RADAR in your studio.

I usually work between those two particular work surfaces, my Otari 24-track, and my 24-track RADAR, which is a hard disk recording system. Ultimately, I look at tape recording formats like a photographer would look at film and filters. You look at the picture you want to create, and you have to think about what you're going to put things through to get the effect you desire. While some stuff is going to pretty much stay with the analog, I might cut something on the hard disk. A lot of times, the combination of analog and digital is where it's at. I just cast the recording format to fit the project.

For working with bands, the RADAR is excellent for just the editing between takes and flying stuff around. The RADAR is more intuitive for an engineer, who is used to working with tape. The fact that it's dedicated and you don't have to go through a lot of computer stuff and you're not moving a mouse around is wonderful. It's real fast, too. I believe my job is to document phenomenal performances of great songs via a great arrangement. If the band does a half a dozen takes, The RADAR allows me to get at vocal takes on all of them and find those magic moments when people are playing outside themselves and not thinking about the red light. It allows me to assemble those parts easily.

If there was a word that defines what I'm always trying to go for in a session it's "momentum." Once again, momentum helps to bring out intuitive things in everybody in the room. From the assistant down to the players, each person's momentum is crucial. Having a machine like the RADAR keeps that momentum going and helps take things to a new level for me.

Also having the setup at home takes a lot of pressure off of forcing a session to be spontaneous in a given, short amount of time.

The great thing about having your own studio is that it takes that element of "We can't do this because of the budget" out of the equation. If you want to spend extra time on something, you can, and that's what this is all about. It is creatively freeing.

Say you're 22 years old and still pretty insecure about what it is you're doing, and you want to do great, yet at the same time you're not entirely sure if you deserve to be there. There's a record company throwing all this money at you, and all of you are spending a zillion dollars more than you ever imagined in a high-dollar studio. The pressure is on, and it's like, "Okay, now be brilliant!"

I'm excited that everyone is trying to bring their budgets down, in general. Once you realize that technology has gotten to be lower-budget's friend, as opposed to keeping the budgets up, you can now make great records in any environment you desire.

The "red light fever" just does not seem to happen in my studio. I don't know if it's because there are windows in every room and it looks out over beautiful, serene pastures with horses grazing and dogs lying in the sun, or the fact that everyone is kind of close together.

At first I was real self-conscious about having musicians in there, because it's not that big. At first they're a little like, "Damn, I've got no space," but the next thing they know, they're right in each other's music and it's great!

It's like when you're playing in a band and you'd bitch when you'd go into clubs where you had to squeeze on a small corner stage and barely fit; but for some reason, those gigs were the shows that would be awesome. There's something about people being intimate that is conducive to digging into the music.

There are some people who'll say, "Well I'm more of a documentary engineer," while others feel that the artistry of production and engineering kicks in when the recorded event is transported from being merely documentary into a kind of hyper-realism. Any thoughts on that?

In film, you may capture a landscape, but there may be something in that landscape you emotionally want to focus on and pull out. That's the same with choosing sounds and settings for me. I prefer not to go for an exact copy of what happens in the recorded moment. I respect the fact that some people are into perfectly documenting a performance, but that stuff usually leaves me cold. I like to find the emotional element a picture is putting out that makes the picture more real than literal, like an impressionist painting.

For starters, I still believe in getting as much live as possible. I like to have a band in front of me playing and hear a singer singing, and I still like to hear that band react to the singer. I'm still a believer that you need to have everyone hear the record when they're playing. That doesn't mean that you can't do creative things. Once you get the performance on tape, you can manipulate elements as long as you know what the original sound was and have a live performance somewhere, just to sort of verify that it's still music and human beings playing. It comes back to this whole 02R and RADAR thing. I can hit one button, and there is the band in its rawest, purest state. At that point, we want to try to create sound that draws out angles of emotion here and there, that we may want to explore and see how it feels.

Sounds like the Nashville area has been good for you.

I don't think there's anywhere else in the country that you could be in the record business, and not have to be a multimillionaire, and be able to get some land and a place, and still be where a car could drop off whatever piece of gear you could possibly want in 15 to 30 minutes.

We have the studio situated in the middle of close to 50 acres of land in the Cumberland Ridges. It's beautiful. Here I'm out in the country, and there are so many studios around me that it would just blow your mind. There are more out here than in most cities. It's amazing. It's going to get to the point, probably in the next year or two, that if I wanted to, I would never have to leave Franklin, Tenn. Once a good mastering lab gets set up in Franklin, who needs to leave? ■

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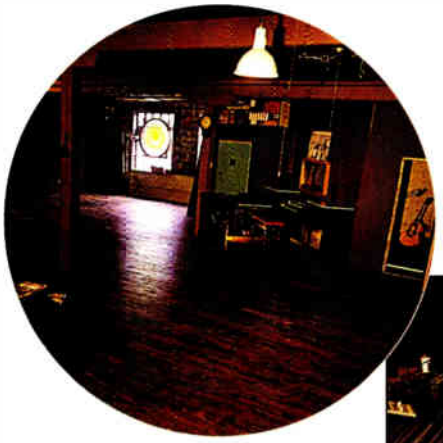
A POPPI BLOOMS IN NASHVILLE

Just what Nashville—with the densest studio population on Earth—needed: another recording studio, right? Actually, Neal Cappellino is betting his career on exactly that. The Rochester, N.Y., native and keyboard player came to Nashville in 1992, at the height of the country music renaissance, after stints as an assistant and freelance engineer at Long-View Farm in central Massachusetts and other Boston-area studios. At a time when Music Row was expanding with palatial new studios and record company headquarters, Cappellino sought out a funky warehouse space on Eighth Avenue South near Nashville's legendary rock emporium The Cannery. Two years later it turned into Poppi Studio (named for his musical savant grandfather), a "rough-hewn, grassroots, self-designed Bohemian studio that offers a unique alternative," says Cappellino. "I came to Nashville because I found a huge community of people here who are into rock 'n' roll, blues, R&B, jazz, even Afro-beat—different roots music. What I bring to the picture is a vibe studio, a place with some voodoo."

The voodoo comes from the rawness of the 2,000-square-foot brick-faced space (1,600 square feet for the live room, with hardwood floors and a ceiling that varies from 11 to 14 feet), the quirky and earnest charm of Cappellino himself, who engineers most sessions, and a combination of retro and modern technology. The main format is an MCI JH-16 2-inch, 16-track deck to which a 16-track Digidesign Pro Tools system is slaved, running through a 48-channel Mackie console and Tannoy and Yamaha close-field monitors. The same mix of new and old is found in the outboard racks, which hold gems like LA-2As and an LA-4, as well as a Lexicon 300. The keyboards are equally vintage, including a 1964 Hammond C-3, a pair of old Leslies, a



1954 Wurlitzer electric piano, a Hohner E-7 clavinet and a Fender Rhodes. The studio also has a pre-1956 Ludwig WFL drum kit.

Poppi joins a growing host of small, offbeat and inexpensive rooms in Nashville that cater to independent labels and artists. But Cappellino has designed Poppi to accommodate and appeal to a specific group of artists—the often elusive but undeniably extant collection of diverse local talent, from punk to jazz—who continue to labor under the shadow that country music casts over Nashville. He's recorded albums with artists like Spoonful, Liz Kelly, The Katinas and Singing Seergeant Washington, who are not household names even in Nashville, but who are trying to open up a hole in the country fabric.

"Poppi gives them a creative base from which to do that," Cappellino says. "The hard part is getting the word out, letting them know we're here. Some people aren't looking for voodoo; they want a nice lounge and a good coffee maker. That's not what this place is about. The room here has soul. It's undeniable. When musicians walk in, they immediately say, 'Yeah, cool, it feels good here.' What I've tried to do is set up shop around the soul, without letting the technology be intrusive."

BY DAN DALEY

Though he does most of the engineering at Poppi, Cappellino stresses that it "is not a project studio. It's a commercial studio that's trying to carve out a niche for itself. And when country music has to go and reinvent itself, like it's doing right now, that opens up the doors for other types of music to come through. That's where this studio has found its market, in supporting the musical diversity that we all have an interest in seeing thrive. You see labels here like Dead Reckoning that are putting out good music on a roots level—and so are others that people outside Nashville need to know about."

PHOTOS: GOMEZ/NASHVILLE

It's a business plan that might not convince a bank, but then he doesn't have to: Cappellino says the neighborhood and his equipment choices help keep the studio's overhead manageable. And he has staked out one of the last of the real warehouse districts in downtown Nashville, one that has yet to be gentrified like the nearby Cummins Station complex. Freight trains roll down the tracks less than 100 feet from the studio, but, he says, "We've never had to sacrifice a take and it's all part of the vibe." Poppi was intended from the start to be an alley for certain types of alley cats. And as long as there's an alley handy, Cappellino intends to keep it that way. ■

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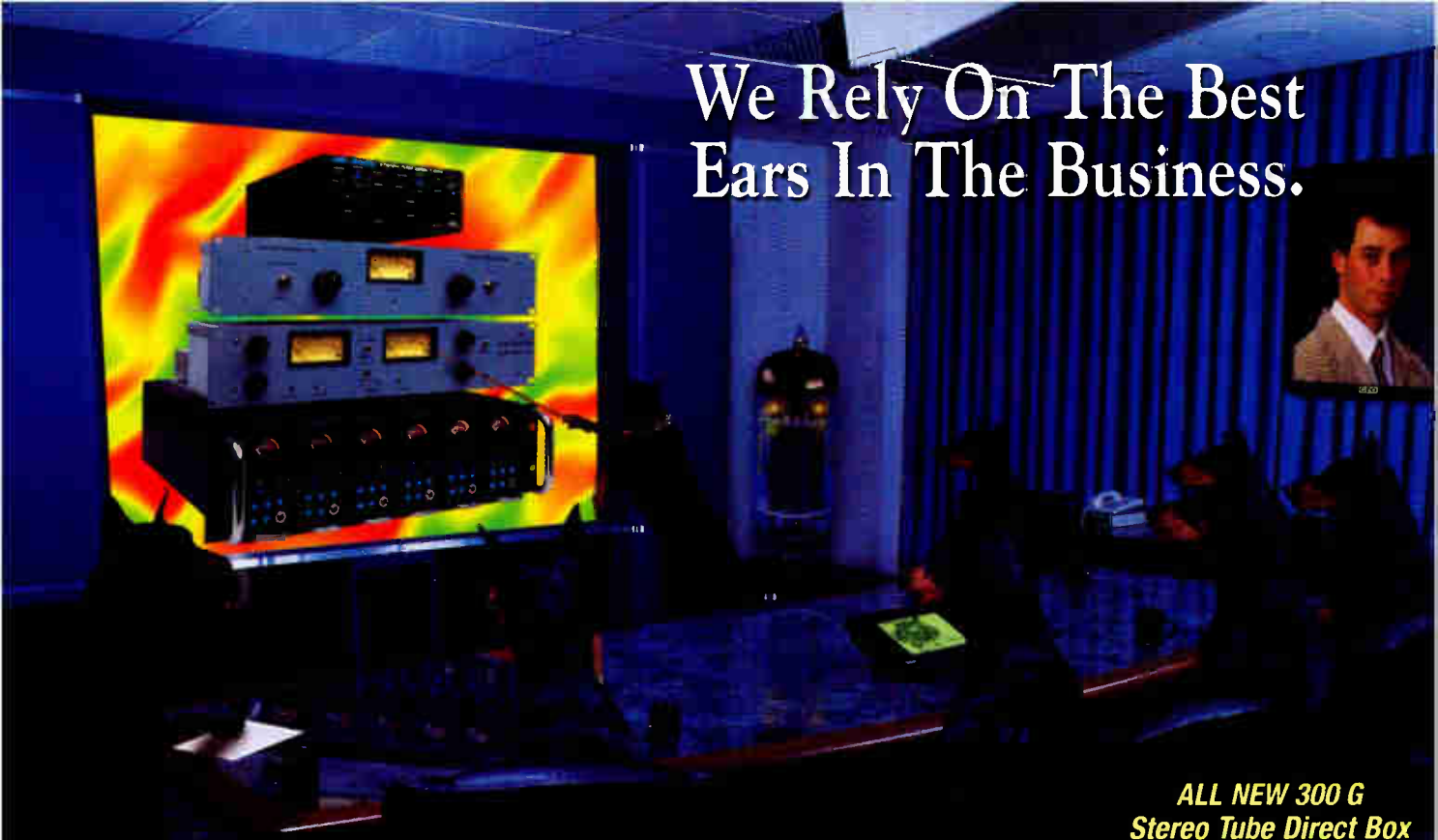

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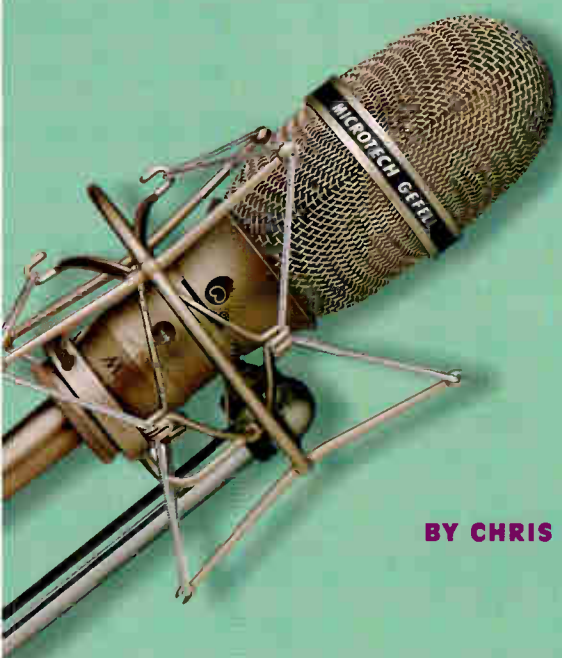
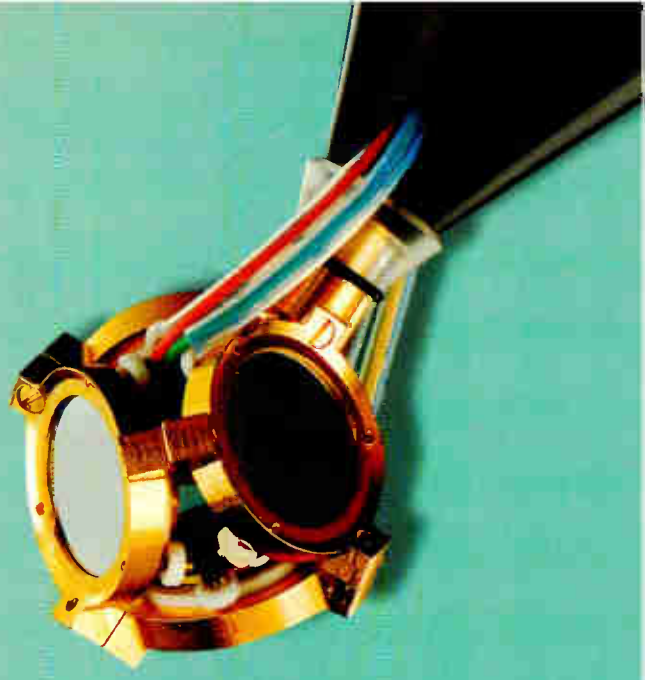


BY CHRIS MICHIE

With the right microphone, a skilled engineer can create a complete sonic picture that, if properly reproduced, will always reveal the full subtlety and nuance of the original sound source. On the other hand, pick the wrong microphone and the sonic picture will be distorted or incomplete; in most cases, once recorded, the damage is irreparable.

Of the three basic microphone types—dynamic, ribbon and condenser—the condenser is generally regarded as the most precise, the most revealing and, for many applications, the most flattering. Wait a minute! If a microphone is designed to capture reality, to act as an uncolored and precise instrument—much like a biologist's microscope or an astronomer's telescope—then how can it also flatter or enhance? Audio reproduction is as much art as science, and reality is a highly subjective notion. Just as a photographer chooses film stock, lens and shutter speed to capture his subject in a certain light, audio engineers select microphones to emphasize or disguise various characteristics in the audio source.



This process of selective emphasis is often used to greatest effect when recording the human voice. Although vocals have a relatively limited frequency range and are less dynamic than almost any percussion instrument, they can often present the engineer's greatest challenge. Warmth to one listener is tubbiness to another; presence can too easily be perceived as edginess; fullness may be heard as boominess. Singers who are disappointed on playback are unlikely to perform to their maximum potential, let alone rave about the studio or engineer. But a mic that exactly complements a vocalist's strengths and weaknesses can help the production team create a memorable sonic signature. And in the world of the independent producer/engineer (or recording facility) this makes for repeat business.

For practical and technical (and perhaps even emotional) reasons, large-diaphragm condenser mics are the first choice for vocal recording. In the past, European mic manufacturers have dominated the field, but there are now many Japanese and U.S.-made mics that can boast equally impressive specs—and very competitive prices. In addition, two companies, SCIP Electronic Systems and Inner Tubes, remanufacture and/or modify other manufacturers' mics. What follows is a survey of available condenser microphones with diaphragms larger than ¾-inch.

GENERAL NOTES

Almost all of the manufacturers state a frequency response of 20 to 20k Hz (exceptions are noted in the text). Microphones run on 48V phantom power except where noted. The accompanying chart should provide some basis for comparison shopping, but there is no substitute for extensive listening tests.

AKG offers two top-of-the-line multipattern condenser mics, the **C426B** and the **C12VR**. Both feature nine-step incremental pattern selection (the C426 has an external pattern control box) and are each supplied with power supply cable, suspension mount and windscreen, and frequency response documentation. The C426B's upper transducer can rotate up to 270 degrees relative to the lower capsule; LEDs indicate capsule position. Additionally, the entire dual-head capsule can rotate 45 degrees relative to the mic body. The **C12VR** is a reissue of one of AKG's most famous microphones, and features twin diaphragms in the familiar housing, with 10 and 20dB pad switches on the mic body, and a +10dB boost selector within. The AKG **C414B/TLII** and **C414B/ULS** are physically similar, but contain different capsules. The C414B/TLII includes the same capsule as in the C12VR, which features frequency response peaks at 4 to 5 kHz and 9 to 10 kHz. The **C3000** is a rugged dual capsule condenser suitable for live vocal performance and instrument miking (rising response at 6 to 7 kHz) and offers cardioid and hyper-cardioid patterns. The

LARGE DIAPHRAGM CONDENSER MICROPHONES: FEATURES AT A GLANCE

MANUFACTURER	PRODUCT NAME	TYPE	PATTERNS	PAD(S)	ROLL-OFF SWITCH	LIST PRICE
AKG	C12VR	Tube	9 patterns	10, 20dB	Y	$4,540
AKG	C3000	SS	C, HC	10dB	Y	$749
AKG	C414B/TLII	SS	C, HC, O, F8	10, 20dB	Y	$1,675
AKG	C414B/ULS	SS	C, HC, O, F8	10, 20dB	Y	$1,249
AKG	C426B	SS	9 patterns	N	Y	$4,699
AKG	C5600	SS	C	N	Y	$716
Audio-Technica	AT4050	SS	C, O, F8	10dB	Y	$995
Beyerdynamic	MC 740	SS	WC, C, HC, O, F8	10dB	Y	$1,699
Beyerdynamic	MC 742	SS	WC, C, HC, O, F8	10dB	Y	$3,099
Beyerdynamic	MC 834	SS	C	10, 20dB	Y	$1,099
B.P.M. Studio Technik	CR-73 II	SS	C, O	10dB	Y	$1,000
B.P.M. Studio Technik	CR-95	SS	C, O, F8	10dB	Y	$1,200
B.P.M. Studio Technik	TB-95	Tube	C, O, F8	10dB	Y	$1,849
Brüel & Kjaer	4011	SS	C	20dB	N	$2,190
Brüel & Kjaer	4040	Tube/SS	O	10, 20dB	N	$8,995
CAD Professional	Equitek E300	SS	C, O, F8	20dB	Y	$999
Electro-Voice	RE200	SS	C	N	N	$310
Electro-Voice	RE500	SS	C	N	Y	$375
Electro-Voice	RE1000	SS	Supercardioid	N	Y	$774
Electro-Voice	RE2000	SS	Supercardioid	10dB	Y	$2,042
Groove Tubes	MD3A	Tube	C-O (variable)	variable	N	$2,195
Groove Tubes	MD5 SC	SS	C	10dB	Y	$649
Groove Tubes	Model 6/System 6TM	Tube	C, HC, O, F8	10dB	Y	$1,395
Josephson Engineering	C700A	SS	C, O, F8 (variable)	N	N	$3,400
Lawson Inc.	L-47	Tube	C	12dB	N	$1,695
Lawson Inc.	L-47MP	Tube	C, O, F8 (variable)	12dB	N	$1,995
Lawson Inc.	L-47S	SS	C	10dB	Y	$1,295
Lawson Inc.	L-47SH	SS	C	10, 20dB	Y	$1,295
Lawson Inc.	L-47SMP	SS	C, O, F8 (variable)	10dB	N	$1,395
Manley Laboratories	Baby Tube	Tube	C	N	N	$1,600
Manley Laboratories	Langevin CR-3A	SS	C	10dB	Y	$800
Manley Laboratories	Reference Cardioid	Tube	C	10dB	N	$3,000
Manley Laboratories	Reference Gold	Tube	C, O, F8 (variable)	10dB	N	$5,500
Manley Laboratories	Stereo Reference Gold	Tube	Each O/P variable	10dB	N	$8,000
Microtech Gefell	MT 711S	SS	C	10dB	Y	$895
Microtech Gefell	UM 92.1S	Tube	C, O, F8	N	N	$2,695
Microtech Gefell	UM 900	Tube	5 patterns	10dB	Y	$3,995
Microtech Gefell	UMT 70S	SS	C, O, F8	10dB	Y	$1,295
Microtech Gefell	UMT 800	SS	5 patterns	10dB	Y	$2,250
Neumann USA	M149	Tube/SS	WC, C, HC, O, F8	N	Y	$4,750
Neumann USA	TLM 170 R	SS	WC, C, HC, O, F8	10dB	Y	$2,725
Neumann USA	TLM 193	SS	C	N	N	$1,495
Neumann USA	U87 Ai	SS	C, O, F8	10dB	Y	$2,725
Neumann USA	U89 i	SS	WC, C, HC, O, F8	6dB	Y	$2,725
Pearl Microphone Labs	TL-44/TL-4	SS	Variable	N	N	$2,150
Peavey	PVM T-9000	Tube	C	10dB	Y	$1,299
RØDE	Classic	SS	9 patterns	10, 20dB	Y	$1,995
RØDE	NT1	SS	C	N	N	$499
RØDE	NT2	SS	C, O	10dB	Y	$749
Sanken	CU-41	SS	C	N	N	$2,695
Sanken	CU-44X	SS	C	N	N	$2,295
SCIP Electronic Systems	C414 T Valve Job mod.	Tube	HC, C, O, F8	10, 20dB	Y	$789
Sony Professional Audio	C48	SS	C, O, F8	N	Y	$1,150
Sony Professional Audio	C-800	Tube	C, O	N	N	$4,665
Sony Professional Audio	C-800G	Tube	C, O	N	N	$6,240
Soundelux	U95	Tube	9 patterns	N	N	$2,900
Soundelux	U195	SS	C	Y	Y	$1,299
Soundfield	SPS 422	SS	mult (Soundfield)	variable	Y	$3,500
Stedman	SC3	SS	C	9, 18dB	Y	$998

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C5600 is a single capsule cardioid condenser featuring flat frequency response and rugged construction. The 150Hz roll-off is switchable between flat, 6 dB/octave and 12 dB/octave.

Audio-Technica offers the AT4050/CM5, a three-pattern condenser studio mic featuring low-noise transformerless electronics and a matte-black "traditional" appearance. The package includes an elastic suspension shock-mount and carrying case.

The dual-capsule stereo MC 742 from **Beyerdynamic** offers a variety of polar patterns; the upper capsule can rotate 360 degrees relative to the lower capsule, and an optional remote control and power supply allows remote adjustment of each capsule's polar pattern. The mic is finished in black to minimize reflections on-camera. A suspension shock-mount and case are included; power supply or combined remote control/power supply are extra. Frequency response is quoted as 40 to 20k Hz. The Beyerdynamic MC 740 is a multipattern condenser, and the MC 834 is a cardioid. Both mics may be powered by 48V phantom, or by model-specific power supplies. Shock-mounts are optional.

Audio-Technica also offers its AT4050/CM5 as matched stereo pairs in a flightcase.

Beyerdynamic MC 740

Microphones from B.P.M. Studio Technik USA are hand-made in Berlin. The TB-95 features tube electronics and a dual-voltage power supply. The CR-95 and CR-731I (frequency response 40 to 18k Hz) feature solid-state electronics; all three mics are shipped with a case, shock-mount, pop filter and cable.

B.P.M. CR-7311

Brüel & Kjaer offers two large-diaphragm condenser mics. The B&K 4040 is a single capsule omni featuring exceptionally low noise and a frequency response of 10 to 20k Hz ±2 dB, with a

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4 to 6dB boost at 8 kHz. The electronics are an unusual tube and solid-state hybrid, and both outputs are available at the power supply, which also features 10 and 20dB pad select switches. Capable of accepting up to 144dB SPL inputs, this expensive mic ($8,995) is shipped with dual output power supply, mic clip, case and a 5-meter SM Mogami cable. The 4011 is a single capsule cardioid with an extended frequency response (20 to 40k Hz ±3 dB) and high SPL capability (a 20dB pad is switchable at the mic).

The **Equitek E 300** from **CAD Professional Microphones** is powered by a combination of 48V phantom power and a pair of rechargeable 9V NiCad batteries, which provide the additional current necessary for accurately capturing high SPL transients. An automatic shut-off circuit ensures that batteries do not drain when phantom power is removed. Frequency response is 10 to 20k Hz. The supplied swivel mount allows the mic to rotate 360 degrees, and accessories include an external power supply, shock-mount, pop screen and various cables.

Equitek E 300

The **Electro-Voice** supercardioid **RE2000** features exceptionally low noise and a frequency response of 70 to 18k Hz ±3 dB, and can run on either phantom power or a computer grade power supply. An integral heating element maintains a consistent environment (not operable without power supply). Shipped with power supply, shock-mount and stand mount. The supercardioid **RE1000** features transformerless output and frequency response of 70 to 18k Hz ±3 dB. Introduced in early 1997, the **RE500** is a cardioid mic with a fixed roll-off at 80 Hz (frequency response is

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"After comparing the CAD E 100 to the mics I have been using on kick drum... it outperforms them all!"

Randy Siegmeister,
Production Manager - Touring and Special Events for Maryland Sound

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80 to 18k Hz), and though the mic offers no input pads, it can accept up to 148dB SPL inputs. A shock-isolated transducer mount and Warm-grip™ finish minimize handling noise, making this mic suitable for live as well as studio applications. The RE200 features a frequency response of 50 to 18k Hz and is supplied with a windscreen, stand clamp and vinyl carrying pouch.

Event Electronics offers three large diaphragm condensers. The RØDE Classic is a tube-based mic featuring 9-position pattern selection and comprehensive pad and LF cut controls on the associated power supply. List price includes power supply, 30-foot multipin cable, and flight case. The RØDE NT2 is a solid-state dual-diaphragm design. It offers cardioid and omni patterns, and is supplied with windscreen, shock-mount and flight case. The RØDE NT1, introduced in May 1997, is an economic single diaphragm, cardioid-only mic and features a unique pop-filtering head design.

Groove Tubes was slated to introduce its newest mic, the tube electronics **Model 6/System 6TM**, in June '97. With a frequency response of 20 to 18k Hz ±1.5 dB, the Model 6 offers four polar patterns and its PSM-2 power supply can drive any two Groove Tubes mics. Also introduced in 1997, the **MD5 SC** is a low-cost, solid-state, two-capsule cardioid with a 20 to 18k Hz ±2dB frequency response. The tube-driven **MD3A** features a 15 to 20k Hz ±2dB frequency response and a variable pattern select—a screw terminal adjusts between omni and cardioid. Mic sensitivity is also adjustable over a 20dB range.

Event RØDE Classic

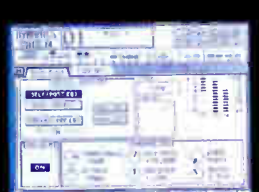
InnerTUBE Audio (www.gr8music.com/innertubeaudio.html) offers InnerTUBE, a no-tools-required retrofit tube kit that replaces the solid-state electronics in your Neumann U87 with an internal tube preamp. The system installs in a few minutes and if necessary, the tube electronics can be simply removed to restore the U87 to its original state. The kit includes replacement tube electronics, external power supply with remote pattern switching and cables. Retail is $1,795.

Josephson Engineering offers a range of large-capsule condenser mics featuring two different capsule topologies. The C700A's dual-diaphragm is designed to pick up pressure-gradient information while a smaller omnidirectional capsule picks up sound pressure. Combining these two outputs allows the engineer to select any directional pattern from omni to figure-8. Alternatively, outputs may be recorded separately and pattern selection postponed until mixdown. A stereo version, the C700S, has two pressure-gradient capsules at right angles to each other, with an omni in the middle so that any coincident-stereo pickup can be synthesized at the mixer.

Lawson Inc. offers several variants of its L-47, a large-diaphragm cardioid tube microphone that reproduces major features of the Neumann U47 and M49 microphones. Each capsule features a 3-micron gold-sputtered di-

Imagine a digital mixer that achieves audio perfection, beats your deadlines and still leaves you with the gas money to get home.

Photo: Jay Groener



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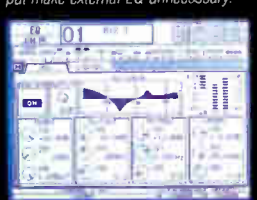
EQ. *4-band parametric EQ with peaking, shelving and high/low pass filters on every input and output make external EQ unnecessary.*



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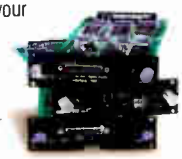

Memory. Store every setting of your mix—fader positions, EQ, effects, compressors, etc.—and recall them instantly. You can even store your realtime moves from start to finish. Then, when you have to make changes to a previous mix, the 03D's time-code automation will help you beat deadlines by days.

Powerful Processing. Two new state-of-the-art 32-bit digital effects processors come pre-loaded into the 03D. Under the hood you'll also find 4-band parametric EQ and a digital compressor/limiter/gate on every channel and bus. Store your custom settings in 03D's libraries.

Remote Control. Put your entire studio at your fingertips; manage MIDI-controllable hardware, like tape machines and HD recorders, right from the 03D.

Surround Sound. Discrete 6-channel surround sound panning on every channel makes the 03D a must for post production and new multi-channel music applications.

What does the 03D and all of its built-in gear cost? Just $3,699 MSRP. That's your dream come true. So get to a Yamaha dealer and be the first to drive one home.

Yamaha 02R. *The 03D has many of the features of its bigger brother, the 02R shown above. The same impeccable sonic quality and power have made the 02R the choice of top recording and post production professionals.*

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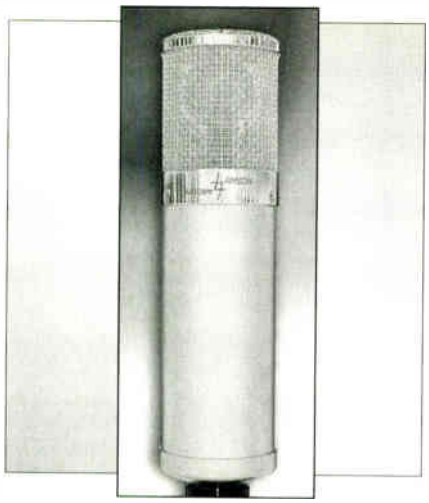

Lawson L-47

aphragm, is precision-machined from solid brass and hand-lapped, and is shock-mounted. The L-47 also features the 6072 vacuum tube coupled through a MIT multicap capacitor to provide an open top end and a slight presence peak.

Manley Laboratories offers three versions of its Reference microphone, as well as the Baby Tube and the Langevin CR-3A. The **Reference Gold** microphone is an all-tube, dual-capsule design and features continuously variable polar pattern selection (omni, cardioid, figure-8). Frequency response is 10 to 30k Hz ±3 dB. The **Stereo Reference Gold** microphone includes two complete dual-capsule systems; the upper capsule is rotatable through 90 degrees for X-Y Blumlein coincident pair recording. In addition, each capsule has its own pattern select control and individual 10dB pad switch. Frequency response is 10 to 30k Hz ±3 dB. The **Reference Cardioid** microphone is electronically similar to the Reference Gold but has a thicker gauge diaphragm. Frequency response is 20 to 25k Hz ±4 dB. The **Baby Tube Cardioid** microphone is claimed to be the world's smallest large-capsule (1.25-inch) front address tube microphone. Frequency response is 20 to 20k Hz ±5 dB. The **Langevin CR-3A** is a cardioid solid-state mic; frequency response is 40 to 16k Hz ±3 dB. All Manley and Langevin mics are supplied with shock-mount and rigid stand mounts, pop shields and carrying cases.

Manley Reference Gold

The newest microphone from German manufacturer **Microtech Gefell** is the striking looking UM 900, which premiered at AES Munich in March (see June *Mix*). The mic is the first all-tube design that does not require a power supply and can run on standard 48V phantom power. Five polar patterns are available, and frequency response is 40 to 18k Hz ±4 dB. The **UMT 800** features the renowned M7 capsule (used in the Neumann U47) and offers five polar patterns. The **UM 92.1S** is another tube mic offering three polar patterns and a frequency response of 40 to 18k Hz ±4 dB. The solid-state **UMT 70S** is physically similar to the UM 92.1S and offers the same patterns and frequency response. Frequency response is 40 to 18k Hz ±4 dB. The **MT 711S** is a fixed

The AT4050 goes live.

"The 4050 gives a true sound with no coloration. Clear, transparent, really smooth."

Russell Fischer
Sound Engineer for Garbage, Veruca Salt, Patty Smyth

"Using AT4050's is like plugging the guitars straight into the PA."

Mick Hughes
Sound Engineer for Metallica

"The 4050 made a world of difference. It sounds so natural and unmasked."

Alan Miller
Sound Engineer for Bruce Hornsby, Alan Jackson

"The 4050 gives back exactly what you're putting into it."

Brad Madix
Sound Engineer for Def Leppard, Queensrÿche

These live-sound engineers have discovered the key for natural, true-to-life sound in concert. The AT4050 provides superior, uncompromising performance on guitar cabinets, drum overheads, backing vocals, piano and more.

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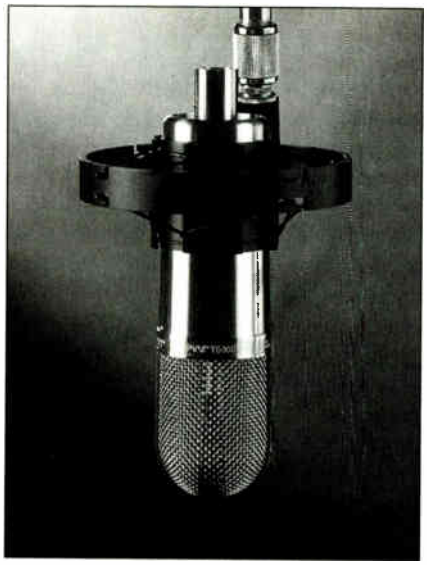
cardioid, solid-state mic featuring transformerless output and a frequency response of 40 to 18k Hz ±4 dB.

For decades, the Neumann name has been synonymous with high-quality large-diaphragm condenser mics. **Neumann/USA** offers five models, led by the **M149**. Designed to recapture the legendary sonic characteristics of the U47 and M49 mics, the M149 features an innovative tube/solid-state electronics design (a tube impedance converter with a solid-state differential amp line driver) and is the first transformerless tube mic. There are detented positions between the five polar patterns (wide cardioid, cardioid, hypercardioid, omni, figure-8) for a total of nine selectable patterns, and a four-position highpass filter with detents in between. The **U87Ai** is the current version of the famed U87, which was first introduced in 1967. The solid-state mic offers three patterns, a 10dB pad and a roll-off switch and is now available in matched stereo pairs. The **U89i**, first introduced in 1979, is physically similar to the U87, but smaller and lighter. It offers five polar patterns and is available in matched stereo pairs. The **TLM170R**, first introduced in 1983 and revised in 1993, is a transformerless output, solid-state, multipattern mic and features remote-control capability via the optional N48R-2 power supply. No special cables are necessary, and the N48R-2 can control two TLM170R microphones. The **TLM193** is Neumann's most affordable mic, and it uses the same dual-diaphragm capsule as the TLM-170R and U89i mics. A TLM193 Special limited-issue version is finished in satin-nickel, rather than standard black matte. Like the standard 193, the Special is hardwired for cardioid operation and features a transformerless output.

The **TL-4** and **TL-44** from Sweden's **Pearl Microphone Labs** are essentially identical: The TL-44 has lower gain and lower impedance. Both mics feature a dual-diaphragm design with independent outputs, allowing continuously variable polar patterns to be achieved by combining the outputs at the mixing desk. The two rectangular dual-membrane capsules are mounted only 5 mm apart, making the TL-4/TL-44 suitable for 180-degree coincident stereo miking.

The **Peavey PVM™ T9000** tube microphone system combines a self-polarized condenser capsule with a vacuum-tube preamplifier. The mic features a uniform cardioid directional pattern and up to 137dB SPL handling,



Peavey T9000

making it ideally suited for studio vocals and other critical applications. The unique, multipurpose shock suspension incorporates a finned heat-sink to help dissipate tube filament heat.

Sanken (distributed by AID, W. Hollywood, CA) offers two models, the CU-44X and the CU-41. The CU-44X is a transformerless cardioid mic

Sanken CU-41

with a dual-capsule condenser design and features a dynamic range of 132 dB; price includes a shock-absorbing stand adaptor. The CU-41, also a dual-diaphragm cardioid, can accept a maximum SPL of 140 dB; it comes with a carrying box with calibration chart, and a shock-absorbing stand adaptor.

The **414 Valve Job** from **SCIP Electronic Systems** is a tube head-amp modification for the popular AKG 414 series of condenser microphones. The high-performance upgrade includes new 8319-based head electronics, multicore cable, UL-listed power source and improved feature switching.

The **C-800G** from **Sony Professional Audio** is a dual-diaphragm tube mic with a frequency response of 20 to 18k Hz and features a Peltier cooling device to regulate the tube temperature. The solid-state **C-800** is capable of handling exceptionally high SPL inputs (150 dB); both C-800G and C-800 are shipped with power supply, carrying case, shock-mount and stand adapter. The **C48**, a solid-state design, offers a frequency response of 50 to 16k Hz and may be driven by 48V phantom power or by a 9V battery.

Soundelux recently introduced the **U195**, a dual-diaphragm FET electronics cardioid condenser. Notable features include a Fat/Norm mode switch that, in the Fat mode, emulates the tonal characteristic of classic tube mics. Nine polar patterns are selectable at the dual-voltage power supply. The vacuum tube-based **U95** offers omnidirectional, cardioid and figure-8 patterns with six intermediate settings, for a total of nine polar varieties. Pattern selection is made at the power supply, which is switchable between 115 and 220 volts.

The **SPS422 Studio Microphone System** from **Soundfield** is designed specifically for "main microphone" recording studio applications, and offers a unique range of recording options via its patented four-diaphragm tetrahedral capsule array. A matrix processor allows manipulation of the four independent outputs to create mono, conventional stereo, wide-image stereo and SoundField recordings in which the sound image may be "steered" through the recording environment. All microphone parameters can be adjusted from an optimum listening position in the studio control room via the single-rackspace processor.

Stedman Corporation recently introduced the **SC3**, a 48-volt, phantom-powered cardioid pattern condenser with a sonic mode selector switch that offers vintage, enhanced and bass roll-off characteristics. Frequency response is 25 to 20k Hz. The mic is finished in satin black; matched sets are available. Options include shock-mount and windscreen. ■

Chris Michie vividly remembers the nasty shocks he used to get from poorly grounded U47 power supplies at Central Sound in Denmark Street, London's Tin Pan Alley. He still regards Tuchel connectors with suspicion.

The Logic System:

Logic Audio 3.0* – The Pros choice. Feature rich 960ppq real-time Sequencer. Professional scoring and printing. Unlimited virtual mixers with full automation. Up to 24 tracks of digital audio with intense offline and real-time DSP editing.

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* Available Third Quarter 1997

Logic Audio 3.0
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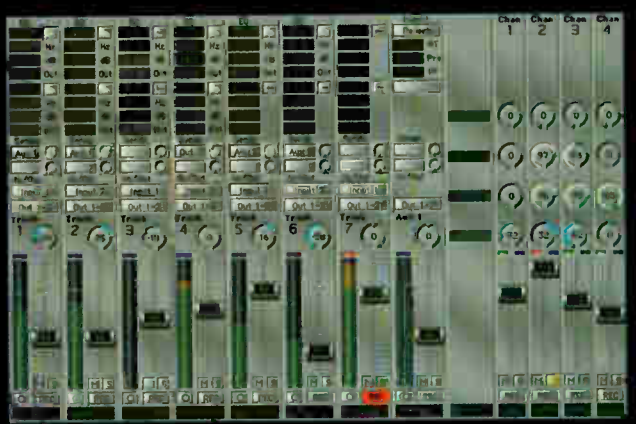
Logic Audio, the professional's choice and the flag ship product in the award winning Logic System just took a giant step forward. After pioneering integrated DSP with Logic Audio 2.0, Emagic's new Logic Audio 3.0 does it again with professional quality Real-Time DSP, EQs, Flanging, Chorus even Reverb built right in. Used with Logic Audio's already powerful feature set you can possess the cutting edge in Audio, Scoring and MIDI all in one integrated package.



Real-Time DSP, Enhanced Automation and Scoring, & Built in Simultaneous hardware support The Pros ask, Logic Audio 3.0 responds.

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- Real-Time Equalization with high and low pass filters
- Real-Time professional Reverb, Chorus and Flanging
- Punch-in on the fly and Cycle Recording of audio
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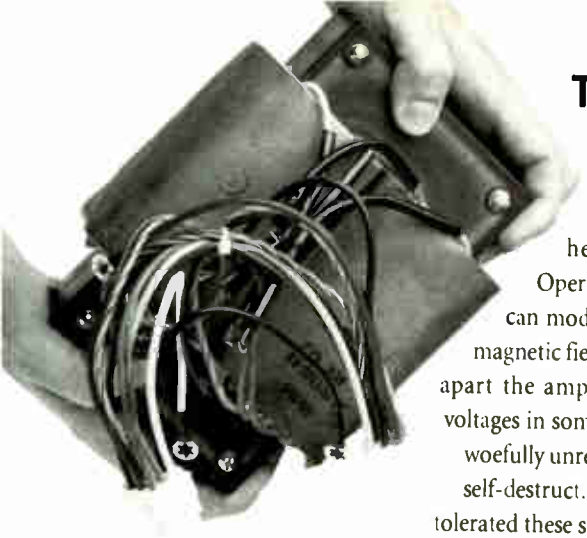
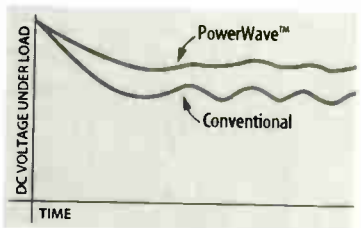


THE PAST...

High power amplifiers with old fashioned iron core transformers are dinosaurs. While effective at delivering raw power, these big, heavy, and slow devices have weaknesses. Operating at AC line frequency, the supply voltage can modulate the audio signal under clipping. Strong magnetic fields induce AC hum. Big transformers can tear apart the amp and racks on the road. Poorly regulated voltages in some popular high end brands cause them to be woefully unreliable and inclined to self-destruct. Audio engineers have tolerated these shortcomings because there was no other alternative. Until now...

...AND THE FUTURE

PowerLight™ amplifiers use patented PowerWave™ power supplies, the most efficient power supply available in audio. Operating at 114kHz, a one pound PowerWave™ transformer has more current capacity than a 50 pound conventional 60Hz transformer. Primary capacitors operating at a higher voltages more than double their energy storage. The result—a stiffer supply with more power and more energy storage for gut-wrenching bass. AC magnetic fields never enter amplifier circuitry—reducing hum to inaudible levels and increasing dynamic range. Reliability is increased because light weight prevents transit damage while the robust design and Intelligent Amplifier Protection™ keep the things working under conditions that would kill a conventional amp.



PowerWave sags less under load and has less AC ripple

Output Power in Watts per Channel			
MODEL	8Ω*	4Ω*	2Ω**
PowerLight 1.0	200	325	500
PowerLight 1.4	300	500	700
PowerLight 1.8	400	650	900
PowerLight 2.0^{HV}	650	1000	N/A
PowerLight 3.4	725	1150	1700
PowerLight 4.0	900	1400	2000

IN THE END, IT'S THE PEOPLE

No matter how good the gear, it's people that make the difference. We know your performance depends upon our peformance. When you buy a product from QSC you buy more than just a piece of equipment, you get our support and involvement. New PowerLight models and features have come from working directly with people like you. If our standard models don't meet your needs, our Technical Services Group can provide you with custom modifications. Need a question answered or got a problem? Get on the phone or the Web. It's like having your own engineering consulting group.

Contact QSC for more infomation...better yet, come by for a visit!

QSC's PowerLight Project Team *(clockwise from left):* **Darrell Austin,** *Technical Services Manager,* **Pat Quilter,** *Chief Technical Officer;* **Robert Becker,** *Design Engineer,* **Greg McLagan,** *Market Manager (Live Sound),* **Doug Teulie,** *Industrial Designer*

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"...excellent bass response... performance can exceed that of traditional amps, with the weight and energy savings as an added bonus."
Mix *Magazine*

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NEW!

The new PL 2.0^{HV} was designed for maximum power at 4ohms in a 2RU chassis, while the new PL 3.4 provides maximum power from a standard 120V, 15A line cord

ALL POWERLIGHT AMPS FEATURE:

- PowerWave™ Switching Technology
- Clip Limiter *(user defeatable)*
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- DC, Sub Audio, & Thermal Overload Protection
- Advanced Thermal Protection
- Patented Output Averaging™ Short Circuit Protection

"Zero defects, 450 shows"
Mike Southard
Southard Audio (Mt. Crawford, VA)

"I bought one ton of PowerLights and replaced 3 tons of conventional amps...you do the trucking math!"
Dave Cousins
Sound Arts (Winnepeg, Canada)

"...we feel that the best of all worlds has been created...light weight, sonic excellence."
Tom Smith
LD Systems (Houston, TX)

"Best sounding, most reliable amps on the road...hands down"
Dave Shadoan
Sound Image (Escondido, CA)

"...my choice for a long, long time..."
Jeff Lilly
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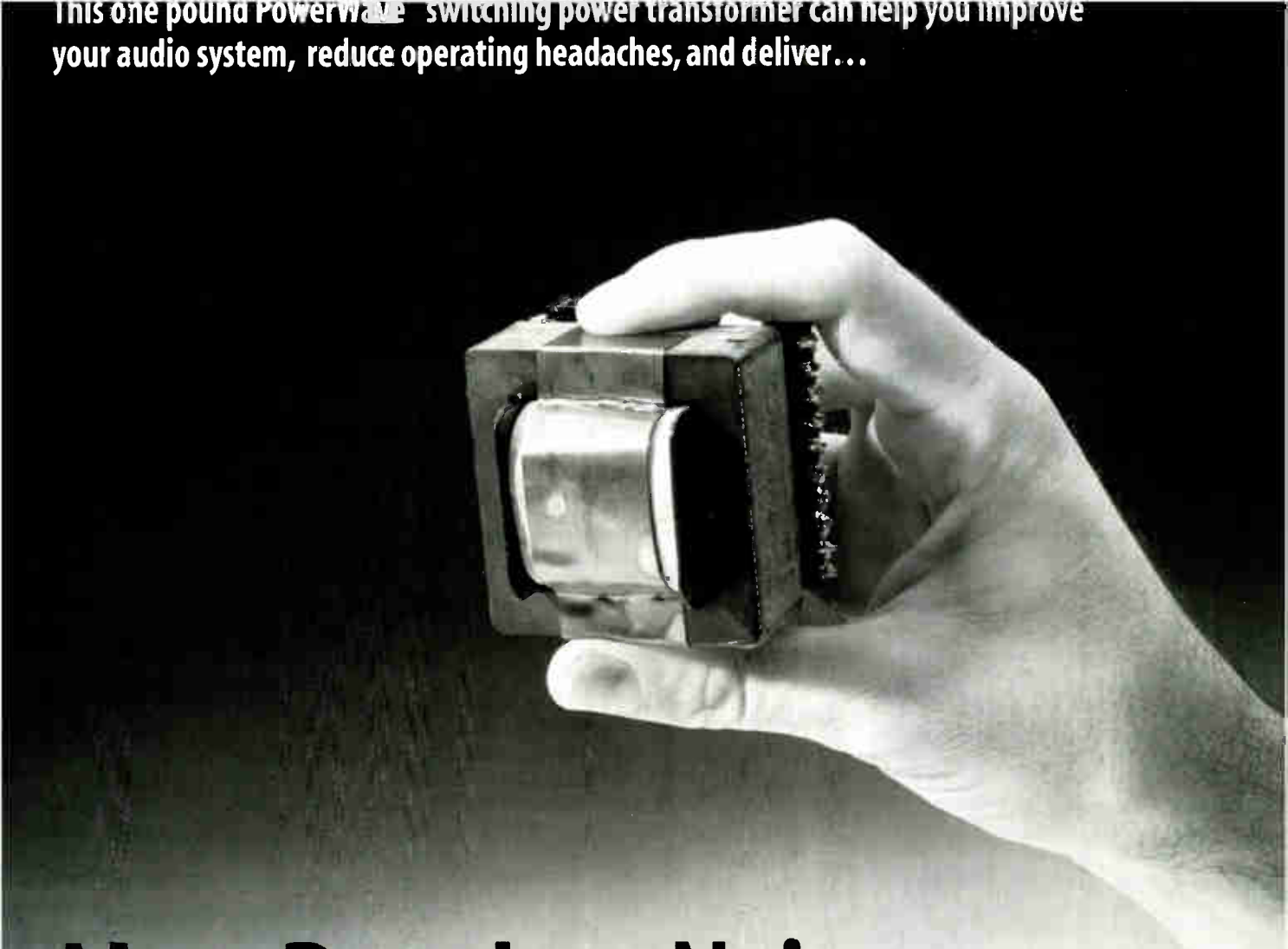
This one pound PowerWave™ switching power transformer can help you improve your audio system, reduce operating headaches, and deliver...



More Bass, Less Noise and Fewer Problems

PowerLight amplifiers are the first lightweight amps to surpass conventional technology in both audio performance and reliability. Advanced PowerWave™ technology eliminates the bulky, heavy power transformers and their problems while improving audio. Large sound systems powered by PowerLight amplifiers are better sounding, more compact, lighter and more reliable than systems using the traditional solutions.

POWERLIGHT 8.0 COMING SOON

With thousands of shows logged all over the world, the PowerLight Series has built a tremendous following among demanding professionals. Now PowerLight amplifiers have been improved—with new models and increased 2 ohm power, the addition of defeatable Clip Limiters and a HD15 Dataport connector for QSControl compatibility. Check out PowerLights for yourself. Contact us for complete information—better yet, talk to someone who owns them. References gladly provided.

QSC AUDIO

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SEE US AT NAMM BOOTH #730

Hear the Power of Technology™

PREVIEW

TC ELECTRONIC G-FORCE

The G-Force guitar processor from TC Electronic (Westlake Village, CA) is a single-rackspace digital multi-effects processor that can run up to eight different effects simultaneously. Including a powerful new DSP and TC's DARC-3 chip, the G-Force offers 24-bit digital input and output converters (I/Os are balanced and unbalanced), intelligent pitch shifting capabilities designed by Wave Mechanics™, and a highly visible illuminated display. Effects include delay, chorus, reverb, filter, compression, pan and tremolo, and drive. Effects may be inserted in any order, and users can define individual wet/dry mix parameters; 125 parameters may be controlled via an intuitive user interface or via MIDI. Frequency response is 20-20k Hz. Retail: $1,795.

Circle 327 on Product Info Card

MIDIMAN PORTMAN 4X4/S PC INTERFACE

MIDIMAN (Arcadia, CA) introduces the Portman 4x4/S, a 4x2-in/4x2-out parallel port PC MIDI interface with SMPTE sync. Fully Windows MME-compatible (works with Windows 3.1, 3.11 and Windows 95), the Portman 4x4/S plugs into the PC printer port and supports 64 independent MIDI transmit and receive channels that can operate simultaneously at full MIDI bandwidth. The 4x4/S can read and write 24, 25 and 30 drop or non-drop frame LTC SMPTE formats, converts LTC to MIDI Time Code for sequencing MTC-capable sequencers, can regenerate bad SMPTE timecode via a selectable flywheel that can be set to any value from 1 to 255 frames (or forever) and performs jam sync in all modes. Price is $279.95.

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NEUMANN AK20 MIC CAPSULE

Neumann (Old Lyme, CT) introduced the new AK20 capsule for the KM100 miniature microphone system. A Figure 8 capsule, the AK20 offers identical frequency response curves at 0 and 180 degrees, excellent low-frequency response, and even directional characteristics. When the AK20 is combined with the KM100 or KM100F output stage, the resulting KM120 measures only 4.32 inches. Accessories for combining the AK20 with other mics for MS and Blumlein stereo setups are available. Neumann also now offers its KM184 cardioid condenser microphone in matched pairs. Consecutively numbered KM184s are presented in a handsome wooden case, which is also available separately.

Circle 329 on Product Info Card

EVENTIDE PRODUCTION ULTRA-HARMONIZER®

Eventide (Little Ferry, NJ) developed the DSP4000B Production Ultra-Harmonizer® for production and broadcast applications. The digital multi-effects processor includes dozens of audio environments and effects created by sound designer Jay Rose, including audio backgrounds and effects such as rain and thunder, the seashore, wind, jet fly-bys, etc. Effects include reverbs, chorus, flanging, pitch change and Timesqueeze® stereo time compression and expansion. A 6-line graphic LCD screen, soft keys and a shuttle wheel ease parameter selection and editing, and presets may be stored in the unit's internal memory or on a removable PCMCIA memory card. Remote control is available via MIDI and PA422 serial port interfaces. Frequency response: 5-22k Hz ±1 dB. An optional card offers 24-bit AES/EBU and S/PDIF digital I/O and digital sampling at various rates. Retail: $3,995.

Circle 330 on Product Info Card

JOEMEEK VC-1 STUDIO CHANNEL

Joemeek (distributed by PMI, Torrance, CA) has introduced the VC-1 Studio Channel, a combination mic preamp/compressor/enhancer. The two-rackspace unit (which replaces the half-rack Studio Channel) features a direct-coupled transformer-balanced mic pre, a Joemeek photo-optical compressor, and a Joemeek enhancer with sweepable filter. The unit is stereo-linkable and offers a ¼-inch instrument input and XLR balanced DI out. A large VU meter indicates input or gain reduction. Balanced I/Os are on ¼-inch jacks. Price is $1,299.

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PREVIEW

WAVES PLUG-INS

Waves (Knoxville, TN) is now shipping its Renaissance® Compressor and PAZ PsychoAcoustic Analyzer plug-ins for Pro Tools. The Renaissance Compressor emulates classic analog hardware with a "5-knob" control interface (Threshold, Ratio, Gain, Attack, Release) plus Waves' new Auto Release Control technology. Priced at $850 as an individual plug-in for TDM, SDII and MultiRack, the Renaissance Compressor is available to TDM and MultiRack bundle owners for $400. The PAZ PsychoAcoustic Analyzer is a real-time analyzer that includes three modules: Frequency Analysis, Stereo Position and Loudness/Peak Meter. Available as part of the Waves TDM and MultiRack bundles, PAZ PsychoAcoustic Analyzer is priced at $550 as an individual plug-in.

Circle 332 on Product Info Card

OPCODE STUDIO VISION PRO 3.5

Opcode Systems (Palo Alto, CA) announced the release of Studio Vision Pro 3.5, featuring PowerMac Native code, full support for Digidesign® TDM busing, new DSP features (including formant based audio pitch shifting), enhanced integration with Apple® QuickTime and support for all major audio file types. Version 3.5 increases the number of Audio Instruments from 16 to 64, providing up to 64 channels of I/O and 48-track support. Enhancement utilities also included on the Studio Vision Pro 3.5 CD include an array of processing plug-ins, including AudioTrack and EZVerb from Waves, Adobe Premiere-compatible plug-ins from Arboretum, drum sequences, a universal patch librarian, and tutorials with example files. Retail: $995. The upgrade can be ordered on Opcode's Web site at www.opcode.com.

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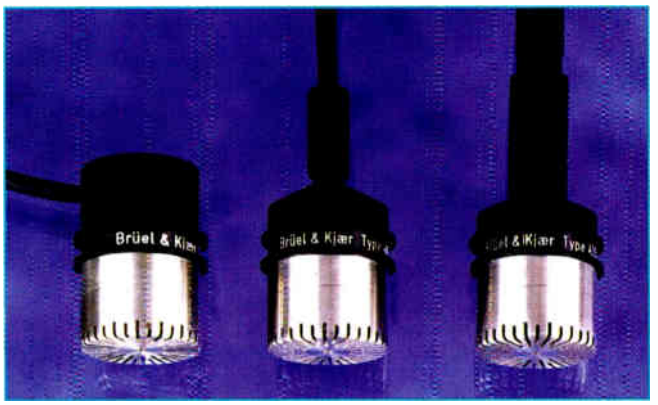

SCHOEPS CCM-L COMPACT MIC

Schoeps (distributed by Posthorn Recordings, NYC, NY) announces the CCM-L compact microphone, a new version of the CCM non-electret condenser microphone with a detachable cable and built-in three-pole Lemo connector. The CCM Series includes 16 different models with a variety of polar patterns and frequency response characteristics; a common source impedance of 90 ohms allows for long cable runs and ensures immunity to electrical interference.

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B&K COMPACT OMNI MICS

Brüel & Kjaer (distributed by T.G.I. North America, Ontario, Canada) introduces a new line of compact, lightweight omnidirectional microphones. The B&K 4051, 4052 and 4053 feature a prepolarized 16mm condenser cartridge (similar to those in the 4003/4006 mics) and include built-in ultra-small, thick film-mounted FET preamplifiers for reduced size and maximum placement flexibility. Performance characteristics include wide dynamic range, linear frequency response and low noise floor. The 4051 has its cable mounted at 90, and the 4053 features a Lemo connector.

Circle 335 on Product Info Card

AARDVARK SYNC D.A.

The Sync D.A. from Aardvark (Ann Arbor, MI) is a 1x6 Word Clock distribution unit that accepts either a WC or AES/EBU source and outputs five WC and one 256x Superclock sync sources, easing synchronization of multiple digital devices. The unit's front panel displays include source (WC or AES/EBU) and sample rate indicators, and LEDs to show 0.1% and 4% down/up conditions. Any AES/EBU device, such as a DAT, workstation, digital mixer, or the AardSync II may serve as a master source.

Circle 336 on Product Info Card

XYTAR MASTERING SYSTEM

The Audio Digital Mastering System (ADMS) from XYTAR (San Francisco) is a rackmount hard disk recording/mastering system, capable of recording up to 16 tracks from line inputs to disk. A base ADMS incorporates a Cyrix 6X86 CPU with a high-speed 64-bit bus structure, and includes CD recording software, an internal 2.5GB hard drive, a 1GB removeable Jaz drive, 8x-read/2x-write CD-ROM drive and 128 MB of RAM. Also incorporated are a 2-channel audio card and a 17-inch color monitor. Options include 4- and 8-channel audio input cards, faster processor and larger hard drive. Prices start at $3,499 for a base system. SMPTE and MTC sync is planned.

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HOHNER MIDIA PC RECORDING SYSTEMS

ARC 44 from Hohner Midia (Santa Rosa, CA) combines a 4x2-in/4x2-out analog ISA card with 8-track hard disk recording software and powerful DSP functions. The system, which runs on Windows 95 or NT, and requires a 486 or higher processor, can record four and play back eight tracks at once. Features include 3-band parametric equalization per channel (EQ can be displayed as a frequency graph, FFT curves or as a 3-D waterfall graph), up to 2000 ms

PREVIEW

of delay with feedback control and multitap delays and real-time compression. All settings can be stored and recalled. ARC 44 is priced at $899 for hardware and software. ARC 88 offers a complete ADAT nonlinear editing solution. The software feature set is identical to the ARC 44 software, but the PCI Card has an ADAT optical LightPipe interface. Additional features include an analog monitoring output and MIDI interface. Retail: $1,599.

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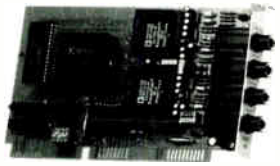

KLARK-TEKNIK DN4000

Klark-Teknik (Buchanan, MI) announces the DN4000 dual-channel digital parametric equalizer and delay. The 2U rackmount unit offers five bands of fully parametric EQ per channel with high- and lowpass filters and HF and LF shelf equalizers on each channel. Delay (up to 340 ms) is displayed in units of time and distance and is adjustable in 21-microsecond increments. Front panel controls include rotary pots for frequency, level and Q; a high contrast LCD screen displays EQ curves and menu selections, and there are 30 non-volatile memory addresses. I/Os include balanced XLRs and MIDI In/Out and Thru, and an AES/EBU digital interface is optional. Up to 16 DN4000 units may be controlled from one master.

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HOT OFF THE SHELF

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DIGIDESIGN PRO TOOLS 4.0

AUDIO PRODUCTION SOFTWARE

The Pro Tools 4.0 Audio Production Software is the next step in the evolution of Digidesign's popular software package for the Macintosh. The new software, released last March, is a much anticipated upgrade from Version 3.2 and is compatible with the current Pro Tools family of products. These products include:

- Pro Tools III (NuBus and PCI), which consists of a Disk I/O card, which supports either an 888 or an 882 Audio Interface for 16-channel direct-to-disk record/playback; a DSP Farm card, which powers Pro Tools audio mixing and DSP Plug-ins; the TDM environment software and plug-ins.
- Pro Tools Project (NuBus and PCI), which consists of Project Audio Card, which supports either an 888 or an 882 Audio Interface for 8-channel direct-to-disk record/playback.
- Pro Tools PowerMix extension for use a) on PowerMacs without any additional hardware or b) on PowerMacs with Audiomedia II and III cards for higher-quality A/D/A conversion and digital I/O.

It's important to note that one of the most powerful features of Pro Tools software—the TDM plug-ins—are available only on those systems that have a DSP Farm, which is required to take advantage of the TDM architecture. In other words, Pro Tools III systems. Everybody still with me?

The system requirements for a Pro Tools Core System are a PCI- or NuBus-based Mac with at least 32 MB of RAM (48 MB recommended); Apple's system software Version 7.5.3 or higher; A 17-inch or larger color monitor; QuickTime 2.5 or higher (supplied); a hard drive connected to the Mac SCSI bus for the Pro Tools software; and at least one hard drive connected to the Disk I/O card for record/playback of Pro Tools audio.

For this Field Test, I used the Pro Tools 4.0 software with a Pro Tools III PCI Core System Expansion Kit on a Power Macintosh 8500 running under System 7.5.5 with 32 MB of RAM. (I also successfully installed and ran it on a NuBus 8100av Mac with System 7.5.) As described above, the expansion kit is a hardware package consisting of a Disk I/O card, a DSP Farm and the appropriate cables. Each PCI-based Disk I/O card adds 16 tracks of record/playback capability. In the system tested, a single 888 interface provided eight tracks of input/output capability; the addition of a second 882 or 888 interface would yield another eight channels with this system. I found that 32 MB was barely enough to handle the System (12 MB), Pro Tools (8 MB) and DAE (9 MB).

Since Pro Tools 4.0 is written in PPC native code, it runs much faster on PowerPCs than its predecessors. Most notable are improvements in screen redraw speeds and faster response to fader changes and changes in mute/solo states. And it's obvious that much thought has gone into improving the mixer interface (Fig. 1). The result is a set of well-designed user-selectable views, including a low-profile mixer view (with redesigned LED meters) that allows you to take maximum advantage of valuable computer monitor real estate at a minimum sacrifice of information. Similar improvements in the Edit window design—such as individual track height choice (five options)—are welcome features.

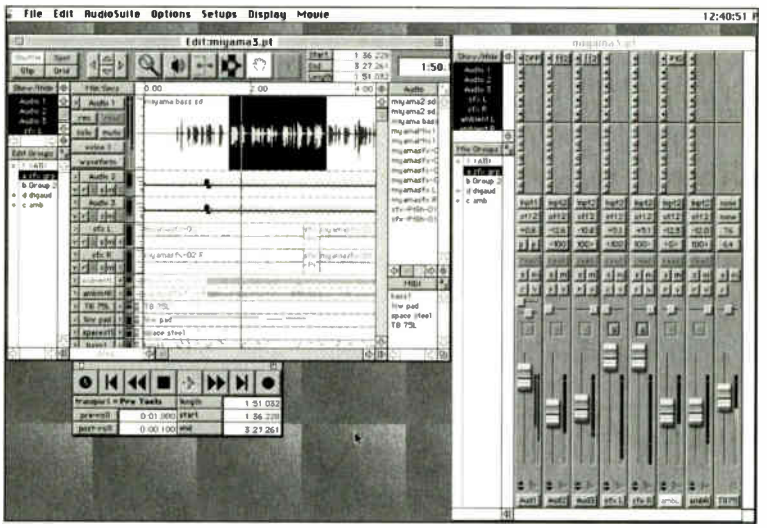


Figure 1: Pro Tools 4.0's Edit and Mix windows feature improved interfaces.

DYNAMIC AUTOMATION

The most significant improvements address much more than speed and interface design issues: now practically any fader, knob or other controller—including TDM Plug-In parameters—can be easily automated and updated dynamically. This is a real biggie in my book. Of course, snapshot automation is available on the same parameters. For example, the DPP-1 Pitch Processor Plug-In (Fig. 2) lets one record a continuous adjustment of the pitch of any track. This is great for fixing a vocalist's or string bass player's flat note, and the pitch shift quality is the best I've encountered in my checkered career. And the possibilities that automation affords for just this one type of plug-in are limited only by one's imagination. Note that any of the plug-in parameters can be selected for automation in the Plug-In Automation

BY PAUL POTYEN

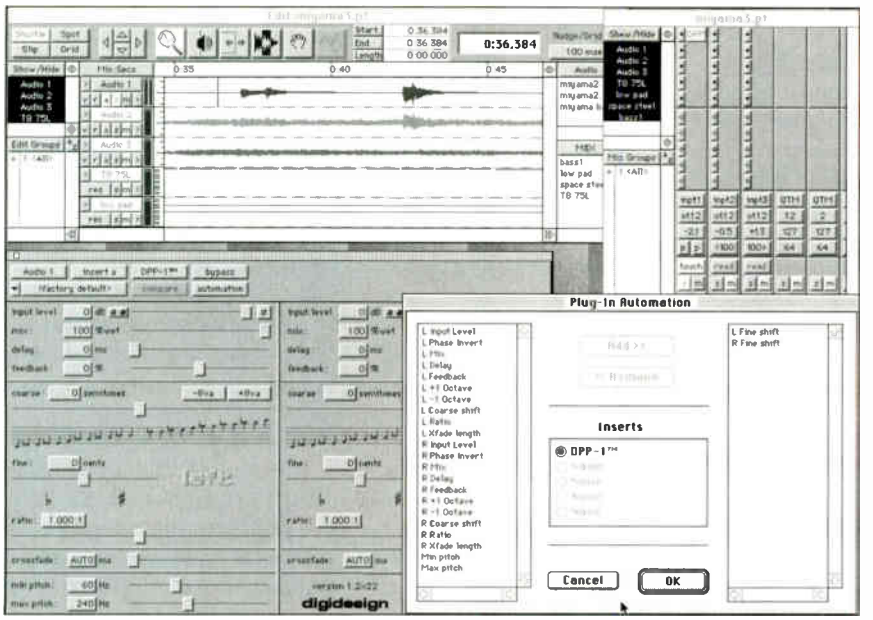


Figure 2: The DPP-1 Pitch Processor offers several parameter automation modes.

window. Several Automation modes are available for any parameter to be automated, and are selectable from either the Edit or the Mix window above the solo/mute buttons:

- Automation Off: to disable automation playback;
- Auto Read: for playing recorded automation on a track;
- Auto Touch: for updating/editing previously recorded tracks (this is active only when the controller is "touched"; when the controller is released the value returns to the original value at rate specified in Automation Preferences—see Fig. 3);
- Auto Latch: the same as Auto Touch, but the fader/controller is active until you stop playback;
- Auto Write: "absolute write" mode—the best mode for recording an initial automation pass.

PLUG-INS

The DPP-1 is just one of many TDM-plug-ins available for Pro Tools 4.0. As with the Pro Tools V.3 software, these plug-ins use the computing power on the DSP Farm card(s) to non-destructively process audio material during input or playback of tracks. Real-time plug-ins shipping with Pro Tools 4.0 include Dynamics (Compressor, Expander, Gate and Limiter); EQ (1-band and 4-band); Mod Delay, including mono or stereo short delay (.05-18 ms), slap delay (.05-158 ms) and medium delay (.05-366 ms); Procrastinator extended delay (up to 2 secs in 16- or 24-bit); TimeAdjuster (new to V.4.0); and Dither. The Dither plug-in is designed for improved 16-bit performance and reduced quantization noise when mixing or fading low-level audio signals. TimeAdjuster provides phase inversion and delay up to 1024 samples. Since DSP processing in digital audio systems invariably incurs delays ranging from a few microseconds to several milliseconds, maintaining phase coherence can be a problem, especially if you are working with tracks recorded with multiple microphones. TimeAdjuster is designed to provide adjustable delay compensation for delays due to TDM-based processing. The Pro Tools 4.0 manual provides a convenient list of delays caused by each TDM Plug-In. Also, delay templates for each Digidesign (and some third-party) TDM plug-ins ship with Pro Tools V.4.0.

Other TDM plug-ins, such as the aforementioned DPP-1, are available separately from Digidesign and third-party developers. Digidesign also offers D-Verb digital reverb, Focusrite d2 multiband EQ, and DINR (broadband noise

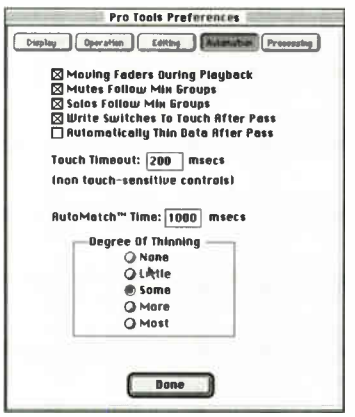


Figure 3: An Automation Preferences window controls Auto Touch settings.

reduction and hum removal). The list of third-party plug-ins manufacturers is a long and impressive one, including CEDAR, dbx, Dolby, Drawmer, QSound, Spatializer Audio Labs, Waves and more.

But Pro Tools 4.0 software also supports a second type of plug-in: the AudioSuite set of file-based plug-ins. Accessed from the AudioSuite menu, these plug-ins offer some of the functionality that Digidesign's flagship Sound Designer software has offered over the years. When you apply one of the AudioSuite plug-ins to a track, you are actually permanently changing the information in the source file. (Obviously you have the opportunity to "Save As..." or create a new file.)

AudioSuite plug-ins include: Time Compression/Expansion, Pitch Shift, Normalize, Reverse, Invert, Duplicate (for creating a single file from a series of edited regions), Gain and DC Offset Removal. Many of these functions (pitch shift, invert, DC Offset Removal) could also be performed using a TDM plug-in. However, where limited DSP Farm power is an issue, users might want to reserve that power for other TDM functions. And it just makes more sense to do some operations destructively, such as DC Offset Removal or Normalize. What's more, since the AudioSuite plug-ins don't require the use of TDM, they are available with any of the Pro Tools family of products.

ENHANCED GROUPING

Pro Tools 4.0 provides the ability to group up to 26 different sets of tracks. These groups can be created, edited and displayed from either/both the Mix and/or the Edit windows. When a group is selected, the following parameters affect the entire group: solo, mute, automation mode, track display format, track height, and volume level. This last feature—true relative fader grouping—is very useful. Grouping does not affect record enables, panning, voice assignment, output assignment or plug-in instantiation. And groups can be nested within other groups, making for a very flexible system. As a Pro Tools V.3 user, I found the grouping functionality a little counter-intuitive at first, but the advantages were well worth the effort required to break old working habits and learn a new set. Curiously enough, I found that I couldn't group MIDI tracks for the purpose of adjusting group levels.

Figure 4: QuickTime movies are viewed in a floating Movie window.

NEW FILE FORMATS

The new software supports a much more complete list of file formats. As with earlier Pro Tools versions, SDI, SDII and AIFF mono and stereo (auto-converted to two mono) files are supported. However, a Convert and Import Audio feature also supports .WAV and SND formats, and 8-, 16- and 24-bit files of any sample rate. Files can be directly imported into tracks as before, but if you wish to import into a region in your Edit window, you now access this menu more intuitively from the pop-up menu at the top of the Audio Regions List. The Convert and Import Audio command is also found in this same menu. If the file is of a different sample rate, a new file with the sample rate of the session is automatically created and imported into the Audio Regions List. A similar pop-up menu for importing MIDI files is located at the top of the MIDI Regions List. Another welcome addition is the addition of region sorting and finding commands in these pop-up menus.

Now QuickTime files can be seamlessly imported into Pro Tools. A new Movie menu lets you import any QuickTime movie into a separate movie track in your current session. You can choose to view imported movies in a separate floating Movie window, as well as in "picon" form in the movie track (Fig. 4). You can also use this menu to import only the audio from a QuickTime movie, as well as import audio from an audio CD. In the case of importing CD audio, the digital transfer is done via Apple's Sound Manager. While I have done this with satisfactory results, the Digidesign manual reports "the results may not be as optimal as if you were to connect the CD player to your Audio Interface and record its audio output into Pro Tools." But let's not re-open that debate, shall we? (Digidesign reports having varying results using QuickTime Sound Manager code for this application. Using S/PDIF I/O is said to be guaranteed to work.)

Back to QuickTime: Once a movie is imported into your session, synchronization of audio to the movie is a trivial matter. Audio elements can be scrubbed in tandem with a movie, and regions can easily be spotted and nudged to picture. I found that the rendering of picons in the movie track for an imported 640x480 movie was slow enough to cause me to turn off the picon display. It's also important to note that a separate monitor for video is a really good idea if you're going to be doing a lot of QuickTime audio post. And to get reliable frame rates on your movies, a separate high-quality video capture/playback card is recommended.

Similar file format flexibility has been built in to the Bounce to Disk command. In addition to the options available in Pro Tools 3 (mono, split stereo, stereo; SDII, AIFF), other bouncing options include .WAV, SND, QuickTime, Dolby Drive (a PC-based stand-alone 8-track digital dubber for film stage); 8-, 16- or 24-bit; user-selectable sample rate up to 48k; and variable conversion quality. There is even a Use Squeezer option for optimizing 16-bit to 8-bit file conversions to minimize low-level noise. At least that's the way it's supposed to work. Unfortunately when I tried to convert to a "squeezed" 8-bit 22kHz AIFF file, the software delivered a very nice-sounding 8-bit, 44kHz SDII file. And at that point the deadline was looming, so I eschewed the option of contacting tech support.

OTHER IMPROVEMENTS

Digidesign is obviously aware of users' need to have fast, efficient software and has taken steps to address the issue on many levels. One of these—called Plug-In Caching—is designed to improve load time and memory efficiency. Even so, on our 8500/120 with 32 MB of RAM, it took more than a minute to launch an 8-track session with as many TDM plug-ins in use as our single DSP Farm would allow. But once a session was up and running, I found that the new software is in fact much more efficient and stable. The only time Pro Tools crashed during this review period was when I quit DAE while Pro Tools was running—an admittedly imprudent thing to do.

The software also performed well without the Pro Tools III hardware on an 8100/100 PowerMac, using the Powermix DAE extension. In this configuration the TDM features were of course disabled. Since the new software uses DAE and DigiSystem™ INIT V.3.1, the audio features of Opcode's Studio Vision 3.0.3 installed on this machine were un-

fortunately disabled, since it requires earlier versions of these extensions. So, my advice is that if you want to be able to run other audio programs that use DAE and/or Digisystem INIT along with the new Pro Tools software, you may be looking at additional software updates for these other products as well. In fact you might be well-advised to devote a separate computer entirely to a Pro Tools workstation in order to minimize software conflicts of any kind.

Speaking of software conflicts, it's inevitable for a product of this complexity to require access to technical support, especially at first. While Digidesign does have a policy of free software support for the first year after registration of a new product (90 days for upgrades), there still remains the nasty problem of getting through to a qualified technical support person. In my review of Pro Tools III (*Mix*, April '95) I complained about the understaffing problems that caused "on hold" wait times in the range of 20 minutes. I regret to report that this time my experience was even worse. Three different calls for tech support resulted in a total wait time of about two hours. In one case I hung up without getting through after 50 minutes. That's a lot of down time for any recording studio that bills by the hour.

No review of a software product of this scope and complexity can hope to be comprehensive. I have only briefly described what I consider the most important new features of this new release. There are many others—such as Batch Processing of Regions through any AudioSuite plug-in, and Multiple Edit Playlists per Track—that I haven't had time to explore in the course of this review process. But given the time allowed, I came away very impressed with the new and improved feature set, as well as the speed and flexibility that Pro Tools 4.0 provides. Pro Tools 4.0 software is included with the Pro Tools III Core System (PCI version is $7,995; NuBus system is $6,995) and Pro Tools Project (PCI and NuBus are $2,495), and as a stand alone package with DAE PowerMix for $795. Current registered owners of Pro Tools III systems can upgrade from Pro Tools software V.3 to V.4 for $395.

Digidesign, 3401-A Hillview Ave., Palo Alto, CA 94304; 415/842-7900; fax 415/327-0777. ■

Paul Potyen is an independent composer, producer and partner in Site4Sound (www.site4sound.com), a company that licenses original music to Web sites.

MILLENNIA MEDIA HV-3C

MIC PREAMP AND 20-BIT A/D CONVERTER

The Millennia Media HV-3B is widely recognized as one of the highest-quality solid-state mic preamps available. The HV-3C is essentially the same device, but with important new features. The full name of this product is the Millennia Media HV-3C High Voltage Microphone Preamplifier & Apogee 20-Bit A/D converter + UV-22. Besides being a great-sounding microphone preamplifier, the HV-3C sports Apogee 20-bit ADCs and the Apogee UV-22 Super CD Encoding system.

The converter resolves analog signals to 20-bit detail and outputs 20-bit, 16-bit triangular dither or 16-bit UV-22. The UV-22 process captures the resolution and detail of 20-bit conversion in a 16-bit word length. Also standard is something for anyone concerned about digital overloads: the Apogee Soft Limiter (offering selective peak limiting), inserted between the analog inputs and the A/D converter. An Apogee C768 Ultra Low Jitter Slaving Clock references to the internal crystal (or an external clock source) and provides a low-jitter timing source for use in digital studios. The "high voltage" designation refers to the optional 130V supply that powers B&K's 4003, 4004 and 4012 high-voltage microphones.

OPERATIONAL LAYOUT

The front panel of the HV-3C is divided into two identical sets of controls for mic channels 1 and 2, a group of controls for the A/D converter, five green LED DC Power indicators and an AC power switch. Two buttons activate the Attenuate and Link functions. The Attenuation switch applies a -12dB pad (adjustable to -40 dB via two small pots accessed from tiny holes above and below it) to the line inputs. The Link switch routes the preamp outs to the converter inputs. Controls for the mic preamps consist of a high-resolution stepped rotary gain control, a +18/0/-18dB Range switch, a +48V phantom power switch, and a high-voltage switch for units equipped with the HV option. The rotary gain control is stepped from +26 to +42.5 dB in 1.5dB increments, and it interacts with the Range switch, which adds/cuts 18 dB from any given setting, for a total range of 8 to 60.5 dB. A red "OL" LED indicates when the output reaches +24 dB, the nominal peak level (not preamp clipping); a green "SP" LED indicates hazardous SPLs when the unit is used with B&K 4003, 4004 or 4012 microphones.

The converter section has three knobs for input select, sync source and sample rate, and three toggles that engage the soft limit function, select output (20-bit, 16-bit triangular dither or UV-22) and engage the optical interface for recording to ADAT. You can also power down the converter section in the event that you wish to use the preamp section independently, a nice touch as the converter section runs fairly hot. The rotary input selector has 12 positions, though only five of them are active, and the two labeled Mute are identical in function. ANA accepts analog signals from either mic or line inputs; OSC selects a built-in 1kHz digital oscillator for headroom alignment and testing; DIG allows an AES, S/PDIF or lightpipe (ADAT) signal to be reclocked and formatted into various digital outputs, allowing for AES or S/PDIF conversion to ADAT and other useful format conversions (a Digital Through option allows UV-22 processing of all digital signals); Mute causes the digital outputs to transmit "audio black" (absolute zero level input) in their various formats and powers down the A/D converter; the Sync Source rotary switch selects the various synchronization sources; XTAL selects a sampling frequency derived from an internally generated clock; WORD SYNC locks the HV-3C to external word sync/word clock inputs; and the AES/EBU (and AES BRIDGED), S/PDIF and OPT (optical) lock it to those sources. The Sample Rate rotary switch chooses between 32, 44.1 and 48 kHz, EXT SYNC, and

BY BARRY CLEVELAND

the optional Paqrat feature allows stereo 20- to 24-bit recording on (multiple tracks of) an ADAT or DA-88.

Green LEDs show the status of all DC power rails. Small DIP switches accessible through the top of the HV-3C select the termination of the BNC Sync input, select oscillator level output and -12 LED threshold, select polarity of the analog XLR inputs and select the UV-22 Process level.

INS AND OUTS

On the rear panel there are pairs of XLR connectors for line and mic I/O, and special 4-pin connectors for High Voltage mic in. For some reason, the line in connectors are labeled "right" and "left," while the mic in and line out connectors are labeled "1" and "2." AES and S/PDIF digital outputs are XLR and phono connectors, respectively, while optical digital connections are made via two TosLink-type optical connectors labeled TX and RX. When the front panel converter power switch is set to ADAT, data is transmitted in the native ADAT optical format, while if it is set to NORM, S/PDIF data is transmitted. The RX connector normally receives optical digital data in the S/PDIF format, but with the Digital Thru option installed, and the switch set to ADAT, it will receive native ADAT and Paqrat formats. There are also two 9-pin "D"-style connectors for remote gain control, two BNC connectors for Sync I/O, a line voltage switch and an AC line jack.

TEST DRIVE

I enlisted the aid of several engineers and musicians in order to test the HV-3C in several very different applications, both with and without the A/D converters. I used the HV-3C to record Carl Weingarten's solo dobro at his home project studio. We used a Countryman contact mic on the resonator and placed an SM58 four inches from the lower sound hole, routing both mics through the preamp and the converters and recording directly to a Sony DAT recorder. The results were very impressive. The HV-3C made even those very modest microphones sound quite good, and we managed to get a very clean and realistic recording, again with no appreciable distortion or noise. Millennia provides an EIN noise spec of -128 dB (150-ohm source at 60dB gain), and its flat frequency response is only -0.15 dB down at 100 kHz. I then went to the Spark recording complex in Emeryville, Calif., where chief engineer/owner Tony Mills and I tested the HV-3C in a more critical listening environment. We used a U87, and this time monitoring was on Spark's large ACD/Meyer speakers. We used only the preamplifier section, and as a control we compared the results to the mic preamps in his vintage Harrison console and a high-end tube preamp. We used a male voice, a tambourine and a set of keys as our test sounds. The HV-3C performed admirably in all cases, and it did a particularly good job of reproducing the very high frequencies. There was no detectable distortion, sound coloration or noise. In fact, it was almost too accurate, if such a thing is possible.

I then asked Alex Artaud (editor of *Mix en Español*) to use it while recording some of instrument builder Michael Masley's exotic percussion and stringed instruments. He used a Neumann U87 microphone, routed directly to an Audiomedia II card via S/PDIF, and monitored on Meyer HD-1 monitors. Masley's instruments produce a wide range of very complex sounds with lots of subtle nuances, and are particularly challenging to record. Artaud found that the HV-3C was able to capture the full range of frequencies and dynamics without any noticeable coloration of the sound, and with practically no noise. He was enthusiastic about the results.

The HV-3C retails at $3,795. Options include HV mic powering ($400) and a UV-22 digital through functions ($400), for applications when the user wants to access UV-22 coding without using the converters. Also available is the HV-3C Platinum Edition ($750 additional), which includes both UV-22 through and Paqrat encoding.

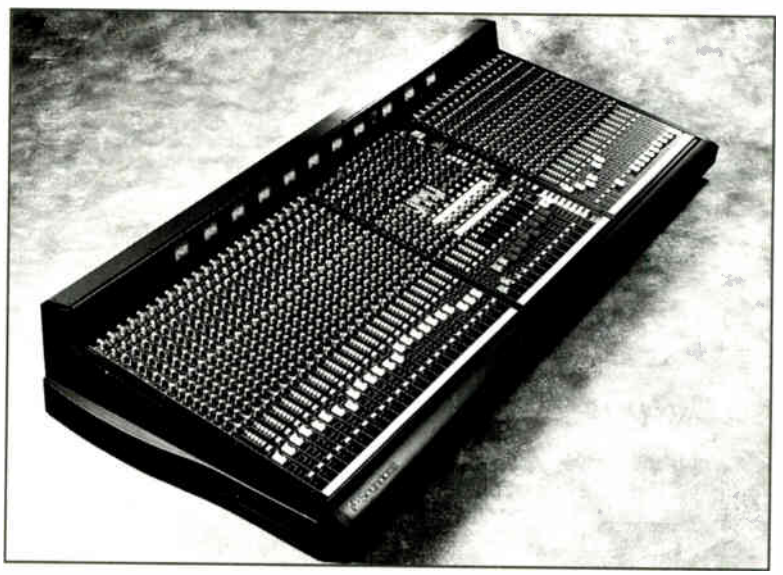
Hats off to the Millennia design team. The only complaint in the course of my tests was I would have preferred continuously variable gain controls to the 1.5dB stepped rotary controls. But the HV-3C is a remarkable device, offering a truly outstanding pair of microphone preamplifiers, great-sounding Apogee 20-bit converters, and a host of excellent features and options. Note: At press time, Millennia announced a 20/24-bit (switchable) version of the converter, which is upgradable in any existing HV-3C and is slated for deliveries this month.

Millennia Media, 4200-B Day Spring Court, Pleasant Valley, CA 95667; 916/647-0750; fax 916/647-9921. Web site: www.mil-media.com. ■

Barry Cleveland is a San Francisco-based engineer/producer and composer.

SOUNDCRAFT K2

SOUND REINFORCEMENT MIXING CONSOLE



Introduced at the beginning of this year, the Soundcraft K2 console is available in three sizes: 24, 32 and 40 channels. The K2 we reviewed had 32 channels, with the master section in the middle, and it came standard with four extra stereo inputs, plus four stereo effects returns all on faders. Its $10,995 list price includes one PSU. The 32-channel version weighs only 110 pounds—an easy lift for two—and measures 60 inches wide, a comfortable reach for most operators. The 40-channel version adds 22 pounds and 8 inches.

FLEXIBLE CONFIGURATION

The K2's mic preamp uses the same pad-less active circuitry found on Soundcraft's top-of-the-line Europa desk, and the sound quality is in the same league. The K2's EQ section offers a wide range of creative and musical options. The mono mic input channels have 4-band EQ, with low and high shelving fixed at 60 and 12k Hz, plus two fully overlapping swept mids that can be switched between a wide Q of 1.3 and a narrow Q of 2.7. The tunable highpass filter sweeps up to 400 Hz—a helpful feature usually only found on more expensive consoles—allowing the operator to clean up the low end of individual inputs without resorting to the EQ. Eight auxiliary buses can be switched pre-fader in pairs, and the last aux can be used to control the channel's direct out level. Internal jumpers set the aux source to be pre-insert, pre-mute and pre-EQ in two groups of four.

For this field test, we used the K2 to mix some of the wide variety of R&B acts that come through the famous Key Largo club in Portland, Ore., each week. For our mixed-mode use of the console to feed four separate mixes to floor monitors plus the mains, we set the first four auxes pre-EQ. Normally a time-consuming job involving pulling individual channels on many desks, the job was easily accomplished in a few minutes by removing the belly-pan and moving one jumper per channel with a pair of hemostats.

The second set of four auxiliaries were used for effect sends and were returned to the four stereo channels that come standard. All three frame sizes include four extra full-sized stereo line-input channels in the master section, with 300 to 3k Hz swept-mid EQ, insert points and access to all eight auxiliary buses. All mono mic inputs and these four line inputs have 8-segment LED metering beside the faders, making them a breeze to use in live situations. The ability to "look down" a mix and see it all on the LED meters beside each fader is invaluable in seat-of-the-pants situations where you don't always get a full sound check.

Over the first four subgroups there are four additional stereo inputs on shorter 60mm faders with bass and treble EQ and access to auxes 1 and 2 or 3 and 4. These were perfect for returning our playback devices: CD, cassette, DAT and the feed from the bar system. All eight stereo inputs have a width control that adjusts from mono, past stereo to a phase-enhanced super-stereo "wide" image. As with the four matrix outputs, these can be metered above on the VU meter bridge that comes standard with the board.

The main output faders can be switched so that the left controls the stereo mix and the right controls the mono mix. In addition to the stereo and mono output buses, the K2 console has eight subgroups. Eight Fader Swap switches trade each subgroup's fader and insert with the corresponding auxiliary's master above it for using the console in stage monitoring applications where a master fader and insert point are desirable for each mix. The main and group outputs are balanced on XLRs, as is an 11x4 matrix. We used the matrix outputs for our recording feeds to the DAT machine and cassette deck. By submixing the drums, vocals, acoustic instruments and guitar amps separately, we could rebalance the recording and make up for the imbalance in the room created by the back-line, so that blistering guitar solos didn't end up missing from the tapes.

The K2 has some great features that make it a joy to use. Besides the LED metering on every input, the Solo and Cut switches are illu-

BY MARK FRINK

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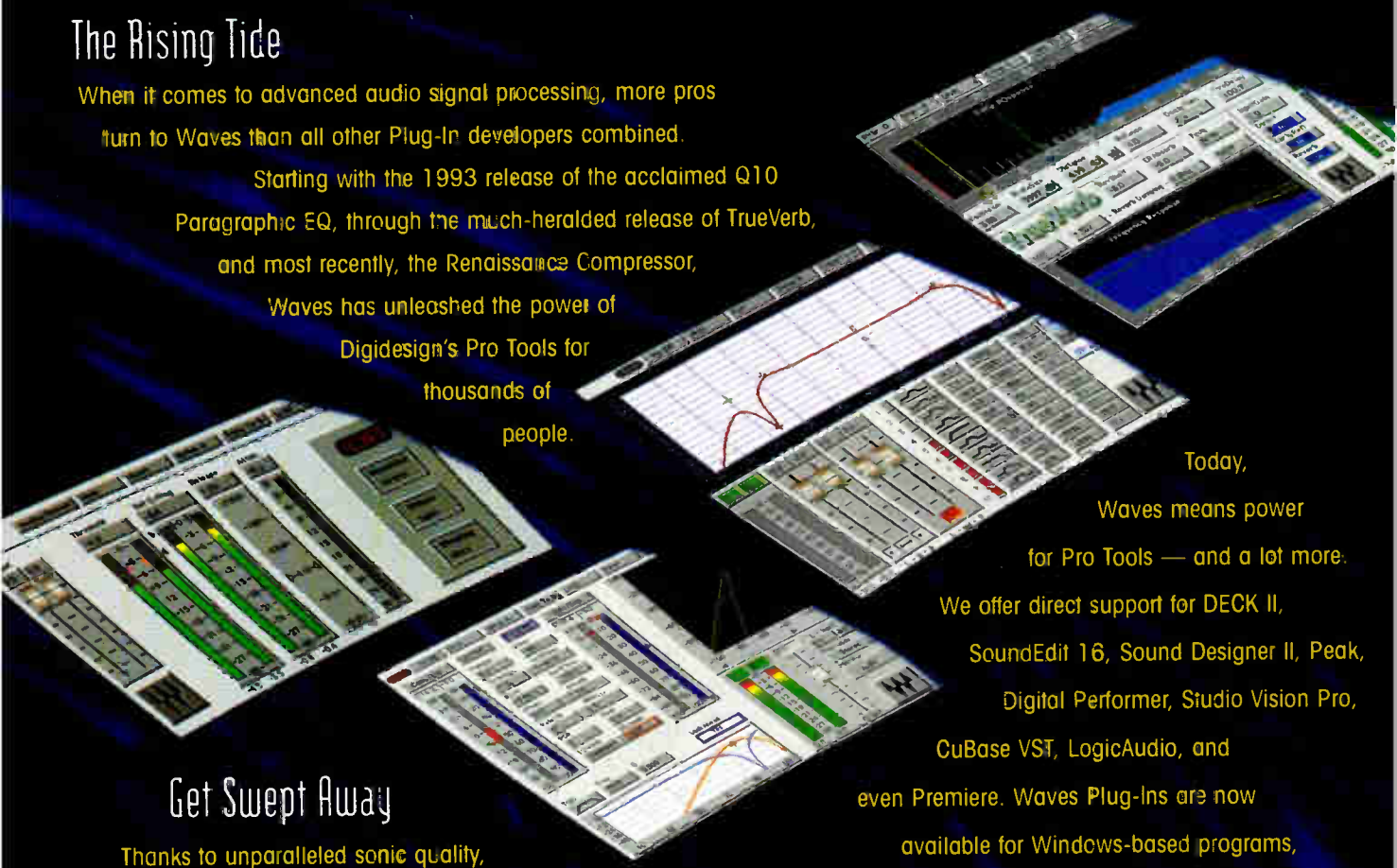

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minated, with the Solo conveniently located below each fader. Solo-in-place monitoring, auto-cancel of the solo, a solo trim control for 10 dB of gain or attenuation, plus a large, red Solo Clear button make the K2 feel like a console that costs twice as much. An XLR talkback input routes a dynamic microphone to the auxiliaries, to the groups or out an XLR on the back. From there, it is sent with a DC switching signal for use with the talkback input of other Soundcraft consoles as an intercom. The only compromises on this desk are the use of unbalanced sends and returns on the single TRS insert jacks and the fact that Soundcraft has forgone a modular design in favor of sectional construction. But both of these configurations are common on mixers in this price range.

POWERFUL AUTOMATION FEATURES

Extensive MIDI and mute capabilities make the K2 a powerful control center for automating mixing tasks. Next to the master faders, the MIDI-mute strip provides two functions. The Mute Scenes controller stores and recalls 128 snapshots of all input and output mute switches, referred to by Soundcraft as Cut switches. Eight traditional Mute Group switches at the bottom of the module work independently of the 128 scenes, allowing eight conventional overlapping mute groups. This is the usual mode of operation for live music, allowing the eight mute groups to be "layered" like mechanically switched mute systems found on older consoles and familiar to concert sound engineers. The eight mute groups can also be confirmed during a performance in Preview mode without affecting the mix. When one of the 128 scenes is recalled, either from the console or by an incoming MIDI scene change command, the mute groups are deactivated and the scene is engaged, but a mute group can be reactivated to layer on top of the scene.

The 128 mute scenes can be stored or recalled in Active mode, where changes take place immediately, or in Preview mode, which allows the operator to inspect or edit scenes during a performance "offline" without affecting the current status of the console. Two switches, labeled Active and Preview, allow the operator to change between these two modes. Changing the scene number causes it to flash, indicating the active scene does not correspond to the displayed number until the Recall button is pressed. In Preview mode the status of all cut switches in a scene is displayed on the preview LEDs next to each cut switch. After you press Store, the console asks for confirmation of the overwrite. A device capable of storing MIDI SysEx data can be used to offload, store and later recall the console's memory of 128 scenes.

The K2's MIDI control can be used in conjunction with the scene set automation to send or receive program change messages, useful for controlling outboard gear or running the desk from MIDI automation. Each cut switch has a corresponding MIDI note-on and note-off capability that can be used, for example, to trigger an outboard sampler. As a broadcast or theatrical mixer it offers useful features at a bargain.

EXPERIENCED SUPPORT STAFF

The most pleasant surprise of this Soundcraft review was the help and support received from the folks at Soundcraft in Nashville. Everyone was friendly and accessible, all the way up the line to newly hired service technician Troy Venable, who was able to sort out some of the finer points of the console over the phone quickly. Touring readers may remember Venable from his travels on the road with acts like the Allman Brothers, and he brings years of hands-on experience. Soundcraft has been somewhat maligned of late over service issues, and the company has made extra efforts to put together a strong support team in their new Tennessee home.

The K2 is an excellent all-purpose desk. Its flexible routing and generous supply of outputs make it suitable for a variety of tasks and make it equally at home in theaters, houses of worship, multipurpose venues, broadcast facilities or at corporate events. As inventory for a rental company, it provides instant comfort for both customers and owners who appreciate the Soundcraft name for its ability to satisfy clients and operators alike. Able to switch-hit mixing FOH one day, monitors the next and even be used for both at once, the K2 is the perfect utility desk for local sound companies that must count their pennies but still want the features and quality found in more expensive mixers.

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

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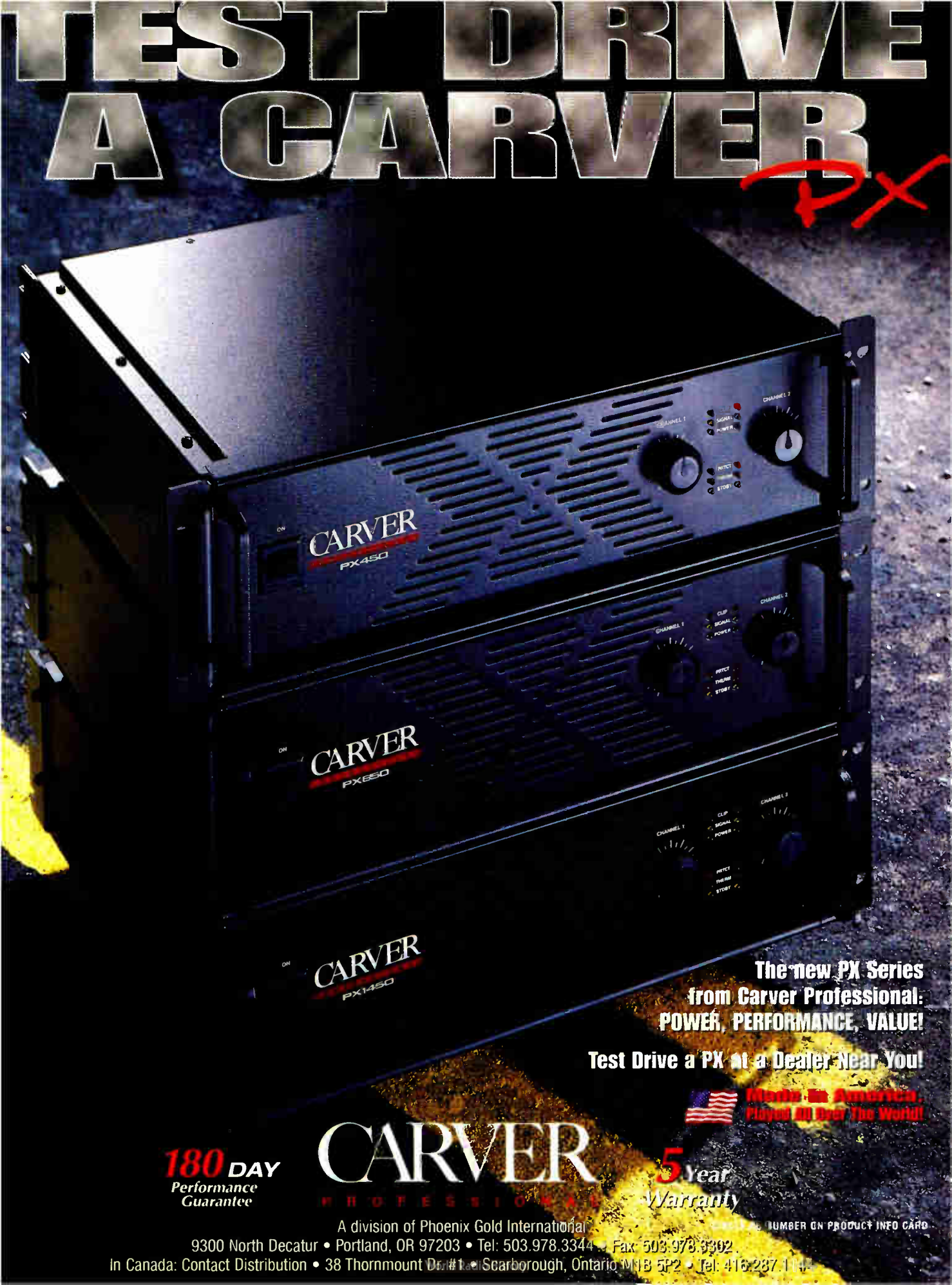

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POWER TECHNOLOGY DSPFX

DIGITAL EFFECTS PROCESSING SYSTEM

One imagined advantage of the digital revolution is the ease with which we can manipulate our manifestations of aural delight within the magical digital audio workstation. I say "imagined advantage" since, typically, we consign a reasonable amount of cash and an enormous amount of time (or is that an enormous amount of cash and a completely unreasonable amount of time?) to the hardware and software we thought we needed to reach digital nirvana, only to discover that there are at least a few holes in the emperor's new clothes.

A particularly exposed and sensitive spot is often discovered as we come to the battle between number of tracks and amount of effects processing. We find that we can indeed apply effects to the tracks in our editor, but that we can only apply so much before we start having to limit the number of tracks playing, or do our processing offline. There are many fine programs that allow the resources of the CPU to be applied to effects processing, and they often do an excellent job, but there is no substitute for being able to hear an effect in real time, while it is a part of the mix we are producing; and the only real way to effectively do that is to have hardware DSP to take the load off of the CPU of the host machine.

As I have four systems running SAW and SAW Plus software, and another running Spectral's Producer and Studio Tracks XP, I was intrigued to hear about the DSPFX system from Power Technology. This system provides quality 32-bit floating-point processing that can be patched into your editor via either analog or digital connections. In addition, the folks at Power Technology are working with both Innovative Quality Software and Spectral Inc. to develop links to allow the DSPFX processors to work with SAW Plus as a plug-in, and to be accessible internally within the Studio Tracks XP software.

INSTALLATION AND SETUP

Many otherwise sanguine audio professionals have been known to become somewhat unhinged in the process of adding components to their computers. I have even heard some wonder aloud why the difficulty of installation seems directly proportional to the effectiveness of the gear. Power Technology has created a rather clear exception to this so-called rule: I was checking out the sounds of the DSPFX processor within about 30 minutes of opening my door to FedEx.

Figure 1: An 8-band Parametric EQ plug-in offers a variety of preset options.

For this review I installed a pair of the DSPFX cards, with their AES/EBU daughter cards attached, in a Pentium 100 system already loaded with a Spectral Prisma Digital Audio card, a Digital Audio Labs CardD+ sound card, an MQX-32 MIDI/SMPTE card, and an ISA network card, along with PCI cards for video and SCSI. This is, to say the least, a fairly full house. I had some concern that getting all this up and running would become a complex process, but I was pleasantly surprised.

During the setup process, you are asked to indicate how many cards you have installed, and to enter the address for each. You will find a separate icon for each in the DSPFX folder when the installation is complete. Because the real work of handling the audio is done entirely on the cards, the front end of the control software does not take much in the way of resources, so it is no problem to run multiple instances of the DSPFX control program along with a digital editor on the same computer.

BY DAVE TOSTI-LANE

THE HARDWARE

The basis of the DSPFX system is the ISA bus DSPFX card ($749, includes one plug-in FX module), which provides A/D-D/A conversion using the Crystal Semiconductor 16-bit delta sigma converter, and Texas Instruments' TMS320C32 32-bit floating point DSP.

Each card sports four -10dB (ref. 1.0V) unbalanced ¼-inch phone connectors for stereo input/output, and a standard 9-pin jack that is only used when the optional processor card is added. There is also a proprietary connector on the back of the card that will allow interconnection of multiple DSPFX cards internally for enhanced operations:

- Adding the AES/EBU/S/PDIF Digital Interface daughter card ($250) extends the flexibility of the DSPFX card by adding digital in/out on the supplied interconnect cable. The daughter card attaches to the DSPFX card and does not take up an additional slot, nor does it exceed the maximum width specified for ISA bus devices.
- A second version of the AES/EBU/S/PDIF Digital Interface includes additional memory (512Kb)

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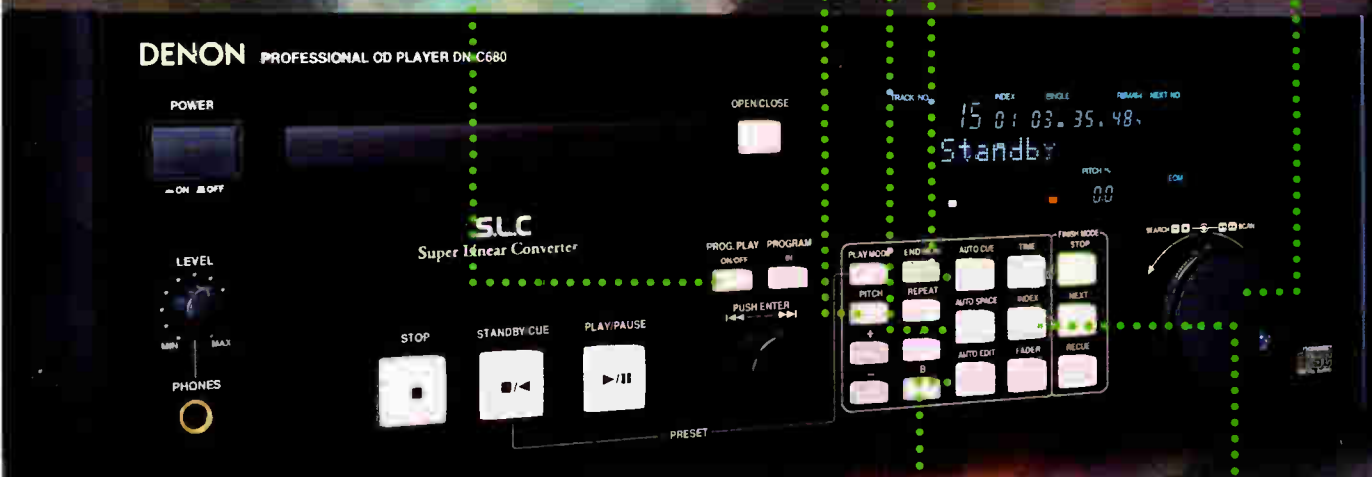

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to allow longer delay settings, and extended reverb tails ($399).

- The external DSPFX AES/EBU 20-bit A/D-D/A Converter ($549) is a 1U rack-mounted converter providing 20-bit A/D-D/A conversion, and balanced +4dB (ref. 0.775V) "pro" level inputs and outputs.
- The DSPFX MIDI Controller ($699) is an external surface that provides a tactile interface to the functions of the DSPFX system. It is functionally identical to the JLCooper CS-102, and can be used to control other MIDI applications as well.
- The FX PACK (Price TBA) is a modular (2U) rack-mount system configured with up to four of the DSPFX cards. It connects via either Ethernet or serial connection to either a PC or a Mac, and does not require a card to be mounted inside the computer, making it ideal for laptop applications.

THE SOFTWARE

The DSPFX software is organized into plug-ins that are loaded into the FX software engine. Each instance of the DSPFX engine can currently have only one plug-in loaded at a time; future plans call for the ability to access multiple cards with a single instance. Included with each DSPFX card are an Auto-Panner plug-in, a Tremolo plug-in, and one of the six other available plug-ins, which currently are: Graphic Reverb, Parametric EQ, Flanger, Chorus, Multi-Tap Delay and Pitch Shifter.

Each additional plug-in costs $179, though you can save quite a bit by buying the entire complement of plug-ins as the DSPFX Card Studio System Plus for $1,099; or by buying the Studio System Upgrade Package, offering the full set of plug-ins for $350.

Note also that the software allows complete control from any MIDI application using MIDI Controller Mapping, an application detailed in the well laid out User's Guide, or by using the very handy Power Technology DSPFX MIDI Controller mentioned above.

The DSPFX software runs very well in both Windows 3.1 and Windows 95, on a 386 or better, though a 486 or Pentium is recommended. Minimum RAM requirements are 4 Megabytes for Win 3.1 and 8 MB for Windows 95 if you are running DSPFX alone; 8 and 16 Megs respectively would be advisable if you are also running an editor on the same computer. I easily ran two simultaneous instances of the software along with the Spectral interfaces on Windows 95 on a 100MHz Pentium with 16 Megabytes of RAM.

OPERATION AND USE

The DSPFX system is particularly well-suited to working with a system like Spectral's Producer. With the AES/EBU in/out, I was able to connect the cards directly to the digital connections of my Spectral interface, and simply patch them into the send/return loop, eliminating the need for intermediate stages of A/D-D/A conversion, and its attendant introduction of delay.

As we make the transition from twiddling knobs to mousing about on a screen, it is comforting to see something that resembles our old tried and true equipment. Power Technology doesn't disappoint in this regard, but the product also includes a visual reference that is new. The designers realized that they had to invent a sort of visual short-hand for parameters of equipment that we've always thought of primarily in aural terms. I found the graphical representations of most of the plug-in modules quite suggestive of the action.

Probably the most obvious is the Parametric EQ (Fig. 1), which was in late beta stage when I worked with it for this review but should be released by the time you read this. (Obviously, the curve shown in the figure is a bit aggressive to say the least, but it does get the idea of the display across.) Note that on the left side of the display, you have controls for the parameters of band 6, with coarse and fine adjustments for the center frequency and Q, as well as an adjustment to set limits to the scale of adjustment (Maximum Boost/Cut). Beneath the knobs, which change color to match the color of the band being adjusted, are a bank of buttons that, among other things, allow you to call up or save user presets, bypass the effect being applied, compare the current settings with those immediately prior to the last adjustment, select different plug-ins, link left and right channels (or display and control either one individually) and call up one of five user-selectable Quick Pick presets. You can also access the help engine, or switch the controls above over to the high- and low-frequency shelving filters, which are also a part of the Parametric EQ plug-in.

To the right of the display is the graphical representation and eight faders that control boost/cut in each of the eight bands of the Parametric EQ. Under the Settings button, you can also change the number of bands with selection from one to eight bands allowed. This makes it possible to build special EQ presets with restricted function. At the bottom of the display, you see meters for input and output.

In use, the EQ is exceptionally clean and quite natural sounding. It was possible to dial quickly into an area of the spectrum and apply the needed EQ (and no more). The range of Q adjustment is from 20 to 0.1, which takes you from quite narrow to quite broad bandwidth. Any of the filters can be swept over to double another, and one of the presets provided locates all eight bands at 60 Hz with narrow Q and deep cut. (I would hope this setting is not used too often before attempting to eliminate the source of the hum!)

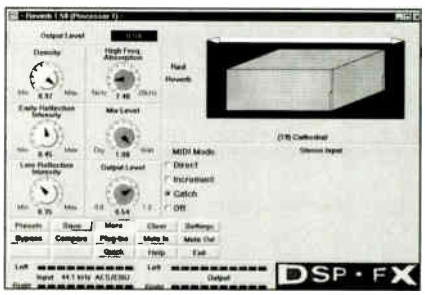

Figure 2: The Graphic Reverb display includes a visual representation of room size.

The image used to represent the Graphic Reverb is also evocative (Fig. 2), with the size of the room directly indicated by the size of the "box" in the display. The levels of early and late reflections (controlled by the two knobs at the right that appear when you click the More button) are indicated by the two small blue columns at the lower and upper right of the "room" in the display. Room Decay is indicated by the density of the color of the surface of the whole box, while the adjustment for high-frequency absorption is indicated by changing color density on the top and right side of the box. Stereo spread (which is reversible) is indicated by the position of two arrows at the top of the image, while the density of the reverb is shown by the thickness of the line joining the arrows.

That sounds a lot more awkward to remember than it is. Fact is, you will begin to easily associate these visual changes with the excellent quality reverb you will be hearing. I found the reverb to be especially good with the larger rooms modeled in the presets, but I've always been a sucker for the sound of a good cathedral reverb! The benefits of using full 32-bit processing really show in the reverb, which is

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smooth and completely free of artifacts. I did find myself wanting to have a more control over the EQ on the reverb, especially in terms of allowing different EQ tailoring on the early and late/left and right early reflections, but this is more in the way of wanting to make an excellent tool better than a complaint.

I can tell you that the Pitch Shift module is very unpopular with the cats in my house. Of course, I mean the four-legged, furry ones, not the cool jazz variety. The real-time Pitch Shift module is another clean, solid application of the quality DSP processing in this gear. Presets included are quite effective, including a range of vocal and instrument Fatteners, which use varying degrees of pitch shifting up and down then panned variously left and right to add "body" to the dry sound of the source. Once again, the graphics make a good deal of sense once you use the application a few times, and parameter values are listed below each control, but as the effects are created in real-time, you'll be adjusting to sound most of the time.

I used the Pitch Shift module, along with the Reverb module, in preparing a set of comic "head bonks" for a theater production, using the sound of ping-pong balls hitting the table as a source. Quite remarkable what several trips through the pitch shifter, a bit of time stretching (in the Spectral system), and the application of stereo reverb can do to such an ordinary sound.

Figure 3: Effect parameters are displayed graphically in processing modules.

Each of the other effects currently available works in a similar way, with direct reading of the parameter value under the appropriate knob, and with a graphic representation that manages to communicate what is being done in a minimum of space and clutter (Fig. 3). I found all to be very high-quality, and would not hesitate to use them in any project. In fact, I managed to hang on to the units long enough to use them in several projects, and I'm going to have a hard time sending them back at the end of the evaluation.

Okay, so are there any down sides to the system? One, which will probably be addressed before too long, is the gradual disappearance of the ISA slot in recent computers. Most PCs on the market these days have only about three ISA slots, so you would be limited in the number of cards you could use, especially if your audio cards are also ISA. To a large measure, the existence of the FXPACK rack module mitigates this one, as with that option you would not need any cards in the computer to use the DSPFX. While a PCI version of the card is inevitable, it is not immediately forthcoming. Given the availability of cheap used 486 systems however, this may be less of a problem than it seems, as one could easily set up one of these machines to function as a DSPFX server.

Another issue is the current limitation of a single plug-in to a single card at a time. This can be vexing when you change plug-ins, as it takes some time for the cards to clear and then reinitialize with the new plug-in. The situation is likely to improve with the implementation of the internal physical connections between cards, and with a revision of the software to allow addressing more than one card at a time.

Finally, it takes a big monitor to be able to easily operate more than one in-

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stance of DSPFX and a DAW at the same time. On a 17-inch monitor there is a bit of overlapping that can be awkward when you are shuffling back and forth between the send/return levels on the DAW and the adjustments on the DSPFX panels. Two cures for this are a larger monitor (always a good thing anyway) and the use of the DSPFX controller, or another MIDI interface, which allows control of the software without the need to see all the controls.

One of the great things about Power Technology's concept is that the DSP engine is so completely programmable that what is an EQ at one moment can be transformed into something completely different the next moment. This can save a good deal of patching and re-patching for the engineer, to say nothing of a good deal of schlepping heavy boxes around the studio. I had the chance to watch the development of the Parametric EQ from early beta stage to shipping, and while the plug-in was working solidly from the first beta I loaded, it got consistently better, with more and more attention to detail, as each revision was loaded.

Power Technology is excited about the development of the DSPFX FX-PACK, because it eliminates the need for a card within the computer, and expands the potential customer base to include both Macintosh and PC users for the first time.

Owners of DSPFX cards recently got a pleasant surprise when the company put the Tremolo and AutoPanner plug-ins up on their Web site for free download. I understand from talking with Mark Kaplan at Power Technology that the company hopes to be able to provide this sort of extra service to their customers from time to time while they pursue development and marketing of major plug-ins for the future (the next major project is reportedly a compressor).

I'd have to say that the DSPFX system is a solid investment, and a solid addition to the studio, with a value that appears to grow with each addition to the software.

Power Technology, 100 Northill Drive, Bldg. #24, Brisbane, CA 94005; phone 415/467-7886; fax 415/467-7386; e-mail: dspfx@dspfx.com; Web site: www.dspfx.com. ■

Dave Tosti-Lane is a theatrical sound designer currently serving as chairman of the performance production department at Cornish College of the Arts in Seattle.

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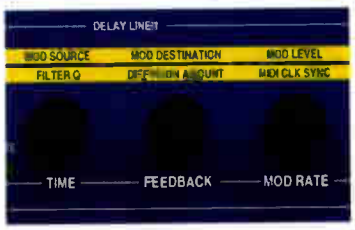
MIDI: Not just for changing presets, but also for control over the 606's parameters. Lock the delay into the timing of the song. Then use the MIDI Clock Sync to perform changes to the song while it plays. The effect becomes more like a separate instrument as you control echo rhythm.

Tap Tempo Input: True performance control so that delay conforms to the song, not the other way around.

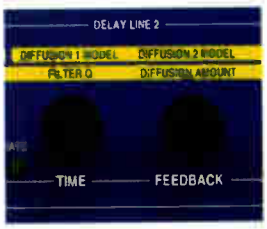
Pro Box: Many boxes promise high quality effects and a professional design, but the 606 really delivers. 20 bit A/D D/A, balanced inputs and outputs, and an internal power supply. No wall warts.

Modulation: Six different modulation sources that can be assigned to affect practically any delay parameter. Create a chorus effect so thick you can't see your speakers. Want to modulate a modulator? Go ahead.



Room Simulations: Place the signal source anywhere within a room that you specify by height, width and length. Change the characteristics of the space not only by size but also by texture.

Diffusion: Control over delay diffusion? When was the last time you saw that? The 606 lets you dial in the perfect amount of density for echoes. If that isn't enough, try modulating the diffusion for "unheard of" effects.



Filter: Classic multimode synthesizer effects. Vintage phase shifter effects that can sweep from side to side. Select the right effect tonality to produce natural or unnatural decays.

Global: Using the Global function unlocks over 80 additional parameters. Hand-tailor your sound with the 606 Delay F/x Machine.

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ADA AMPULATOR AND MICROCAB II

GUITAR AMP AND CABINET EMULATORS

Getting a great guitar sound in the studio is no easy task. It requires just the exact combination of player, effects, preamp and/or amp, cabinet, mic and room—and if any of these factors is less than optimum, then the sound will suffer. Guitar preamps have become popular over the past ten years and provide the opportunity to track in the control room, but sometimes they just don't match the sound of a real amp or the various tones offered by different cabinets.

With this in mind, ADA Amplification offers two rack-mount solutions to this problem, in the form of the MicroCab II cabinet emulator and the Ampulator power amp and cabinet emulator.

Priced at $269.95, MicroCab II is a single-rackspace processor that emulates current and vintage guitar cabinets in a choice of speaker sizes (1x12, 2x12 and 4x12 types), speaker array, open or closed back cabinet, and a 2-band EQ section optimized for guitar applications with knobs for LF Thump and HF roll-off to control excessive brilliance. The latter simulates the effect of off-axis or distant miking, resulting in a darker tone. Thump is a fixed-frequency EQ centered around 200 Hz for tuning the "box" resonance. The front panel also has a level control with LED clip indicator and bypass switch for comparing the direct and emulated outputs.

On the rear panel, ¼-inch rear panel inputs accept line-level signals; "pass thru" jacks route an unaffected signal on to the power amp or speakers; and direct outputs to the console are available either on ¼-inch (line-level) or XLR mic level jacks.

Priced at $699.95, ADA's Ampulator combines the cabinet simulation properties of the MicroCab II with a tube amp simulator package. Ampulator is also built into a 1U chassis and accepts a preamp input, but is a mono in/mono out device, a definite drawback if you're using one of those newfangled preamps with onboard stereo effects.

Ampulator's tube amp emulation uses a 12AX7 tube operating in a push-pull, transformer-coupled circuit. The latter is controlled by front-panel rotary pots offering user control over characteristics such as drive level, presence, tube matching, hum injection, tube bias and power level, along with switches that select either triode or pentode tube "character." And when these are combined with a cabinet emulator, the number of possible tonal variations is impressive.

The rear panel has a ¼-inch TRS balanced input jack (also usable unbalanced) and ¼-inch and balanced XLR line outputs. The XLR out has switches for ground lift and attenuating the line output to mic level.

In the studio, with a variety of guitar preamps (digital units from ART and DigiTech and analog designs from Boogie and Hafler), I found the Ampulator and MicroCab II to be useful additions, actually expanding the palette of available sounds without destroying the distinctive character of the preamps and guitar rigs used. Both units can be noisy unless the user monitors the gain structure, but as long as levels are optimized, both units operate cleanly.

These boxes certainly allow silent, yet full-tilt amp tracking in your project room at 3 a.m. But one of my favorite tricks was to use either the Ampulator or MicroCab II *with* a miked amp rig in the studio. In the control room, I printed both signals (mic and emulator) to tape, giving me the flexibility of using any combination of the two during the mix. Once I used a miked Boogie (mixed with a touch of vintage Marshall emulation) on the verses and emulated Marshall for the solo and chorus fills. This technique would be equally valid in stage applications with a large P.A.

Anybody looking to take a preamp's tonal options to the next step, or for an alternative to lugging five—or 55—different amp or cabinet combinations to the next gig should check out the ADA Ampulator or MicroCab II.

ADA Signal Processing, 420 Lesser St., Oakland, CA 94601; 510/532-1152; fax 510/532-1641. Web site: www.adasignal.com. ■

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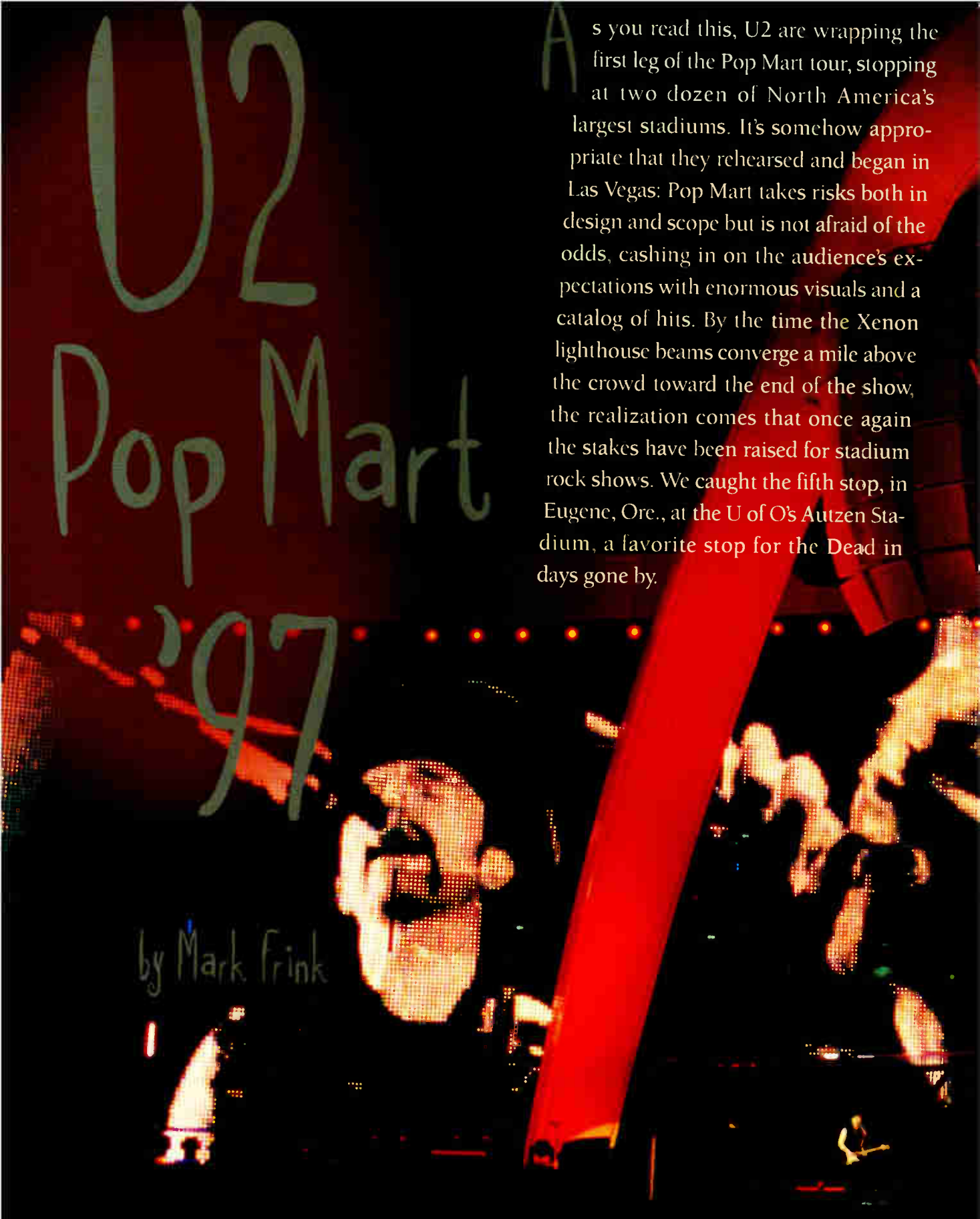
U2 Pop Mart '97

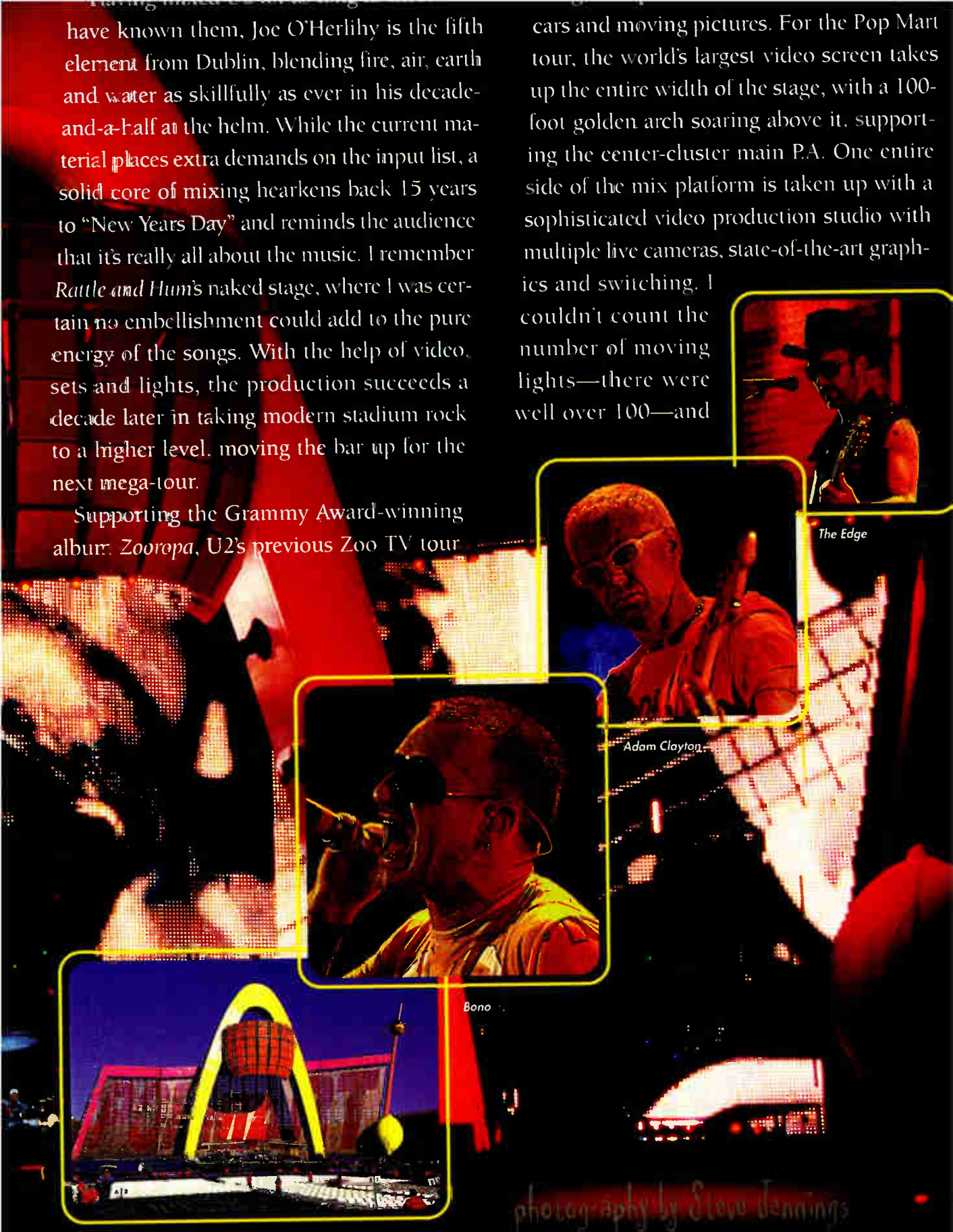
by Mark Frink

As you read this, U2 are wrapping the first leg of the Pop Mart tour, stopping at two dozen of North America's largest stadiums. It's somehow appropriate that they rehearsed and began in Las Vegas: Pop Mart takes risks both in design and scope but is not afraid of the odds, cashing in on the audience's expectations with enormous visuals and a catalog of hits. By the time the Xenon lighthouse beams converge a mile above the crowd toward the end of the show, the realization comes that once again the stakes have been raised for stadium rock shows. We caught the fifth stop, in Eugene, Ore., at the U of O's Autzen Stadium, a favorite stop for the Dead in days gone by.



have known them, Joe O'Herlihy is the fifth element from Dublin, blending fire, air, earth and water as skillfully as ever in his decade-and-a-half at the helm. While the current material places extra demands on the input list, a solid core of mixing hearkens back 15 years to "New Years Day" and reminds the audience that it's really all about the music. I remember *Rattle and Hum*'s naked stage, where I was certain no embellishment could add to the pure energy of the songs. With the help of video, sets and lights, the production succeeds a decade later in taking modern stadium rock to a higher level, moving the bar up for the next mega-tour.

Supporting the Grammy Award-winning album, *Zooropa*, U2's previous Zoo TV tour cars and moving pictures. For the Pop Mart tour, the world's largest video screen takes up the entire width of the stage, with a 100-foot golden arch soaring above it, supporting the center-cluster main P.A. One entire side of the mix platform is taken up with a sophisticated video production studio with multiple live cameras, state-of-the-art graphics and switching. I couldn't count the number of moving lights—there were well over 100—and



The Edge

Adam Clayton

Bono

photography by Steve Jennings

Setup at the University of Oregon's Autzen Stadium

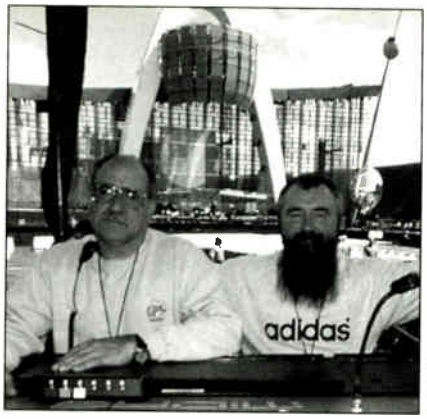


PHOTO: STEVE JENNINGS

FOH engineer Joe O'Herlihy (left) and Clair Bros. system crew chief Jo Ravitch

the visuals on this show are stunning. Sound provides the beginning and ending points, but never again will large audiences be totally satisfied with warm-wash, cool-wash and image magnification.

The sound setup is a departure from the usual dual-mono designs typical of large stadium shows. Six rows of ten bright orange speakers are spherically arrayed below the apex of the golden arch. The centerpiece of Clair Bros.' S-4 speaker system captures the heart and imagination of fans and road-dogs alike, with 60 boxes at the center forming an engineering and architectural marvel. "The entire show was redesigned from scratch," O'Herlihy comments. "The band wanted to get away from the look and sound of the traditional left-and-right design to clean up both the sightlines and the sound." Although the P.A. has been criticized in the popular press for being mono, it's widely understood that in large venues only a small percentage of the audience enjoys any benefit from a stereo design. The coverage throughout the stadium was very even. For extra control, the center cluster is broken into three horizontal zones, with each two rows of speakers having its own TC Electronic 1128 EQ and CBA Coherent Transfer System processing. This allows the lowest speakers, which can be heard out on the sides of the stage, to be tweaked and turned down. The tour also carries four delay towers for the far end of stadiums, each of which hangs up to eight S-4s in two columns, along with a row of high-Q, high-frequency "after-burners" at the top.

The tour carries 50 subwoofers, and for the Eugene show, 32 were used across the front of the stage. These were delay-tapered with three TC Electronic 1280 stereo delays with a spread of 30 to 60 milliseconds. Clair P-4 Pistons were used on their sides for front fill along the entire downstage edge, as well as out at the end of the 100-foot runway, which ends at a small stage in the 35th row (where the band performs a finale after making an entrance in a giant mirror-ball lemon). Each of six zones of Piston speakers and the four delay towers had their own TC 1128 and a Toa DP-0204 processor. The system drive racks alone comprise four 16-space units at the back of the mix position. The system is powered by Crest 9001 and 10004 amplifiers, except for the delays, which use the Clair Carver amps.

O'Herlihy mixes on two automated Midas XL-4 consoles. A pair of self-powered EV 100EL reference monitors are perched on the Midas' meter bridge and were kicked back about 200 milliseconds with another TC 1280 stereo delay, putting them in sync with music coming from the P.A. 225 feet away. To those familiar with the music, it's no surprise that there are several delay effects in the racks, including an AMS, a Roland SDE-3000 and two Yamaha SPX-1000s. Other effects include a Lexicon 480, two PCM 70s and two Eventide H3000/SE Harmonizers used with the first console, which has guitar, keyboard and vocal inputs. Inserts include eight dbx 160A compressors for the keys, nine Summit DCL-200 stereo comps for vocals, bass and acoustic guitars, plus an Aphex gate used to turn off a couple of the extra background vocal mics scattered around the stage for The Edge. The second console has the drums and the various playback devices, plus the inputs from the small stage at the end of the runway. Two more PCM 70s and two more SPX-1000s are returned to the second XL-4 and used for drums. Inserts include three

PHOTO: STEVE JENNINGS

Dove Skaff, left, monitor engineer for Bono and The Edge, and Don Garber, monitor engineer for Adam Clayton and Larry Mullen Jr.

BSS DPR-402 stereo comps on the video playback, two dbx 166A gated compressors on the kick and snare inputs, ten channels of Aphex gates for toms and toys (plus the four-piece kit on the second stage), and two more DCL-200 compressors for the bass and acoustic inputs on the runway.

Monitor world is located underneath the stage-right wing, and four Yamaha PM-4000M consoles are helmed by Dave Skaff and Don Garber, with Skaff handling the chores for The Edge and Bono on one pair of desks, while Adam Clayton's and Larry Mullen Jr.'s mixes are handled by Garber. Inserts include 20 channels of Aphex Expressors in two card cages, a dozen channels of the Aphex 622 gates, four Klark-Teknik DN-504 quad-comps on the keys and a couple of Summit DCL-200 compressors on the acoustic guitar and bass channels. Monitor effects include three Lexicon PCM 90s and an H3000 for kit reverbs, a TC M5000, a pair of SPX-1000s for delays and a TC 2290 for the main delay effect, with a spare for backup. There are also two Yamaha SPX-990s used for guitar ambience, with an FM chorus patch. "These give the guitar some space, particularly in the ear mixes," Skaff explains. "And drying up the effect brings the guitar front and center for solos."

There are six Garwood Radio Stations in the system, all used with Aphex Dominators as brick-wall input limiters. Clair's approach is to sum all the outputs of the Garwoods into a Microsonics custom combiner to reduce the number of masts onstage, feeding to a single log periodic antenna. The six stereo inputs to the Radio Station transmitters are matrixed from the console outputs using six Logitek PRE-10 stereo switchers so that any mix can be instantly reassigned to any transmitter. One Radio Station is assigned to each bandmember (there is a spare unit), and Skaff uses the last one as a wireless cue system with a Conex switcher and a remote to monitor the in-ear mixes post-Dominator. Mullen and Bono are on ears all night, though The Edge uses his for only part of the show. Clayton is forced to use his ears when they are all down on the stage at the end of the thrust, because they are 100 feet in front of the P.A. out there. The Edge and Bono have been custom-fitted with Sensaphonics' new 2X two-way in-ear transducers; Clayton and Mullen use Sensaphonics' ProPhonic IV ribbon transducers.

A Yamaha ProMix 01 is used as a

programmable talkback mixer, sending all the talkback inputs to the two pairs of monitor consoles. Besides the usual talkback mics at the consoles, there are mics around the stage for musicians and techs, including several fitted for D-3's IR-1 optical (infrared) proximity gate, which only turns the mics on when someone is standing in front of them. The IR-1 is a unique product that has become the switch of choice for musicians' talkback from stage with in-ear monitors. Also at the monitor position was a Hewlett-Packard 8590L spectrum analyzer for monitoring the radio waves, providing easy identification of local broadcast activity at each frequency.

The stage is amply supplied with Clair's new Series II wedges. Bono is surrounded at center stage by four of the company's new 212AM double-12 floor monitors. There are two more of these for Clayton at stage-left, and The Edge also uses two, plus two of the new series of single-12 12AM wedges. Three-way Clair R-4 speakers are used for sidefills, and ML-18 subs are used to support the ear mixes at the main stage drum and bass positions. There are additional AM wedges up on the wings, where Bono runs up to address the side-stadium audience. The audio crew's strategy is to be able to provide the band with anything they may ask for, and to be prepared with floor monitors or ear mixes at all times. While this is a great theory for pleasing clients, the approach met with mixed success, as there were howls and squeals throughout portions of the show.

Other Clair Brothers engineers and technicians on the tour include Brent Carpenter, Dave Brantley, Tom Ford, Ed Conrad and Matt Herr, who load, rig and cable the P.A. and wire the stage. The microphone list includes copious quantities of Shure products—the stage is littered with Beta 56 mics, used on Edge's various Vox and Randall guitar amps, as well as for toms and overheads at Mullen's second kit. Snare mics are 57s, while the kick mic at the runway stage is a Beta 52. The main drum kit uses SM98s on toms, and the popular SM91 and a Beyer M88 combination is used for the main kick drum. The main kit's overhead and ride cymbal mics are AKG 414s, while an SM81 is used on hi-hat. Clayton's bass rig is miked with an M88. Except for the Countryman Isomax headset mic Bono uses for a couple of numbers, the vocal mics are all SM58s or Shure UHF wireless with 58 capsules. "Shure products were chosen for their durability and RF stability," Skaff says.

All in all, the Pop Mart tour combines an interesting mix of technology and music spanning several decades. There are three leap-frogging sets, and every show loads into over a dozen trucks: one truck each for the backline, FOH mix position and the subwoofers, three each for video, P.A. and lights, plus one each for the lemon, the arch cladding, the video screen facia and, of course, one for dressing rooms and related production kack. Walking out of the show with *Mix* photographer Steve Jennings, I beheld one last icon of abundance backstage: two dozen idling forklifts in a row with drivers in their saddles—a production manager's fantasy. This summer, U2 makes 24 more stops in nearly as many countries across the pond, taking their new mix of Eurodance music back where it came from. They'll return for a second North American leg in the fall, mostly in those acoustical white elephants, the "domes" of America, ending in the Seattle Kingdome on December 11. Other international shows are planned for 1998. ■

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Choosing Custom In-Ear Monitors or Eight Ears in a Road Case

Custom-molded in-ear monitors are perhaps the only pro audio product that must be bought before they are heard—unusual in an industry where hearing is believing and listening tests are a time-honored part of kicking the tires. But these small custom earphones must be individually manufactured from an impression of the user's ears, because without a good fit, much of the benefit from the coupling to the ear and the isolation this provides are lost. There is a range of non-custom options that can be purchased cheaply, but the cost may eventually include damage to the user's hearing. Professional musicians subscribing to the in-ear approach for the first time should make sure that all the steps are in place to protect their most valuable asset, their hearing.

CHOOSING IN-EAR MONITORS

The concept of in-ear monitors began with Walkman-type ear-buds that sit at the ear's opening. These cannot provide the isolation of a custom mold that fits deep into the ear canal, which means the artist is forced to listen at high volumes to compete with background sounds. Some manufacturers offer consumer ear-buds using generic press-fit vinyl ear pieces with helix locks that hold them in the ear, but these do not have an ear canal stem. They offer minimal isolation and should not be confused with custom ear molds for professional applications. These models may work for solo musicians or acoustic duos, but full-production groups should avoid them, because the higher volumes they require can damage the ears. There are several generic options that do provide an acoustic seal with the ear. They offer reduced isolation and comfort over custom molds, but they can be an affordable option for non-professional musicians.

There are several issues that affect selecting a set of custom-fitted ear transducers. First is the state of the user's hearing. Before making the move to in-ear monitors (IEMs), many musicians have spent much of their career performing in the midst of high sound levels generated by a band's backline and stage monitors. The average professional musician already has suffered some hearing loss, usually beginning with a notch around 3 to 4 kHz and deepening over time. The first step in choosing IEMs should be to get a baseline hearing test. Many IEMs have a bump in their response in the region that matches the insertion loss, which makes them sound better than if they had perfectly flat response. First-time users will be amazed at their ability to suddenly turn the volume way up and hear as never before. Beginners must carefully set levels in order to avoid increased hearing loss. Many transducers get loud enough to damage hearing over the course of a typical show. Though this technology has great potential for hearing conservation, the greatest danger is that some users will fool themselves into thinking their ears are safe when they're being damaged.

Another consideration has to do with what the user will be listening to. The focus of the individual's listening helps determine which transducer's frequency response is a better fit. For example, many drummers and bass players need extra response in the low end. Though their in-ear mixes may be supplemented by subwoofers or "shakers" mounted to the floor or drum throne, the low end they hear can seem unnatural if it is not complemented by low-frequency response in their IEMs. (Engineers should note that supplementing the lows with subwoofers or "shakers" is necessary for many kinds of pop music, especially for drummers. The ubiquitous Fletcher-Munson curve places higher demands

BY MARK FRINK

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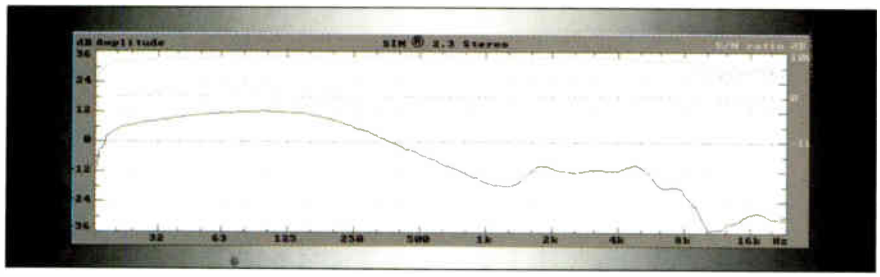

A Meyer SIM system analysis of the Future Sonics Ear Monitors™ frequency response

on the tiny transducers, and many models cannot provide enough lows to satisfy rhythm players without distortion. Conduction transducers that run on 50-watt amps are attached to stools or risers and pass the lows via bone conduction, vibrating the listener's feet or buttocks—there's a word I haven't used in an article yet. Use of subwoofers can also help performers who run all over the stage, but they add a boominess that annoys some FOH engineers. Some sound companies place wedges and turn off the horns in order to localize the lows at each player's position and provide backup for the IEMs in case of some kind of failure or change of heart. For truly hard-to-please cases, a full wedge mix or drum fill may be used in combination with IEMs to 'turbo-charge' the listener. Or in the case of louder groups, there is often enough low end from the P.A. to supplement their ear mixes without subs or shakers, and performers may prefer thinner sounding tranducers.)

Considering what the user will be listening to helps in determining which transducer's frequency response is a better fit.

A singer, on the other hand, is primarily interested in the vocal, and excessive lows can cloud the sound of the voice in their ears; transducers that might sound too thin to players in the rhythm section will often be preferable to singers. Also, players in acoustic-based groups are able to listen at lower levels, while full-on rock musicians will place higher demands on their IEMs, needing higher SPLs and extra isolation.

The long-term effect of listening fatigue and the volume at which IEMs will be used must also be considered. What might sound accurate and pleasing for music playback or in rehearsal might be too bright or distorted in a performance situation that requires several hours of attention at the higher volumes needed to compete with the ambient sound levels of a P.A. In other words, models that seem pleasing at first can sound different onstage with the back of a half-million-watt P.A. roaring away. Transducers that seem a little dull can actually be easier on the ears over longer periods of time, particularly when the listener is monitoring at high SPLs. Ear-molds with higher isolation allow the user to listen at lower levels in these situations.

Another issue that may affect IEM choice is how the mix will be ap-

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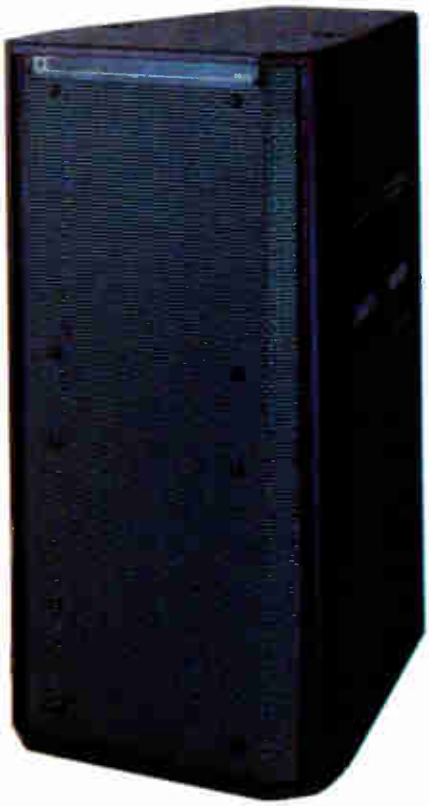

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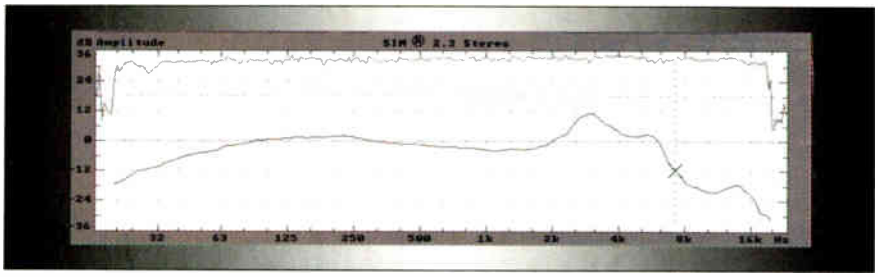

Precision Audiotronics Challenger One

proached. Many in-ear monitor rigs carry over the use of graphic equalizers from wedges, allowing the engineer to tailor the EQ on each mix to individual hearing, but choosing transducers that suit the hearing of the musicians can eliminate the need for extra processing. One approach is to choose the same transducer for all performers, giving the operator a consistent platform to mix from; the engineer can then modify the frequency response of individual mixes as needed. The other approach is to choose transducers that fit the tastes and needs of the individuals onstage, with plenty of lows and bite in the rhythm section and smooth midrange and highs for vocalists.

INDIVIDUAL FIT

Because IEMs are usually worn for several hours a day, they must fit the ear canals precisely. When having ear impressions taken, the individual being fitted must move the jaw as the impression sets up, alternately opening their mouth and clenching their teeth to make sure the mold taken matches the small range of movement of the ear canal. Even a tiny mismatch can be annoying over time, requiring the mold to be redone.

Ear impressions are taken to different depths inside the ear canal. Some only go past the first bend of the ear canal while others reach to the second bend. Deeper molds provide more sonic isolation but place a higher requirement on comfort. Shallow molds can be made of hard plastic, but deeper ones require that the canal portion be made of a soft silicone material that is less irritating to the inside of the ear. Many manufacturers use a combination of materials, though a couple of models are entirely made of soft silicone or vinyl.

There are two types of custom drivers. Ear molds with so-called dynamic transducers are vented, and this reflex tuning can adjust their bass response. They are offered with a set of a half-dozen interchangeable plugs that vary the vent size to adjust bass response. Plugging them entirely minimizes the lows, while larger ports increase the bass. These vents also allow ambient sound to enter the ear via the mold. Many performers use these with a smaller vent, minimizing leakage but still getting some low-frequency tuning advantage. Dynamic transducers roll off an octave or more of highs than do ribbon drivers. Ribbon drivers are manufactured without vents. These balanced armature transducers have a smaller moving mass and are less suited for producing lows at loud volumes. They have more highs at the expense of sounding a little thin by themselves.

CHECKING OUT THE SYSTEMS

For the past year, I've worked with a number of FOH engineers in a variety of performance situations using IEMs, and I've made a point to compare the different models and ask the engineers

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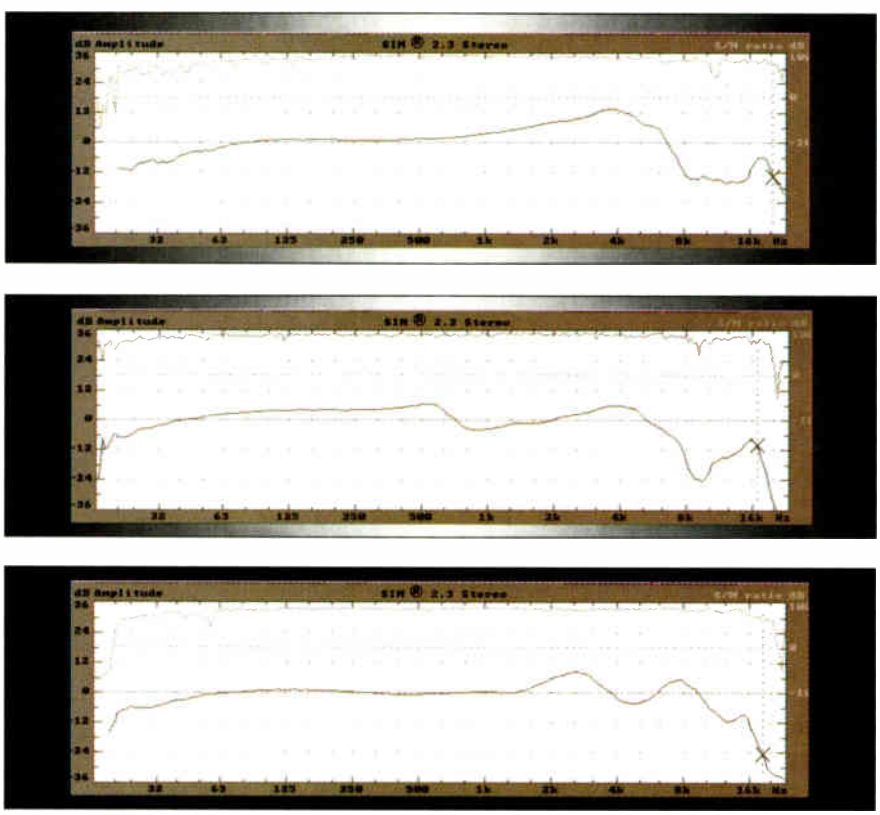
for their feedback. There were several shows where the artist's engineers were kind enough to dial up a mix while I switched from one piece to another over the course of the show. As it is with vocal mics, some operators have only ever used one IEM model and are able to make it work for a wide range of music and performers. (At the end of the night, an experienced operator counts more toward satisfying performers than choosing the right product.)

For each system I listened to, a Meyer SIM system was used with a B&K 4007 microphone, and custom couplers were fabricated to fit the transducers to the mic and mimic the coupling to the ear. Please note that the measurements taken are intended for comparison purposes. Also, the ear is a nonlinear device, responding differently at various SPLs, and each set of ears is unique; the geometry of individual ear canals plays a part in determining the listener's frequency response. The coupling of the transducer to the ear canal gives slightly different high- and low-frequency effects to individuals. In actual use, ambient sounds add to what is heard, both directly through bone conduction of lows and through open microphones. And the response of ear transducers is only one of many factors that affect how they sound to individuals onstage with the P.A. roaring. More isolation allows users to turn down and counts towards hearing conservation. The following products were evaluated.

Future Sonics (www.futuresonics.com) is the best-known and the original company in this field and offers Ear Monitors® brand custom earphones ($798 list). Like all dynamic transducers, they are supplied with a variety of plugs to alter the port size, varying the amount of low-frequency response. The Ear Monitors have a dark response that is weighted to the low end. They sound similar to high-end Sony consumer earbuds: lots of extra bass below 300 Hz, nearly flat in the mids to 4 kHz and then tapering off gently, and all but gone by 16 kHz. Some users claim less high end reduces ear fatigue over long periods of use. It also attenuates some of the distortion found in wireless transmission. The Ear Monitors' stem is made of the same hard plastic as the case, and its shorter length doesn't protrude beyond the first bend of the ear canal, which means this model offers lower isolation than models with longer stems that fit more snugly, but they are slightly easier to pop in and out. Ear Monitors are also availble with a soft canal; this model is easily one of the loudest tested. It has



Top: Shure E-1 frequency response; Middle: Ultimate Ear UE-5 frequency response; Bottom: Sensaphonics ProPhonic 2X frequency response

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been around for a long time and has many happy users. As the founding player in this field, Future Sonics is committed to being a full-service vendor of these critical listening systems, providing a full range of onsite consulting.

Precision Audiotronics (www.precisionweb.com) makes three models that were tested. Both of the higher end Challenger models have a soft vinyl medium-length stem, and half of the shell is covered with the same clear vinyl. The 4-foot cable detatches from the side of the Challenger molds with two right-angle prongs. The Challenger III ($329 list) uses a vented dynamic element. Its frequency response has solid lows, presence peaks at 1,300 and 3,300 Hz and then gently rolls out with a small final peak at 12 kHz. The Challenger Pro ($499 list) is a non-vented transducer that looks similar to the Challenger III. This model has a smooth response, with warm midrange, a gentle peak at 3 kHz and extension in the highs out to an "air" peak at 16 kHz where they start to roll off. The Challenger Pro also has a tiny potentiometer that allows the user to turn down the highs by 3 dB above 2 kHz.

The Challenger I ($214 list) is a low-cost model that uses a lower-power ribbon transducer in a smaller mold made entirely of silicone. These small, light transducers have medium-length stems, offering moderate isolation. They put out about 10 dB less than the Challenger Pro products, and they sound a little thin, peaking at 3 kHz. The highs start to roll off after 8 kHz and are out by 16 kHz. This model would be a good choice for budget-minded folk musicians, because they seem fairly rugged and cover the range of acoustic instruments and vocals well, even though they don't get as loud. In addition to flesh tones, Precision Audiotronics offers molds in a choice of eight rainbow colors, plus clear, white, black or "sparkle" finishes. The pair tested were supplied with the right ear in red and the left in blue, making them easy to identify.

Shure Bros. (www.shure.com) released the E-1 generic transducers ($190 list) at this year's winter NAMM show. One size fits all and, like the Etymotic ER-4 (see below), the E-1's are supplied with a compressible yellow foam seal that will fit most ears but must be cleaned or replaced as they wear out or get funky. The Shure E-1 can also be used as a generic-fit piece with Shure's PA-755 rubber triple-flange accessory. The universal-fit Shure E-1 drivers can also be upgraded with custom poly-vinyl ear molds (around $80 for the

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mold) from Westone Labs (part #57), that fit around the stems instead of the replaceable foam donuts, along the idea of the Sensaphonics IV all-silicone piece that also comes in a universal fit model. The E-1s are about the same efficiency as the Precision Audiotronics Challengers but have more highs, with a rising response until 4 kHz, and they don't drop out until 20 kHz. Adding the custom molds can offer slightly better isolation than the foam, depending on the individual's ear geometry, but also changes the high-end response, adding 6 dB of 6 kHz at the expense of 12 dB of 12 kHz in our measurement comparison. With Shure's wide distribution, this model makes in-ear monitoring accessible and affordable, with an upgrade path to a custom mold. These ear pieces have a response reminiscent of the SM58 and might be a good choice for the weekend warrior on a budget.

Artists moving into this technology for the first time are well-advised to set aside several "production" days to get everyone accustomed to their new ears

Sensaphonics (www.pcguild.com/sensaphonics) makes several models. The ProPhonic IV ($750 list with custom mold, $650 list for universal fit) is a ribbon transducer that fits into an entirely silicone custom mold and has been around for five years. It evolved from the generic Etymotic Research consumer ER-4 ear-buds ($330 list) that use yellow foam stem seals. While the ER-4 was originally introduced to the hi-fi enthusiast market for portable digital walkmans, the Pro-Phonic IV's ribbon driver has a lower impedance and gets much louder without breaking up. It is extremely flat, with no bumps in the low end, and gentle presence peaks at 3 and 8 kHz, finally rolling off at 16 kHz. For vocals and acoustic music, these are excellent. They have the highest isolation, allowing them to be used at lower volumes. These also make a good choice for louder bands that will get plenty of lows from the main speakers.

Two companies currently make two-way models that use two transducers for each ear. The SensaPhonics ProPhonic 2X ($850 list) is a compact two-way device using two ribbon transducers. The 2X uses a passive crossover at around 1,600 Hz, and a second oversized ribbon driver is used for the lows. The 2X is manufactured with tiny 8-inch Teflon wires that are attached to a stereo mini-jack that connects to a 4-foot cable but can also be ordered with traditional disconnects at the mold. They are offered in a choice of 17 different flesh-tone colors. These molds have a small body and long, soft stems housing dual sound canals for the two drivers. The 2X has smooth midrange, presence peaks at 1,600 Hz and at 4 kHz, and solid highs out to 16 kHz. These are a good choice for pop musicians listening to a full mix.

Ultimate Ear (www.ultimateears.com) makes several models, as well. The UE-5 ($850 list) is their top-of-the-line two-way and uses two ribbon drivers and a passive crossover at around 1,500 Hz. The UE-5's cables detach from the front where the cables start to bend around the ear rather from the side. They have flexible acrylic canals that soften when they reach body temperature. The UE-5 was designed with input from Jerry Harvey of Westone Labs in Colorado, a leading manufacturer of

custom otoplastics (ear molds). The UE-5 has a midrange bump at 500 Hz, a 4k presence peak that rolls off at 8 kHz with an "air" peak at 16 kHz. The UE-5 gets several dB louder than most other models. These are a good choice for contemporary musicians who want to rock with a full-on mix, but will easily get loud enough to damage hearing over the course of average-length shows. Other Ultimate Ears by Westone not evaluated here include the UE-2HP ($360 list) and the UE-3 ($550 list). The UE-2HP is vented and uses a dynamic or diaphragmatic element, while the UE-3 uses a ribbon driver. Like other lower-priced models, these each offer some compromise in frequency performance with more lows in the dynamic and more highs in the ribbon.

FINAL THOUGHTS

Once you've selected the in-ear monitors that suit you, you should know that cleaning of ear molds after each use is important for the safety of the user's ears and the well-being of the transducers. A film of ear wax builds up on the stem, both inside and out. This wax can pick up germs from handling which are then re-inserted into the ear. Buildup inside the tip of the stem is a leading cause of failure with new users. It affects frequency response and eventually blocks the sound entirely, causing what seems to be driver failure. Transducers should have a safe, organized home within a roadcase that also holds cleaning supplies, making care and safe stowage a part of the daily routine. Ear molds can be cleaned with a soap and water solution but using rubbing alcohol to disinfect affects soft acrylic canal tips, causing them to shrink and deteriorate. A good maintenance kit includes a disinfectant cleaner or towelettes, along with a small cleaning brush with a tiny wire loop for digging out the tip.

It's also worth noting that any new in-ear monitor purchase must be matched with an investment in the time needed to adjust to a new way of mixing and hearing. Artists and bands moving into this technology for the first time are well-advised to set aside several "production" days to get everyone accustomed to their new ears; otherwise the money spent may be wasted because the performers will decide to go back to wedges. However, once they are comfortable and happy, there is no comparison. ■

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

New Sound Reinforcement Products

DDA CS8 8-BUS CONSOLE

EVI Pro Audio Group (Buchanan, MI) introduces the DDA CS8 Live Mixing Console, an 8-bus board featuring the Spatial Image System™ for Left-Center-Right panning. Available in 16-, 24-, 32-, 40- and 48-input configurations, the CS-8 features 4-band EQ (two sweepable mids), phase reverse and insert points on all inputs, eight aux sends, four mute groups and a 12x6 output matrix. Additional stereo line inputs feed into two of the eight mixing buses. Also featured is flexible pre/post signal routing, direct outputs and 12-segment LEDs on the outputs. Any two CS-8s may be linked with a single ribbon cable, and LED bar graph and VU meter bridges are optional. Prices range from $6,410 (16 inputs) to $12,590 (48 inputs).

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NEW SABINE PRODUCTS

Sabine (Alachua, FL) announces three new products: The Power Q ADF-4000; the DQX-206 Instant Delay, Parametric Equalizer; and the SDA-102 Instant Delay. The Power Q ADF-4000 ($1,799) is a 2-channel, 24-bit digital multiprocessor that combines 12-band parametric and 31-band graphic EQ, real-time analysis, compression/limiting, gating and digital delay in one unit. Up to 12 digital filters (per channel) may be switched among parametric, fixed FBX Feedback Exterminator and dynamic FBX functions. Other features include automatic room EQ and adaptive level control. Configurations are saved and recalled via the front panel data wheel/hot keys, or through a serial/MIDI interface and Windows software. The DQX-206 Instant Delay, Parametric Equalizer, Compressor/Limiter and Crossover ($1,229) is a 20-bit, 2-in/6-out unit providing extensive crossover functions (with programmable compression/limiting and adaptive level control), three-band parametric EQ, HP/LP filters and digital delay of up to five seconds in 20-microsecond increments. An AutoSetup mode calculates and sets post-crossover speaker delays. The SDA-102 Instant Delay ($424.95) is a 1-in/2-out 20-bit digital delay offering up to 1,000 milliseconds of delay in 20-microsecond increments.

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QSC POWERLIGHT 1.0HV

QSC (Costa Mesa, CA) adds the $1,550 PowerLight 1.0HV to its PowerLight Series amplifiers. Optimized for maximum power into 8- and 4-ohm loads, the 2-rackspace 1.0HV delivers 300 watts/channel at 8 ohms and 500 watts/channel at 4 ohms. Features include a high-voltage power supply and QSC's PowerWave™ switching technology, Class AB output circuitry for low distortion (0.01% THD typical), switchable clip limiters, detented gain controls and LED meters. An HD15 data port interfaces the amp with QSC's MultiSignal Processor for remote control and monitoring. Inputs are Neutrik "combo" XLR/¼-inch connectors.

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APOGEE SOUND AE-7/7SB

Apogee Sound (Petaluma, CA) introduced the AE-7/7SB speaker system, comprising the AE-7 Concert Loudspeaker and the AE-7SB Dual 15-inch Subwoofer. The 2-way passive AE-7 features dual 10-inch woofers and a 2-inch ferrofluid-treated HF compression driver; max SPL is claimed to be 136 dB continuous, 142 dB peak. The AE-7 and AE-7SB trapezoidal cabinets have the same rigging features; both measure 61 cm wide, allowing them to be stacked four wide and three high in standard European trucks. AE-7 retail is $2,814; AE-7SB is $2,214; and the associated P-7 PVS single-channel processor is $779.

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CARVIN DCM POWER AMPS

Carvin's (San Diego, CA) DCM Series includes the three-rackspace models, DCM2000 ($699) and DCM1500 ($559), producing 2,000 and 1,500 watts respectively into a 4-ohm bridged load. Both amps feature custom-wound toroidal transformers and a modular design with solderless Molex and AMP high-current connectors, multispeed SilentService fans and opto-isolator limiting circuits. Inputs are XLR and ¼-inch; outputs are Neutrik Speakon, ¼-inch and binding-post connectors. The units are offered with a ten-day money-back guarantee and a three-year warranty.

K-T LOUDSPEAKER PROCESSOR

The DN 8000 loudspeaker processor from Klark-Teknik (Buchanan, MI) combines a five-way crossover with comprehensive digital delay and multiprocessing features. Two inputs may be individually delayed, combined and then split to five outputs, each channel featuring mute, delay, compression, high- and lowpass filtering, peak and shelving EQ, phase adjust, expansion and limiting. The single-rackspace unit has 32 user memories with memory protection and user-password lockout. Its 20-bit converters provide 114dB dynamic range; selectable crossover types include Linkwitz-Riley, Butterworth and Bessel with slopes from 6 dB to 48 dB per octave. Input delay is programmable up to one second and output delays are individually variable up to 300 ms. I/Os are electronically balanced XLRs; an AES/EBU I/O is optional. Remote control is possible via an RS-485 serial interface.

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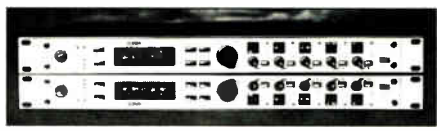

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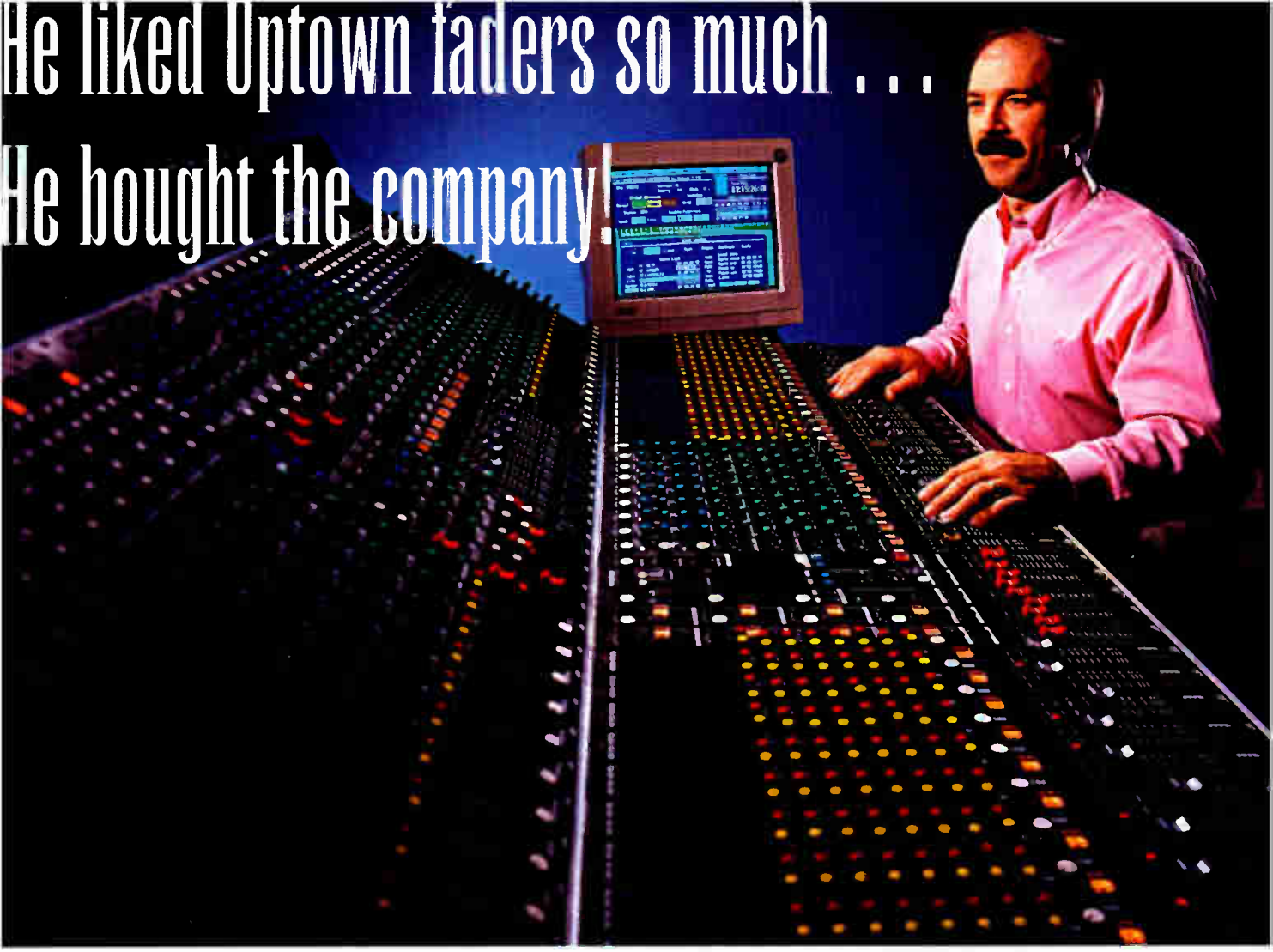

When Larry Droppa* was looking for an automation system to fit the renowned Paragon Console, a variety of systems were considered. After all, he couldn't put just any automation into the most sophisticated live mixing console ever built — he needed the *best*. And he found it in the System 990 from **Uptown Automation Systems,** the leader in high quality moving fader automation. An Uptown Automation system is easy to use, installs in virtually any console, and is one of the most affordable automation systems on the market.

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PRODUCT HITS FROM NSCA

NEW TECHNOLOGIES FOR TOURING PROS

This year's NSCA show was held in Charlotte, North Carolina, and this show continues to be an important meeting not just for engineers interested in the latest audio technologies but also for contractors and installers. The atmosphere at NSCA is relaxed and informal, and the timing of the show—toward the end of the spring—makes it a great last-minute way to check for new products before the live sound industry gets into full swing for the summer. I heartily recommend this convention for anyone making sound-reinforcement investment decisions. For those who missed it, here, listed alphabetically, are some of the highlights from this year's show.

AB International (Roseville, Calif.) was showing the SUB2000 3-channel amplifer with crossovers ($2,030 list), a lower-powered sibling to the SUB 3600, which was introduced last year. The SUB2000 is designed to power stereo systems with two 425-watt channels actively crossed over to a common subwoofer powered at 1,125 watts at 2 ohms. The front panel has detented level controls, 9-segment LED metering and four selectable crossover frequencies. On the rear are balanced inputs, dual temperature-controlled fans and an audio ground lift switch. The SUB2000 weighs 42 pounds and makes a complete, dedicated solution for many speaker systems.

Audio Composite Engineering (a division of Sound Image, Escondido, Calif.) introduced the 500 Series of compact two-way fill speakers made of the same proprietary composite material developed for SI's touring systems and used in its model 1250 12- and 2-inch, lightweight 47-pound enclosure. Cabinet construction employs woven carbon fiber over a Nomex® honeycomb core in a seamless, one-piece magnetically-shielded enclosure. The weather-resistant C550 ($799 list) has a rear port, a 5-inch woofer with a massive 3-inch voice coil and treated 1-inch dome tweeter for response to 22 kHz. The weather-proof C540 ($799 list) is an infinite baffle, sealed enclosure and was displayed operating underwater in a fish tank.

BSS DPR-422 dual compressor/de-esser and DPR-522 dual gate

BSS (Nashville) was showing the first products in its new Opal Series of signal processing equipment. The Opal Series is intended to appeal to a wider market; it's an affordable line that incorporates BSS quality and functionality with a striking visual appearance. These two dynamics processors are bound to become instant classics. The DPR-422 dual compressor and de-esser ($899 list) uses only a subtractor and gain control in the main signal path. De-essing can be either broadband or only high frequencies, leaving the lows uncompressed. The DPR-522 dual gate ($799 list) has a parametric key filter. A Check key manually opens the gate for line checks, and Key Listen allows the response of the key filter to be monitored. The gate's Open/Shut LEDs mimic the envelope of the gate. More Opal products are due out at the summer NAMM show.

CableTek Electronics (Port Coquitlam, B.C., Canada) showed a series of steel, 19-inch universal stage boxes/wall panels with 50 XLR ins and insert jacks, ten XLR outs and a choice of MASS, Veam or any customer-specified multipin interfaces. I don't get excited about stage boxes, but what made these stage boxes special was a red LED above each XLR input that automatically flashed when any ground noise was present on the line. This could be a real time-saver when you're setting up in a hurry...

ClearCom (Berkeley, Calif.) was showing its TW-20 two-way radio interface ($249 list). This standalone interface connects a walkie talkie system to a ClearCom intercom. It is powered from the intercom system, drawing less than a belt-pack. An XLR connects to the ClearCom system, a DB-9 connects audio to and from the base radio, a relay provides keying of the radio, and there are front panel adjustments for transmit and receive levels. Touring productions that rely on two-way radios will wonder how they ever got along without this clever device.

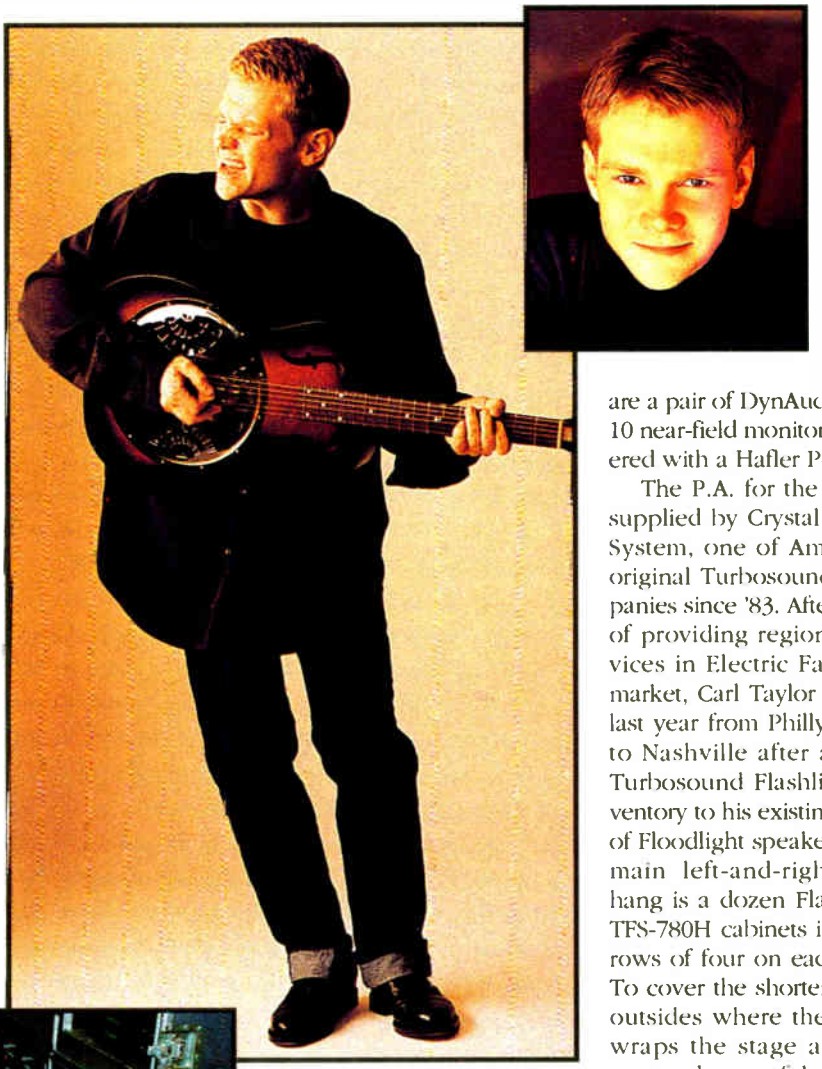
Crest Audio CA18 amplifier

Crest Audio (Paramus, N.J.) extended its popular CA Series amps with the introduction of the three-space, 75-pound CA18 amplifier ($3,390 list), satisfying customers' requests for affordable power for 1,000-watt, 8-ohm speakers. The CA18's power spec is 1,800 watts at 4 ohms and 2,500 at 2 ohms. Out-

—CONTINUED ON PAGE 164

BY MARK FRINK

STEVEN CURTIS CHAPMAN



Steven Curtis Chapman's Signs of Life tour stopped by Portland's Rose Garden Arena earlier this year. Chapman, one of the top Christian entertainers, has a new album, a new sound, a new sound company and a new FOH engineer, Paul Middleton. Middleton is a long, tall Texan, who has been mixing Bonnie Raitt for the past 11 years, and his career includes stints with Chris Isaak, Kenny G and four years with Julio Iglesias (a record in itself—there are engineers who never made it past soundcheck).

Middleton mixes the Chapman show on a Gamble EX-56 that is stuffed, and his input list spills over onto the Crest GTx console used for support acts Audio Adrenaline and Carolyn Arends. "This is the same console I've been mixing on for over a decade and my console of choice," he says, adding that there are several unique features that can't be found on other boards, like the meter bridge. "Having the extra visual aid of being able to see everything at a glance is incredibly helpful," he notes. "The other day I heard this huge pop and I just blinked across the meter bridge and instantly found the problem channel."

PHOTO: MARK FRINK

Front-of-house engineer Paul Middleton

Gracing the top of his meter bridge are a pair of DynAudio BM-10 near-field monitors powered with a Hafler P-3000.

The P.A. for the tour is supplied by Crystal Taylor System, one of America's original Turbosound companies since '83. After years of providing regional services in Electric Factory's market, Carl Taylor moved last year from Philly down to Nashville after adding Turbosound Flashlight inventory to his existing stock of Floodlight speakers. The main left-and-right P.A. hang is a dozen Flashlight TFS-780H cabinets in three rows of four on each side. To cover the shorter-throw outsides where the arena wraps the stage are two more columns of three Turbosound 750H Floodlight cabinets. Hung under each array as downfill are four Floodlight 760HM two-way high-mid and high-frequency boxes. Ground fills are a couple more pairs of Floodlights; four small Martin EM-25 speakers are used on the deck for center fill to the front rows. Paul Giasante, who has worked with Flashlight systems with the Pet Shop Boys, Pink Floyd and others, came out for a couple shows on the first leg, bringing his experience with previous Turbosound tours for Brit Row.

There were also a dozen Flashlight 780L subwoofers ground-stacked in two columns at each side of the stage, but as I walked in that afternoon the production manager was taking a couple subs away for sight-line reasons. "I originally was using the subs across the front of the stage, but the low end just pools up on the floor," Middleton explains. "Using columns to each side of the stage addresses the

BY MARK FRINK

entire room better." This reminds Middleton of the time he was mixing "Red," as he affectionately calls Raitt, at the Cape Cod Melody Tent. The local constables came in at soundcheck to find out which speakers went "boom-boom-boom" and promptly confiscated the subwoofers for the night. (I digress, but a chat with Middleton is an endless exploration of his life on the road with many good yarns. Later that night, Middleton told me the one about flying over the Amazon on a C-130 transport full of S-4s with a blown engine, but that's another story.) While we go out to the bus for a quick chat, CTS crew chief and system tech Jeremiah Hamilton EQs and balances the system with pink noise and program. Hamilton is assisted in flying the rig by Dave Cepeda.

Effects are run using Buford Jones' MIDI FX Cue Sheet, a HyperCard application running on a Powerbook. This simple yet functional software, in beta-test for several years, replaces the old-fashioned 3x5-inch cards with an onscreen display for each song's notes, automatically changing effects via MIDI. Middleton's effects include two Lexicon PCM 70s on concert hall settings for instruments and vocals, an AMS RMX16 reverb for vocals and an Eventide H3000 D/SE set at "6 cents" for background vocals. A Yamaha REV5 with a percussion plate at 1.3 seconds is used for snare. There are also three SPX-990s, one for vocal delay effects and two others used on instruments with an ambience setting. Inserts include six channels of Drawmer gates for toms, congas and bongos and eight channels of Drawmer DS-441 quad compressors for kick, snare, bass and backing vocals. For Chapman's two vocal mics, Middleton uses Summit TLA-100 tube levelers in line with his personal Gamble 6-band parametrics.

Chapman spends much of the night running around onstage wireless, playing guitar and singing into a custom Sennheiser MK-48 headset mic with a Samson UT-5 transmitter. For one section of the act, Chapman sings into a hard-wired Audix OM-5, as do the five backup singers in his six-piece band. "Ed Cherney came out during rehearsals the first time I tried the Audix on Bonnie and said, 'That's the best I've ever heard her vocal live,'" Middleton comments. "As it turns out, both Rob and I carry one around with us, so it was an easy choice for this tour." Chapman's group is constantly breaking into beautiful four-part harmonies, and their singing talents are no doubt helped by the fact that they're all using in-ear monitors.

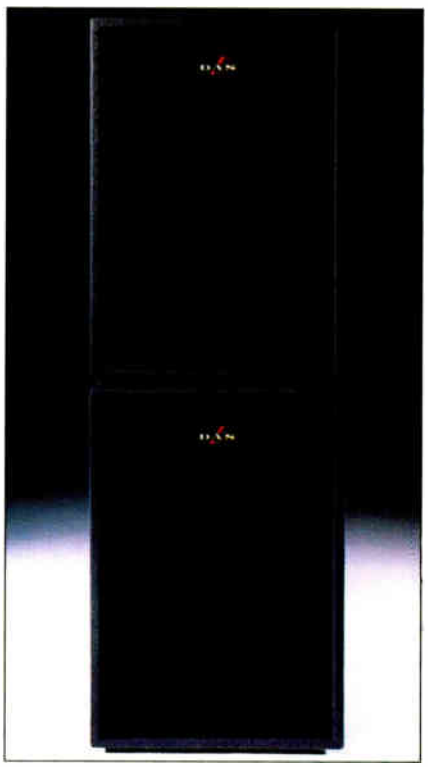
Monitor engineer Rob "Nev" Nevalainen, originally from Vancouver, B.C., is in his fifth year of mixing monitors for the group. He mixes on a 52-channel Yamaha PM-4000M console, with three more SPX-990s and the same Drawmer gates and compressors as at FOH. He is assisted in monitor-world by CTS technician Joe McFadden. The entire band is on Jerry Harvey's UE-5 Ultimate Ears two-way custom molds with Garwood Radio Stations. Nevalainen uses a rack-mount 8-channel Conex Electro-Systems AS-101 switcher with a small AS-401 remote that sits above the 4000's VCA faders to switch his ears between the mixes and the solo out of the console. He also has a novel system of mounting "shaker" transducers for the bass player, percussionist and drummer onto steel plates that they stand or, in the case of the drummer, sit a stool on. The drummer, of course, gets two. Calling them "thumpers," Nevalainen says this unique mounting method seems to increase LF conduction. Chapman relies on additional Turbosound subs at the downstage corners for low end.

The microphone list contains an assortment of old stand-bys. Middleton likes to use an AKG D-112 in the kick drum. "It sounds to me like an authentic, old kick drum," he says. Shure SM-57s are used on snare, as well as the high end of the Leslie cabinet and one of the electric guitars. EV N/Dym 408s are used on toms and bongos, and Shure SM-81s for hi-hat, ride cymbals, and for the percussionist's overheads; AKG C-3000 condensers are kit overheads. Sennheiser MD-421s are on the congas, the low end of the Leslie and the other two guitar cabinets, while the bass amp is miked with an EV RE-20. All the instrument amps are located beneath the stage where they are baffled and close-miked for isolation.

After a jangly alternative-Christian support act, the Chapman show sounded great at a reasonable volume, with a classic R&B sound that reminded me of a certain redhead. And with arena and theater shows constantly touring, the Christian market for entertainment seems to me to be healthy, with its own independent pipelines for distribution and marketing. The fact that instead of hawking T-shirts, the artist encouraged fans to go out to the lobby during intermission and contribute to a fund to feed a Latin American orphan for a year was also refreshing. ■

—FROM PAGE 162, PRODUCT HITS FROM NSCA

puts can be optionally ordered with Neutrik Speakon connectors. In other Crest news, the single-space LCP-AC8 system controller (retail is less than $1,000), nicknamed "the octopus," will be available this fall. Designed to work with Crest's CK Series power processing amps, this Locally Controlled Processor (LCP) saves up to 32 snapshots, addressing attenuation, EQ, crossover, limiters or delay on the internal NC processors of up to 8 amps (hence the name octopus). Programming and control are accomplished with Windows software via the 232 port, and the first eight snapshots can be recalled from the front panel or via contact closures.



D.A.S. Audio ST-2000 system

D.A.S. Audio, distributed in the U.S. by Sennheiser (Old Lyme, Conn.), introduced its ST-215 full-range enclosure ($3,474 list) to complement the ST-218 dual-18 compact folded-horn subwoofer ($2,265 list). The D.A.S. ST-215 employs horn-loaded dual-15s, along with a 2-inch driver on a unique spheroidal horn in front of the woofers, which acts as their diffusion plug, for 50x30-degree dispersion. Together they are called the ST-2000 system. All D.A.S. Sound Touring enclosures are carpet-covered, are made of Finland birch ply, and have fly points with internal steel bracing and castors on the back for easy transport.

DDA (Buchanan, Mich.) introduced its new CS8 console, available in frame

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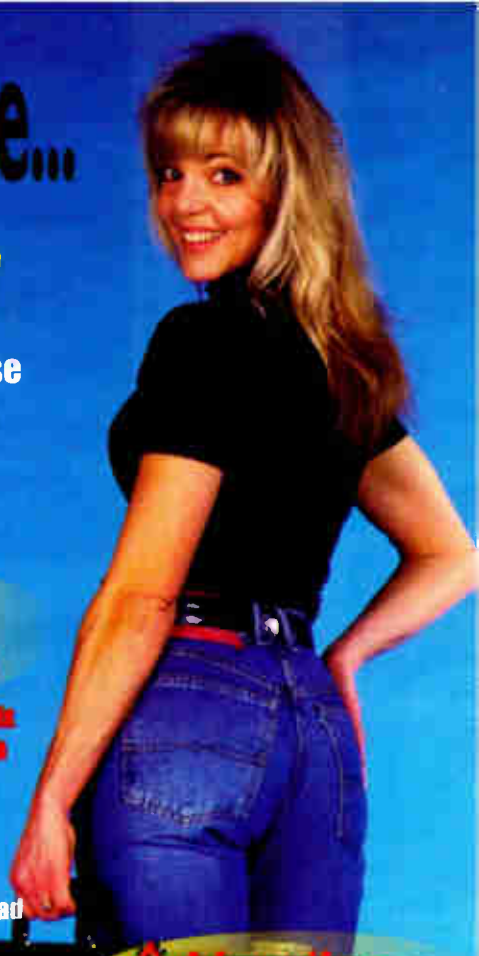

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sizes from 16 to 48 channels; the last four are stereo. This 8-bus, 8-aux console has stereo and mono main buses that can be selected and assigned as a Spatial Image System™ (SIS) that changes the action of the panpot to give it three-way panning across the three main outputs. The inputs have 4-band EQ with fixed highs and lows, swept mids and an 80Hz highpass filter. The master section has six matrix ouputs and two additional stereo returns. The solid look and feel are borrowed from the board's Midas siblings, and all CS8 consoles can be linked together. The 24-channel version lists for $7,910, and the 40-channel with Touring Package Option (spare PSU w/auto-switchover, meter bridge, Littlites™ and road case) lists for $15,600.

EAW AS-690 compact three-way speaker

EAW (Whitinsville, Mass.) unveiled a new, compact three-way speaker for its Architectural Series, the AS-690 ($2,415 list). The enclosure measures 3x2x2 feet and is loaded with a 1-inch compression driver, a 10-inch horn-loaded mid and dual slot-loaded 12-inch woofers. EAW also introduced the MH433 high-output, long-throw mid-high speaker. This product uses four 2-inch high-frequency drivers, three 10-inch mid-bass drivers, and marks the debut of EAW's Phased Point Source Technology (PPST). This technology places drivers in close proximity to act as a line array in the vertical plane and, when arrayed, as a point source in the horizontal plane. The use of signal processing allows the vertical pattern to be steered.

Electro-Voice (Buchanan, Mich.) added two trapezoidal models to its DeltaMax™ line. The DMS-2122/42 ($5,667 list) is a long-throw mid-high speaker with 40x20-degree coverage. It employs dual 12-inch woofers and two N/D4 compression drivers. The DMS-2181T ($3,434 list) is a dual-18 subwoofer in a matching-sized, flyable, trapezoidal enclosure. This new sub nearly matches the bass reponse of the

Electro-Voice DeltaMax DMS-2122/42 speaker

larger rectangular manifolds and allows arrays for touring or installations to be easily constructed, along with the existing DMS-1183/64, which has a 60x40-degree coverage pattern. In other EV news, a new low-cost, front-loaded dual-18 sub was introduced, the TL770D ($1,659 list).

Galaxy Audio's The Far Outlet

Galaxy Audio (Wichita, Kan.) introduced "wireless AC." The Far Outlet™ is a portable, self-contained source of 110-volt, 60Hz household electricity ($299 list, battery not included). About the size of a lunchbox and light enough to carry in one hand (less than 30 pounds), The Far Outlet provides up to 200 watts continuous and 400 watts peak power for four to eight hours, enough to power small "sound-on-a-stick" P.A.s out in the field (literally). DigiScrub filtering circuitry produces low-noise AC power that will not introduce distortion into computers and audio devices. Charging is as easy as plugging into a wall outlet or (with the optional converter) into a car's cigarette lighter.

JBL Professional DSC260 digital system controller

JBL Professional (Northridge, Calif.) unveiled its new single-space DSC260 digital system controller ($1,895 list), which has 60 storage registers, including factory-programmed settings for specific JBL speakers, including the new HLA. Its six outputs can be derived

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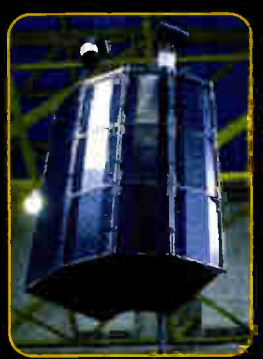

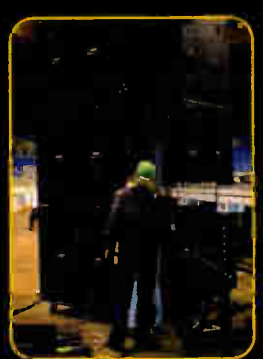

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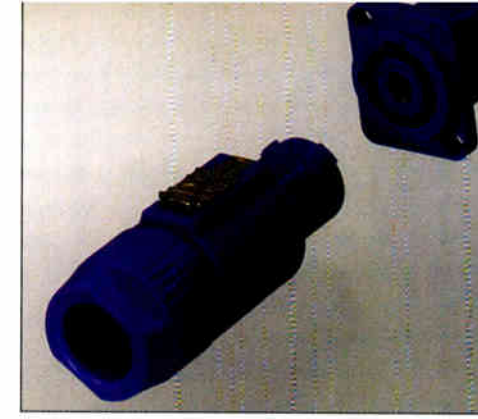
from either or both of the two inputs, and the DSC260 provides up to 630 milliseconds of delay, crossover slopes up to 48 dB per octave, mid-band type limiters and a total of up to 30 parametric EQ filters that can be assigned to inputs or outputs. In other JBL news, the Architectural horn-loaded family of speakers has been expanded to 11 models, all with the same footprint. The AS3215 three-way speaker augments the previous AS3218, substituting a 15-inch speaker in the low end, and both models are now offered with 90-degree or 60-degree horns. Similarly, two AS 2210 mid-high enclosures with single 10-inch mids are offered, and there is also the dual-10 AS2220 with a tight 40x20-degree pattern. Adding to the existing AS1028B dual-18 are three new low boxes: the AS1015B single and AS1025B dual-15s and the AS1018B single-18.

Klark Teknik (Buchanan, Mich.) introduced the DN8000 single-space 2-in, 5-out speaker processor ($3,692 list). Each ouput includes crossover filters up to 48 dB per octave, alignment delay up to 300 milliseconds, two bands of parametric EQ, shelving, compression, limiting, phase and polarity. Each input can be delayed up to a second in 21-microsecond steps. There are 32 user-programmable memories and 60 factory presets for Electro-Voice and other speaker systems.

Littlite RLX Raklite

Littlite (Hamburg, Mich.) introduced the RLX Raklite ($89 list), a single-space rack panel equipped with a dimmer and two XLR connectors for accommodating the variety of Littlite XLR Series detachable gooseneck lamps.

Meyer Sound (Berkeley, Calif.) introduced its newest and smallest self-powered speaker, the HM-1 ($1,100 list). The HM-1 has a 7-inch graphite cone driver and a concentric soft-dome tweeter in a shielded enclosure whose front is the size of a piece of paper and 9 inches deep. The internal bi-amplifier provides 300 watts total power along with crossover and protection. It provides 100-degree dispersion and a maximum output of 116 dB. These unique speakers are remotely powered from a 48-volt supply, eliminating the need to install their wires in conduit.



Neutrik PowerCon

Neutrik (Lakewood, N.J.) was showing the new PowerCon locking AC mains connector. Designed to fill the gap between expensive industrial motor connectors and nonlocking IEC "Euro-connectors" found on most professional gear, the PowerCon is the same size as the company's incredibly popular Speakon, and is keyed differently, natch, but pricing will be similar. The 3-pole connection is rated for 20 amps, mates the ground first and last and is designed to prevent arcing when connected under load.

Renkus Heinz SR6 and SR7 speakers

Renkus Heinz (Irvine, Calif.) unveiled the new SR6 and SR7 three-way compact speakers (around $1,875 and $2,100 list, respectively). At their heart is the new CDT-1 CoEntrant driver, combining the output of an 8-inch midrange and a 1-inch compression driver in a single device. Mounted to a 2-inch exit Complex Conic horn, the result is true point-source performance from 500 to 17k Hz, with a program handling of 350 watts. The two enclosures are rounded out by a high-power woofer, either a 12 or a 15. Each model is available with either 60- or 90-degree horn patterns. The compact speakers weigh 70 and 91 pounds, respectively. At the show, Karl Brunvoll provided an informative demonstration of this new approach, which combines both of RH's propri-

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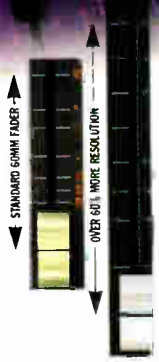

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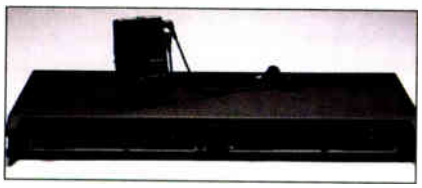
etary technologies for the first time.

Sabine (Gainesville, Fla.) introduced the Power-Q ADF-4000 stereo processor ($1,799 list). This two-space digital processor incorporates parametric EQ, 31-band graphic EQ, delay, gate, compressor and RTA functions into a single package. The Power-Q adds automatic room equalization, whereby the unit can adjust its filters to match a target equalization curve to the functions previously found in Sabine's popular ADF processors. In other Sabine news, the REAL-Q2 was reintroduced with a new low price ($1,999 list). Contractors flocked to see Sabine's new DQX-206 single-space processor ($1,230 list), which combines delay, EQ, compression and crossover functions, as well as the tiny SDA-102 single-input, dual-output delay ($425 list).

Sennheiser (Old Lyme, Conn.) entered the wireless in-ear monitoring market with the new 3050 Series; a single-channel system will list for around $4,000. The system uses Sennheiser's HiDyn plus* for a signal-to-noise of



Sennheiser 30560 in-ear monitoring system

more than 105 dBA and a range of over 500 feet. The 3050 Series operates on one of 16 frequencies in a range between 450 and 960 MHz. There are two transmitters: the single SR3054-U and the dual system SR3056-U, each contained in a single-space chassis. The EK3052-U beltpack receiver is designed for use with most transducers, including the custom-molded type suggested by many audiologists. The quarter-pound beltpack has LED power and battery indicators, and it runs eight hours on two AA alkalines or four hours on Accupack rechargeables. Other new products in Sennheiser's 3000 wireless Series include the SKM3072-U handheld UHF transmitter and the single-channel EM3031-U and dual-channel EM3032-U receivers, all of which can be used with other Sennheiser wireless products.

Soundcraft (Nashville) finally unveiled the new Series Five FOH live sound console. The company has gone to great lengths to incorporate all the features demanded by top touring engineers and has come up with a modern

Symetrix 562E windowing expander/gate

Symetrix 533E graphic equalizer

successor to the classic Series Four of yesteryear that competes favorably with other consoles in and above its price class. The Series Five is available in sizes from 24 to 48 mono input channels; each size includes an additional four stereo mic/line inputs, bringing the number of inputs to 56 on the largest (list price only $48,000). Mono inputs have separate A/B inputs, fully parametric EQ with high and low shelving, adjustable high and lowpass filters and ten-segment LED metering beside each fader. There are eight mono plus two stereo auxes, eight subgroups, ten VCA groups and ten matrix outputs. The ergonomic white fader deck is horizontal, and the console incorporates extensive solo, mute and MIDI capabilities, including a MIDI data fader.

Spirit by Soundcraft (Auburn, Calif.) had just gotten the new Monitor 2 mixer straight off the boat from England. The Monitor 2 is offered in 24-, 32- and 40-channel versions ($4,700, $6,000 and $8,000 list, respectively). It has 4-band EQ with swept mids, 100Hz, 18dB-per-octave highpass, individual phantom power and a built-in splitter. It has 12 auxiliary buses, and the last two pairs are set up for stereo in-ear applications with two additional inputs for ambience mics.

Symetrix (Lynnwood, Wash.) expanded its new family of equalizers with the addition of the 533E three-space stereo graphic ($929 list). "The 533E is our flagship dual-channel equalizer," commented Steve Kawasaki, Symetrix's sound reinforcement guru. "Now in the popular three-space format, it offers audiophile topology filters and metal-shaft sliders with grounded center detents, like the rest of our new graphics." I was able to compare the sound of the Symetrix graphics to several popular EQ brands and was very impressed with the sonic quality. Symetrix also intoduced the 562E "Windowing" Gate ($579 list), which uses advance processing to eliminate pops and clicks and features high and low key filters demanded by professionals. ■

QUICKTIP

Alex C. Jacobs wrote:

I just finished reading your article on touring loudspeakers. You mentioned the all-too-often-used claim of array-ability, and stated that it is possible to reduce harshness and coloration by spacing cabinets slightly. Is it ever truly possible to set up a system whose combined output will replicate the theoretical perfection of a spherical wavefront? I've been trying to figure out a way of testing this concept but don't know of any technically acceptable forms. Any suggestions? The systems I deal with are small, typically used for medium to large clubs, but with multiple speakers horizontally. I haven't had to deal with vertical problems...I'll jump off that bridge when I come to it!

Alex, let me answer your second question. Arrayable speaker systems with adjustable elements address the issue of vertical coverage. When it comes to flying, there are many methods of steering the lowest row of horns. Some proprietary systems have enclosures designed for the top or bottom row with the horns preangled. Other systems allow individual boxes to be adjusted by tilting the baffle. Some use a "center-of-gravity" hang to tilt down the bottom row of an array by moving the hang points towards the back, while others use "pull-up" straps.

During the stacking years, many companies simply put a dozen or so blocks of "audio wood" in with the mic stands to manually tilt up the top row for the balcony. For your club applications, I suggest a dozen 1-foot lengths of 2x4 painted black, with your company's name and phone number stenciled. Placed under the back, they can tilt a speaker down for the dance floor; under the front can point it up toward the balcony. These simple devices will also serve you well onstage for adjusting the angles of wedges and sidefills, and may be the best audio investment you will ever make. Longer versions can be used as a mixing stick. Total cost: under $10 and an hour of your time. With a dozen pieces of "audio wood" you're ready for the next "level." Good luck. —*Mark Frink*

BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

BEING YET ANOTHER TREATISE ON TIMECODE

by Larry Blake

It pisses me off just to *talk* about timecode. Sometimes.

More often than not, it's a fun topic, because it is one of the few things in my line of work where right and wrong, good and bad, are clearly delineated, like a *Dragnet* episode. What has to be done and how to do it are pretty straightforward, and there is no reason why anyone should have timecode problems. (Of course, saying this will put the hex on me, just like when my father and I were leaving an LSU football game in the '60s with the Tigers up by 9 points and a few minutes remaining. "There's no way they can lose," said young Larry. A long pass and a field goal later, my father was quite seriously blaming me for "putting the mouth" on the team.)

Just as the qualities you like in a person are the same things you don't like—flipped out of phase—so does the apparent simplicity of timecode make it frustrating. Getting correct timecode starts with a spec sheet detailing "just the facts, ma'am" to whomever will be doing all recordings and transfers. The most important lines are not the specs themselves, but the admonition that "if they are not followed, we will bounce the transfer back to you." In this regard, get your spec sheet to them a few days before the transfer and talk with the person who will be in charge (usually the telecine colorist or his/her chief engineer). Send your spec to the post-production supervisor and to the picture editing department at the same time, because they are also in this with you. (The minimum prep that the picture editorial department needs to do is to add lengthy head leaders to allow pre-roll during telecine.)

Make sure they know how to reach you day and night, because transfer gremlins tend to be nocturnal creatures who manage to do things the wrong way for years without anyone noticing. Thus, I can assure you that you will end up on the receiving end of a classic "no one has ever complained before."

One of the more crucial go/no go points in timecode is the transfer of edited picture, either at telecine from a conformed workprint with accompanying mag track or a dub of a "digital cut" output from a nonlinear edit system. Since you will be cutting your sound to this picture, the relationship of the timecode to the film workprint will guide how "in sync" your tracks will be. The key here (and you'll have to forgive me for repeating this for the umpteenth time) is to get your start point dead on. The first frame of picture on a reel should be the first field of the hour timecode of that reel number. Thus, when you jog the videotape for reel 4, when the timecode counter turns over to 04:00:00:00 should be the first field in which the "Picture Start" frame is visible, and likewise the footage counter should also turn over to 0000+00. (Some video facilities will put a numeric prefix before the footage counter in an attempt to aid in identifying the reel number, but I think it's redundant and just takes up space.)

What *should* be added, though, as a check in the field accuracy of the transfer, is an A/B/C/D frame identifier for the footage counter, plus a field 1/field 2 identifier for the timecode. This makes it easy to check, as should be clearly stated in your spec, that the start frame (and every fifth frame thereafter) is an "A" frame. That is, the :00 and :05 timecode frames will all exactly match film frames with no overhang.

Unless you make it a habit to start every reel with the A frame represented in such a manner, you have no guarantee that the next transfer's timecode and film footage counters will match. You will appreciate this accuracy when you have to start cutting sound to a video output of a nonlinear offline cut. (There are companies that specialize in creating film footage and timecode burn-ins from the timecode track on the "digital cut" dub.)

Note that the start point for television shows is for the first frame of a program to start on the hour, and not the first frame of the 8-second leader, as is the case with features. Both approaches make sense for their own purposes: In film, you're counting from a physical start mark on film, where you "zero" your counters, and in television you're frequently trying to match the

—CONTINUED ON PAGE 174

FACILITY SPOTLIGHT

SAN FRANCISCO PRODUCTION GROUP

by David John Farinella

As the San Francisco Production Group went through its recent expansion and reorganization into four divisions, including The Editorial Group, The Design Group, The New Media Group, and Audio and Video Post Services, Leroy Clark watched all of the changes taking place, anxiously awaiting the move into his new space. He saw Avid systems upgraded and reconfigured. He saw a wave of programmers take over new office space after SFPG's sister company, SOME Interactive (South of Market Entertainment Interactive), moved in from across the street. Then CEO Debra Robins walked down the stairs, took Clark into the room formerly known as Edit 1, and said something like: "Leroy, here's your new home."

It was now time for Clark, audio engineer and sound designer at SFPG for more than 10 years, to build his own space into a complete digital audio post-production suite. Finally it was time to retool and take advantage of the acoustic suite previously designed and built by Randy Sparks of RLS Acoustics. The space includes a multi-layer suspended floor, floating speakers (JBL 4430s, with close-field Yamaha NS-10s and Auratones), birch sloped ceiling, RPG Diffusors on the rear wall, and custom consoles designed and built by Michael Christ. Clark, meanwhile, was revamping his own knowledge of the products on the market. Even though he had used a Studer Dyaxis II workstation with Sound Designer II sample editing software for a number of years, he decided it was time to move into Pro Tools. "For us, the decision was based on the Avid," Clark explains. "As Avid has gained popularity, especially among producers in this town, it

—CONTINUED ON PAGE 176

PHOTO: STEVE JENNINGS

Leroy Clark in his comfortable, fully digital audio suite at SFPG Studios

POST NOTES

Todd-AO just won't sit still. Last year, the company acquired the Skywalker Sound South facility on Santa Monica Blvd. and recently opened two London facilities. Now the one-stop sound editorial shop has purchased **Hollywood Digital** (all management will remain), with plans to add a Hollywood Digital boutique in Santa Monica. Todd-AO also opened a five-room digital editorial complex in the CBS Studio Center in Studio City. And rumor has it that the company is eyeing Nashville. Stay tuned... **Soundelux** is also growing, having added Signet Sound to its Hollywood and Orlando-based editorial family last year. Now the company has added mobile ADR services for actors who can't get away from their next location. A Tascam DA-88 is locked to ½-inch video, with Mackie 1604 mixer for control and Timeline MicroLynx for cueing and system sync...Speaking of growth, Fairlight has made impressive inroads into the post world recently, having installed FAME consoles at Superdupe (NYC), Audio Recording Unlimited (Chicago) and Producers Video (Baltimore); MFX3^{plus} workstations went to Soundelux (10), Warner Bros. (17), and Post Group (6); and at NAB, the Digital Audio Dubbers, DaD, were big sales items, with eight going to the new stages just built by Stephen Flick and EFX Systems and another six going to the new facility Westwind Media in Hollywood...Alan Ett Music Group (original music production and sound design) and Media City Sound (full-service audio post) have joined forces and moved into a new 6,000-square-foot space in Studio City. The facility, which includes three mixing suites, four editorial rooms, two music production rooms and a music library, is based around Avid and Pro Tools workstations.

Noted Hollywood sound editorial houses Creative Cafe and EFX Systems have joined forces to build a full-service mix/editorial facility in the old Canon Film Building on Wilshire. The new facility will include two of the largest Harrison Series Twelve/MPC consoles in the world. Pictured at the Harrison booth at NAB (L to R) are: Richard D'Abo of Creative Cafe, Gary Thielman of Harrison, Dave Powell of Harrison, Rick Stevens of Creative Cafe, Steve Flick of Creative Cafe, Judee Flick of Creative Cafe and Jeff Evans of Audio Intervisual Design.

Consoles include Otari Elite and Status, Yamaha 02R and two Soundcraft Ghosts...On the other coast, **Broadway Sound** opened an additional studio in June. The new suite is built around an AMS Neve Logic 2, with VO booth, two Foley pits, 6-channel surround and an overhead projection system. The room was designed to accommodate long-form programs so the other studios could maintain the spot work...**The Santa Fe Center Studios** has opened in Albuquerque, specializing in industrials, corporate and ADR. The two-room facility includes an Amek Einstein board and Pro Tools stations...Composer/sound designer Jeff Elmassian and exec producer Lori Rose opened **Haven**, a music and design shop in Santa Monica, then quickly added staff composers Christopher Guardino and Andy Rehfeldt and sound designer Rich Pavone...**What the Hale Music**, one of Chicago's leading music production facilities, is looking to expand further into film and television work by opening an L.A. facility on Sunset Boulevard. The facility is centered around three cascaded Yamaha 02R consoles...**The Stokes Group**, one of Dallas' top video houses, opened a digital audio room, incorporating ISDN technology and headed by senior audio engineer Collyer Spreen...Back in February, **AcousTech** opened a studio to complement its music-production-for-advertising business. And partners Wayne Dykes and Danny Stern decided to go with two Otari 24-track analog machines for recording and Studer Dyaxis workstations for editing. Matthew Still was added as a sound designer/mixer... Howard Schwartz Recording in New York added engineer/mixer **Leslie Mona-Mathus**...**Paul Robb**, founder of electronica group Information Society, has joined the staff of Mess Hall Music and Sound Design in New York... Audio post mixer **Todd Miller** has moved over from Acme Soundworks to Photomag in NYC...Worldwide Wadio, the award-winning radio production/post house, promoted **Stewart Sloke** to vice president/production director... National Boston hired **Jeff Largent**, Oscar winner for *Braveheart*, to head its audio division...**Digital Sound & Picture** completed the edit/mix for the New Line film *Austin Powers*...Dave Grusin and director Christopher Reeve were in Clinton Recording, NYC, to record a 7-channel score on the refurbished Steinway grand for the HBO picture *In the Gloaming*...**Soundwave Post** (Arlington, VA) VP/engineer Jim Bloch employed a Fostex D-80 hard disk recorder and AMS Neve Logic 3 to create a 7-channel soundtrack for a 16-sided "barn," a special venue presentation in historic Mt. Vernon...On to San Francisco: Hunter Pipes of music production house **Dubeytunes** began audio production for the animated Nickelodeon series *Life With Lupe*...Andy Newell of **earwax productions** created the music and sound design for Budweiser's "Left Field" spots, Isuzu's "Ambush at Canyon Creek" and Nike... Actor Rob Schneider was in **Crescendo!** recording voice-over for TNT's "Sports Illustrated Swimsuit Special," engineered by Tim Claman...Composer Rex Taylor Smith and engineer Scott Strain, principals of **noise**, an S.F. music production/post studio, worked up a Nike "Women Role Models" TV spot and handled full editorial/mix for *Laughing Out Loud*, a short film by Richard Sears...Up in Seattle: **Clatter&Din** handled audio for spots for McDonald's and Fox Sports, and multimedia projects for Sierra On Line and Microsoft...**Bad Animals/Seattle** sound designers Dave Howe, Mike McAuliffe and Tom McGurk were nominated for two Emmy Awards—sound editing and mixing—for their work on *Disney Presents Bill Nye the Science Guy*. Last year, the team won for *Bill Nye*...**Non-Stop Productions** (Salt Lake City) created an all-new theme for ABC's Wide World of Sports, but maintained much of the signature sound of "The Thrill of Victory" we all grew up with. The old theme was largely synthesized; the new theme is full orchestral...Nike made use of **Newton Bard**'s ISDN capability to record athletes Jason Kidd and Gail Devers for the product leadership campaign...Finally, **Kurt Schwenk**, formerly of Dolby, has been hired as director of professional THX operations at THX Theatres and Theatre Alignment Program. ■

—FROM PAGE 172, SOUND FOR FILM

"clock on the wall," so starting the program on the hour is smart. In the latter case, when working in NTSC, you have to use drop-frame timecode or your display will be running a little faster than the clock on the wall.

But please don't let this appear to be an endorsement of drop-frame code; in fact, you should use it only for episodic television shows that have to follow a defined set of acts and commercial breaks. For all other NTSC programs, you should only use nondrop code.

I know I have harped on this one for a long time, but I am constantly amazed when material such as home video telecine masters of feature films are spec'd to use drop-frame. My standard reply to the standard question of "how else will we know how long the film is?" is that you do it the old-fashioned way: add up the reel lengths and convert from feet/frames to time. Duh.

As soon as your tapes arrive, you need to check them not only for the obvious matters such as burn-in window placement and footage/timecode relationship, but also for stuff that you should be able to simply take for granted, like whether the longitudinal timecode (either on a dedicated timecode address track or on track 2) matches the visual burn-in. Or whether the worktrack is in sync with the picture.

This last one, especially, stumps

FILM SOUND FORUM

The Los Angeles County Museum of Art this summer will sponsor a unique five-week seminar/screening series on film sound as an art form, from silents to digital release. The series, which takes place on Friday and Saturday nights from July 11-12 to August 8-9, will feature lectures by Bob Gitt of the UCLA Film and Television Archive, Tomlinson Holman, developer of THX, Ioan Allen of Dolby Laboratories, and sound designers Walter Murch, Ben Burtt and Gary Rydstrom. Scheduled themes, and films, include: an introduction called A Century of Sound; 70mm Magnetic: *Ben-Hur* (1959); Early Sound Musicals: *Applause* (1929), *Love Me Tonight* (1932); *The Conversation* (1974), *Blow Out* (1981), *Forbidden Planet* (1956), *Theremin: An Electronic Odyssey* (1994); Picturing the Score: *Tommy* (1975), *Metropolis* (1926/1984); Things That Go Bump in the Night: *The Exorcist* (1973), *Repulsion* (1965); Dolby Stereo: *Raiders of the Lost Ark* (1981), *Earthquake* (1974); Digital Sound I: *Das Boot*, 1982/1997); Digital Sound II: *Jurassic Park* (1995).

For more information, call the museum hotline at 213/857-6110. ■

even top transfer houses. While they know that picture is delayed by *n* fields because of video processing such as noise reduction, very few facilities will actually then take the trouble to delay the worktrack by the same amount. The way to check sync is *not* by eyeballing lips (no two people will ever agree, and you'll start doubting yourself eventually) but by scrubbing the tape at the "two pop," which will be 0009+00 feet/0*n*:00:06:00 timecode. Tweak the audio delay, either with a digital delay line or by adjusting the mag start mark, until you hear the pop as you see the 2 frame (or 3 if you are using an Academy footage leader).

One of the least obvious aspects of timecode is when not to use it. Well, not *not use* timecode, but to not go by it. If you are cutting or mixing sound for any project that will match a film negative, be it a feature film or certain movies of the week, I wholeheartedly advise you to take advantage of the opportunity to use feet/frames as your guide. There's every reason to do so.

First of all, it's much easier to tell at a glance where you are with 35mm footages than with timecode. Ignoring the fast-moving frames units that are common to both timecode and footage burn-ins, it's easier to absorb 45 feet than it is 04:00:30. You're basically looking at one three- or four-digit number that is changing every ⅛-second (owing to the 16 frames in every foot and 24 fps film speed).

Ergonomics aside, if you intend to match the final conformed negative exactly, you really *have* to cut to film footages, since only one out of every four film frames precisely matches two fields of one video frame (the A frame discussed above). This applies primarily to the idea of scene changes and beginning and end of reels; if you cut on timecode frames (and don't get into the nasty world of subframes), your cuts will not exactly be where they will be on the negative.

Even if you've cut everything "properly," you need to take all of this into consideration when mixing to video copy and using a timecode synchronizer to keep everyone together. If you are mixing from multitrack to multitrack, and have to do offsets to accommodate picture changes, you can maintain absolute accuracy only if you use subframes.

For example if they add or subtract one film frame, the offset is 1.25 video timecode frames. And two is 2.50, three 3.75, and four is exactly 5 frames. Stare at these numbers long enough (it's a first cousin of understanding drop-frame timecode) and it will all make sense keeping in mind the 4/5, 24/30 integers. It's clear that you'll never have to deal with subframes if said picture changes are in multiples of four film frames, but good luck in getting your picture department to help you in this regard.

You can get the timecode right and still be out of sync with regard to sample rate. The subject of sync and digital audio is a book unto itself and is much more easily screwed up than garden-variety timecode and analog audio or video tape. Just as I harp on the importance of good start point hygiene with timecode, the use of a frequency counter on the word clock output is your best insurance as to the sync integrity of your digital audio recordings. While I don't mean to imply that timecode is irrelevant with digital audio (it most definitely isn't), eventually you will have to do a D-to-D copy of your digital audio tapes, and if your sample rate is

not what it is supposed to be, you will be unable to stay in sync without doing some sort of sample rate conversion, which is a pain in the ass.

We don't usually devote much brain power to laying out timecode tracks because there are very few places it can go. Nevertheless, there is some small room for interpretation. First, put your timecode for cutting videotapes in as many places as you can find. For example, if you're using ¾-inch tape (which won't be for long; if you're still using it, you'd best start looking for a replacement), you should put code on the address track, track 2, and as VITC. While your current system might only use one of them, you never know where this tape will be played next week or in five years when someone wants to remix the show.

On DASH-format digital multitracks, since the analog tracks are useless for audio recordings, I put field rate sine wave pulse on one track and spare timecode on the other as a backup. I've never had to use it but...

Send stories of your tired and poor timecode to P.O. Box 24609, New Orleans, LA 70184; fax 504/488-5139; or via the Internet: swelltone@aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be that it has more good restaurants and invented-in-this-city dishes than you can shake a heated Napoleon House muffuletta at.

—FROM PAGE 173, S.F. PRODUCTION GROUP
made more sense to work with a system that was much more compatible."

It also made more sense in his eyes to use a system that allowed him to make additions and upgrades as he saw fit. "In the audio domain [the plug-ins] allow me to get a whole rack of EQ modules in one plug-in," he says. "I don't have to buy all the hardware or have racks and racks of processors. It's all in the computer, so there's a lot more creative flexibility. The top-quality plug-ins like Focusrite, TC Electronic, people that make very professional boxes, are making these plug-ins for a fraction of the cost. You've got the ability to have multiple uses, and you're not limited to having one hardware box that does one thing."

While he has added plug-ins like the Focusrite D2, TC Chorus, and TC Reverb and Dither, to name a few, it's the DINR noise-reduction plug-in that he uses the

most. "Most of what I get is from the field. 'Oh, yeah, we got audio on tape and they can fix it in the mix,'" he mimics. "Well, that's where I come in and where Pro Tools is really great."

Clark also likes the way Pro Tools interfaces with the rest of the company. "We've got all the computers in the building tied together with Ethernet. We ship files back and forth shamelessly, and it gives us a lot more flexibility," he says. "The simplicity of working between the Avids and Pro Tools frees up our editors to really focus on the details. This allows each of us to do what we do best and put it under the microscope, or in my case a stethoscope, instead of expecting the editor to focus on all of the details simultaneously."

The new facility has enabled SFPG to enter the next wave of audio transfer via the Internet. Clark says that rather than shipping a VHS tape off for overnight delivery, he is getting calls from agencies saying, "Just put a QuickTime movie on your Web site and we'll download it. That's the kind of direction we're seeing, not just from agency people, but even people locally," he says. The facility is plugged into EDNet with a Telos Zephyr Digital LAN Patch, which gives Clark a little peace of mind and enables him to be more creative with his sound design. As an example, he says, he recently called a company in Hawaii to get a particular bird sound, and rather than having to wait for the files to come through the mail, he received them almost right away. "That's where we're going, as opposed to where we came from, which was the traditional post-production work of physical tapes," Clark says.

As the Dyaxis and physical tape days came to an end at SFPG so did the days when a board was needed in Clark's suite. His trusty Neve console was moved out, although he keeps a small Mackie 16-channel mixer on his desk. "The Mackie is really for monitoring," Clark says. "Everything I need to do is in the digital domain of the computer, which has full 24-bit processing. There's no reason to go out with [the signal] until the final output tape."

Since Clark is now up to speed with the rest of the company, and the SOME Interactive folks are established upstairs, SFPG is finding that their clients are more apt to use them for all parts of their marketing tools. "It's not unusual for a video client to come to us now and say, 'Now we need CD-ROMs or something to put on our Web site,'" he says. "It seems a natural to us, and it's something we're really trying to embrace."

Indeed, client services manager Lauri Clark says, "It's exciting because we can do part of a project or we can do the whole thing. With the audio suite, now it's a matter of crossing the hall and not town to finish a project. People are realizing the advantage of keeping everything under one roof. It allows the whole creative process to really flow." As an example, she points to recent a video, CD-ROM and Web site project that was completed for Vanstar; an ongoing video, Web site and PowerPoint presentation project for Broadband; and a CD-ROM/ video project that was completed earlier this year for Maxis.

While the company has worked hard to be partners with the rest of the San Francisco post scene, Clark sees that SFPG has one distinct advantage. "So many companies have virtual companies where there aren't the tools, the equipment and the talent all in one place. I think SFPG is unique in having the video and film background, which is so crossed with the computer world and the interactive media world. We have an added value of understanding both ends of the spectrum of today's technology."

And Leroy Clark, who now sits in his comfortable, fully digital audio suite, adds quickly: "Without the tools we'd be just a bunch of creative people." ■

New Audio Products For Film/Video Sound

ARX AMBIENCE 5

The Ambience 5 compact loudspeaker system from ARX (Victoria, Australia) is designed for a range of installed and mobile uses, including cinema surround and AV applications. A two-way system with a frequency response of 50-20k Hz ±5dB, the Ambience 5 features an 8-inch woofer and a 1-inch tweeter. Power handling is rated at 200 watts (program). The lightweight, high-impact resin cabinet features integral mounting hardware and a molded carrying handle.

Circle 301 on Product Info Card

DIGIGRAM PCXPOCKET

Digigram (Montbonnot, France) announces the PCXpocket, a type II PC card that brings Digigram's professional sound recording and editing technology to the laptop computer. Functionally equivalent to Digigram's PCX digital audio boards, the PCXpocket operates in both PCM-linear and MPEG audio compressed modes for coding, processing and decoding in real time. Features include two balanced mic/line inputs and two unbalanced outputs at line or headphone level.

Circle 302 on Product Info Card

AMS NEVE AUDIOFILE UPGRADES

AMS Neve (New York City) announces software upgrades for both 16- and 24-bit AudioFile systems. Version 2.0 includes new editing features: Event parameters may be adjusted on-the-fly, and Event Trim functions can be accessed on any track. Other new features include an ADR facility that automatically records multiple takes and a Loop editor that allows audio loop points and crossfades to be specified and auditioned. Stereo events can be split into two mono events and recombined. Multiple SCSI devices can now be attached to a single interface card, and Event Lists may be saved into Exabyte, allowing all project parameters to be archived together.

Circle 303 on Product Info Card

DRASTIC TECHNOLOGIES DDR RECORDER

Drastic Technologies' (Downsview, Ontario) vd-0 DDR is a disk-based video/audio recorder that plays and records NTSC or PAL Composite, Component and S-VHS video along with two or four channels of uncompressed audio. Designed for offline editing and audio post, the vd-0 has fully insertable video and audio channels, allowing the recording or re-recording of material at variable compression rates. Features include editing, time delay, time lapse recording, GPI triggered playback, variable length loop record, still/clip store and nonlinear playback with audio scrub. Prices start at $7,995.

Circle 304 on Product Info Card

YAMAHA 02R SOFTWARE

Yamaha (Buena Park, CA) announced summer delivery of Version 2.0 software for its 02R digital recording console, requiring the installation of a new ROM chip in the 02R. The new software provides surround sound capability on every input channel and digital aux sends via Yamaha digital I/O cards; 24-bit recording is possible by using two tracks per record channel; and improved automation will provide added functionality. A MIDI remote function allows control of remote and outboard equipment via the 02R control surface; control templates for many Yamaha products and Pro Tools are included.

Circle 305 on Product Info Card

SANKEN MICS

Sanken (distributed by Audio Intervisual Design, North Hollywood, CA) introduces two new microphones. The Sanken CSM-3 Mono Shotgun combines a second gradient mic and a line mic to achieve high directivity over a wide frequency range in a 10.6-inch- long package. Newly designed condenser elements feature polyphenylene sulfide diaphragms, said to provide excellent response and temperature/humidity stability. Price is around $1,390. The ultra-miniature COS-11S lavalier features a new 2.1mm cable with a 0.5mm cable jacket, jointly developed by Autograph Sound Recordings, and has been extensively tested in demanding live theater applications. The omnidirectional COS-11S has a 20-20k Hz frequency response and a 95dB dynamic range. Price is $279.

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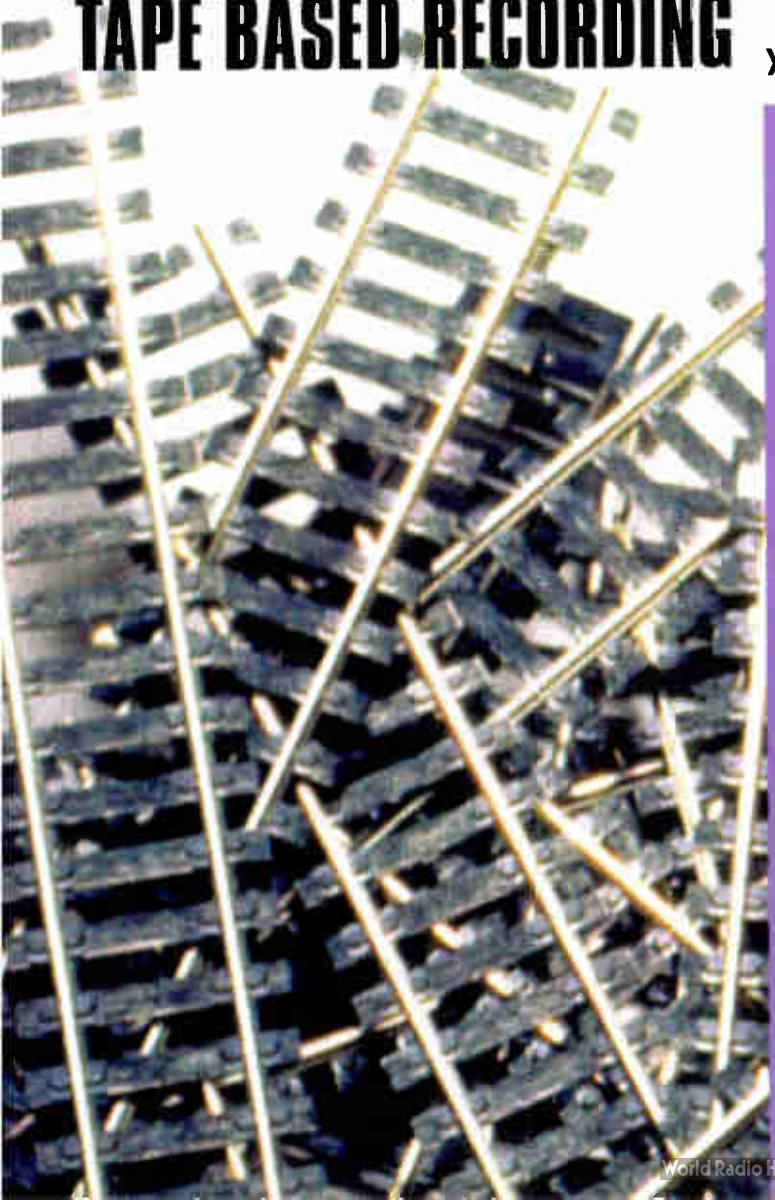

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CIRCLE AD NUMBER ON PRODUCT INFO CARD

Check out the processing racks in any large studio, broadcast facility, or concert rig and chances are you'll find one or more dbx 160's (amongst a bevy of other great signal processors). Names like Abbey Road, A&M Studios, Westlake Audio, and Skywalker Sound still count on their 160's to deliver silky smooth vocals, tight bass and crisp, punchy drums . . . all dbx hallmarks.

While designing the successor to our early classics, we talked to countless musicians, engineers, and producers about the way they like to work and what's important to them in a dynamics

V8™ VCA

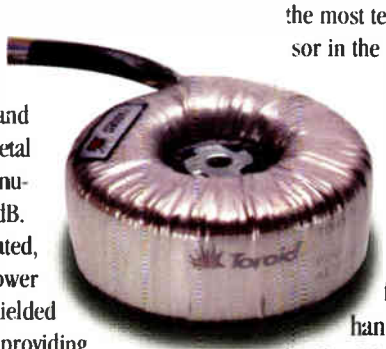
The heart of any dynamics processor is its VCA. The dbx 160S features dual proprietary V8™ VCA modules. This state-of-the-art implementation of dbx's original Blackmer decilinear VCA boasts an unheard-of 127dB dynamic range and ultra-low distortion. Encased in a specially designed aluminum-zinc housing for shielding and thermal characteristics, the V8™ maintains its superior performance in harsh environments.

Premium Signal Path

High-voltage 24V supply rails and wide dynamic range active components in the signal path allow the 160S to cleanly process audio while providing a huge 26dB of headroom. Patented high current transformer isolated outputs feature >100dB common-mode rejection and distortion so low it's immeasurable. Designed for extreme conditions these outputs will drive 1000 feet of Belden™ 8541 cable at +30dBm.

Over-designed Power Supply

The 160S power supply features a massive toroidal transformer chosen for its low stray flux characteristics and mounted in a mu-metal can designed to attenuate stray field by 30dB. The can is then isolated, along with the AC power circuitry, inside a shielded power supply cover providing even more noise attenuation. Only clean DC power exits the isolated supply.



Discriminating Component Selection

The new 160S takes full advantage of the most technologically superior components available today. Premium active electronics, precision 0.1% and 1% metal film resistors, great sounding temperature stable polypropylene capacitors, high-reliability board-to-board connectors with gold-palladium-nickel contacts, Jensen® transformers, gold plated Neutrik® XLRs, rare earth magnet relays with gold contacts in a hermetically sealed nitrogen environment. military grade glass epoxy circuit boards, to mention a few, contribute to the most technologically advanced compressor in the world.

Distinctive Craftsmanship

The craftsmanship of the 160S is as stunning as the engineering is innovative. A striking blue front panel machined from 1/4" aircraft aluminum, hand-crafted solid aluminum knobs, LEDs mounted individually in machined stainless steel housings, custom VU meters with peak indicators, and heavy gauge chassis solidify the 160S as the benchmark compressor for decades to come.

What Makes the 160S xt Industry Standard?

processor. Over and over again you told us what you wanted, classic dbx sound in a great package, with all the right controls. The result is the new 160S Stereo Compressor. Twenty-five years of experience, visionary technology, and impeccable craftsmanship combine to produce this masterpiece, a device destined to take its place in pro rigs around the world for years to come.

Ultimate Flexibility

The 160S combines the best features of all the great dbx compressors, past and present. In addition to having the auto attack and release as well as the hard knee threshold characteristics of the classic dbx 160, the 160S is also switchable to OverEasy® mode, made standard by the classic dbx 165A. And speaking of the 165A, all of its features, including variable attack and release controls, as well as dbx's latest limiting algorithm PeakStopPlus™, are included in the 160S. Not to mention new features such as hardwire relay bypass and external sidechain input, switchable from the front panel.

Designed and built in the USA

All dbx products including the 160S are proudly engineered and manufactured in our US factory. Every dbx product is performance tested and specification verified using Audio Precision® System One. The 160S is a most worthy successor in a long line of world class dbx compressors.

See, feel, and hear one for yourself.

dbx Blue Series -- Twenty-five Years of Experience, Visionary Technology, Impeccable Craftsmanship

dbx Blue Series MIC PRE

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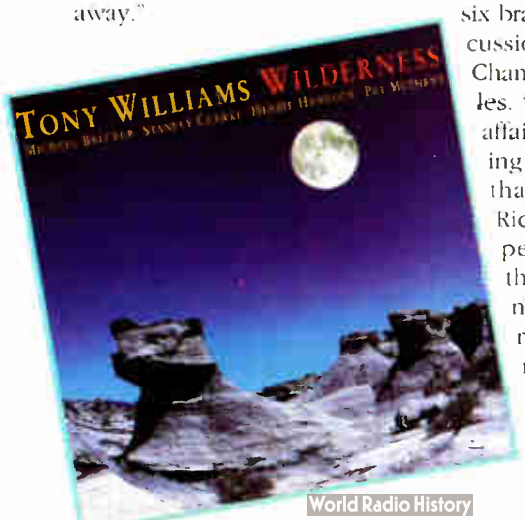
RECORDING NOTES

TONY WILLIAMS' TRACKS OF A LIFETIME

by Robin Tolleson

The death of jazz great Tony Williams this year at 51 followed the release of *Wilderness*, arguably the most complete musical statement yet by the groundbreaking drummer of his generation. His typically adventurous stickwork drives a powerful jazz quintet (Herbie Hancock, Pat Metheny, Stanley Clarke and Michael Brecker) on several cuts. But equally impressive is Williams' growth as a composer, as heard on tracks like the album opener "Wilderness Rising," a buoyant, spiritual piece of Americana completely orchestrated by Williams for a 29-piece classical ensemble. "Tony had been studying orchestration and composition, and I believe that he had worked on the first song on the album for quite a while," says saxman Brecker. "I know that he was tremendously excited by the result, and when he played it for us we were blown away."



Williams' plan was to record the orchestra parts first, and Stanley Clarke recommended John Richards an experienced film score engineer with a classical background. On December 1, 1995, Williams, Richards and co-producer John Van Tongeren assembled a cast of eight violins, four violas, two cellos, bass, six woodwind, six brass, harp and percussion at the Sound Chamber in Los Angeles. "It was a one-day affair. We were working to a budget at that point," recalls Richards. "A lot of people, including the record company, were somewhat reticent to put too much money into it at that stage. It was a bit of an unknown concept. At Sound Chamber we went analog 15 SR with the orchestra. We knew we were going to be in the land of experimenting later and wanted as much flexibility with the track as possible. We then transferred those master tapes to a 48-track, and we built everything up on the one 48-track and never went back to the original analog.

"Tony knew what was going to happen with it afterward," Richards continues. "Normally one sweetens a prerecorded rhythm track with strings and horns and woodwind, once you've laid your tempos down and gotten the feel of the track. But this one was completely reversed. Here we'd go in and lay the tracks down with the orchestra, and only Tony had the vision as to

—CONTINUED ON PAGE 187

SKY CRIES MARY

PAST MEETS FUTURE

by Bryan Reesman

As we experience the fallout of the alternative explosion, many audiences are looking to bands with fresh ideas and approaches, artists who can reinvent the past into music for the future. Sky Cries Mary are among those talented bands who are capturing people's attention via their eclectic musical blend, where the swirling realms of psychedelia, the complex compositions of prog, the trippyness of space rock, as well as modern electronic and rock sounds meet in an enigmatic crossroads. It's not easy to categorize them, for in a way they are their own niche, which is one reason they captivated producer Paul Fox when he saw them play live at the Troubadour in West Hollywood.

PHOTO CHARLES PETERSON

"I thought that they fused all these different elements that have come about in the last 20 years in rock music into one band," the veteran producer recalls. "I thought they were very much a quintessential '90s band. This was a really great opportunity to do something that I'd wanted to do, which was to

—CONTINUED ON PAGE 192

GRAND MASTER MELLE MEL & SCORPIO

BACK IN THE GAME

by Chris Walker

Back in the late '70s, Grand Master Flash & the Furious Five were one of the most influential groups on the East Coast—kings of the scratched groove and the true godfathers of rap. The group produced a long succession of R&B hits in the late '70s and early '80s, culminating in the controversial 1982 smash, "The Message," which opened the door for many other socially conscious rappers and DJs.

PHOTO WILLIAM HAMES

Other standouts from the group's career were "Freedom," "White Lines," "New York New York," "Check Yourself" and "Beat Street"—songs that were popular on their own and also covered by performers like Tha Dogg Pound, Ice Cube and even Duran Duran.

Now, after a seven-year layoff, DJ Grandmaster Melle Mel and Scorpio, whose partnership goes all the way back to grammar school, are back on the scene with a new recording titled *Right Now*. As the title of the album implies, the duo have updated their sound and their attitude to stay on the cutting edge. Unlike much of their earlier work, this new project contains enough obscenities to merit a parental advisory rating. So what's the difference between them and the current rappers? Melle Mel comments, "Right now in rap there's no separation between the performer and the person. The current rapper wants to be the baddest guy on his block, which he can never be. Nobody is that tough or bad."

The comeback CD was

—CONTINUED ON PAGE 229

OTIS REDDING'S "(SITTIN' ON) THE DOCK OF THE BAY"

PHOTO: GRAY AVERY/MICHAEL OCHS ARCHIVES

by Blair Jackson

The story of modern popular music is filled with tragic tales of young, promising lives cut short by the Grim Reaper—through accidents, suicides, drug overdoses, you name it. Invariably, there is a sort of canonization that occurs when a great musician dies, followed by unending speculation—what would_____be doing today if he/she were still alive? Well, the late, great soul singer Otis Redding would be turning 56 this year, and I bet he would be as legendary a figure as contemporaries like Aretha Franklin and Curtis Mayfield are, because Otis Redding definitely had *the goods*: He had incredible range as a singer, he was a superb songwriter and a showman who could whip a crowd into a frenzy one moment and have them in a puddle of tears the next.

Redding was born in Dawson, Ga., on September 9, 1941. He sang in the church and showed promise as a singer early in life, when his main influences were people like the smooth-voiced pop and gospel singer Sam Cooke (both with the Soul Stirrers and on his own) and rock 'n' roll wildman Little Richard. Redding was still in his teens when he went on the road with Little Richard's former backup group, The Upsetters, and when he cut his first singles, like the Richard-inspired "Shout Bamalama." He was working as backup singer (and driver) for Johnny Jenkins & the Pinetoppers when his first big break came in the fall of '62, when Jenkins' band drove from Macon to Memphis to cut a few songs at Stax studios. While they were there, Redding was given the opportunity to record a couple of songs himself, backed by a band that included Jenkins on guitar and Stax session aces like Steve Cropper on organ (rather than guitar, because Booker T. Jones had to leave work early that day), Lewis Steinberg on bass and Al Jackson on drums. Of the two songs cut that day, a Redding tune called "These Arms of Mine" appealed to Stax boss Jim Stewart, and it was released on a Stax subsidiary, Volt Records. The record made it up to Number 20 on the national R&B charts and it created enough of a buzz that Stewart invited Redding back to Stax for more sessions in June and September 1963; the latter sessions produced two more minor R&B hits, "That's What My Heart Needs" and "Pain in My Heart."

From there, Redding's career took a long, slow upward trajectory, as he continued to churn out one great tune after another, including such classics as "Mr. Pitiful" (his first Top 10 hit), the incredible ballad "I've Been Loving You Too Long" (which hit Number 2 on the R&B charts and was covered by the Rolling Stones), "Respect" (Number 4 R&B in '65, Number One pop for Aretha Franklin in '67), "I Can't Turn You Loose," "My Lover's Prayer," "Fa-Fa-Fa-Fa-Fa (Sad Song)," his dynamite cover of the Stones' "Satisfaction," and "Try a Little Tenderness," to name the best known. Not only was Redding a gifted songwriter at a company that boasted the talents of people like Isaac Hayes and David Porter, he also was a multi-instrumentalist and a producer. Most of his records were made using the Stax stable musicians—Booker T., Cropper, Duck Dunn, Al Jackson, etc.—and they were engineered by the company's in-house crew at the famous Stax Studios on McLemore Avenue in Memphis. (Atlantic's Tom Dowd also engineered an album for Redding.)

Though Redding always had more of an R&B following than a pop one, curiously enough he was warmly embraced by the San Francisco hippie movement, and he performed several sold-out shows at the Fillmore Auditorium in 1966 and '67. That led to his being booked at the Monterey Pop Festival in June 1967, where he brought down the house with an incendiary performance of some of his best songs—his set was later released as part of a live album where half was devoted to Jimi Hendrix's Monterey set, the other half to Redding. That same year, Redding teamed up with fellow Stax artist Carla Thomas for a pair of high-charting duets, "Tramp" and "Knock On Wood."

Between the acclaim he received after Monterey and his work with Thomas, Redding was hitting a career peak in the fall of '67. During the first week of December, Redding made one of his periodic trips to Stax to work on some new material. He stopped in to see Steve Cropper, who both co-wrote and played on many of his records, and showed him a fragment of a new song he was working on called "(Sittin' On) The Dock of the Bay," which had been

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inspired by Redding's stay on a houseboat in Sausalito, Calif., following the Monterey Pop Festival.

"Otis was always writing," Cropper recalled. "Every time he came to Memphis to record he always had 14 or 15 ideas. A little piece of this. A little intro there. He played me what he had [of "Dock of the Bay"] and it was only the first verse. I sat there with him and within about half an hour we had written the other two verses and the bridge."

As was typical in those days at Stax, Redding went into Studio A almost immediately to record the song. The main studio was equipped with a custom Auditronics board and a Scully 4-track recorder. The band on the session included Cropper (who played acoustic guitar during the live tracking and then overdubbed his electric part later), Duck Dunn on bass, Marvel Thomas on keyboards and the Memphis Horns. "We had Otis on a [Neumann] U87 way in the back of the room," engineer Ron Capone says of the session. "We usually did the vocal live with the track. It was so far in the back of the room and there was so much delay on it that it was sometimes hard for the rhythm section to play to him—without headphones there was a huge delay and they learned how to work with it." Stax had a couple of live echo chambers, and engineers would sometimes augment that with an old AKG reverb. Capone says he generally used a Shure SM57 on Cropper's electric guitar amp, and a pair of RCA 77s on the organ cabinet, and 77s on the horns.

"The day we cut that song," Cropper said in the book *Goin' Back to Memphis*, "Otis and I looked at each other and said, 'This is a hit.' Not everybody in the studio agreed with us, but we knew in our minds this would be his biggest record. In this business, you know when you have a winner."

"That was Otis' last session," Capone says. "We had cut the tracks, and we were doing the horns in the control room, using the speakers—no headphones—and Otis walked in and said, 'See y'all,' and I remember him walking out the door with his coat over his shoulder, and that was the last time we saw him."

On December 10, three days after the session, Otis and five members of his touring backup group, the Bar-Kays (trumpeter Ben Cauley, guitarist Jimmy King, sax player Phalon Jones, keyboardist Ronnie Caldwell and drummer Carl Cunningham) were flying from Cleveland to a gig in Madison, Wis., when their twin-engine Beechcraft plunged into Lake Monona just a few miles short of their destination. Redding, the pilot and four of the five Bar-Kays were killed; Cauley survived. Needless to say, this was a tremendous blow to the Stax family, all of whom deeply loved this gentle, humble and extremely talented young man—he was just 26 when he died.

Cropper and Capone returned to the studio shortly after Redding's death and completed "Dock of the Bay," adding the famous wave and seagull sound effects, which Capone believes he got from the Memphis-based William B. Tanner jingle company, where he used to work. The song was released in the beginning of 1968 and it eventually made it all the way to Number One on both the pop and R&B charts. Redding scored several other posthumous hits, including "The Happy Song," "Amen," "I've Got Dreams to Remember" and "Love Man," but nothing that surpassed "Dock of the Bay."

There have been a zillion Otis Redding hits packages put out through the years (I'm partial to Rhino's 16-song *The Very Best of Otis Redding*), and a spectacular, definitive four-CD boxed

set. Any of them is worth your money. No record collection is complete without a heapin' helpin' of the King of Memphis Soul. ■

—FROM PAGE 182, TONY WILLIAMS

what would go against it rhythmically."

Richards likes to use room mics where possible, but in this instance he also needed to spot-mike sections because the room was very live. "I wanted to get some detail in the sound, so I had the instruments close-miked and also a couple of room mics, and it's a fusion of those two aspects that we ended up with. It worked very well. The orchestra sounded rather large considering how small the quarters were."

Williams sat in the booth with Richards at Sound Chamber, following along with the score. Stanley Clarke conducted the orchestra on his composition, "Harlem Mist '55," and Van Tongeren did the orchestrations and conducting on three other tracks. "Tony would set the tempos, and I'm sure he and Van Tongeren had many discussions prior to the session as to where the tempos should be," says Richards. "This was the culmination of a lot of hard work for Tony, and he was very pleased with what we got. That energized him to take it to its next level, to bring the ensemble in and track on top of the orchestra. This was an interesting period," he laughs.

They had recorded most of the orchestra tracks along with a click, and after moving the operation over to O'Henry Studios in L.A., Williams came in on December 6 and laid down his drum tracks to establish the feel of "Infant Wilderness," "Wilderness Voyager" and the single-stroke roll feature, "Wilderness Island." "Then we would put Herbie, Stanley, Pat and Michael over that prerecorded drum track," Richards explains. "Sometimes Tony would want to get back in and re-do the groove after the others had put in their ideas. So it was an interesting fusion of everybody coming in and being dictated to by this prerecorded orchestral track, but at the same time realizing that this vehicle was taking us all into an area that we hadn't been to before. Tony gave people the creative ability to go ahead and try things. We just got as many good ideas down as we could. That was the freshness of it all. Basically, what we have is everybody's first

thoughts, which makes it special. It wasn't produced out the wazoo and back again. And it all came together during that week," smiles Richards. "They were long, amazing days. I can still turn around and see Tony sitting there with a big fat cigar, smiling with that big oval face. He had this saying—when it worked and he knew it, he'd go, 'Bam!'"

There was also inspired live playing by the jazz quintet on material by Metheny and Williams. "Pat came in with a tune that we rehearsed and then played live, which turned out beautifully," Brecker recalls. "Tony's music was written out also. Tony came in very prepared. And then obviously, we improvised."

Metheny's "The Night You Were Born" has lots of interaction between the players and captures a delicate brush sound from the drummer. Williams' "China Road" features some flat-out screaming from Brecker, with Williams' flamboyant leadership. "Tony was such a ferociously great drummer, the energy level was very high," says Brecker. "China Moon" appears later, a "China Road" outtake with incredible energy. "In the period between recording and mixing, Tony took home a rough mix of all the takes, and he just grew to love that rawness," Richards says. "He was creating a different album, something that was meaningful to him. Even as rough as that track was, it had an energy that he wanted on his album."

"Macchu Picchu," a haunting 9/8 anthem written by guitarist Lyle Workman, was assembled piece by piece. Williams starts out light on brushes, then double- and triple-times the rhythm as he switches to tom toms, then snare, and Hancock ad libs wonderfully over the onrushing tide. "This track was the most difficult one for me to actually get a concept of," Richards says. "It just grew. It started off as one thing and became something else. Tony added some drums here and then Lyle added a bit more stuff there. Well, okay, we've got that part of the wall built, let's go in this direction, some toms here, maybe a bit of time here, maybe this brushwork out in front. It had a life of its own, and we all felt like it had a place on the album."

Richards doesn't take much credit for the great toms or the brush sounds on Williams' snare. "I think a lot of that is just the tremendous driving energy that Tony had, and this amazing time that was like a machine," he says. As a

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drummer, Williams' concentration and consistency endeared him right away to his engineer. "He was reliable about getting the same dynamics out of each tom, out of each skin, which allows for a continuity of sound. It's nice to have the same velocity hitting the skins each time. It allows you to get more out of the mic pre's—it's less work to do when the drummer does it for you that way. He knows those skins so well, and has got them tuned exactly right, but the way they sound is very much dependent on the velocity of the beater hitting them."

Richards double-miked the snare with a Shure SM57 over and a Sennheiser 421 under. "I used 421s on the toms and the kick," he reports, "Telefunken 251s on the overhead and a [Neumann] 84 on hi-hat. Nothing new; it's all been around for years. As you know, the sound on tape is only as good as that which comes from the source of the sound. The minute you've got to start the heavy EQ or change a mic, you know you're in trouble."

On his song "Gambia," Williams plays a loose, swinging Lifetime-ish beat—fearless, peerless, with incredible single strokes and a firm foundation underneath. "He could cross over from that metronomic feel and take the whole thing to a different space," Richards says. "He wasn't just a time machine. He could make them talk in a language all their own." Brecker describes Williams' playing as "Great, always. Always of the highest quality. He changed the shape and the directive of drumming, came up with a whole new vocabulary, and was constantly looking for new ways of playing and new ways of making his drums sound."

Brecker also appreciated the good working atmosphere around the *Wilderness* sessions. "Tony was very relaxed, very enjoyable to work with," the saxophonist says. "He had a great sense of humor, and that came through in the session. We had fun. He had little routines that he would do. But he felt sure about the music. I think the orchestral recording coming out so well made him feel pretty confident, so he sailed into the rest of the session. We rehearsed the day before, then recorded it and pretty much played together as a unit."

"These people were able to fuse their personalities and work together as a group," concludes Richards. "Sometimes the most difficult thing is bringing a bunch of soloists together and not sounding like a bunch of soloists just

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playing. And that was due to Tony. These guys were generous with their thoughts and respected each and everybody else that was contributing to the album, [letting them] just do their thing. 'Bam!'" ■

—FROM PAGE 183, SKY CRIES MARY

get involved with a record where there were a lot of synthesizers going on, but that's still in the core of a real band, as opposed to a band that's completely techno. And they do it so well."

Take the above-mentioned musical cocktail and add vocalist/wordsmith Roderick Romero's thought-provoking lyrics with Anisa Romero's commanding, sensual vocals, and the aural elixir becomes more potent. "I've worked with some pretty amazing singers, like Bjork," Fox says, "and I think Anisa's up there on that level as far as her ability to use her voice, her range and her dedication to her musicianship."

Recorded at Robert Lang Studios in Seattle, *Moonbathing on Sleeping Leaves*, the band's fifth release, clocks in at 74 minutes and is the longest album Fox has ever produced. He also feels that the length is justified by the quality of the final product. Ed Thacker, who engineered and mixed the album, found the band's epic arrangements a challenge, and he was concerned about "getting as much concise information as you could without handicapping them in any way." So Fox and Thacker helped them sculpt the songs without sacrificing the band's integrity or sound, which Fox felt was his biggest contribution.

"Logistically, just to capture it all was a bit of a challenge," Thacker says. "The way Paul and I like to work, we like the bands to play it live, and this band certainly can. You get that certain spark when there's eye contact, and people can move this way and that way because they're looking at each other. So it always gives a record a little bit more excitement than just painting it in by the numbers."

For Romero and his fellow bandmates, recording *Moonbathing* was an exciting process because they were able to develop a rapport between themselves and their producer, both personally and professionally, which made recording easier. "We got to really communicate our ideas to someone, and he [Fox] brought a whole other objectivity to it where he could get inside it yet pull back and really analyze it. He didn't change our music, but he kind of clarified some things and helped us focus."

In the past, the Seattle septet would start working from the rhythm section up through the guitars and keyboards to the final vocal. Even though the quality of the music was high, the group's concert energy did not make it onto record. Fox wanted to capture their live sound and intensity.

Moonbathing was recorded on an API desk, which was actually a combination of two 24-input APIs strapped together—the console offered 48 faders of "various vintages," according to Thacker. "It didn't have any foldback sends, and everybody wanted their own headphone mix, so I ended up having to use all the echo sends as headphone sends. It was definitely stuck together with gum and glue."

To record Anisa's vocals they used a Neumann M49, while for Roderick they employed an AKG C12 sent through a Neve 1073 Class A mic pre (which was also used for the kick drum and snare). The guitars were captured with a combination of SM57 and U87s. A 57 was used on the snare, Sennheiser 421s for the toms, a D12 on the kick drum. An RCA 44 served as a room mic. The bass was recorded through a combination of direct and miked inputs.

With the many synthesizers available to keyboardist Gordon Raphael and programmer T.R., Fox and Thacker found it easier to take a stereo pair out of Raphael and T.R.'s mixers (for both keyboards and drum machines) to bring them up on the console. Since Raphael knew his parts well, he knew what sounds he wanted to use, and any sounds that didn't fit in the mix went on separate tracks. "If we had those all separate and had to mix all those parts, it would have been a nightmare," says Fox. Specific pannings were determined from the mixers so that "we didn't have to fight later to create positioning for the sounds."

"Everything that you hear on the record, minus the percussion stuff, and maybe one or two parts here and there, was done with everybody playing live, including the vocals," relates Fox, who says that roughly 90% of the album was recorded live. "Basically, the drum machines and loops were going live and Ben [Ireland], the drummer, was playing to them, which I think is one of the most remarkable things about the record. There are moments where you can really hear the bass drum and the drum machines interact in this incredible

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trade-off of phrases. It's really a testament to his ability to be able to lock in with the loops and sequencers."

Elements that were overdubbed later included vocal harmonies by Anisa, additional tracks by guitarist Michael Cozzi, Moog pedal parts supplied by bassist Juano, other keyboard tracks, and additional percussion for "Smoke Break," the tribal bridge at the center of the song triad including "Ringing" and "Want."

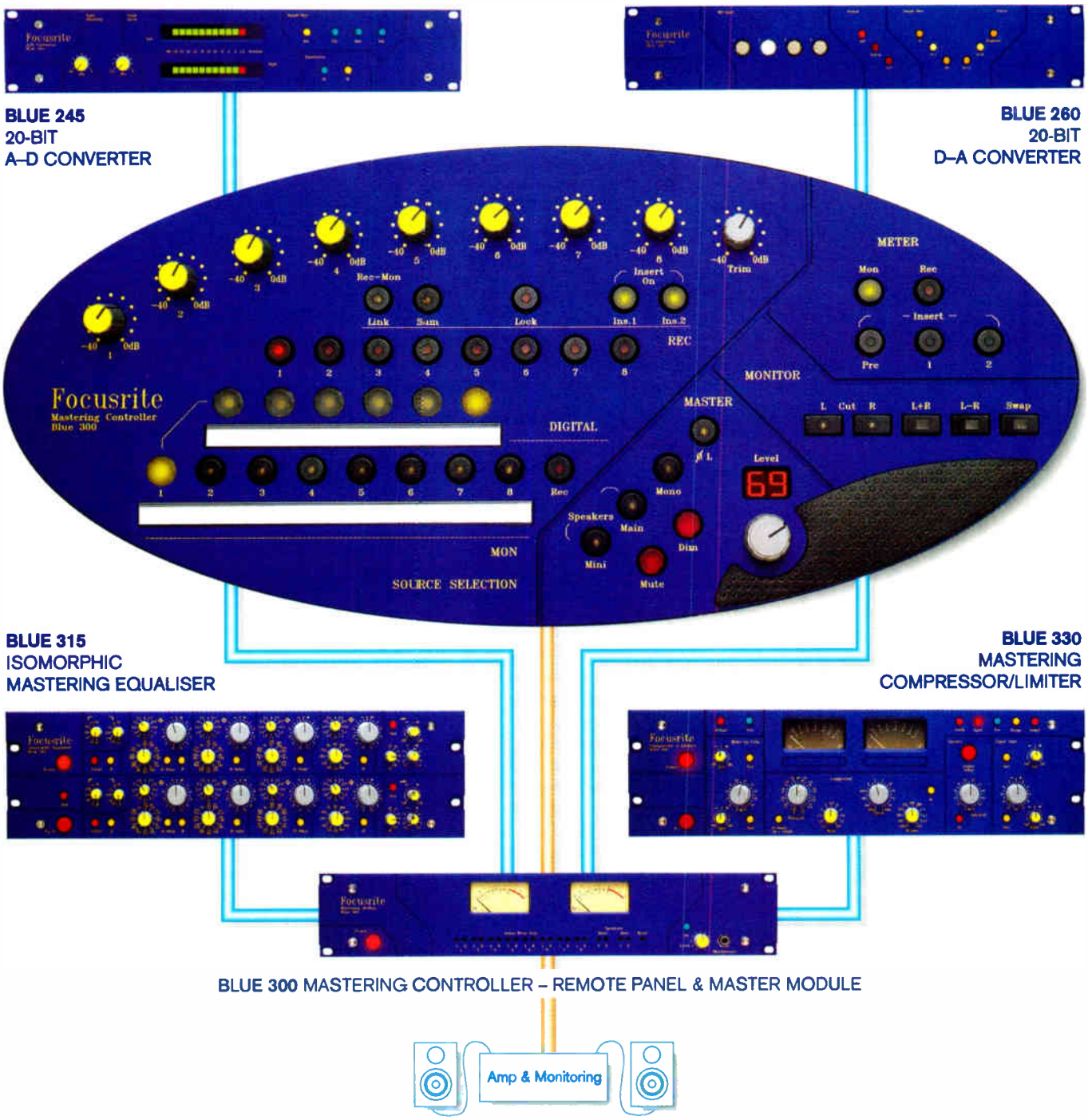
An integral element to the Sky Cries sound is an old Roland SDE delay that they use live and on record. "When they play live, they use it on their vocals, and they can vary the amount that they feed themselves into it," explains Fox. "As a result of the vocals being fed into the

Paul Fox

unit, everything else kind of feeds into it as well because everything leaks through the vocal mics. They have a fair amount of regeneration on the effects device, so it creates this very ambient, swirling kind of a sound. In the mixing, we really tried to create a record that was really ambient and very ethereal. On the vocals, we stayed true to the sound that they had already invented for themselves by using the repeat on their vocals."

Moonbathing is filled with layers and layers of sound. "One way that we were able to help enhance that was the use of a device called the Spatializer," explains Fox. "It basically extends the listening sphere of the sound beyond just the actual physical realm of where the speakers sit. You'll hear things coming from almost slightly behind you and off to your side, things that seem like they come right up in front of you." Manufactured by Desper, the Spatializer added a 3D quality to songs like "Queen of Slug Theater," as Thacker notes: "You

MASTER-PLAN:



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hear these loops and things that seem to be outside of the speakers, they're kind of swirling behind your head. It always kind of makes the hairs on the back of my neck stand up."

The album offers a nice combination of ethereal textures and crunchiness. "One thing is that the bass drum and guitars had to be really punchy, so the grit is really there," says Thacker. "The keyboards and vocals in this band are what give it the spacy atmosphere, and the programming lands somewhere in the middle. The great thing about this record was getting to use big, wild reverbs and delays. Through the alternative era we've been going through, those things have been less in vogue. It's always fun once in a while to pull out all the big guns and let it go, and on this record you can certainly let it go."

The cavernous studio (which resembles the interior of a castle) created an environment good for big drum sounds but could also be padded down for more subtle effects. "It has this really compact but live sound," Thacker says of Lang Studios. "Using a combination of room mics, I was able to do a lot of both close and distant miking on the kit and various percussion things we did and some of the guitar overdubs and stuff like that. From an effects standpoint, that was the main focus in the recording."

Unlike during the recording process, when mixing Fox and Thacker used a wide variety of processing at A&M Studios in Hollywood. "There are a fair amount of echoes used on the vocals and other instruments that are the real thing, not digital ones," Fox says. Their processing gear of choice included a Sony DRE2000 (used a lot for the snare drum), Lexicon 480, EMT 250, PCM 80, PCM 70 and MXR flangers. "We processed a lot of things through older gear. We used a Fairchild compressor across the drum kit when we recorded the album, and we used it again in the mix of various things."

"The wonderful thing about mixing at A&M," points out Thacker, "is that beyond the usual array of digital effects and reverbs that all of us know about, they have a great assortment of old EMT plates—one or two in particular that I really love—and they also have a couple of great live chambers."

Romero found that Fox had an unusual technique for mixing: He asked Romero to draw a picture, no matter how odd, of how he envisioned the final outcome of the song. "He'd give me some paper and a pen, and I'd go doodling and go crazy for about 45 minutes or so and make these weird little drawings and then leave them for him," Romero recalls. "And the next day...*he could do it*. He could translate my cryptic little stick figures into something that was actually really close to how I saw the song. I've never heard of anyone doing it." Romero was also impressed with the way Fox captured Anisa's warm, deep, emotive vocals.

An added bonus for the group was getting to witness up close the intricacies of the highly creative, decade-long partnership between Fox and Thacker. Their resume includes the Sugarcubes, XTC, 10,000 Maniacs and many others. Both men have backgrounds as musicians, while Fox also has experience as an arranger. "We kind of meet somewhere in the middle and overlap each other," says Fox. "It's almost like having a two-headed monster." But a two-headed monster that's in sync. "We never try to approach each record as anything but an individual record, in terms of developing a sound for it," Fox says. "It's just a good flow of communication that makes the records develop an identity quicker because we'll discuss what type of a sound we're going for, what we want to try and achieve, and how best to achieve it."

"We've known each other for a long time and we're best friends," adds Thacker. "It's just something that, when we started working together about ten years ago, we just found that we complemented each other really well."

Romero felt very comfortable with the duo. "I really trusted Paul and Ed a lot because they really earned the respect from all the band members," he says. "Personally, I'm a control freak, so I can never really completely let go, so I was just around the album constantly, yet trying not to get in their way at all." He felt that the two were an "amazing team" who gave the band room to breathe rather than controlling them.

"It's like a movie for me," Romero says of the finished album. "Some of the scenes really stand out, and then some are really subtle, and you have to go back and watch it again. It's a lot to take on 74 minutes of different emotions and stories."

"The record is an amazing journey," Thacker adds. "This is a Pink Floyd for the millennium. They're hooky and catchy, yet there's this whole ambience around the music that people can get into." ■

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MEDIA & MASTERING NEWS

ITA RALLIES INDUSTRY TO SAVE CASSETTES

Responding to news from the Recording Industry Association of America and other sources that prerecorded music cassettes are increasingly out of favor with music consumers, the ITA (International Recording Media Association) announced that it plans to launch an awareness program to revitalize the flagging format's sales.

Targeted at both trade insiders and consumers, the program has the initial support of more than 30 major record distributors, cassette duplicators and raw materials suppliers, who have formed the ITA Audio Cassette Coalition. The coalition will create an advertising, industry-awareness and retail sales promotion program. According to a news release from the ITA, the format's "vastly improved sound quality" and "portable, pocket-sized packaging" will be among the main points emphasized in the campaign. The group's working slogan is "READY casSETte GO."

The cassette's plight is highlighted by the RIAA's 1996 figures on shipments of prerecorded music products. Net (after returns) shipments of cassette albums dropped 17% to 225 million, while singles slid 15% to 60 million.

Although much of the cassette's loss has been the CD's gain, ITA executive VP Charles Van Horn is anxious to clarify that the intent of the coalition is not to strike back at the CD, in which many coalition members have an important stake, but rather to expand the overall music market by recapturing dormant cassette buyers.

"We will not promote one format over the other," Van Horn said in the statement announcing the coalition. "It is our goal to promote the unique features of the cassette and to use it as a way to reach consumers who are not otherwise buying music. It is clear that audio cassette sales have been declining. It is up to the ITA to find out if we, as an industry, can gather our resources to breathe some life into the format for a few more years. Smart marketing of the audio cassette may actually boost music industry sales."

CINRAM, TECHNICOLOR ADD DVD REPLICATION

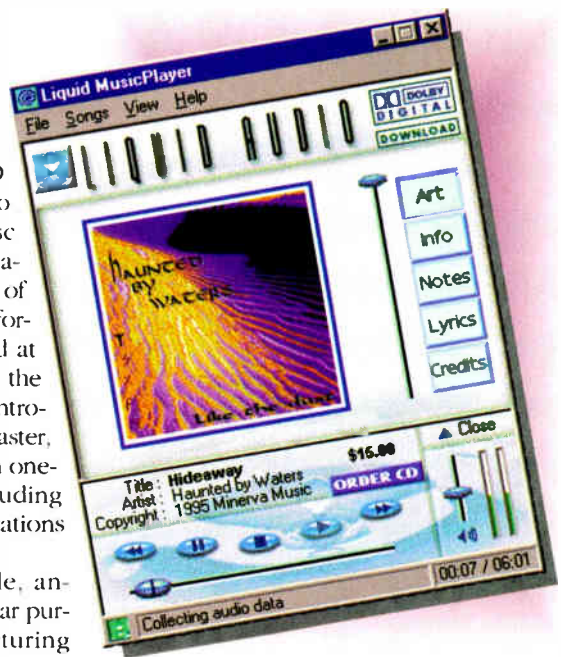
Two new CD replicators have come onboard the DVD bandwagon, announcing the addition of DVD mastering and replication to their services. Cinram/Disc Manufacturing chose its Anaheim, Calif., plant as the first of its facilities to offer the new format. In a statement released at the NAB show in Las Vegas, the company also announced introduction of the DVD LaserMaster, a master glass disc for use in one-off DVD applications, including field testing of DVD applications prior to replication.

Technicolor, meanwhile, announced a "multimillion-dollar purchase" of DVD-manufacturing equipment for the company's plant in Camarillo, Calif. Initial DVD capacity is expected to exceed 5 million annually. To offer one-stop DVD services, Technicolor will work closely with sister company Complete Post, a Hollywood post-production house offering DVD compression and authoring.

GAUSS GOES CD-R

Long a dominant vendor of high-speed audio cassette duplication gear, Gauss is making a move into the CD-R duplication field. The company is offering an initial line of two units, one for copying, the other for printing. The CD DupliManager (MMC 1700) is a stand-alone system requiring no external computer or hardware. It uploads information at 8x speed to an internal hard drive then copies at 4x speed to one or two CD-R drives. The CD Shuttle Printer (MMC-1300) offers full-color direct-to-disc CD label printing. The printer offers continuous automatic printing of batches of up to 100 discs.

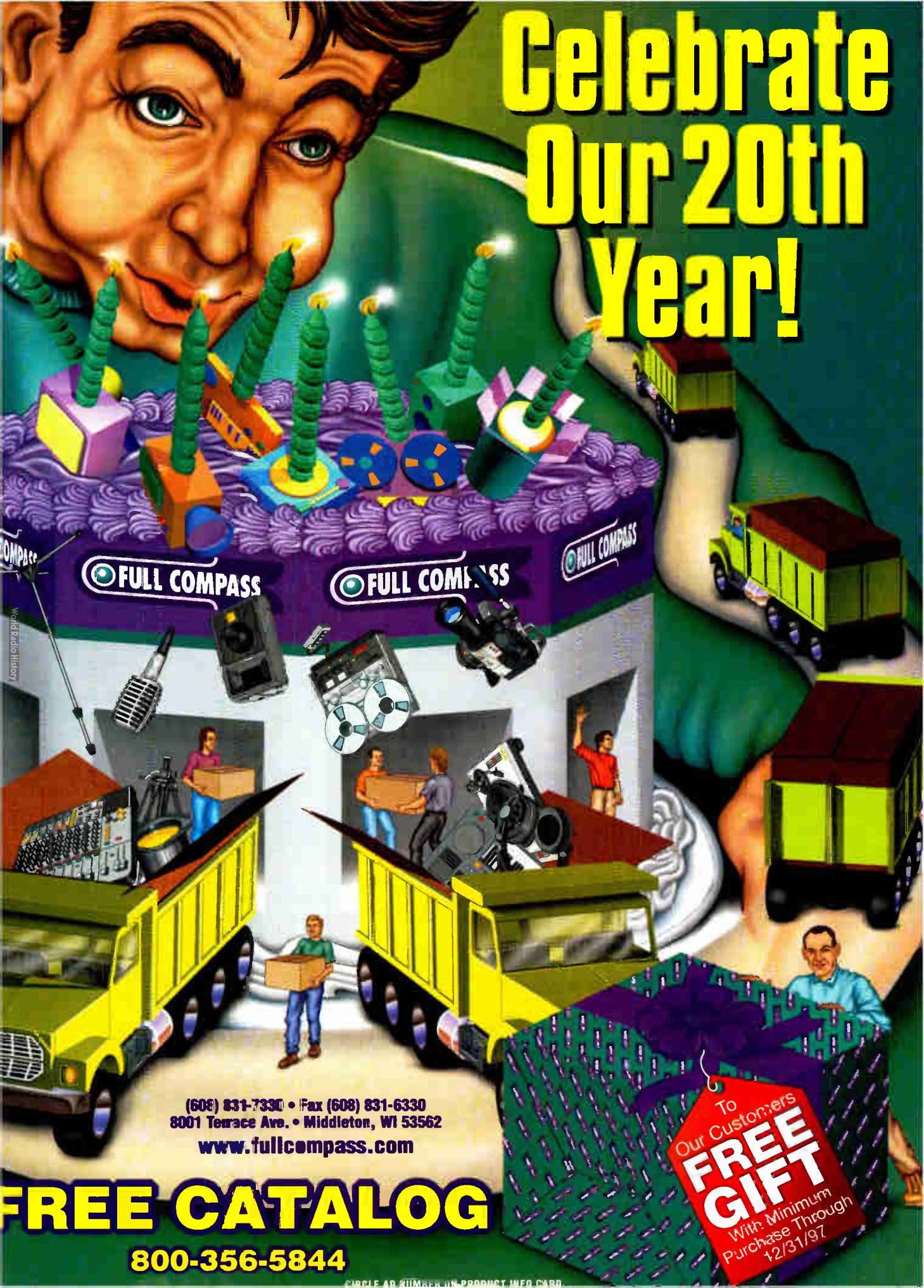
BY PHILIP DE LANCIE



Liquid Audio and EDnet's jointly developed SST, a system for previewing audio over the Net in the Dolby Digital compression format

LIQUID AUDIO AND EDNET BOW SST

Liquid Audio and EDnet announced the availability of SST, a collaboratively developed system for online preview and download of music and sound effects. The system is designed to allow engineers and producers to preview audio in the Dolby Digital compression format as it streams over the Internet using the Liquid MusicPlayer. SST also facilitates the downloading of full CD-quality versions of sound files for use in production. A complementary feature called SonicMail allows a Dolby Digital file to be sent as an e-mail attachment to one or more users.



Liquid Audio also announced the release of the Liquid MusicPlayer for Apple Macintosh computers. The MusicPlayer is available for free download at www.liquidaudio.com.

Los Angeles mastering studio The Mastering Lab recently opened a new room. Taking a break at the facility were (L to R) independent engineer Chris Lard-Alge, studio owner Doug Sax and producer Steve Tyrell of Tyrell Music.

MASTERING NOTES

The Mastering Lab reports the opening of its second room, almost 30 years after Doug Sax first opened the Los Angeles facility in 1967. Featuring mostly custom-designed electronics, the room was opened by Sax with projects by engineers Al Schmitt, Chris Lord-Alge and Bill Schnee. The original room will continue to be used by mastering engineer Gavin Lurssen, whose credits include Jackson Browne, James Taylor and Little Feat. "Our third room will be finished in 2026," says Sax...Recent projects at Future Disc (Hollywood, CA) include albums by John Cale and Annointed—both mastered by Steve Hall using the HDCD process—as well as a new Motley Crüe album mastered by Tom Baker...A new mastering house has been opened in Wilton, NY, located in upstate's Capitol District. Headed by Larry DeVivo, Silvertone Mastering features a custom discrete Class A console and is equipped with gear from TC Electronic, Summit Audio, Digidesign and Westlake Audio...DJ Shadow mastered a single for his new album at San Francisco's Rocket Lab, which also saw action with Junk, Mover, Juliana Kohl and D-Shot. ■

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COAST TO

L.A. GRAPEVINE

by Maureen Droney

Sound Chamber Recorders in North Hollywood keeps a low profile, while keeping busy with an eclectic mix of clients. Owner Dick McIlvery showed me around the three-room facility, which has been open in its present location for seven years. The original Sound Chamber started in 1981 in Pasadena, but in 1990 McIlvery saw the writing on the wall and opted to move to a more close-in location. "We had grown, and our clients had grown, and it simply became inconvenient for some of them to come to Pasadena," he explains. "Mark Isham, for instance, is a longtime client of ours, and when he became so busy that he was running several rooms at once he just couldn't spare the time for the drive. Also, with the proliferation of home studios, we realized that it made sense for us to provide what people couldn't have at home—a large recording space well-equipped for orchestral music. It had become decision time for us—we had to either fold up or move and get bigger. We got bigger, and it's worked out very well."

Built from the ground up, the entire complex at Sound Chamber feels spacious, with high ceilings, skylights and a full kitchen. The main room, Studio A, is fitted with an SSL 4056 E/G Series console with G Series computer. "We've achieved a certain balance here with the SSL console and the large live room," says McIlvery. "Some record people really want the SSL, while a lot of orchestral and TV people care more about the room than the console. The studio can hold up to 40 musicians, and we've got a lot of music stands, lights, single-sided headphones, chairs, all those things—along with a large microphone selection. We also have a good-sized iso room—big enough to house a whole brass or woodwind section."

McIlvery, himself an engineer whose credits include *Ace Ventura, Pet Detective* and *Dr. Quinn, Medicine Woman*, still mans the board for some sessions, although a lot of his time is taken up with his other job—he's chairman of both USC's Music Recording and Music Business departments. "Some people

—CONTINUED ON PAGE 214

PHOTO: MAUREEN DRONEY

Sound Chamber owner Dick McIlvery (foreground) and sound supervisor/composer Chris Brooks

NY METRO REPORT

by Dan Daley

At Acme Recording (Mamaroneck, N.Y.) producers Danny Kortchmar (L) and Steve Jordan, along with studio owner/engineer Peter Denenberg (R), worked on a new High Street/Windham Hill release for Kim Wilson of the Fabulous Thunderbirds.

Trouble In River City? River Sound, a one-room, Neve 8078-equipped facility, opened in 1991 as joint venture between Steely Dan's Donald Fagen and producer Gary Katz, closed to the public as of mid-April. That announcement was found on the studio's Web site, www.aswas.com/riversound. What New York Metro has found out is that the studio will remain functioning as a private studio for Fagen, who, according to his Steely Dan counterpart Walter Becker (who owns his own facility in Hawaii), bought out Katz's share.

"I'm not aware of it being anything other than a business deal," Becker says, confirming that Katz was no longer a principal in the studio. "And as far as I know, Donald intends to continue to use the studio for himself in the future." Fagen and Becker were finishing up the newest Steely Dan recording there at the time. In closing to the public, the studio let go all but one of its staffers; chief engineer Phil Burnett remains onboard.

Giant Sound was in the process of being sold in May. Owner Doug Pell was awaiting the finalization of a deal to sell the studio intact; however, he said, if that arrangement fell through, he would sell the space and the equipment separately, if necessary. The studio's consoles are an SSL 4056, a Neve BCM-10 and a Trident 65.

Pell says the decision to sell was motivated by a number of factors, not the least of which were the increasingly thin profit margins that result from a static rate environment and a slow-growth New York music

—CONTINUED ON PAGE 210

COAST

NASHVILLE SKYLINE

by Dan Daley

Both Sides of the Aisle: Using a wedding invitation motif, Battery Studios announced the marriage of its Neve 8068 with another 8068 that was purchased from A&M studios founder and engineer Shelly Yakus. The result of the union, performed by local Neve magician "Rev." Fred Hill, was a 64-input console outfitted with GML moving fader automation.

"We wanted to try to compete by offering something different than the usual consoles in Nashville," explains studio manager Lee Groitzsch. "It's an interesting alternative to all the SSLs in town, and it's a new niche that simply wasn't being addressed before this and Ocean Way coming to town." The addition of a relatively rare automation system to a Music Row studio is also prompting Battery to bring on a staff second engineer, according to Groitzsch. (This place is getting more like L.A. every day.)

The board is attracting interest from both tracking and mixing clients, and Groitzsch suggests that the retro-country trend illustrated by BR5-49 and Lee Ann Rimes will increase demand for vintage consoles and other similar gear in Nashville. "Combined with moving back to some of the old recording techniques, I think you're going to be hearing some very vintage sorts of sounds more often out of Nashville than the slick-sounding tracks of the last few years," he says.

The historic RCA Studio B

Speaking of old things made new, RCA Studio B has been enjoying a period of renewed vitality. The vintage studio on the corner of Music Square West and Roy Acuff Place was the site of many of Nashville's best records from the mid 1950s through the 1970s, and was the main studio used by producer/RCA label head Chet Atkins during that time. Now owned by the Country Music Foundation, which had partially restored the site to an approximation of its '60s look, the studio was brought back to life in 1995 when Javelina Studios owner Warren Peterson moved into the facility to do sessions that were, during the day at least, open to tour groups on their way through the Music Row area. The equipment for that reincarnation, leased from former Sanctuary Studios owner and now Dreamhire Rentals manager Barry Sanders, consisted of a Neotek Elan, a Studer A80 24-track, several vintage microphones and a combination of vintage and contemporary outboard gear.

"The CMF's research had indicated that tourists would like to see a live session when they were in Nashville," says Sanders. "So they added some glass panels that people could watch through. The room sounded great, and I had a blast doing sessions over there. The room was definitely viable, but it wasn't in high demand because of a lack of isolation." Peterson did a combination of commercial and special projects in the studio for approximately a year before moving out.

Producer/engineer and educator Fred Bogert then made a proposal to the CMF to use Studio B in a similar manner and has been leasing Studio B from the CMF since early this year, doing a combination of independent recordings for his Studio C Productions (Bogert refurbished and began operating the old RCA Studio C five years ago) and for-hire work, using a Yamaha 02R digital console and a Spectral Audio hard drive recording system.

Though some Nashville professionals would like the Foundation to bring more of a museum aspect to Studio B—one idea involves equipping it exclusively with original, vintage gear—CMF director Bill Ivey says, "We're not in the studio business, and we don't see it as ever becoming a purely antique analog studio. We feel it will always be a mix of contemporary and vintage equipment. We want it to have a life."

Bogert says that tourists now have the opportunity to experience sessions in progress every day: Since Studio B reopened, sessions have included John Berry recording

—CONTINUED ON PAGE 208

SESSIONS & STUDIO NEWS

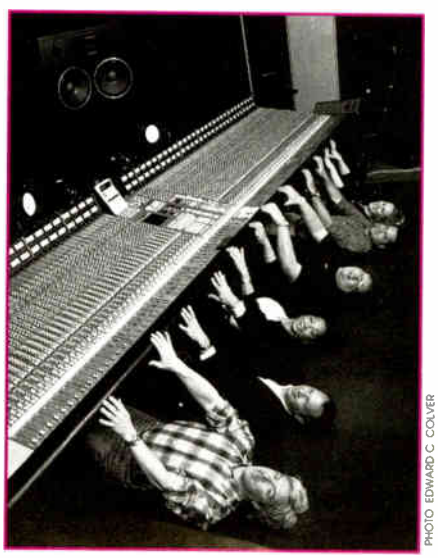
SOUTHEAST

Country star **Faith Hill** tracked for Warner Bros. at Nashville's **Masterfonics** with producer **Dan Huff**, engineer **Jeff Balding** and assistant **Mark Hagen**. MCA artist **Chely Wright** was in the studio mixing with producer **Tony Brown**, engineer **John Guess** and assistant **Patrick Murphy**...The **Sound Emporium** in Nashville had **Charlie Major** in overdubbing for a BMG/Canada project with producer/engineer **Mike Poole**, and **Mark Alan Springer** working on writer demos for EMI Music with engineer **Matt Andrews**...**Mark Chestnutt** mixed for Decca at the **Sound Kitchen**, in Franklin, TN. **Mark Wright** produced, **Greg Droman** engineered and **Tim Coyle** assisted...At Nashville's **The Castle**, **Lionel Richie** tracked in the studio's recently redecorated control room with producers **James Carmichael** and **Lloyd Tolbert**. **Ralph Sutton** engineered, assisted by **Mike Purcell**. Also, classical guitarist **Gordon O'Brien** tracked with engineer **Dennis Cronin** in Studio B...The inimitable **Michael Bolton** cut vocals with producer **Toni Rich**, engineer **John Fry** and assistant **Ken Stallworth** at **Doppler Studios**, Atlanta. Also in was **Kenny Rogers**, working on an upcoming Magnatone release with producer **Greg Phillinganes**, engineer **Mike Wilson** and assistant **James Hansen**...Resuscitated disco icons **K.C. & The Sunshine Band** returned to the scene of their former glory—Miami's **Criteria Recording**—to work on a new Tommy Boy release with producer **Stefan Galfas**, production manager/engineer **Rick Raymond** and assistant **Scott Kieklak**...**Symphonic Tribe** tracked a live EP, recorded on location at Tremont Music Hall by producer **Rob Tavaglione** of **Catalyst Recording** (Charlotte, NC), with assistant **Leah Redwine**...

SOUTHERN CALIFORNIA

Those demented geniuses **The Melvins** recorded and mixed an Amphetamine Reptile release, titled *Honky*, with producer/engineer **Joe Barresi** at **Grandmaster Recorders Ltd.** in Hollywood...While on tour in San Diego, U2 stopped in at **Signature Sound** to overdub and mix two songs for future release. The sessions were produced by **Flood** and **Howie B.** and engineered by **Rob Kirwan** with **Michael Harris** assisting...At **The Enterprise** in Burbank, **Tamia Washington** tracked for an upcoming Qwest album with producer **Sam Sapp**, engineer **Bob Brown** and assistant **Dave Huron**...Blackground/Atlantic artist **Aaliyah** recorded tracks and vocals at **Scream Studios** in Studio City with producer **Playa** and engineer **Dou-**

During ongoing tracking and mixing for Michael Jackson's next project in the SSL 1 room at the Record Plant (Hollywood, Calif.), engineer Mick Guzauski (third in from top) decided to take the view from underneath the 8000 G+. Joining him under the 96-input board were (Front to Back) Matt Forger, engineer; Bill Bottrell, producer/engineer; Rose Mann-Cherney, studio president; Matt Carpenter, programmer; and Amy Burr, booking and operations manager.



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-John Mattick, Keyboardist currently performing and touring with ***Alabama***

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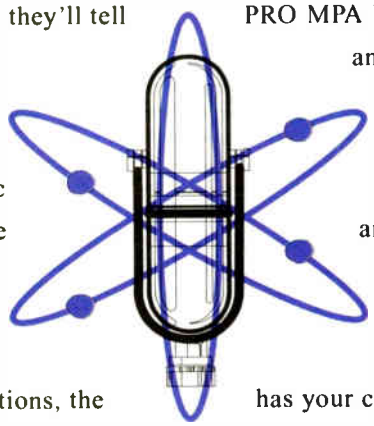

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glas Trantow...Recent sessions at Mad Dog Studios in Burbank included Dale Watson mixing his new High Tone release with producer Bruce Bromberg and studio owner/engineer Michael Dumas, and Mercury/Little Dog artist Joy Lynn White, singing a vocal duet with Dwight Yoakam for her new release...Elektra artists Coward recorded for their debut at Conway Recording in L.A. with producer Jerry Finn...

NORTHEAST

Singer/songwriter Dar Williams mixed her next Razor & Tie release at Beartracks Recording in Suffern, NY, with producer/engineer Steven Miller and assistant Kristen Koerner...Americana four-piece Hannah Cranna recorded their new release for the Big Deal label at Trod Nossel Recording in Wallingford, CT, with producer Joey Molland (ex-Badfinger)...Reggae artist Nasio Fontaine mixed his new Aphelion Productions album with Perry Margouleff and Chuckie (Neville Kelly) at Pie Studios in Glen Cove, NY. Also in was saxophonist Mark Vinci, recording for Iris Records with engineer Nick Prout and assistant George Fullan...Boston studio Soundmirror handled a few location recording projects recently, including engineer John Newton recording Seiji Ozawa of the Boston Symphony; engineer Bill Winn recording for the Thelonius Monk Institute of Jazz; and Mark Donahue capturing Joel Cohen and the Boston Camerata...Rype finished mixing a demo at Sound Techniques (Boston) with producer Brian Gottesman and producer/engineer Huck Bennert. Tom Richards assisted...Producer/songwriters Carl Sturken and Evan Rogers have been busy at the Loft Studios in Bronxville, NY, working on projects for Don Philip (MCA), China Black (Polydor) and Roland Gift (London)...Carly Simon recorded a few classic film noir songs with producer Jimmy Webb and engineer Frank Filipetti in Studio B at Clinton Recording (New York City) for a fall release on Arista Records...

PHOTO: LISA ROY

L to R: Producer Keith Olsen, singer Lou Gramm and assistant engineer Peter Love were at Olsen's Goodnight L.A. Studios in Los Angeles working on material for a Led Zeppelin tribute album for Eastwest Records, due out this summer.

NORTHWEST

At the Emeryville Recording Co. (Emeryville, CA) Greg Volker and Deer Crossing mixed an upcoming independent release, and Stephen Kent finished his next album for City of Tribes Communications with engineer Simon Tassano...John Santos recorded a project with his group Machete at Bay Records in Berkeley, CA. Jeff Cressman engineered. The Rova Saxophone Quartet started work on their latest project for the Black Saint label with engineer Bob Shumaker...

NORTH CENTRAL

The Chicago Recording Co. had veteran rapper KRS-One in finishing up his next Jive/Zomba release with engineer York Xu. In Studio 5, producer Brad Wood remixed tracks for English act Whale...OarFin Studios (Minneapolis, MN) had local soul group The Steeles in Studios A and B, mixing an album for Angel Beach Records. Producing was J.D. Steele, with engineers Todd Fitzgerald, Dave Streeby and Blake Anderson...Hipsters extraordinaire Garbage returned to Smart Studios in Madison, WI, to begin tracking their second Almo Sounds release. Also in were Fluores-

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cein, mixing their Geffen debut with producer Mr. Colson...Sony/Work Group artist Sabelle remixed the song "Why Would I Lie" in Flyte Tyme (Minneapolis) Studio A along with producer Stokely of the group Mint Condition and engineer Jeff "Madjef" Taylor...

STUDIO NEWS

Seventeen Grand (Nashville) constructed a new overdub and mix room equipped with a Neve V3 Legend with Flying Faders and a custom Dynaudio Acoustics M4 surround sound monitoring system...David Parmley and Scott Vestal of the band Continental Divide opened a new studio, Acoustic Images, in Hendersonville, TN, near Nashville. In operation since the fall, the studio caters to singers and bands who record acoustically, and is equipped with an MCI JH16 24-track and a Soundcraft TS-12 console...Producer/engineer Richard Dodd installed three Furman IT-1220 balanced power isolation transformers at his Nashville studio, Vital Recordings...Westlake Studios in Hollywood, CA, recently added an AMS Neve Flying Faders automation system to the 60-input Neve V3 Series console in its Studio C...New York City's National Video Center/Recording Studios launched its own label, the National Record Co., appointing Ron Alexenburg as label president. ■

Scott Vestal (left) and David Parmley at Acoustic Images

—FROM PAGE 203, NASHVILLE SKYLINE

an "unplugged" concert for Westwood One Radio, LeAnn Rimes making a promotional recording appearance for WSIX radio, jazz notables Paul Martin Zonn and Chester Thompson and a "Words & Music" recording event for the State Education Association. Bogert adds that he and the CMF share a complementary vision for Studio B that includes educational outreach programs and recording for a wide variety of musical styles. "It's a working recording studio," he says, "as it was meant to be."

Nashville-based Custom Tape Duplicator is moving to new facilities in town. Part of the new facility will be five new mastering rooms designed by Steve Durr. The new rooms will serve as combination listening/digital prep suites using Sonic Solutions digital audio workstations and monitoring with Tannoy DMT 15 speakers, powered by Bryston power amps and processed with White ⅓-octave EQs.

Durr, who has done several mastering facilities in the past but never mastering-type studios in a replication or duplication facility, says that the industry might be seeing more of that in the future. "There's a new emphasis on quality at the plants themselves, and at the record labels, especially the independent labels," he says. Durr also recently upgraded his monitor design at Seventeen Grand Studios on the Row, including new crossovers and re-aiming the speakers.

I stand corrected: In a recent column I quoted someone as saying that Nashville has no surround-capable mixing facilities. I was wrong. Both SeisMic Sound and Scene Three offer Dolby surround sound mixing capability. Sorry 'bout that. ■

E-mail Nashville items to Dan Daley at danwriter@aol.com, or fax to 615/646-0102.

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—FROM PAGE 202, NY METRO

market. "I had a lot of good years here, but it was time to do it," he says.

Pell was a New York R&B booking agent in the 1970s and '80s who got into the studio business after doing a Christmas record featuring several of his clients, including Ben E. King and Martha Reeves, in 1983. He wound up working at the studio starting the next year, learning the business. When the lease came up for renewal in 1989, Pell bought the one-room studio on what he says were "very favorable terms" from the family that owned it, eventually building it into a three-room facility. "I was an unusual studio owner in that I didn't start with a 4-track and I don't engineer," he says.

Sound On Sound will add new George Augspurger monitoring to both of its studios. The installation is expected to be complete some time this summer. The new speakers will replace two pairs of UREI 813s.

"The rooms needed the higher power capacity and the smoother high frequencies that more modern monitors have," explains studio owner Dave Amlen. In addition, he cited the fact that more producers and engineers now prefer to mix on large main monitors. "The trend is away from near-field monitors these days," he says. "Five years ago, everyone was on NS-10s. But now that speakers like Genelec and Meyer have high-end, powered near-fields, when you go to older main monitors, you really notice the difference."

Hollywood on the Hudson: New York's film community has benefited from a convergence of several events. First, there is the maturing of the city's own community of filmmakers: Veterans Woody Allen and Martin Scorcese have been joined in recent years by auteurs like the Coen Brothers, Jonathan Demme, Spike Lee, and Harvey and Steve Weinstein of Miramax Films. Second, New York's notorious film unions blinked in a showdown with the larger film industry several years ago and conformed to producers' requests regarding hours and fees.

As that was going on, in 1992 Sound One (which was established 20 years ago when New York's film post business was still in relative infancy) was rebuilding its infrastructure in the Brill Building, adding and refurbishing soundstages and edit and transfer rooms and adding offices for production companies to use. "All these things came together at once," recalls Jonathan Porath, chief engineer at Sound One. "In fact, we were a bit ahead of the trend. You know they say, 'Build it and they will come'? Well, we built it, but for the first few months no one came. Then it all came together, and we've been incredibly busy ever since."

Most recently, Sound One, now the largest single film facility on the East Coast, completed the first feature motion picture using the Akai DD8 as the multitrack audio recorder for the full production chain. The movie, *Picture Perfect*, from 20th Century Fox, used the Akais for Foley, premixes and final mixing. Additionally, *Storefront Hitchcock*, directed by Jonathan Demme, and *Addicted to Love*, directed by Griffin Dunne, were also on the mixing stage.

Two of the facility's six soundstages are recording to the Akai dubber; the rest are using a combination of DAWs and 35mm mag. The studio took delivery of 23 DD8 dubbers, and Porath says that Sound One's audio staff participated in the development of the Akai dubber. However, the most-used format at the facility for sound transfer is the Sony 3348 digital multitrack.

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"New York went through a tough period in terms of film in the 1970s and 1980s," Porath says. "Five years ago, we thought that drought would be coming to an end, so we started a rebuilding campaign that extended the number of stages, suites and floors in the building." Sound One now occupies eight of the Brill Building's 11 floors, with the eighth floor completely rebuilt with four new digital editing suites and interformat rooms, as well as new transfer suites.

Porath says that, as in Hollywood, the basis for getting and keeping work in New York for film is personal relationships. He counts many of his clients as friends, as well. But another important point is the ability to provide not only service, but also the one thing that is most at a premium in Manhattan: space. "Production companies come into town, and they will rent seven or eight rooms for Foley, sound editing and offices from us for six months at a time," he explains. "Once they're here, we can provide all the related services they'll need during filming, like dailies and transfer and premixing. Then we can also post the film. That's exactly the way it went with *Addicted to Love*."

Sound One has about 100 rooms of all types, used for both in-house work and for rental to outside clients. Typically, says Porath, each floor will have one main stage and numerous smaller suites and studios around it. "When you think about it, about 90 percent of all of New York's film post-production community is housed in two buildings—the Brill Building and another building across the street," he says. "When you compare that to the kind of space they have in Hollywood, it's all the more amazing how much feature film work gets done here."

Boulevard Recording has reopened its studio in New Milford, N.J., after a six-month complete redesign and upgrade. The studio, operated by chief engineer/producer Geno Porfido and studio manager Chris Taylor, offers tracking, mixing and mastering services, aimed at the still prolific independent market. Studio renovations and new gear include Manley Variable-Mu and Summit limiters, Amek/Neve 9098 EQs, a Lexicon PCM 90, 24 tracks of Tascam DA-38, custom patchbays, a Soundcraft Ghost console and custom-built API mic pre's and compressors. The main studio and control room have also been completely remodeled. ■

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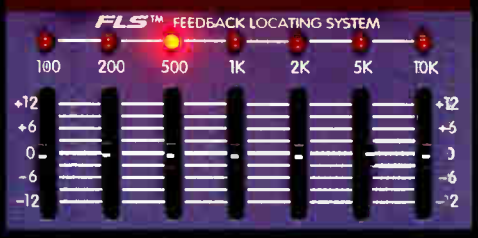

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—FROM PAGE 202, L.A. GRAPEVINE

don't realize that USC is one of the top conservatories of music in the country, with great music business and recording programs," he comments. "We're equipped with an SSL/Studer studio, similar to what I have at Sound Chamber. Our department is a bit different from most others around the country in that I'm actively involved every day in the business; it's a bit amazing to me, actually, that many people who teach music recording have never really worked in it. And, of course, being in L.A. we have another edge—I get a lot of my studio clients to come and speak. Elsewhere in the country you can't get the top composers or lawyers to drop by after work to talk to the class!"

Recent projects in at Sound Chamber have included soundtracks for the film *Love Jones*, TV's *Seventh Heaven* and *Home Improvement*, the buzz-about-town film *Boogie Nights* with music composed by Michael Penn, Dwight Yoakam's upcoming album release and Mark Isham's scores for television's *Easy Street*.

Sound Chamber's Studio B is generally booked on a long-term lease to composers, most recently Pat Seymour, and, by the time you read this, a mastering room will be up and running. McIlvery, with veteran engineer Randy Farrar, is expanding their current Sonic Solutions suite with a custom console and EQs designed and built by Farrar that will be set up for DVD/5.1 mastering with monitoring through customized Tannoys and a 5.1 home theater system.

Also in North Hollywood, at Rotund Rascal Recording on Lankershim near Burbank, owner Dave Pearlman took a few minutes off between running passes of a mix to give us some info on his studio. Pearlman has been running studios since 1979; Rascal's present incarnation has been in operation for four years with a client base that's a combination of live bands and film and television scoring work. Recent projects have been guitar overdubs with Richard Thompson for Cajun greats Beausoliel, who are recording their latest Rhino Records release; The Dukes O' Hazzard's Tom Wopat; producer/engineer Matt Wallace working with Tiny Buddy; and scoring for the soundtrack of NBC's hit series *The Naked Truth* with Tea Leoni. *The Naked Truth* sessions, co-engineered by Pearlman and producer Hank Cecalo, with music composed by Alan Elliott, are particularly fun, requiring a weekly large band setup, with two electric guitars (Wah Wah Watson is a regular bandmember), two keyboard players, drums, bass, percussion and a small horn section—all live, of course.

The studio's size lends itself to such band setups, with a 20x15-foot control room, a main recording room that's 35x15 with 12-foot ceilings and an additional iso that's 10x15. The control room is equipped with a Quad 8 Ventura 28-input console that features Class A discrete circuitry and Jensen mic pre's along with a Sphere 16-4 sidecar, also Class A and discrete with more Jensen mic pre's. "When I describe it to people," Pearlman says, "I say, 'If you take an API and an old Neve and throw them in a blender you get something approximating the sound of a Quad 8. It was made in the mid-'70s, with EQ designed and built by the guys who made the API 550s, and it's almost identical in look and sound to an API, with a nice, airy high end. It's really a beautiful little board—everybody likes it."

Pearlman is also (another!) collector of vintage gear—the main 2-inch tape 24-track machine is a 3M 79, and his outboard collection includes Telefunken mic pre's, a pair of 1953 C-12s, and a bunch of RCA ribbon mics from the '30s and the '40s. Rascal's outboard complement also includes additional Jensen Quad 8 mic pre's, Concertone/Berlant tube mic pre's, and an ADL 1000 tube limiter along with more modern "classics" like the Manley EQP1A.

Hollywood's Complete Post is opening a new audio facility dubbed Complete Sound, outfitted with three Solid State Logic Axiom/DiskTrack systems and three SSL Audio Preparation Stations. The decision to purchase the Axioms, was, according to SSL, mixer-driven, based on the need for digital, nonlinear systems that are intuitive to operators who are used to working on standard consoles. Emmy-winning engineer Ed Greene, a consultant to Complete Post for more than 15 years, was key in recommending the Axioms to the new facility. His recommendation was based both on their sound and their ergonomically friendly design. Complete Sound is targeted for a completion this month and is slated to be used for network programming, sitcoms, specials and movies of the week. The new building, located on the Sunset Gower Studios lot next to Complete Post's video facility, was designed by architect Jack Edwards, with acoustical consulting by Paul S. Veneklasen & Associates, and project oversight by Tomlinson Holman's TMH Corporation. ■

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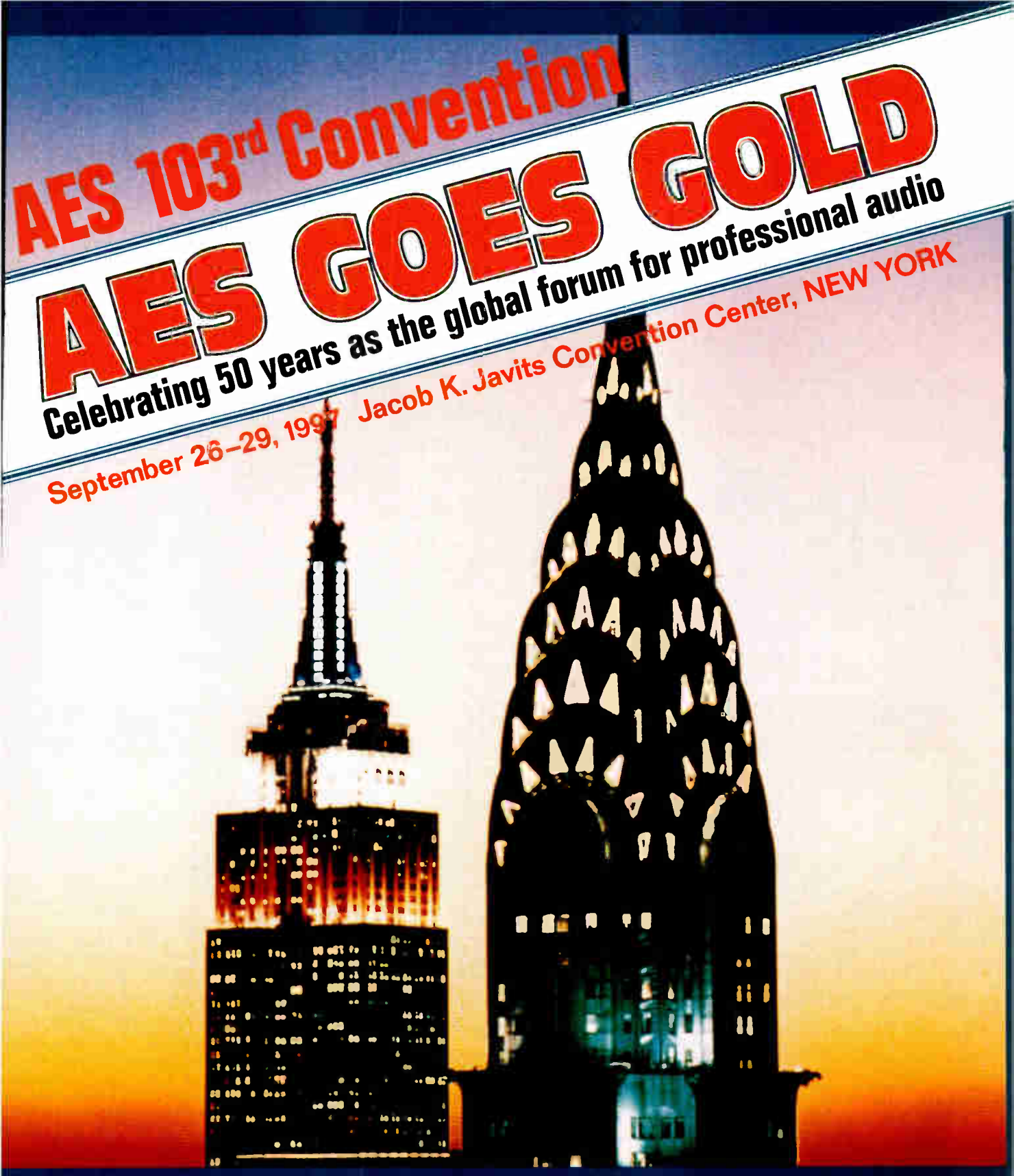

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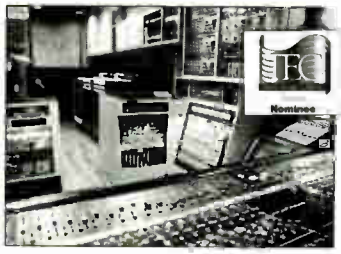

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The Sound Kitchen arrived in Nashville in 1994 and has become a first-call studio for producers and engineers nationwide. This 6,500-sq.-ft. dedicated multimedia recording facility is located in the Cool Springs area of Franklin (ten short minutes from Music Row). A Neve VR 72 legend, a Neve V3 60 Legend and a Sony 48-track digital tape deck are the cornerstones of these superbly equipped studios.

HARBORSOUND
180a CENTRAL STREET
SAUGUS, MASS. 01906
(617) 231-0095 Fax: (617) 231-0295

Harbor Sound Studios

180a Central Street
Saugus, MA 01906
(617) 231-0095; Fax (617) 231-0295

Harbor Sound Studios. Beautiful tracking facility designed and built by Acoustech, featuring custom Neve console (1073/1066), Studer A800 MkIII, Pultec, Teletronix, Genelec, vintage mics and the latest in new gear. Second room to feature Neve 8108 console and AMS Audiofile for mix and overdub. Located 10 minutes from Boston and 15 minutes to Cape Ann beaches. One minute from U.S. Route 1.

Troposphere Studios

One Naylon Place
Livingston, NJ 07039
(201) 994-2990; Fax (201) 994-2965
http://www.garden.net/users/troposphere
e-mail: tropospherestudios@garden.net

Conveniently located in northeast NJ, 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 Plus Series console with lots of new and vinatge outboard gear to satisfy every artist, manager and producer. Spacious iso booths offer comfort to the performer, and a 15,000 sq.-ft. warehouse can easily be adapted as a live room. In short, Troposphere is one of a kind. Call for a brochure and information.

▪ STUDIO SHOWCASE ▪

MasterMix

1808 Division Street
Nashville, TN 37203
(615) 321-5970; Fax (615) 321-0764

Located near Nashville's Music Row, MasterMix has been providing mastering and editing services for over 13 years. MasterMix blends experienced talent with a variety of classic analog and the latest digital equipment. We strive to offer the client the widest range of choices in high-quality listening environments. Our equipment list is always expanding, so call for the latest details.

The Castle Recording Studios Inc.

1393 Old Hillsboro Rd.
Franklin, TN 37069
(615) 791-0810; Fax (615) 791-1324

Originally built as a hideout and bootlegging site by Chicago mob boss Al Capone, The Castle Recording Studio rests upon 34 forested acres only 15 minutes south of Music Row. Much of the building's character was incorporated into the studio's design, including hardwood floors and windows in almost every room. The Castle attracts a wide variety of clients, including Lionel Richie, John Anderson, Tanya Tucker, Megadeth and BR5-49.

THE SOUND LAB

The Sound Lab

1006 E. Guadalupe
Tempe, AZ 85283
(602) 345-0906; Fax (602) 345-6966

Arizona's finest audio facility features a NEVE VRP 48-channel console with Flying Faders automation, Otari 32-track digital DTR900, analog, or 32 tracks of ADAT XT. Yamaha concert grand, vintage Neumann and AKG tube mics, classic guitars, amps and a Gretsch drum kit along with the finest in outboard gear. Experienced professionals in a relaxed atmosphere with Arizona's world-class amenities nearby! Great package rates available on hotel, car and studio time. Highest quality at the best price.

Lisa Roy's STUDIO A

Studio A Booking & Referral Service

1216 16th Avenue South
Nashville, TN 37212
(615) 320-9394; Fax (615) 320-0955

- This is a FREE service.
- Working to find the best studio for your project.
- Booking studios, producers and engineers throughout the Southeast.
- Nashville's first and only professional studio booking & referral service.

Contact Lisa Roy
for more information.

Performance Recording

Orland Hills, IL
(708) 349-9471; Fax (708) 349-5015

Founded in 1995, in collaboration with ouR* House Inc., Performance Recording was developed primarily as a studio for artist C/D and demo recording. The studio is equipped in part with an Otari 2"-24 MTR-100, 32 tracks of ADAT XT, an Amek Big console, Genelec monitors and literally a "Who's Who" of outboard solid-state and tube processing equipment. An extensive collection of vintage tube and condenser microphones, several amps and a B-3 organ round out the gear. The studio was recently tuned by Bob Hodas. Dyaxis digital editing and CDR writing are also available.

The Hook Studios

12623 Sherman Way, Suite 8
North Hollywood, CA 91605
(818) 759-4665; Fax (818) 759-0268

"The best overdub facility in L.A."

With a focus on vocals and overdubs, The Hook is a facility dedicated to serving one client. Our goal is to provide a no-compromise microphone choice for each vocalist and instrumentalist. We feature a Neve 8068, a Studer A827, and 50 microphones including AKG C-12s, C-24s, Neumann U47s, U67s, M-249s, SM-2s, 582s; Schoeps C-221s, Telefunken Elam 250, 251. We are confident that we can meet your needs.

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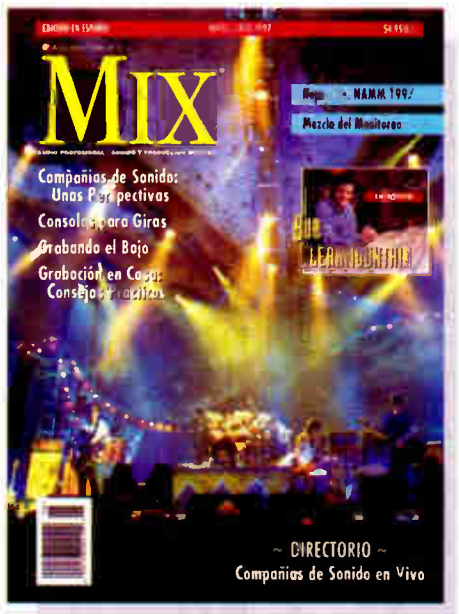

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MICROPHONES

AKG

C414B/ULS

reputation for flawless performance and uncom- on flexibility in the most manding studio and con- rt sound applications. Dual 1" Gold-sputtered diaphrams. Flat on-axis response. 126dB dynamic range. Switchable 10dB and 20dB pad. 20Hz–20kHz.

CAD

E-300
Studio Condenser Microphone

multi-patterned side address mic that ombines vintage cap- ule design with dvanced head-amp elec- onics, the E-300 has an nusually wide frequency esponse of 10Hz to 0kHz & an exceptional ynamic range of 137 B. It also features xtremely low self noise f 11dB. Ideal for even e most critical studio pplications.

hown with optional M-1 Shockmount

nique powering of all Equitek Series micro- hones is accomplished ith a pair of rechargeable ickel 9-volt batteries in com- ination with 48V phantom power. This overcomes nherent current limiting associated with most phan- om power supplies & can supply 10x the current.

audio-technica.

AT4050/CM5
Cardioid Capacitor Microphone

The AT4050 multi-pattern condenser expands upon e AT4033 to set the stan- rd for studio performance ics. 2 capacitor elements. Cardioid, Omnidirectional, & Figure 8 polar pattern settings. Vapor-deposits of pure gold on specially-contoured large diaphragms are aged through 5 steps to ensure optimum charac- eristics over years of use. Transformerless circuitry results in exceptional transient response and clean output even under extremely high SPL conditions.

SENNHEISER

ME66/K6P
Short Shotgun Microphone

This road ready mic system is perfect for camera mount and other short gun applications. It's profes- onal sound quality and affordable price combined ith the flexibility of a modular setup make it a hard oice to beat.

MIXING BOARDS

MACKIE

SR24x4 • SR32x4
Sound Reinforcement Consoles

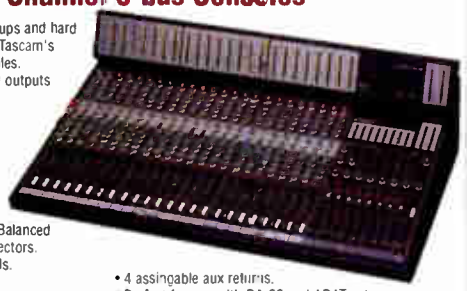
These consolses do for live sound what the acclaimed 8-bus series has done for studio recording. Both pro- fessional grade mixing consoles, the SR32-4 and SR24-4 were built to deliver the same kind of useful features found on "bigger boards" while standing up to 24-hr-a-day use.

- Fast, accurate, easy level setting via "solo".
- 4 submix buses.
- 3 band EQ w/ sweepable mids.
- 6 Aux sends.
- Globally switchable AFL/PFL.
- Mackies "VLZ" technology for low noise.
- Tape return to main mix, mono out w/level control.

The new MS-1202, 1402, 1604 & SR Series all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8•Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

TASCAM M-1600
16 & 24 Channel 8-bus Consoles

Great for modular Digital Multitrack setups and hard disk recording, the M-1600 is part of Tascam's next generation series of recording consoles. It features multiple options for inputs and outputs and uses the same, easy to install D-sub connectors as Tascam's more expensive consoles, all in "a compact design.



- XLR Mic inputs w/phantom power on 8 channels.
- Signal present/overload indicators on each channel.
- Balanced & Unbalanced tape returns & Balanced Group/Direct outputs using D-sub connectors.
- TRS Balanced Line Inputs on all channels.
- 3-band EQ with sweepable mids.
- 5 Aux sends (1 stereo)
- 4 assingable aux returns.
- Perfect for use with DA-88 and ADAT setups.

MINIDISC MULTITRACKS

TASCAM 564
Digital Portastudio

The Tascam 564 Digital Portastudio combines the flexi- bility and superior sound quality of digital recording with the simplicity and verstility of a portable multi- track. Using MiniDisc technology, the 564 has many powerful recording and editing features never before found in a portable 4-track machine.

FEATURES–

- Self-contained digital recorder/mixer.
- Uses low-cost, removable MiniDiscs..
- 2 AUX sends / 2 Stereo returns.
- 4 XLR mic inputs.
- Channel inserts on inputs 1 & 2.
- 5 takes per track, 20 patterns, 20 indexes per song.
- Random access and instant locate.
- Non-destruc- tive editing fea- tures with undo capabil- ity include: bounce forward, cut, copy, move.
- Full-range EQ with mid-range sweep.
- S/PDIF digital output for archiving.
- MIDI clock and MTC

SONY

MDM-X4
MD Multi-Track Recorder

MD recorders are here! Offering up to 37 minutes of high-quality 4-track digital recording, the MDM-X4 is truely the next gen- eration of personal multi-tracks. With a built-in mixer, exclusive Track Edit system, and a Jog/Shuttle wheel for sophisticated editing with ease, the MDM-X4 will encourage you to flex your creativity.

FEATURES–

- Records on high quality, removable MD data discs • 3.5-gen. ATRAC LSI for wide dynamic range.
- 10 Input / 4Bus mixer.
- 2 AUX sends, 3-band EQ. • 11-point locator.
- Random access memory for quick playback and record from anywhere on the disk.
- Editing features include Undo, Redo, & Section/Song

STUDIO MONITORS

ALESIS

Point Seven
DESIGNED FOR MULTI-MEDIA!

NEW PRODUCT

- Shielded reference monitor.
- Front ported venting sys- tem for great bass response.
- 50 watts RMS–100 watts peak @ 4Ω.
- 85Hz–27kHz, ±3dB.
- 2kHz crossover for accu- rate phase and a wide "sweet spot" for mixing.
- Accurate flat sound reproduction.
- Great for studio and multi-media applications.

TANNOY

PBM 6.5II
Near-field Reference Monitors

The PBM 6.5 II is the industry standard for studio near-field reference monitors. They provide true dynamic capability and real world accuracy.

- 6.5" lowfrequency driver and 3/4" tweeter
- Fully radiused and ported cabinet design reduces resonance and diffraction while providing deep lin- ear extended bass.

SONY

NEW PRODUCT

SMS-1P
Powered Near-Field Monitors

The new SMS-1P monitors are perfect for post pro- duction environments. They feature 2 types of inputs with independent volume adjust- ment, 15 watts of power, bass/treble control and shielding for use near com- puter monitors.

JBL

4206 & 4208
Near-Field Reference Monitors

The 4206 & 4208 near field monitors are 6" and 8" respectively. Both offer exceptional sonic perfor- mance, setting the standard for today's multi-purpose studio environments.

- Multi-Radial baffle ABS baffle virtually eliminates baffle dis- tortion.
- Superb imaging & reduced phase distor- tion.
- Pure titanium diaphragm high fre- quency transducer provides smooth, extended response.
- ***Magnetically shield- ed for use near video monitors.***

PRO CASSETTE DECKS

TASCAM 202 MKIII / 302

These decks provide high-fidelity sound reproduction and a wide frequency response, as well as a host of fediting & play back features.

- Dual Auto Reverse, Normal and high-speed dubbing.
- "Dolby HX Pro" extends high frequency performance and minimizes distortion
- Auto sensing for Normal, Metal & CrO2 tape.
- Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks

302 *Advanced Features–*

The 302 is 2 independent decks, each with their own set of RCA connectors, transport control keys, auto-reverse, and noise reducing functions. Cascade and Control I/O let you link up to 10 additional machines for multiple dubbing or long rec & playback.

112MKII/112RMKII

A classic "no frills" production workhorse, the 112MKII is a 2-head, cost effective deck for musicians and production studios. It features a parallel port for external control and an optional balanced connector kit for integration into any production studio. The **112RMKII** features a 3-head transport with separate high performance record and playback heads as well as precision FG servo direct drive capstan motors.

SIGNAL PROCESSING

BEHRINGER MDX 2100 Composer

- Integrated Auto/Manual Compressor, Expander & Peak Limiter.
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
- Servo-balanced inputs & outputs are switchable between +4dB & -10dB *NEW LOW PRICE!*

APHEX 107 Tubessence
2 Channel Mic Preamp

The 107 delivers outstanding sonic performance, as well as a great degree of presence, detail, & image.

- Up to 64dB of gain available
- 20dB pad with red LED indicator, 2 LED input meter
- Full 48V phantom power with red LED indicator
- Low cut filter at 80Hz, 12dB/octave
- Polarity inversion switch with LED indicator
- Switchable +4dB/-10dB output, 1/4" Balanced.

109 Tubessence
Parametric EQ

The Aphex 109 is an extremely versatile, high performance parametric vacuum tube EQ with professional flexibility and sound quality.

Great for "warming up" digital signals.

EFFECTS PROCESSING

JUST IN!

Lexicon PCM-80 & PCM-90
Digital Signal Processors

A great combination for any studio owner with an ear for the best. The **PCM-80** delivers high quality multi-effects based on the legendary PCM 70, maintaining Lexicon's high standards for sonic clarity and extrodinary processing power. The **PCM 90** is a digital reverb with its roots stemming from the studio standard 480L and 300L effects systems. Reverbs from telephone booths to the grand canyon, the PCM 90 is incredibly realistic. Together, they make an excellent addition to any rack mount arsenal.

Buy a PCM-80 and receive a FREE Pitch FX Card
offer valid thru 7-31-97

Lexicon MPX-1 Multi-Effects Processor

Lexicon s latest addition to thier Digital effects family, the MPX-1 features top-quality effects in an eay to use, 1 rack space unit. With 56 Pitch, Chorus, EQ, Modulation, Delay, and world-class reverb effects accesable from the front panel, as well as TRS and XLR balanced I/O and complete MIDI implementation, the MPX-1 creates a new standard for cost and quality in a multi-effects dev ce.

t.c.electronics Wizard M2000 Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and 6 different routing modes making it a great choice for high-end studio effects processing.

FEATURES–

- 250 factory programs including reverb, pitch delay, chorus, flange, phase, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement
- 20-bit A/D conversion, AES/EBU and S/PDIF digital I/O.
- "Wizard" help menus, 16-bit dithering tools.
- Tap and MIDI tempo modes.
- Single page parameter editing, 1 rack space.

SONY DPS-V77 2 Ch. Master Effects Processor

Sony's latest effects processor, the DPS-V77 yields excellent sonic quality combined with realtime control, a digital I/O and many more features that will put a smile on the face of any discerning studio engineer.

FEATURES–

- 198 preset &198 user-definable programs.
- Control up to 6 parameters in realtime via MIDI information and an optional foot pedal
- Use the AES/EBU & SPDIF digital I/O to link multiple V-77s together & when working with digital mixers
- 10-key pad input
- Shuttle-ring equipped rotary encoder allows for quick patch changing.
- A noise gate circuit is provided ahead of the input for guitar players and other instrumentalists who want top quality effects without sacrificing tone.

ALESIS QuadraVerb 2 2 Ch. Master Effects Processor

Alesis' most powerful signal processor, the Q2 offers amazing audio fidelity in a versatile multi-effects unit. Great for professional & project studio owners, its large backlit display making parameter editing intuitive and quick.

FEATURES–

- 100 preset & 200 user-editable programs.
- Octal Processing allows use of up to 8 effects simultaneously in any order.
- Choose between over 50 different effects types for each block, including reverb, delay, chorus, flange, rotary speaker, pitch shift, graphic and parametric EQ, overdriver and more.
- 5 seconds sampling, triggerd pan, and surround sound encoding are built in.
- Selectable -10 dB and +4dB levels, servo-balanced TRS inputs and outputs.
- ADAT Digital Interface allows you to work entirely in the digital between the Q2 and an ADAT XT.

PRO HEADPHONES

AKG K240M

The first headphone of choice in the recording industry. A highly accurate dynamic transducer and an acoustically tuned venting structure produce a naturally open sound.

- Integrated semi-open air design.
- Circumaural pads for long sessions.
- Steel cable, self-adjusting headband.
- 15Hz–20kHz, 600Ω

SONY MDR 7506

The Sony **7506's** have been proven in the most trying studio situations. Their rugged, closed-ear design makes them great for keyboard players and home studio owners.

- Folding construction
- Frequency Response 10Hz to 20k Hz
- 1/4" & 1/8" Gold connectors
- Soft carrying case
- Plug directly into keyboards

beyerdynamic DT 770 Pro

These comfortable closed headphones are designed for professionals who require full bass response to compliment accurate high and mid-range reproduction.

- Wide frequency response
- Durable lightweight construction
- Equalized to meet diffused field requirements
- Padded headband ensures long term comfort

SENNHEISER HD 265/HD580

The **HD-265** is a closed dynamic stereo HiFi/professional headphone offering high level background noise attenuation for domestic listening and professional monitoring applications. The **HD 580** is a top class open dynamic stereo HiFi/professional headphone that can be connected directly to DAT, DCC, CD and other pro players. The advanced design of the diaphragm avoids resonant frequencies making it an ideal choice for the professional recording engineer.

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—FROM PAGE 32, CHET ATKINS

who was building amplifiers, and he started building Fender guitars. It was entirely different in looks from what Bigsby had done, but it was a solid guitar, and it changed the world.

I never liked the damn things, because it was like playing a plate. I was used to that thick guitar, and one that didn't sustain as much, so I was behind the times. Mr. Gretsch didn't get into solid-body guitars for years. He thought that was an aberration. When they got to selling so many, the dollar signs popped up. [Laughs] Then he started building guitars that would sustain more.

The other day, I read in an article where George Harrison said, "We should've had a royalty on those guitars," and he was right. [Laughs] Actually, George has paid me back hundreds of times by playing the Country Gentleman guitar that I designed.

The Beatles were fans of your work. The feeling seemed mutual, too. You even had an album called Chet Atkins Picks on the Beatles.

George Harrison wrote the liners for it. I would love to meet George. I admire him so much. Of course, I would have loved to have met John, but it never happened. Paul came to town about 20-some years ago and rented Curly Putman's house and had Linda and the kids with him. Jack Stamp called me and told me that Paul wanted to come out and visit. So he came out to my house and played piano and sang some of his new songs, and I said, "Can I record that and play it for my daughter," who was living in Memphis at that time. He said, "Sure. Go ahead!" What a nice guy! He asked me about Waylon and Jerry Reed and The Browns and all of these people. I was thinking, "How in the hell does he know about all of these people?" [Laughs]

How do you think the country song has changed over the years?

If you want to hear a clever song or a good ballad, where do you hear it? You don't hear it from Sinatra anymore. You have to tune into a country radio station to hear a good ballad most of the time. At least, I do.

I think the heart was there years ago, but maybe they didn't express it as well as today's songs. Now, the songs are better than ever, because writers are so trained and adept at putting words together and having terrific hooks at the end of each verse and chorus. It has gotten more palatable and sophisticated to the city audiences. They write for those ladies out there who buy most of the records.

We used to have a lot of songs put down women. [He sings] "Seven years with the wrong woman will wreck most any good man." Women didn't like that stuff. We didn't know it at the time. [Laughs] If I had a publishing company, and I had a bunch of writers, I would make them stay at home about once a month and watch all of the soap operas. I think, maybe up until the last ten years, a lot of the writers would go out and live these experiences and then write about them.

I know one guy who once told me that he took one girl out and had a date later on [with another]. He also had to meet with his wife, and she kept asking him "Why do you keep looking at your watch? What is it with you?" He couldn't wait to get her out of there, so he could write the song. He said, "Every damn word she said was in that song." [Laughs] I think that happened a lot in those days.

It's more of a business now. You get a bunch of writers, and you keep them on the ball and make them write a lot, and try and keep their lives straight. If you can do that, then you could have a successful operation. I don't think that existed years ago.

Recently, you've been playing every week at Nashville's Caffe Milano. What led you to doing a steady club gig like that?

This is great for me, because I've been playing about once a month with orchestras and my band all over the country. It wasn't enough to stay agile and in shape. I thought, "If I can play once a week, I'll play better." It has worked out that way. I don't want to go out and embarrass myself. I have always practiced before the gig. I've got a good band together.

We've had Vince Gill, Johnny Cash, Suzy Boguss and K.T. Oslin as guests. I also have a dancer each week and I play fiddle, too.

It's great being able to perform a laid-back gig and have such friends lend their talents.

I've been so damn lucky in this world. Lord, I can't believe it. I pinch myself and say, "How did I do this?" Hell, I've lived out my 72 years, but I want to make it to the year 2000. It might be a big disappointing party, but maybe not. Everybody sure talks about it. ■

Rick Clark is a Nashville-based writer, songwriter and producer.

SEPTEMBER 1997

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—FROM PAGE 16, SICK, SICK, SICK

see how low you can go. Subwoofer technology is *not* sitting still. Some stunning advancements (and some real circus acts) have come along recently. Like most technology, subwoofers are moving targets. This can be literal—certain brands have been known to walk around the room when pushed hard.

What are we trying to do with subs? In some form or other, for some reason or other, we are trying to move air. Perhaps our primary speaker systems are a bit lacking on the low end, or we are using high-quality nearfields and we wish to augment their limited bottom. Or maybe we are mixing the new Star Wars killer and we need to feel that ship fly over. Or some of us might be reggae lovers who need to feel the jammin' in our very souls.

Whatever our motivation, we want to move lots of air. Why? What are we shooting for? What do we want this 30 Hz for? Or now this 20, 18, or even 13 Hz? And how much are we willing to pay? You can move a room full of air at 112 dB for a couple grand, if you are willing to do it all at 40 Hz. But if you want to generate a reasonably *flat* 20 to 80 Hz, you need at least two very high-quality, high-power subs in order to disperse resonances, and some serious structural integrity in your listening room. The lower you want to go (assuming you want to stay in control), the more it costs.

So now you're spending big bucks, displacing lots of living space, drawing some serious current, generating some heat and twisting the image on every video monitor on your block. And for what? Are we really trying to *hear* 15 Hz, or should we admit that we are actually trying to *feel* it?

I SEE THE LIGHT, I FEEL THE BEAT

Sure, you need subs for the low end in film and some music, but as you dive below 25 Hz it becomes more of a physical and less an acoustic event. Now since the first step toward recovery is admitting you have a problem, say this with me: "We are moving all this air so that we can *feel* it." I personally admit that I for one am trying to feel it. I mean, come on—I ride a Harley...

But must we do it the hard way? Must we move all that air, hurt our ears and force our friends out of the building? You do need subs if you are really going for a flat 20 to 20k at any serious level. But if you have felt less than viscerally satisfied even after your very impressive quadra-kilo-buck supersub system was installed, you might consider doing what I did.

Just like the sci-fi dream of jacking your brain directly into the output of your console or stereo system, I have found a way to hook your butt *directly* to your sub output. And as an added extra bonus, only *you* get the hell beat out of you, not the people sitting three feet away. Consider it sort of "subwoofer buttphones."

SIT ON IT

A company called Clark Synthesis makes a little transparent disk about the size of a small frozen dinner (or a contact lens for a sperm whale) with a threaded fitting on one side. You drill a hole somewhere in your favorite chair, screw a stud in and bolt the disk to the stud. You throw a couple hundred watts at the disk, and according to the manufacturer's claim, "you will get enough low-frequency throw to blur your vision."

What do subwoofers and the limbo have in common? Both share the same challenge: to see how low you can go.

Yeah, right. To prroovd thatt I amnm nnnot havinfg mty visionn bnluurrd, I amnmm wrioting thius sentanbnce whiloe uising the Clarjk Tacktille Soounfd systeem.

Inside this little disk are magnets from some other quadrant of the galaxy, and a voice coil bolted directly to some dimensional warp that connects back to itself. To look at it you would think it is a joke, the voice coil and the "basket" are fused together into one assembly. It actually flexes itself, and generates as much as, are you ready...200 pounds of push! Push against what I don't really understand, but the device certainly has jump started my heart more than once. All it

takes is the right movie effect or kick drum.

It seems like a silly little kid toy, and to be sure, previous "seat-shakers" were just that—simple boomers that woke up and buzzed your car seat whenever they got energy that matched their resonance (typically around 40 Hz). But the Clark is different.

A PROMISE IS A PROMISE

At the top I told you this thing was the worst-sounding speaker I have ever heard. Well, it is. Amazingly, they let the thing go (and recommend that you use it) all the way out to 15 k or so. They think this is pretty cool, but I found no use for all that mid or high end in my pilot's chair. In fact, I found that having the surface of my chair sing to me was more than a little distracting. So I roll out at 50 Hz.

The frequency response is, of course, entirely dictated by what you have bolted it to. In my chair, it went to about 5 k but had serious hot spots. How could it be any other way? Chairs just aren't designed to resonate evenly from 20 to 20k. *But*, they told me to go out and bolt a couple units to the underside of my wood pool deck, and I would have stereo (with a very impressive bottom end—almost impossible to achieve in the wild and still be tolerated by your neighbors) all over the deck. They were right. And that justifies its full bandwidth. They also told me to bolt a few to the beams under my listening room floor. See? I told you they told me to put it in a different room. And that, limited to under 80 Hz, was impressive as well.

They make a standard model, but I got my hands on prototypes of the new extreme "pro" version. More lift, more violence. I feed it several hundred watts from around 10 to 50 Hz, and use subs along with it. Now I can *feel* bad splices, mic pops and DC shifts in digital masters. And I mix at a *much* lower SPL, because I am satisfied with feeling the bottom end details!

This brings up what is perhaps the most crucial point to be made about these Frisbees. They are *not* 40Hz boomers. They actually deliver a reasonably smooth curve from 100 Hz down to whatever you want to throw at them! This is what makes them unique, and this is what made me write about them. A silly toy idea so well implemented that it has evolved to a new level. They work. They are used in flight simulators.

And then there is the entertainment aspect. Movies become totally encompassing experiences. You almost feel guilty watching a movie with one of these things bolted to your chair. Every time some effect comes along and compresses your spine or makes your glasses slide off your face, you find yourself looking at your friends to see if it was way, way too loud. But they are happily sitting there, oblivious to the true nature of that gunshot or the 90-terawatt intergalactic cruiser's bone-rattling engine rumble. Let the wimps move their air. I now move the Earth!

THE BIG SECRET

The secret is that you can't tell you aren't actually hearing SPLs of 130. Apparently you can't tell the difference in feeling 20 Hz and hearing 20 Hz, except that feeling it doesn't destroy your ears! You are convinced that you have just broken every window in the place and knocked another 6 dB out of your ears for life, but nobody around you seems to notice (unless you turn on the floor-mounted ones). Very nice trick.

And for music? If you remember what it was like to play to thousands at Monterey, if you remember that feeling of the bass amp stack moving your bell-bottoms two inches back and forth with every open E, and you kinda miss it but there is no way you are willing to further destroy your ears just to re-live it—the Clark Synthesis Tactile Sound system is for you. E. Power Biggs must have known these were coming. I wonder what *two* of them would do in that chair... ■

SSC and his shaky, shaky heart are off to feel The Rock *for the fourth time now.*

—FROM PAGE 82, THE FIFTH ELEMENT

working with a 4-gigabyte drive or less, which basically limited most work to four 4-gig drives. Because it is unwise to invade the storage usage of a drive beyond the recommended 10% margin, this would leave you with a relatively safe working storage volume of 14.8 gigabytes. Some may think that is a lot of computer memory, but those who cut theatrical-style sound know that disk space is fleeting.

This is one of the primary reasons that I spend a seemingly immense preparation time before I commence cutting; it is always wise to recognize the need to prepare and polish the sound effects before you cut them. This seemingly obvious concept, believe it or not, is often overlooked in the heat of battle when cutting complex sequences.

I would receive hundreds of sound effect transfers (per Mangini's cut list). Most of these sound cues were several megabytes long, but by the time I had cut, polished and remastered them, I had distilled nearly 30 gigabytes of sound down to 12.5, spread over four drives. One memorable transfer was a 9.8-megabyte cue of a single high-tech telemetry burst in its original length. After distilling the sound to its usable essence, the cue ended up being only 120K in length, precisely prepared for either drag-and-drop or spot-mode sync cutting—an obvious benefit when one is frame-flipping across countless visual special effects computer graphic-scans and wanting to cut precise, frame-accurate bursts and trills, or when cutting a complex gun battle with multiple shooters wielding various weapons in semi-auto mode.

One of the most extreme examples that I can give is a one-second screen-time performance of a piano being rolled into position by Bruce Willis so that he can reach the ceiling air duct to rescue the character Leeloo. The sound cue that was given to me was a 28MB stereo recording that Mangini had made of two guys pushing a grand piano around on a hollow wood floor. The first task was to distill the two-and-a-half minutes of raw sound down to a workable 30 seconds; but most importantly, the maximum volume peaks of the wheels striking either grit or wood floor seams were suppressing the wonderful low-end richness of the piano's wood frame, which was reverberating from the vibration of its internal strings. Using "normalize" (in Sound Designer II) as a global parameter would not achieve any further richness. Sure, I could have used a dynamic envelope algorithm that would act like a noise gate and a gain-brain expander, but I find such tools are only good for quick and bandage-type work—often yielding a disappointing, flat and sterile result.

Using the magnifying glass function, I was able to study each waveform, often enlarging the image to single samples, ferreting out digital ticks and zits, studying and removing distortion patterns and often redrawing the waveform itself to repair and salvage, rather than cut and remove the offending material. I then highlighted precise regions, even within a fluid action, and laid on DSP functions ranging from normalize to pitch shift to parametric EQ. (This kind of decision-making can only come from years of experience and working on the re-recording stage with the mixer to learn and understand what one can and should do—and that which one should not do to an audio file prior to handing it over for the predubbing process.) It took me four hours to edit the rolling piano effect to a full richness, bringing out the resounding piano chords and the rumble and weight of the instrument. Was it worth the time? For me it is the difference between banging out assembly-line "sync-sync chop-chop" style work and bringing art and craftsmanship to the job—the difference between a Sears couch and a Chippendale.

A good example of where this meticulous approach really paid off is when the salon set blows up. Without bringing out the dynamic richness first, the mixer would be constantly battling maximums in the re-recording process to achieve a similar result, and certainly not as dynamic as the sound that made Besson jump up with excitement during the predub, thrusting two enthusiastic thumbs-up when the expanding audio destruction of explosions and debris tore the salon to bits.

My particular style of cutting sound effects has always been bigger than life—make the track easy to tone down rather than more difficult to beef up. During the involved gunbattle and devastation of the Fhloston Paradise salon, I took the Mangalore weapons and made sample-shifted variants to add more separation and diversity. Rather than just using the pitch-shift function, I called up the sample rate information menu of the audio file, which was 48k. I then entered 42k for one version and 54k on another. This gave me an instant and reversible opportunity to audition to see if I liked the altered performance. If I liked it, I would draw down the sample rate conversion menu, type in 48,000 and let the computer resample the variant copy. But gunfire alone is not exciting. Cause and effect always make richer audio experiences: separate mechanism movements, gun rattle (from Foley performances), brass shell casings cascading onto the appropriate surfaces, bullet impacts, ricos, zip-bys, as well their consequential effects on furniture, marble, glass objects and other delicate items...even if it's not seen.

CONCLUSION

The key to a great soundtrack is variety and variation—with occasional introductions of little subtle, unexpected elements—the hint of hot gasses mellowing on a close-up of a smoking gun barrel, or a single and unusual spatial inversion, such as a delicate sucking-up sound sweetened against a well-oiled metallic movement for a slow-motion close-up of an expandable weapon mechanism being snapped out. These are the additives and delicacies that make such audio experiences stand apart—and *The Fifth Element* has many sounds that make it stand apart.

Unless the designed soundtrack can make it from workstations onto the big screen, what good is it? Just as the mixers are only going to sound as good as the material we give them to mix, we are only as good as the re-recording team that mixes it. This seemingly obvious statement is often overlooked on many projects, but not on *The Fifth Element*. Head mixer Chris Jenkins and Ron Bartlett (effects) and Mark Smith (music) handled predubbing and final mixing chores on the Otari Premiere in Todd-AO West's Stage 2. Rich Ash, Brad Sherman and Gary Geagan handled additional sound effects predubbing on Stage 3. Two 16-voice Pro-Tools units were available at the mix for instant updating and sweetening.

Fortunately for us as well as *The Fifth Element*, the mixing crew put together one of the most interesting blends of sound effects and music that we have heard in a long time. From the clear and heavenly aria of the Diva's opera performance to the in-your-face space D.J. Ruby Rhod, Eric Serra's musical score is anything but predictable, giving a fresh spin to the space opera genre and making *The Fifth Element* a great audience thrill ride. ■

David Yewdall went from The Fifth Element *to* Winnie the Pooh: The Great Adventure. *His palette just keeps growing.*

—FROM PAGE 183, MELLE MEL & SCORPIO
recorded in approximately ten days at Studio Three 2 in the heart of Hollywood. The almost three-year-old facility is owned by Carlos Flores, proprietor of Carlitos Records, an indie label, and musician/engineer Jean-Yves Ducornet. "Out of a thousand sharks Carlos was one dolphin that would drag you to the shore," Mel says. "He's a good guy and definitely made it possible for us to do the album. He is one of the few people around that actually does have respect for somebody's craft."

Another deciding factor for using the studio was the presence of Ducornet. A multitalented musician who goes by the name of Jeeve, he conceived all the original music for the project. Significantly, he had also previously worked with the veteran rappers and contributed his music to the demo that landed them a new recording contract with Str8 Game Records.

"'Hen Gee, an associate of Ice T, brought them over to my studio to listen to some tracks I had done with him [Hen Gee] and other rappers," Ducornet recalls. "Melle Mel and Scorpio liked the music, and they decided to start working in our studio. We recorded about 12 songs together as a demo six months before doing the CD. Five of those tracks were used on the album that just came out. Luckily, for the CD we had a lot of music already recorded, so all we had to do was remix a lot of the stuff. Initially Str8 Game had a specific song they wanted them to do—'Mr. Big Stuff'—and from there it turned into an album deal."

During the sessions for the CD, the Hollywood studio was just a single-room operation, rather than the full suite it is today. Equipment used on the sessions included a Tascam M-600 mixer, three synchronized Tascam DA-88 8-track decks, an Amiga 3000 sequencer, Boss EH-50 enhancer and a Boss GE-231 graphic EQ. "All the music was not recorded onto separate tracks," Ducornet explains. "I used everything coming out of the computer, mixing it internally with submixers. The result of that went to tape—two tracks left and right—and it went really fast because of that.

"It only took about five minutes to dump the music to tape. Then we did the vocals, guitars and whatever needed to be done on top of that. If we noticed something when we were mixing, all I had to do was bring up the computer file, which was up all the time anyway. It was always synchronized with the music. I'd bring whatever was needed for EQ'ing up, and that was pretty much it. I mostly do it that way for music, especially when I'm creating and recording it on the same day. You can actually hear what it's going to sound like right away. Sometimes if there is more of a budget, then we take the time and dump all the instruments onto separate tracks."

The easygoing French-American says he aspires to have a career performing and recording music in the Sting or Peter Gabriel mold, and he seems an unlikely person to be immersed in world of hip hop and rap. Asked about the demands of the genre, he says, "Sometimes initially it can be a little weird, but once we start working, things mellow out. I've just been doing it so much that I'm totally used to it. I have this massive sound library with effects that match the rap vibe, too. They come in asking for special sounds that I usually have. In a way rappers are easier to deal with because they are not as demanding musically and harmonically. They'll give you a basic idea, a bass line or something, and sing some vague notes to you. They'll think that the basic idea is the whole song and they'll call themselves producers. You'll be playing something and it will be a little different and they'll say, 'That's it.' From there, you start writing the music, adding chords and harmonies. That's not something they're doing. Then the finished CD will come out, and you'll learn your name is not mentioned."

However, Ducornet is quick to point out that working with Melle Mel and Scorpio "was really great. They're nice guys. Mel is probably the best rapper around. But as you can see, my name is not on the CD for writers credits once again. I think we're taking care of that now. That should not be a problem royaltywise, I'm still going to get paid." Surprisingly, Melle Mel agrees: "Rappers should try to work with musicians so that they can actually learn and respect what it takes to create music, instead of just doing samples. A lot of rappers don't actually respect musicians because they don't understand the creative process."

Having been out of the studio for close to seven years—an eternity in this business—the duo might have expected to see a lot of changes in equipment and techniques. "The sequencers are better, but nothing was totally new," says Melle Mel. "There are some new machines, but I'm used to working in studios. The technical aspect wasn't too much of a difference." Scorpio, on the other hand, says, "Personally, I liked doing it better back in the day. We'd have five mics and they put the track up and we'd just do it live back to back. It would be just like straight performing, and you could really feel the energy."

Melle Mel recalls, "We actually didn't want to produce this CD, because we're not producers really. We found it hard to work with other producers; they didn't actually want to work with us. They didn't take us seriously. So we basically had to do it ourselves." References to their past accomplishments as members of Grandmaster Flash & the Furious Five are absent from this recording. "We were trying to do some of the things we hear now," Melle Mel explains, "and trying to be as traditional as possible in the way we went about it. We tried to make the kind of album that people who used to listen to our music won't think we totally lost our minds, while also people of today won't think that the stuff is dated."

Scorpio agrees, adding, "The sound we wanted is like right now. If you hear our stuff on the radio, it would stand out. But it won't stand out to the point that people would say that's some real old-school crap. In between tracks we have interviews about the record so people understand and don't think we're just trying to be hard core. We're not—a brother pulls a gun out on me, I'll run like the next man. I'll beg for my life 'cause I'm not ready to die, and we want that to be known."

This legendary duo make a lot of Rodney Dangerfield-like references about their current status in the rap/hip hop hierarchy. They admit that at times they are angry, but they cleverly use the negative to give them impetus to forge ahead. Scorpio expounds, "Rap is the only industry that will basically just write you off, suck you up and spit you out. In other fields all the greats are paid homage. When Muhammad Ali walks into any gym the boxers on top will stop and bow to him. The NBA recently honored the 50 greatest NBA players. We're going to make the people respect us, and not even through anger. Just through being professional. We're going to bring that back to the game. The last brother that was just professional and really made an impact like that was Hammer. Even though people say he's not a good rapper and this and that, he brought showmanship to the game. That's why he got so huge. There was a need for that and there still is." ■

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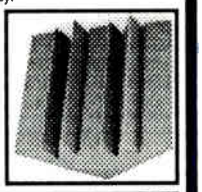

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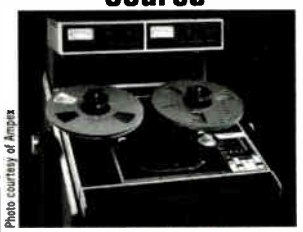

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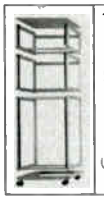

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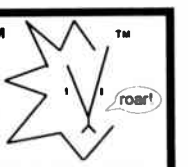

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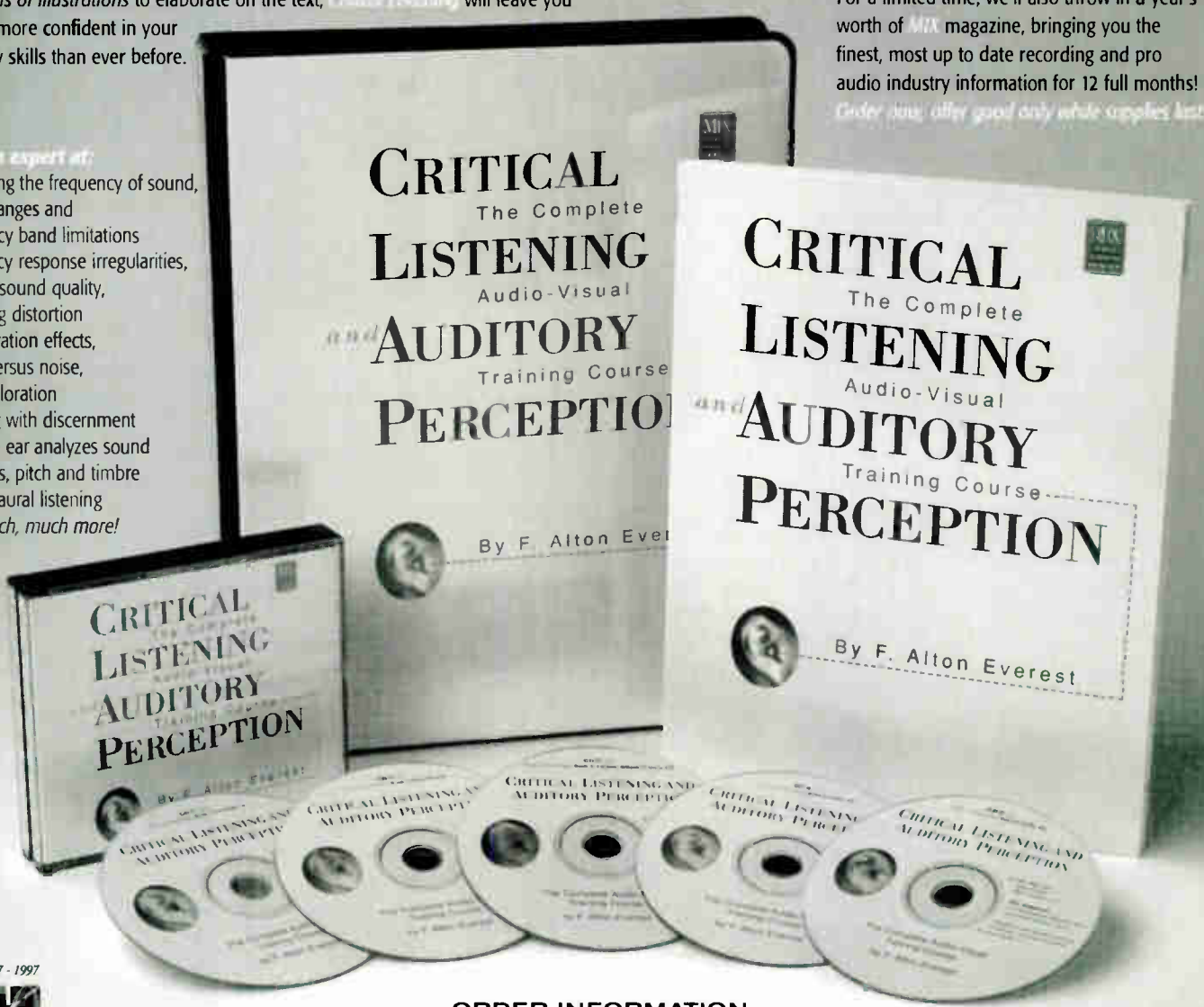

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FEEDBACK

POLITICALLY INCORRECT

I read *Mix* because I learn from its writers, who know more than I do about professional recording, sound and music production. When the description on your masthead includes "social and political comment," then maybe columns such as Paul Lehrman's will be more appropriate, although it's questionable whether he knows more about these issues than your readers. In Lehrman's recent column, ("Next Year's Gear," April '97) he alludes to the supposed arrogance of certain people. But isn't it arrogant of him to assume that the readers of *Mix* are interested in his opinions of Clinton, Rush or Paul Shaffer?

I consider *Mix* a haven, a place where I can go to forget all the gray area of society, a place where my worst inner conflict is whether to go analog or digital. In the world of *Mix*, answers can be found, problems can be solved if I can save enough money or pick the right brain. When I reach for my other periodicals, which deal with social and political issues, I take a deep breath and brace myself for a totally different thought direction. I don't want to know your political views. I want to feel nothing but admiration and comradery. Lehrman's opinions on unrelated subjects contribute nothing to *Mix*, or to my opinion of him. I am interested only in what he can share with me about *audio* from an *insider's* point of view.

I know nothing about Stephen St.Croix's political views. I look forward to his column most of all and would love to run into him and chat for a couple of hours. This illustrates why I subscribe to *Mix*. Mr. Lehrman, share with me your knowledge and opinions relating to "Professional Recording, Sound & Music Production." I look forward to that.

Joseph DeRosa
Sparks, Nev.

ANOTHER WORLD VIEW

Stephen St.Croix, you are my favorite recording industry trade journalist. You're absolutely brilliant when you're exposing the flaws in the audio recording methods, media and equipment that the rest of us would otherwise lazily go on thinking of as virtually perfect. But in the April issue, when you set down for us some of your ruminations on music philosophy...How was it you said it? Something about a warped vision of life?

Really, now! Emotional responses to a "correct" set of tones? Have you never been left emotionally cold after hearing some poor, misguided music student flawlessly execute a series of tones such as, for instance, those that J. S. Bach wrote down as one of his Goldberg Variations? And yet when Glenn Gould played the very same series of tones on the same type of instrument, it was magical, thrilling, moving! Or have you never seen someone play a rhythmically imprecise but touching performance into a MIDI sequencer, and then watched as most of the beauty and humanity was drained from it when they hit the confounded quantize button? Or why are we galvanized by performances by people like Robert Plant, with all of his rhythmic, intonational and timbral "flaws," and yet merely amused (if even that) by a more technically "correct" rendition of the same song by another artist, or some karaoke singer?

Those kinds of experiences demonstrate that music doesn't consist of a series of tones. I believe it must consist of emotional expression, and that the audible tones that have been organized somewhat in terms of pitch and timing are merely the medium. It is a form of communication from one human soul to another. Can you disagree with the statement that good music only happens when an artist lays his heart on the line?

But that doesn't quite get to the heart of the matter. Why does music work? Why does it make any sense at all? Those are the questions at the heart of your article. You seemed to come to the conclusion that music came about simply as a way of calling mates. I think you know down deep that it is much more than that. Have you never sat alone and played an instrument or sang until you felt better about life? Look at the myriad ways music is used and affects our lives. It ain't such a narrow spectrum as improving our love lives! If it were, how come we each love certain pieces of music that were made by people we don't particularly like or agree with?

You're absolutely right—there's no reason that a species evolving in a chance-based universe would "incorporate a mechanism" such as music as we know it. Think about this: Why did the early 20th-century composers fail utterly in their attempt to write good music that fit their relativistic world view? [*Huh?—Ed.*] We have found that the series of tones they produced just don't correspond to human nature.

But music is the least of our philosophical worries here. Why does anything make sense? Why are humans (and, arguably, only humans) driven to seek meaning, relevance, purpose? Those are the questions that lie restlessly beneath the surface of the ones that you set forth in your article. Perhaps the answers lie in the questions themselves. How could music make sense unless its parameters were set forth by a sensible person? Why would we seek meaning unless there were some meaning to be found? Could it be that the existence and power of music in humanity attest to the existence and power of a Creator, in whose image we were made? Or perhaps, after all, we are just a species of farm animal headed for some celestial platter, who happen to be driven to seek meaning and purpose in life, as well as having the ability to delight and affect each other with rhythmically organized series of tones. Right.

DFinnamore@aol.com

WRONG NOTE

I enjoyed Stephen St.Croix's "Songs in the Key of Life" in the April issue, and your reference to "perfect pitch." Yes, in ways, it is a curse. For 30 years, I thought "And Your Bird Can Sing" was in E. However, I recently listened to The Beatles *Anthology 2*, only to find that John had played it in D, and Paul didn't really hit high A on "Can."

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Aux 1 Master with 10dB of extra gain above Unity.

EFX to MONITOR switch lets you feed Aux Return 1's reverb or other effects back into Aux Send 1 and control the amount via Aux Return 2. A Mackie exclusive feature.

Two aux sends per channel w/extra gain past Unity.

Separate tape inputs & outputs.

Check around. You'll discover that even though there are about a gazillion makes and models of ultra-compact mixers, just two tend to show up in the racks and project studios of serious pros. The MS1202-VLZ and MS1402-VLZ tour on stage with top stars, submix into mega consoles, and even record sound for major motion pictures. Why settle for a toy when the real thing is comparably priced?

Solid steel chassis.

Rude Solo Light.

Inserts on mic channels (unbalanced).

Two stereo Aux Returns, with up to 20dB of gain available.

Control Room/Phones switching matrix and separate level control. Select any combination of tape, main mix, or ALT 3-4 and route them to the Control Room/Phones output OR back into the main mix. Consider the possibilities: easy assign to control room monitors, multitrack recorders, submixes, separate monitor mixes, broadcast, or 2-track tape feeds. A Mackie Designs exclusive.

Built-in power supply instead of a wimpy, outlet-eating wall wart.

ALT 3-4. Mute a channel and the output is routed to a separate stereo bus. ALT 3-4 has its own outputs or can be "folded" into the Control Room/Phones bus OR main mix.

Control Room outputs so you don't have tie up your headphone outs to drive a pair of our nifty new HR824 active near-field monitors.

XLR main outputs with switchable mic/line level.

Above right: The MS1402 Control Room section. MS1202-VLZ is similar except without Phantom LEDs, Level Set LEDs and global AFL/PFL solo switch.

Stereo in-place solo (1402) retains channel's correct position in the stereo mix. A soloed channel's operating level appears on the main LED display. Solo is PFL (pre fader) on the MS1202-VLZ, and globally switchable to AFL (after fader) on the MS1402-VLZ.

Below: A few of the 400+ folks who work at Mackie Designs in Woodinville, WA, 20 miles north of Seattle.

1) On stereo channels.
2) This would make a great album title for the '90s.
3) Except possibly drummers who drink triple espressos.

MACKIE®

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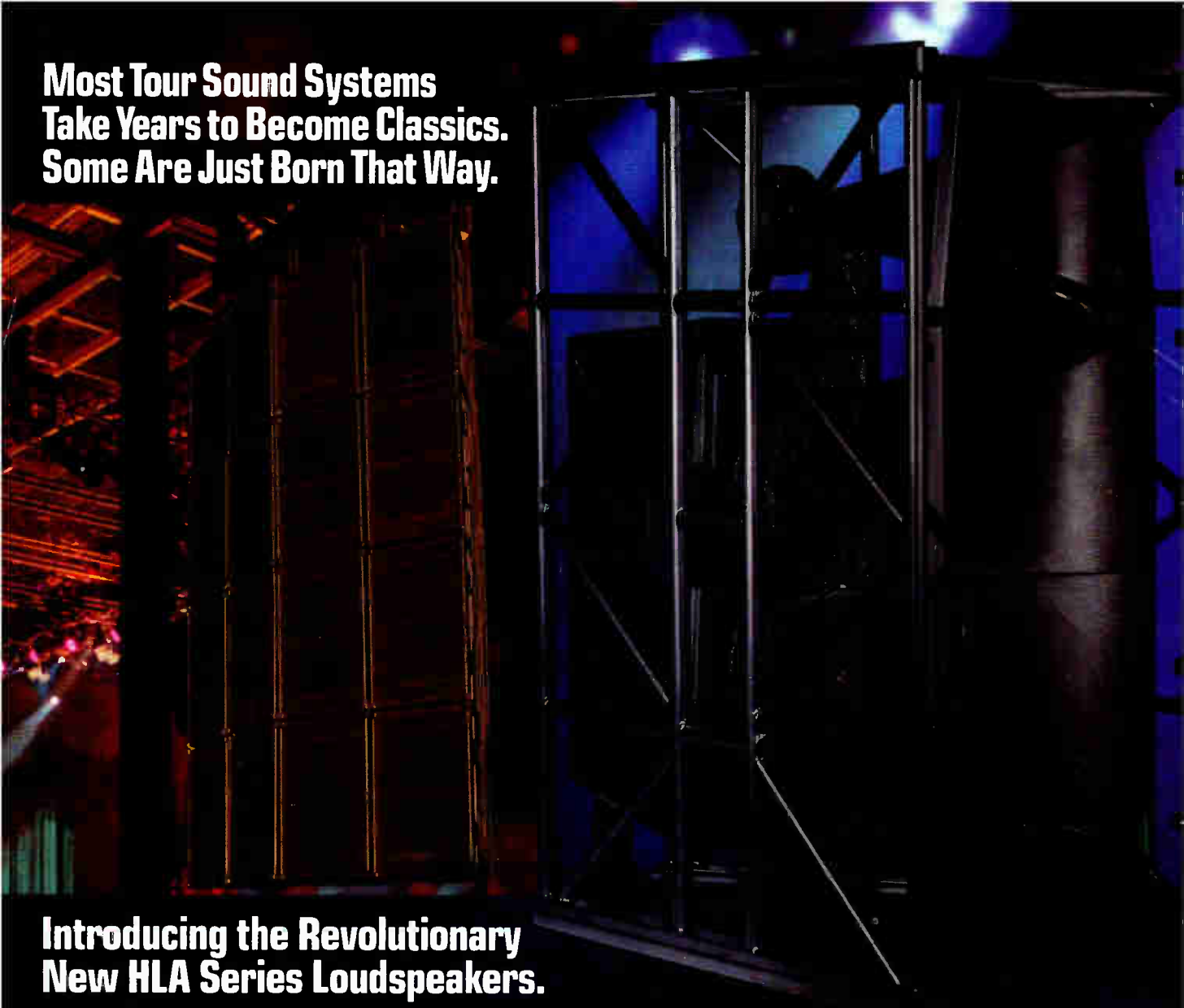
CIRCLE AD NUMBER ON PRODUCT INFO CARD

Most Tour Sound Systems Take Years to Become Classics. Some Are Just Born That Way.



Introducing the Revolutionary New HLA Series Loudspeakers.

Once in a great while, an idea comes along that can be considered truly revolutionary. Well, it's once-in-a-great-while-time again. Introducing the HLA Series and its centerpiece, the 4895 Three-Way -- a metamorphosis in tour sound technology from JBL Professional.

At the heart of the series are two DCD drivers, a 10" and a 14", which offer the ultimate in performance at as little as 7 lbs. per driver. This is accomplished with a new Neodymium magnet design and new voice coil topology which vastly reduce the need for steel. Dual Coil Drive was chosen because it has two magnetic gaps and two voice coils in each driver. This doubles their power-handling capabilities.

To provide each listener with better quality sound, JBL engineers designed a new, three-way MultiBand Waveguide™, powered by the two DCD drivers in a composite magazine with a large format compression driver. The composite magazine gives the drivers the rear compression load required to balance the acoustic resistance furnished by the waveguide. To minimize distortion, Optimized Aperture™ technology is used to supply the longer path length required for precise pattern control. To make the most of this increased efficiency, we then placed the entire system in our patented SpaceFrame™ enclosure, which allows it to be easily tilted and aimed to give the audience even coverage with minimal overlap.

To keep pace with this extended performance, the HLA Series also features our powerful 4897 Subwoofer, which has an innovative composite enclosure made of carbon fiber and aluminum and new port technology. The net result is 3dB more output than any other 18" system in existence and dimensions conveniently equal to the 4895.

Put all its remarkable components together and the HLA Series represents a radical departure from any professional sound reinforcement system currently in use -- one that offers unparalleled flexibility, ease of setup and the most seamlessly uniform coverage ever. With this revolutionary, not just evolutionary, new tour sound system, JBL has given a whole new meaning to the already universally respected "JBL Loaded". If professional sound matters to you, write to JBL Professional or visit our website at jblpro.com. A change for the better never sounded so good.

4895 Three-Way

1997 Nominee

HLA Series

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