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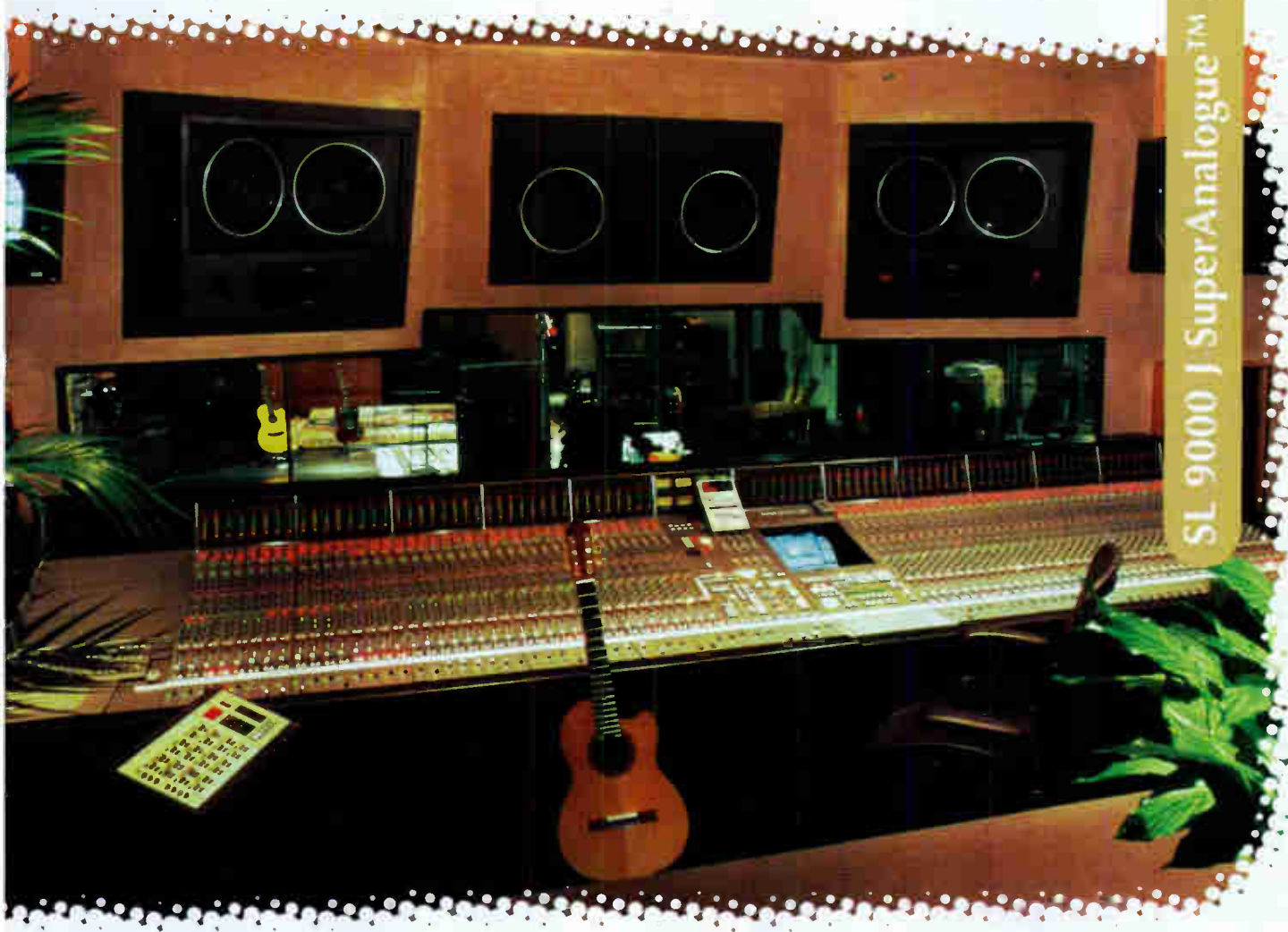
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CIRCLE #001 ON PRODUCT INFO CARD

World Radio History

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Rob Jacobs (right) with
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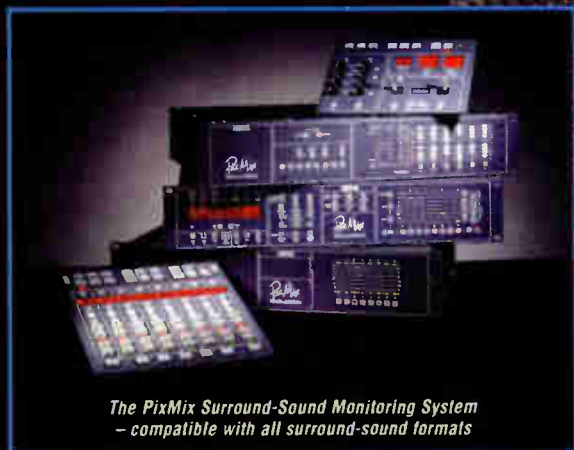
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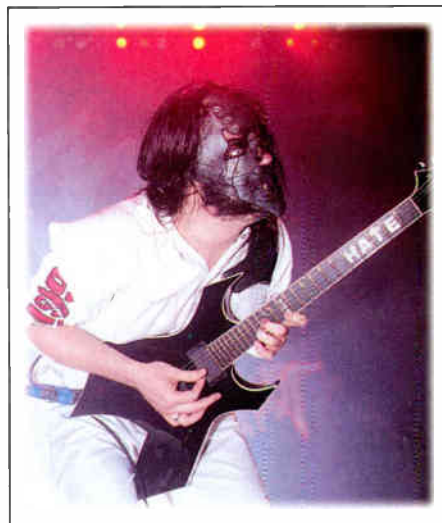
PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

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Mix magazine is published at 6400 Hollis St., Suite 12, Emeryville, CA 94608 and is ©2000 by PRIMEDIA Intertec Publishing Corp. Mix (ISSN 0164-9957) is published monthly. One year (12 issues) subscription is \$46. POSTMASTER: Send address changes to Mix magazine, P.O. Box 1939, Mason, OH 43306. Periodical class postage paid at Oakland, CA, and additional mailing offices. The publication may not be reproduced or quoted in whole or in part by printed or electronic means without written permission of the publishers. Printed in the USA. Canadian GST #129597951; Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement #0478733.

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On the Cover: Unique Recording in New York City houses five Pro Tools24-equipped studios. Pictured here is Studio B and its centerpiece 72-input SSL G+ console with Ultimatum and Total Recall. **Photo:** Michael Hoiland. **Inset Photo:** Steve Jennings.



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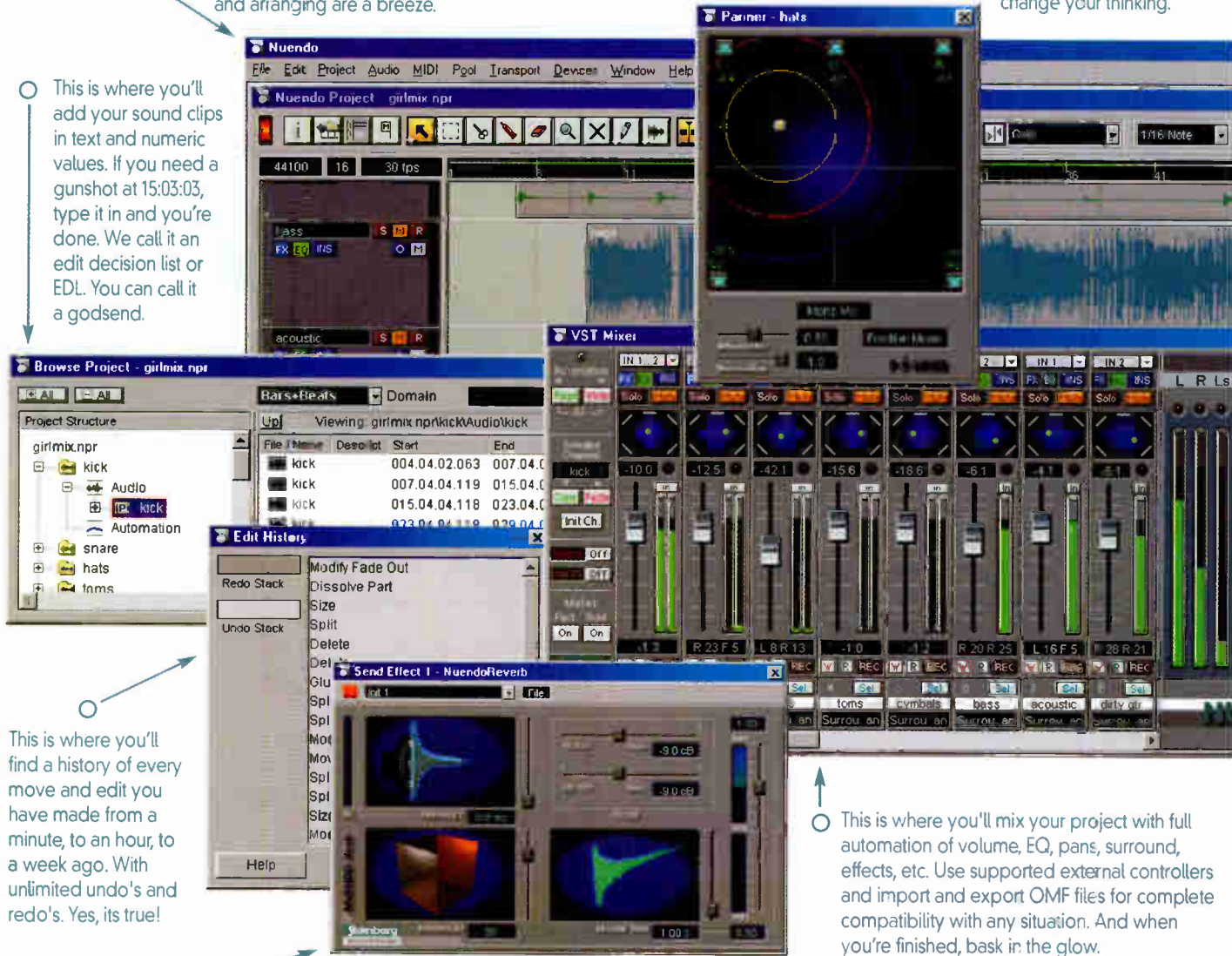


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FROM THE EDITOR

NEW AND OLD

Like most high-tech professionals, we audio types have an affinity—for not an outright zeal—for new products and new technologies. Certainly, there are compelling reasons for this techno-lust—the price/performance ratios of new digital gear offer awesome power at rock-bottom prices, while the era of the affordable desktop supercomputer makes native processing a reality.

Yet, audio is one of the few high-tech industries in which certain pieces of classic older gear—i.e., Pultec EQP-1As, UREI LA-2As or Telefunken 251s—are not only appreciated for their heritage, but are used in everyday applications. Another rare exception to the “newer-is-better” rule is photography, where vintage Leicas M3s and Nikon Fs still command respect. However, it’s hard to imagine computer buffs getting excited about finding a mint PC-XT or video pros salivating over an RCA TK-76 three-tube camera.

Somewhere between the Holy Grail essence of Fairchild compressors and the boat anchor utility of suitcase CPM computers is a huge assortment of gear with plenty of remaining life. Recently, when surfing through eBay (the ultimate virtual garage sale), I encountered several complete Atari 1040ST computers *with* Passport or Dr. T’s sequencers going for \$50 to \$70, and “blackface” 16-bit ADATs moving in the \$500 range. Although these two examples are hardly state-of-the-art, the point is that the availability of low-cost tools—which were good enough to create hit records eight years ago—make recording an affordable option for anyone with some gear savvy and a limited budget.

The bottom line on used or vintage equipment of any sort is *caveat emptor*. Even if a piece of gear is well-cared-for and in good condition, it could be next to worthless six months or a year after the purchase. Keep in mind that older gear expires too, and replacement parts may be difficult or impossible to find. Collectors of vintage gear must have a vested interest in maintaining the unit, but their reward is that unique piece of gear becomes a part of their sound. With that in mind, our resident technowhiz Eddie Ciletti begins a two-part series on analog recorder maintenance this month.

This issue also celebrates our industry’s best and brightest; it contains our annual TEC Awards voter’s guide, with ballots included in subscriber copies. In addition to recognizing pro audio’s top facilities, companies, engineers and producers, the TEC Awards also salutes 90 new products in 15 categories. The voting results will be revealed at next month’s AES show in Los Angeles. So take a couple of minutes to check out the nominees and make your TEC selections. There’s no doubt that older gear can be cool, but there’s a lot of hip new stuff—and some future classics—out there as well.

Your vote counts!



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FEEDBACK

MONITORING "THE TECH'S FILES"

I happened to flip through the pages of your June issue, and my eye fell on The Tech's Files, "Audio Basics & Troubleshooting." This is a particularly sensitive issue with me because I'm an educator.

The first thing I noticed was "0 dBm (1 VRMS)." Everyone knows that 0 dBm is one milliwatt (1 mW) across a 600-ohm load, or 0.775 volts into 600 ohms, not one volt. However, this is an innocuous error.

The information given about calibrating is another matter. Readers who start calibrating their playback systems according to the recommendations in the article are going to suffer lots of broken tweeters and ringing, possibly permanently damaged ears.

The main problem I have with the idea of getting a playback system tuned to half a decibel, and at that, tuned by ear, is that it is unacceptably sloppy and will not serve readers' best interests.

I suppose that if we consider the "average" reader to be a musician with a digital Portastudio and a pair of self-powered monitors, then there really isn't much that can be offered that will improve his or her situation beyond merely making sure that both speakers are working so they know that a mono track is supposed to sound like it's coming from the middle.

But, speaking as both an educator and a studio playback system engineer, I suggest that this topic can't properly be covered in two pages, and definitely should not be dumbed down. Studio monitors are not like EQ and compression where adjustments are artistic modifications to the product. Monitors are, in the most basic sense, test instruments.

In an ideal world, the monitor, like any test instrument, should be flawless. Monitors should be able to reproduce sounds faithfully over a range that exceeds the material that will be played through them. Monitors must play louder than the volume at which they will actually be used, and play without introducing enough distortion to obscure the more subtle aspects of the audio material being played.

One of my tasks as a studio consultant is selling and installing a particular DSP

filter unit that fixes many major problems associated with loudspeakers and listening rooms. I have shown clients their simply dreadful frequency response and then corrected it. I have shown clients their ghastly room reflections and then fixed the results. Even after hearing incontrovertible evidence that it's the tweaked-up monitors that are making the studio's mixes work, with all-too-rare exception, I've been told afterward, "We feel it's more important for our monitors to sound good than to be accurate."

Sometimes it almost appears that all hope is lost. When Dick Rosmini said in 1972 that "craft is dead," I think he pretty much nailed it. I urge *Mix* and other trade magazines to take the lead in helping readers really understand and master their chosen craft.

Drew Daniels
Los Angeles

OUR COLUMNIST RESPONDS

Thank you for pointing out a typographical error, one that I caught after the article appeared in print. Imagine my embarrassment, knowing full well the reference level differences between dBu (.775 volts RMS) and dBV (1 Volt RMS).

I will take issue regarding your comments about my "dumbed down" approach. As educators, you and I are here to teach. Through e-mail, I know my "students" needs. My goal is to tune people in, not out.

Just because *Mix* predates the project studio doesn't mean we don't usher in and embrace a new class of freshmen and women. I would never make claim that one article could be the beginning and the end of an issue. In fact, I fully expect people to come back asking more questions than one article could possibly answer.

I, too, can claim a connection to the late Dick Rosmini. I have the record he made for TEAC (along with my former employers, The Hello People), demonstrating the power of the A-3340S 4-track recorder. Gone are the days when manufacturers include service manuals and theory of operation along with the operator's manual.

Price plays a huge role in the accuracy of monitors; even the "good" ones are

the weakest link. When compounded with their interaction with the room, you have a job! If everyone had to start with the "best gear" and the "best room," no one would get started at all. Across the board, manufacturers make sweeping claims about their products—especially monitors—yet, no two sound the same.

"Use The Force," I say. Listen through the monitors. I tell my readers that all monitors lie, and that no monitor be accepted as accurate until proven as such. Rather than apply EQ while tracking, I always suggest starting at the source, and not just the microphone choice and placement but the actual part being played. When mixing, balance is more important than EQ.

I welcome all feedback so that I might "servo" to readers needs.

Eddie Ciletti

PREAMP CLARIFICATION

I want to clarify a couple of details regarding the Focusrite ISA 430 as listed in the "Goin' First Class" piece in your April 2000 issue.

In the description of the ISA 430, the writer notes "...44.1kHz sample rate selection and external word clock." We want to point out that the ISA 430 supports 48kHz, 88.2kHz and 96kHz, in addition to 44.1kHz, and a Super Clock reference input is also provided. Also, the optional A/D card can also output in 16, 20 or 24-bit mode.

On page 56, under the "Mic Preamp Manufacturer Contacts," you correctly list the contact information for Focusrite in the UK, but we'd also like your readers to know that in North America, Digidesign has been the exclusive distributor for the entire Focusrite product line since January 2000. Our general contact number is 650/842-7900, and our Focusrite Web site is www.focusriteusa.com.

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CURRENT

AES 2000

AES Executive Director Roger Furness and a panel of key convention committee chairs met with the press on June 22 to discuss the 109th Convention, which will be held in Los Angeles from September 22-25. With the proliferation of multichannel home listening environments and the impending flood of commercial DVD-Audio recordings, the theme of this convention, "Surrounded by Sound," is both timely and appropriate.

Legendary jazz keyboardist/composer Herbie Hancock will present the opening keynote address. Given his longstanding interest in new technologies, it comes as no surprise to find that Hancock is actively incorporating surround sound mixing into his current productions, which he will discuss in his remarks. Producers will be interested in "Behind the Glass: Platinum Producers," which will feature an elite panel including Jack Douglas, Geoff Emerick, Eddie Kramer, George Massenburg and Alan Parsons discussing their work.

The AES has been making a concerted effort to reach out to students in the last several years. In addition to an Education Fair and Jobs Forum for young engineers, this year's show will feature mixing competitions in two categories, Classical and Jazz/Pop, with awards being presented at the closing of the Student Delegate Assembly meeting. Music on the Internet is a topic that this year's conference will also delve into. Alan C. Kay, a Disney Fellow and Vice President of Research and Development for the Walt Disney Company, will discuss the computer revolution and the application of the Internet to musicians.

In keeping with the "Surrounded by Sound" theme, there will also be a technical paper session focusing on multichannel audio. The session is being coordinated by Papers co-chairs Marshall Puck and Eric Benjamin. "The technical paper sessions emphasize the tremendous significance each area of audio has in the advancement of the industry as a whole," Furness says. "With the emergence of computer technology, today's research yields endless possibil-

ities for the continuing evolution of audio."

AES officials pointed out that attendance figures have risen steadily at previous shows, and with an estimated attendance at the L.A. convention of over 18,000, that trend should continue. The city's prestigious Biltmore Hotel is the headquarters for those who can book early, and a total of ten hotels are giving preferred rates to attendees. For more information on the 109th AES Convention visit www.aes.org or contact the AES headquarters at 212/661-8528.

—Gary Eskow

PLASA SHOW 2000

With over 400 exhibitors and 14,000 visitors expected, the PLASA Show, now in its 24th year, will run from September 10-13 at Earls Court, London. The show will feature manufacturers, suppliers and distributors of professional lighting, sound and AV equipment for the performing arts, night venues and theme bars, concerts and touring, the DJ market, architectural installation, corporate presentations, amusements and attrac-

tions, recording studios, cruise liners, TV and film, and educational and religious establishments.

Some of the features of note at this year's show include: the PLASA Awards on September 13; the Technology Gallery, dedicated to new product launches; the DJ competition, sponsored by *DJ Magazine* and Gemini Sound Products on September 10; and the DJ Lounge, which will feature the latest products, technology and services offered by suppliers, promoters and retailers of DJ equipment.

Commenting on the growth of the PLASA Show, PLASA managing director Matthew Griffiths states, "With 13,254 visitors to the show last year—3,224 of which came from overseas—our prime objective for 2000 is to continue the show's development and growth. One of our key aims for 2000 is to build the show's appeal to new markets—the architectural and building services, corporate presentations, and amusements and attractions markets—while continuing to develop the show's strength in core markets."

—CONTINUED ON PAGE 16

CORRECTION



PHOTO: RON NELSON

In the July article on Nashville recording, we ran the wrong photo for Back Stage Studios, the joint venture between engineer Chuck Ainlay and Sound Stage Studios. Here is the SSL Axiom-MT at Back Stage.



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World Radio History

INDUSTRY NOTES

Ted Keffalo, co-founder of Event Electronics (Santa Barbara, CA), was recently named president of the company and will continue to stay active in sales operations; previously he was VP of sales and marketing... WaveFrame (Emeryville, CA) welcomed Ron Franklin as the new company president. A 20-year industry veteran, Franklin was formerly the director of marketing for TimeLine Vista... Audio-Technica (Stow, OH) presented "rep of the year awards" to Online Marketing for U.S. Professional Product and Only Audio Marketing for Canadian Professional Product... Solid State Logic (Oxford, England) promoted Claire Hall to national sales manager for broadcast products in the U.S. She will be working out of the New York office... Shure Incorporated (Evanston, IL) has named Michael Pilarczyk as chief financial officer and Christine Schyvinck as VP of operations. Meanwhile, the company announced that it has settled its intellectual property rights lawsuit against Taky Electronics Co. Ltd. (Taichung, Taiwan)... JBL Professional (Northridge, CA) announced a number of recent promotions: Mark Engebretson is now senior systems engineer, Rafael Quintero director of sales for Central and South America and Canada, Staci Moore national accounts coordinator, Brad Ricks systems integration specialist, and Rod Falconer marketing manager... Group One Ltd. (Farmingdale, NY) entered into a distribution contract with SPL Electronics GmbH (Niederkruchten, Germany) to distribute all SPL Electronics' products in the U.S... Joining the Sweetwater (Fort Wayne, IN) team are Robert Rebeck, Donnie Christian, Mike Manning, Paul Lunde, Alexander Jenkins, Greg McDougal and Steve Goodale as sales engineers... The position of key accounts manager at Canford (Washington, UK) has been assumed by Mike Reay... Salil Munjal was recognized as the VP and general counsel

of Leitch (Toronto, ON)... DVDMedia (Philadelphia) announced the arrival of Jimmy Hoffman as studio manager... Ross A. Jerozal was appointed to principal consultant of Charles M. Salter Associates, Inc. (San Francisco) and Brian M. Bustard as consultant in the audio/visual department... Digital Audio Research (Surrey, England) appointed Nick Cook to the post of sales and marketing director... Andrew Hill joins the Studer (Regensdorf, Switzerland) family as a member in the console product management team... Don Hannah joins the ranks of HHB (U.S. office in Los Angeles) as sales engineer... BGW Systems (Los Angeles) announced the appointment of Steven Forrest as Northeast regional factory salesperson... Denon Professional (Pine Brook, NJ) recently named Hudson Marketing "rep of the year" for 1999. In other company news, Plus 4 Marketing was hired to cover Northern California and northern Nevada territories; Audio Associates will service the mid-Atlantic region... Bag End (Barrington, IL) has awarded Aldridge Marketing (Houston) two top rep awards for 1999, while Full Compass (Middleton, WI) took dealer of the year. Top in-house sales of the year was awarded to both Steve Krizka of Audio Biz (Wauconda, IL) and Robert Conklin of Gary Castelluccio and Assoc. (Clifton, NJ); William Caffey Associates, Inc. was named top hi-fi rep of the year. In other company news, Sirius Sales & Marketing (Antioch, CA) will represent Bag End in Northern California... TMH Corp., founded by multichannel guru Tomlinson Holman, has relocated to 2500 Wilshire Blvd., Suite 750, Los Angeles, CA 90057... Rolls Corporation moved to 5968 South 350 West, Murray, UT 84107... Symetrix (Lynnwood, WA) product owners will be able to access this company on the Internet as the it relaunches its Web site. The new address is www.symetrixaudio.com. ■

—FROM PAGE 12, CURRENT

For more information about PLASA Show 2000, visit www.plasa.org or call Carol Talbot at the PLASA Show Office 44/(0)20/7370-8215.

DEDICATED WEB SITE FOR AMEK'S PURE PATH SERIES

Amek has launched a new Web site dedicated to its Pure Path Series of outboard products, designed by Rupert Neve. The new site, www.purepath.co.uk, contains only Pure Path content, with comprehensive operational and technical information on the range, as well as downloadable documents and notes from the designer himself, Rupert Neve.

Pure Path Online is platform, browser and resolution independent, by making use of vector graphics, which enable a large amount of pictorial information to be transferred in very small bandwidth. Users can zoom into complex technical diagrams to a very high magnification without losing quality. The site also features links to Amek distribution and repair centers around the world. For more information, visit www.amek.com.

LAB GRUPPEN ACQUIRED BY TGI GROUP

Lab Gruppen, a developer of DSP and amplification technology, is to join the TGI Group of companies. TGI plc is involved in the design and manufacture of loudspeakers; some of the companies within the TGI Group include Martin Audio, Tannoy and Goodmans/GLL. Martin Audio managing director David Bissett-Powell, who will be chairman of Lab Gruppen, says: "The fit and synergy is seen as being particularly advantageous, and while the TGI companies will continue to trade autonomously, Lab Gruppen's research and development capability will enhance the group's moves into digital electronics, providing us with sophisticated loudspeaker management systems and own-brand application."

CORRECTIONS

There was an error in the June 2000 report on the NSCA Expo. The Meyer Sound USM-1P and USM-100P both have a 15-inch driver. *Mix* regrets any confusion this might have caused. ■

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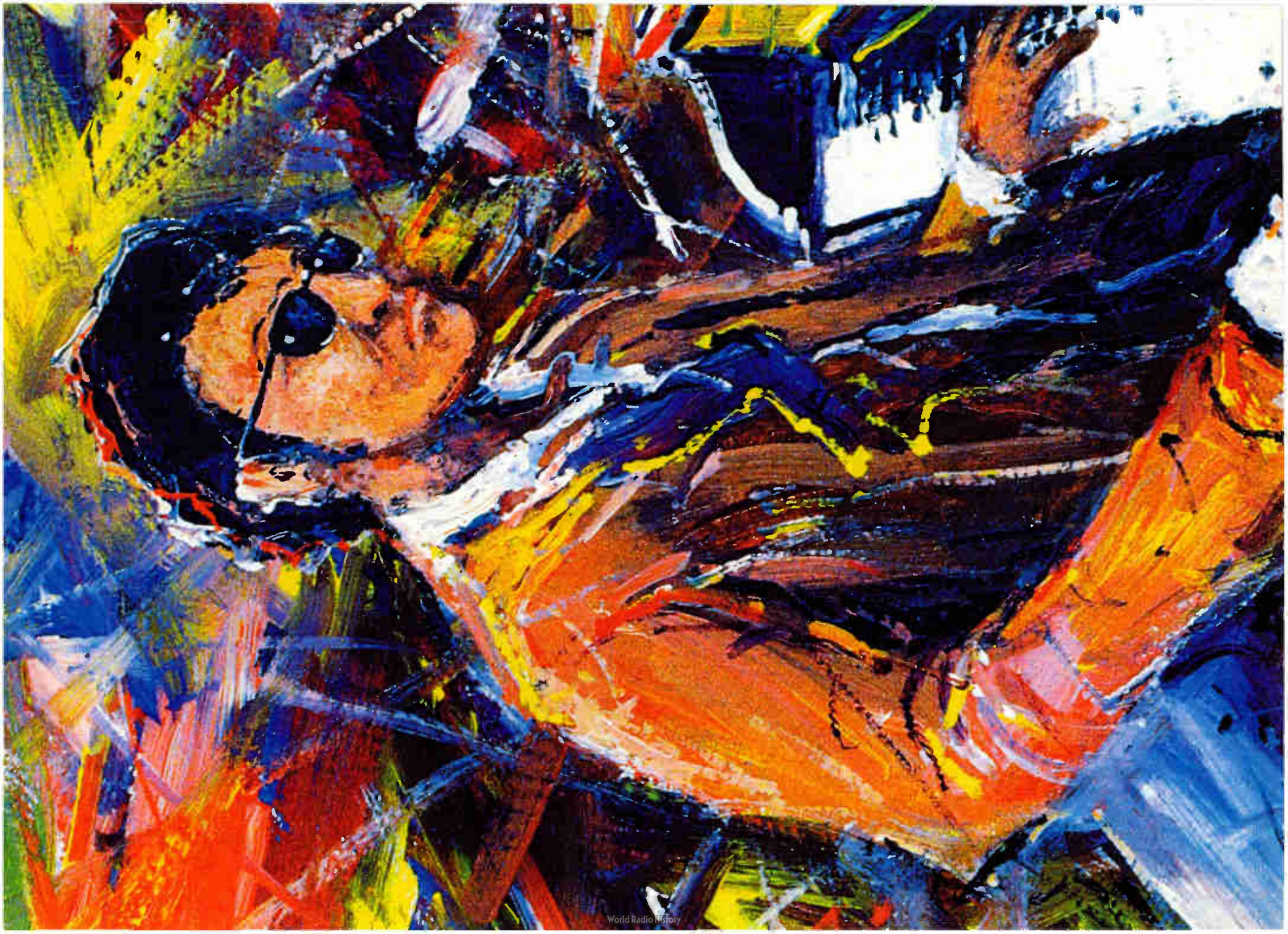
For more information on PARIS, email us at
paris@emu.com, or check out the MIX
Magazine interview with Brian Tankersley at
www.emu.com/tankersley.html

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IS IT REALLY SO GREAT...

BEING STRAIGHT?



ILLUSTRATION NATHAN OJA

Once upon a long time ago I found myself sitting next to Alvin Lee in a barn out in Hook End, England, I think. I mean, I know I was there, I just can't remember if it really was in a place called Hook End.

Alvin Lee, for those of you whose knowledge of industry history goes back to Nirvana and no further, started and led the band Ten Years After for several hundred years, and is one of the most impressive guitar players in history. And for those who *do* remember Ten Years After, here is a piece of trivia: Yes, he did wear those same wooden clogs at home that he wore on stage; he *always* wore them.

And he also had an ear. Not in the Van Gogh sense—he actually had two ears, two very good ones.

He was not a techl, but he knew exactly how he wanted things to sound, and he knew how to get it right. He also knew that he didn't have to do it the way everybody else did. So he moved out to what was then a little village in the English countryside, bought an old house with a big barn (and a very nice swimming pool with a diving board for jumping dirt bikes into the shallow end) and built a studio. In this huge barn.

When you played guitar there, the nearest reflecting walls were so far away that all they did was make everything sound big, but they never interfered with the recording in undesirable ways. The control room was this sort of air traffic con-

troller glass pod built way up into the ceiling, looking down over the entire arena of instruments and divided spaces used for his recording pleasure.

Up in the control room, things were a little different, as well. For one thing, he didn't see the reasoning behind the concept of a 16-foot-wide straight console and a chair with wheels. He had built the room with one carefully planned sweet spot and had made the decision to use an ancient Helios console—or desk, in the Queen's English. And for those who may not have heard of a Helios, it wrapped around you in a semi-circle so that all you had to do was turn or spin a little to access everything—every brown-black Bakelite knob and steel bat-handled switch.

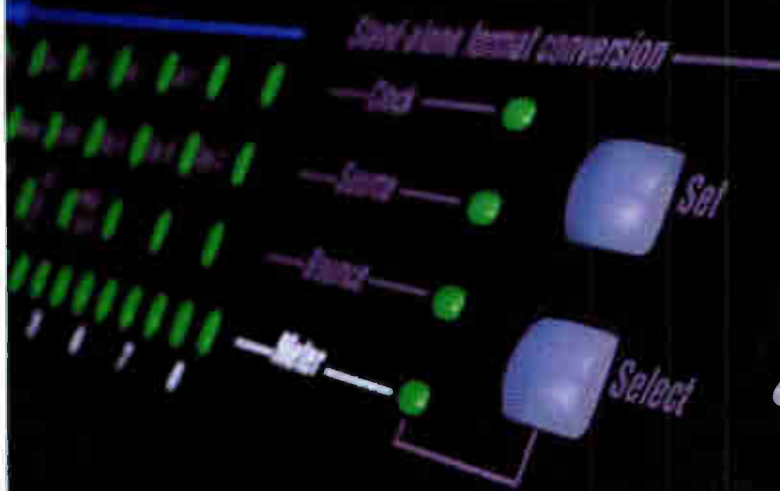
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■ Stereo Aux Return 4 Master can be assigned to Buses 1-2 or 3-4.

■ EFX to Monitor lets you send different effects or effects levels to stage monitors without screwing up your main PA mix.

■ Easy level setting with In-Place Stereo Solo. Just solo a channel & adjust the Trim 'til the meter flickers at the Level Set arrow.

■ Separate Tape Return level control.

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■ Separate Solo section with level control, global AFL (post fader) or PFL (pre-fader) mode switch & Aux/Sub Solo LEDs.

■ Separate Talkback section with level control, LED and switches for assigning talkback to Main Mix or Auxes 1 and 2. There's also a separate mic preamp input on the back of the mixer so you don't have to tie up a channel.

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■ Each Submaster bus has Solo switch, Pan control and Left/Right assign switch.

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■ Super-twitchy -20dB signal present and overload LEDs on each channel.

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■ 6 individual aux sends per channel

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■ 6 aux send masters with individual solos

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■ Double-bussed subs for easy multi-tracking with 8-track recorders

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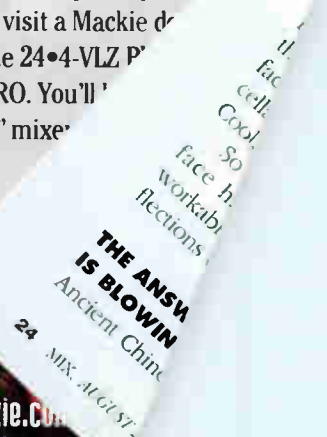
The new 32•4-VLZ PRO and 24•4-VLZ PRO are designed to make live sound mixing easier. You can solo a muted channel. Effects to Monitor lets you "fold" effects back into a stage monitor mix without affecting the main PA sound. There's a separate talkback section with its own mic preamp. Separate tape inputs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

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

Better yet, visit a Mackie dealer to check out the 24•4-VLZ PRO or 32•4-VLZ PRO. You'll find it's a good a "live" mixer.

* U.S. suggested retail price. ©2000 Mackie Designs Inc. All Rights Reserved. "Mackie" and the Running Man figure are registered trademarks of Mackie Designs Inc. VLZ & XDR are trademarks of Mackie Designs. "Could I have more of me in the mix?", "Loaded in. YOU load out.", "It's a free gig but we'll get lots of publicity" and "Can I borrow a pick?" are trademarks of being a musician.



LIKE STONEHENGE, HAVE WE LOST ANOTHER ANCIENT CIRCULAR ART?

Yes. And I think I know why. Even though large multitrack music consoles should not be straight—they are. They should wrap around you. You should not have to move, stretch, reach, twist, slide or ask your second to mute channel 105 for you because it's too far away.

You know, of course, that I am speaking of single-engineer music rooms, not those giant post rooms with five guys sitting side by side mixing epic 7.1 action films.

Some certain Sorta-Semi-Circular systems have begun to show up in the last couple of years as modular constructs for housing multiscreen workstations. And these are certainly steps in the right direction. But it should be taken further. Perhaps the time has come for us to revisit the ancient Helios concept, as it is now possible to eliminate what may have well been its one fatal flaw.

I AM BUT A REFLECTION OF YOU

Acoustic reflection from recording console surfaces has always been a problem. Let's face it, having that giant slab of metal floating just over your lap, angled just right for banging the hottest possible 3ms reflection into your face, does a great deal to negate the million bucks you poured into the room to control just such comb filtering. If you don't think so, play pink noise through your control room monitors, and slowly lean over and kiss your console. Hear that flanging? Well, every second of every day that you work that room, you are being misled by moving notches—groups of canceled frequencies that shift as you reach to grab an EQ knob or to pad an input.

And at the beginning of the day, the notches will be in different places than they are at the end of the day. Why? Because as you begin to tire and slouch a bit, or maybe lean back for support, or lean forward to rest on your forearms, the average distance from the desk surface to your ears shortens and the cancellation notches move up in frequency. huh?

Is there a solution? Well, the surface has to be there and has to be there, but it should focus as few reflections upon your face as possible.

NEVER, MY FRIEND, FIGHT THE WIND

These proverbs tell us that it

is better to bend under pressure and survive than to stand rigid and finally break. The Chinese cite reeds in the wind as an example. Rigid ones will break in a strong wind, while the flexible ones bend in a graceful arc, and though they have been temporarily compromised—though they have, for the moment, bowed before the mighty and oppressive invader—they live to stand and fight another day. Okay.

But it is true. The secret does lie in the bend. Well, half of the secret does anyway. And today's consoles are, albeit understandably, bent the wrong way.

Let's have a look at traditional straight consoles first. The primary control surface is a single plane, and the meter bridge is typically a second plane. If you look at them together, they are in fact a concave reflector, a focused acoustic mirror. Nice. Not only do these surfaces generate unwanted comb filtering, but the combination of the various angles produces extremely complex interactive filters and then literally *focuses the effect on your face*. And the really slick consoles with three or more surface angels do this even more.

It's obvious why they build these things this way—the human hand, at the end of the human arm, moves in an arc as the arm pivots in the shoulder socket. So these desks conform. Great for reach, disastrous for acoustics.

LENS ME YOUR EAR

As manufacturing techniques advance, and as more and more data is displayed on LCD screens, the possibilities for alternate physical formats begin to expand. We know that convex surfaces have a focal point where all the reflections meet, and we know that our ears are generally in the vicinity of that troubled zone. So maybe the combined total shape should be *convex*. Then reflections would be *dispersed* instead of focused.

The curve would not need to be extreme, nothing that would make reaching the knobs strange, just enough to disperse any reflected sound. Data displays—EQ, pan, routing and so on—could be on little LCD windows that sit up from the surface. If each display were aimed directly at the user for optimum readability but were faced with glass that was angled up to reflect audio away from the main surface of the desk and over the user's head, an exceptionally clean acoustic environment would result. And the meter bridge would be handled the same way—visually aimed at your eyes, but acoustically aimed over your head.

Ten years ago, this type of design was far beyond any feasible manufacturing capabilities, but it certainly isn't now.

And what about that wrap-around Helios from the turn of the century? Well, being concave on both the vertical *and* horizontal axes, it was an acoustic nightmare, and so it went away and nobody ever tried again.

But, using the unpatented and totally unprotected St.Croix "BOB" (bend-over-backward) design concept, it is possible to revisit that eminently usable layout and still successfully control acoustic reflections. This would make very usable, nonfatiguing large-format consoles that don't destroy acoustics possible for the very first time (like at Virgin).

While I admit that the multiple-axis, curved-composite surface design needed here is complex, I do know that it is finally well within the capabilities of modern manufacturing. Look at car dashboards or \$29 CD players.

SURFACE IT TO SAY THERE IS A BETTER WAY

And this brings us to the paint. I have no clue at all why the people that make these behemoths paint them with standard paint. I have a 200-year-old Midas that is painted with something once called Nextel—a heavily textured sort of furry rubberized paint that not only breaks up high-frequency reflections, but damps lower frequencies and keeps the metalwork very, very quiet during those long 130dB mixes. And it totally kills reflected light as well. Great stuff! What the hell happened to it? I never see it on anything anymore.

Let's all get together and make whatever killed it go away so we can have it back on our consoles. It doesn't really look furry like a cat, just soft like very mild ultra-suede, if you remember that garbage.

YOU HAVE THE POWER TO CURVE THE VERY FABRIC OF SPACE AROUND YOU

Don't be afraid. Ask for a wrap-around reversed curve, fuzzy console the next time your local major manufacturer drops by with his newest 128-channel monster for you to try. If we all ask loud enough, we just might get them, and life would be that much better. ■

Stephen St.Croix wishes to extend his apologies to each and every large pro recording console manufacturer, but he still wants a fuzzy wrap-around cockpit for his very own.

Up to 160 streaming, disk-based voices
64 MIDI channels
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DOCTOR, IT HURTS WHEN I DO THIS!

WHY YOU SHOULD BE WORRIED ABOUT RSI

A friend of mine who writes for one of the computer magazines, and who also happens to be a wonderful musician, gave me a shiver when he casually opened one recent column with, "When I trashed my wrists back in the '80s..." I got another shiver when I received this reply to an e-mail I had sent to another computer writer: "I am on a typing break right now to rest my wrists, and cannot respond to any e-mail messages. I hope to return to my computer in about two weeks." Yet another friend, also a very talented writer and musician, had to give up both careers when his wrists gave out after just a few months working as a tech support manager for a large company. Now he builds wooden boats and collects guitars, which he cannot play for more than a few minutes at a time. And just last month a student of mine showed up for his final exam with his arm in a brace so complicated that it looked like he must have fractured the limb in three places. "What happened?" I asked. "I've been working on my term project for my video course, and I've been editing at the computer for two days straight. I can't feel my fingers."

Musicians' injuries are a well-discussed topic, and most of us are aware of the dangers of gigging and/or practicing too many hours for too many years. Two published surveys of working musicians back in the '80s concluded that about 50% of them had some kind of job-related pain, but an occupational therapist I know puts the number today closer to 75%. Composer and pianist Robert Schumann complained of overuse injuries more than 150 years ago. More recently, injuries derailed the careers of pianists Gary Graffman and Leon Fleisher. Max Weinberg, drummer for the E Street Band and bandleader on

Conan O'Brien's TV show, once used to freeze his hands and tape his sticks to them to overcome the pain from tendinitis, just so he could get through a set. Now he says he's fine, and he continues to play five nights a week—but he's had no fewer than seven operations on his wrists and arms.

In the recording and live

long hours in the studio know about back and shoulder problems caused by sitting in the same spot while concentrating hard on the task at hand, paying no attention to those annoying little pains. Anyone who's felt that pain linger for more than a couple of days has gone out and invested in an ergonomic chair. We are also now

We in the audio industry are not immune to RSI. Today, we are all computer workers, subject to the same ergonomic dangers as the drones at temp agencies and telemarketing companies.

sound fields, when it comes to occupational hazards, the most popular topic among both engineers and performers has long been hearing loss. There is not a shred of doubt that exposure to high-decibel sound day after day leads to auditory degradation. Pete Townshend is the poster boy for what happens when you play too loud for too long—he surrounds himself with a plastic shell now whenever he's on stage. Thanks to groups like the House Ear Institute and OSHA, a lot of progress has been made, and awareness of the dangers is at an all-time high, as are sales of earplugs and in-ear monitors. Even classical musicians have raised their consciousness about the dangers of loud sound—symphony orchestras now routinely place transparent baffles behind the last rows of the string section, to protect the players from the brass and percussion behind them.

Most of us who have worked

paying more attention to those who insist we get out of the chair (no matter how good it is) and stretch periodically. Good console ergonomics can also contribute to back and shoulder health, and most console manufacturers take into account the amount and frequency of awkward stretches users might have to endure when they design their control surfaces (although now, with the trend toward small-format, multifunction digital consoles, this is becoming less of an issue).

In the business world, however, there has been an alarming increase since the mid-'80s in repetitive strain injuries (RSI) and cumulative trauma disorders (CTD) caused by the huge increase in desktop computers in the workplace. Although it's true that the computer revolution has meant that fewer American workers are losing fingers in threshing machines or breathing asbestos fibers or coal dust, workplace RSI has reached epidemic proportions: According to CNN, in one recent year 60% of workplace-related injuries

BY PAUL D. LEHRMAN

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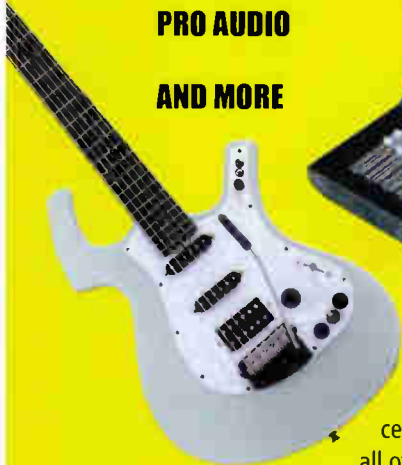
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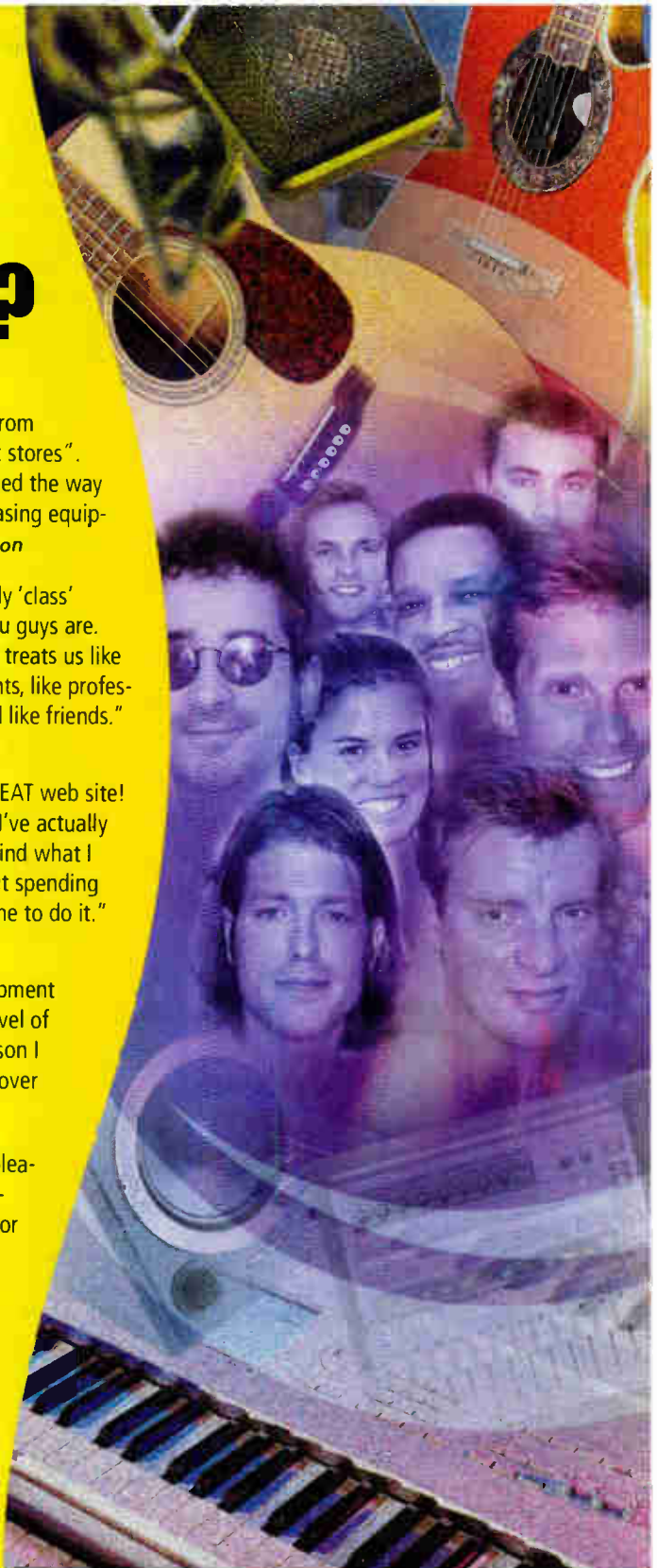
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or illnesses were RSI-related, costing the economy on the order of \$120 billion in down time, lost productivity and workers' compensation claims.

We in the audio business are not immune. Today, we are *all* computer workers, subject to the same ergonomic dangers as the drones at temp agencies and telemarketing companies. And the number of wrist and arm injuries from overuse among the professional audio and production community seems to be rising at an alarming rate.

"But I'm not an office slave," you insist. "I don't have to sit at a desk doing a boring job every day. I work for a great company doing cool things/I'm my own boss/I work out of my home/I can set my own schedule." Don't kid yourself. Any of these situations can actually make things *worse*. Large corporations are forced to pay attention to these issues, thanks to OSHA (and let's face it, the recent brouhaha about OSHA "invading" the home office was really just a smoke-screen set up by big companies who despise any kind of government oversight), the threat of lawsuits and workers' comp claims, and those pesky unions who insist on a safe working environment. (Great bumpersticker I spotted recently: "Unions: The people who brought you the weekend!") But workers in most studios, especially small and home-based ones, don't have these kinds of protections.

If you're trying to grow your business, and you're the only one responsible for scheduling, updating the Web site, designing the brochure, writing contracts and finishing that mix by deadline, the chances are high that you will spend far too many hours than are good for you locked in front of your computer screen, manipulating words, numbers, slider-like objects and pictures of waveforms with a mouse. Although it's not easy to pull yourself away from an intense work session, if you value your health, you'll learn how to do just that.

I've suffered from wrist/arm problems myself, but I'm one of the lucky ones. Some years ago, I jammed my right wrist sliding into third base in a hot and heavy softball game (I swear to this day that I was safe), and it swelled up like a balloon. Two weeks later, the swelling had gone down, but it still hurt like hell. I saw a doctor who gave me some anti-inflammatory

drugs, which seemed to do the trick, but a couple of months after that I started working on the score for an hour-long TV documentary (this was back in the days when MIDI-generated scores were still a rarity), and after a week of ten-hour days playing my keyboards and manipulating my mouse, the pain in my wrist was back.

This time, the doctor wanted to operate. He didn't know what he was looking for—maybe a tear in the cartilage—so he told me it would be an "exploratory arthroscopy." The idea of someone poking around inside my dominant hand with a plastic tube appealed to me not at all, and so I declined his offer and instead went to

**The best principle
to follow if
your hands, wrists,
arms or back
hurt during
a heavy editing or
mixing session
is to stop what
you're doing and
take a break.**

see an occupational therapist. She made me a custom wrist brace and gave me an ice pack, a squeeze ball to play with in free moments, and really good advice on how to take care of my hands. I still don't know exactly what is wrong with my wrist (the consensus is that I have a form of tendinitis), but I have managed to avoid significant problems. When I play tennis, ride a bike, or mow the lawn, I wear a simple Velcro strap that keeps my wrist from turning in certain directions. When I have serious pain, which happens once or twice a year, I take a lot of ibuprofen and immobilize my wrist for a few hours with the fancy brace. And when I feel the first pangs of discomfort after hours of typing or mousing around, I stop and do something else for a while.

There are actually a number of different types of hand and wrist injuries

—CONTINUED ON PAGE 233

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CIRCLE #63 ON PRODUCT INFO CARD

UNIQUE RECORDING STUDIO

Unique Recording got its start back in 1978 as the brainchild of Joanne and Bobby Nathan. The facility began as a one-room, 8-track recording and rehearsal facility for the then emerging new wave and hip hop scenes in New York. When early recordings of Poly-rock, The Dance and Bill Laswell began to generate a buzz within the industry, other artists began making their way toward Unique, leaving the Nathans with no choice but to expand. "We grew quite rapidly," remembers Bobby. "Within one year we grew from a Tascam 8-track to a Tascam 16-track, and then we purchased the first made Otari MTR-90 24-track. The first year was like a big explosion. During that time, we changed consoles three times, Sound Workshop 1280B to a Sound Workshop Series 30 and then to an automated MCI 636."

By early '82, as hip hop was beginning to make some serious waves in the music industry, the one-room Unique facility simply couldn't handle the increased volume of clients. Artists such as Planet Patrol, featuring seminal hip hop pioneers Arthur Baker and John Robbie, and a number of other artists on the Tommy Boy imprint, were beginning to monopolize the limited studio space. "After the few independent label things we did for the new wave stuff, the other thing we were doing was hip hop," says Bobby. "And I have to give credit to Arthur Baker and Tom Silverman because that's what they started. And, of course, Arthur exploded as a producer at that time, so we really built another room so Arthur would have two rooms to work out of. We then did the first New Edition album with Bobby Brown, with Arthur and Maurice Starr producing."

Unique was also well-known for its extensive collection of now-vintage synths, drum machines and some of the first MIDI-equipped keyboards and sequencers—all of which were important to the sound of both the early new wave and hip hop records. "Everybody was searching for new sounds," Bobby continues. "We always had a lot of keyboards—that was our biggest thing. When we were on the road, we had a massive amount of keyboards, and when we opened the studio, we had keyboards that no one had. We were pioneers with the Moog. We were one of the first people to have the Polymoog; of course, we had the Minimoog and the 2600 and the OB-X, which at the time was the hottest synth, and the Oberheim Eight Voice Modular. Later came the OB-8 and the Prophet 5."

Today, Unique Recording occupies the top three floors of the Cecil B. DeMille building in New York's Time Square—just around the corner from Manny's Music and Sam Ash. The five-room facility, besides boasting the world's largest collection of outboard gear, has now booked sessions with everyone from Eric Clapton and George Clinton to Jay-Z, DMX,

ON THE COVER

Rough Riders, Mary J. Blige, Eve, Nelly, Brian McKnight, Big Pun, Lil' Kim, Krs-One, Lord Tariq, Sporty Theivz, Mobb Deep, Ol' Dirty Bastard, Zhane, Destiny's Child, Aaliyah, Juvenile, Joe, Enrique Inglesias, Limp Bizkit, Nine Inch Nails, Marilyn Manson, Hanson and Korn.

The five Pro Tools | 24-equipped rooms break down as follows: Studio A is centered around a 64-input SSL G+ console with Ultimatum and Total Recall; Studio B offers an identically equipped 72-input SSL G+; Studio C houses a 64-input SSL



PHOTO: MICHAEL HOLLAND

Co-owners Bobby and Joanne Nathan

9000 J with Ultimatum and Total Recall; Studio D has a 68-input vintage Neve 8068 MkII with Flying Faders; and Studio E boasts a Mackie Digital 8-Bus console. The four larger rooms all offer 48 tracks of Studer A800 analog recording; the smaller studio E has 24 tracks of analog recording. All three rooms have the option for 24 tracks of ADAT or DA-88.

Unique's stock of floating outboard gear includes a Burwen Noise Filter, Cyclo-Sonic Panner, Technics SL-1200 MkIII Turntable and a Gemini Mixer. Some of the samplers, drum machines and synths include E-mu SP-1200, Akai S-3000, Roland JV-1080 with Vintage, Dance Orchestra, '60s and '70s keys. A tour of the microphone locker also reveals an impressive collection: Audio-Technica 4050, Neumann U87 and U47, Sennheiser MD-421 and MD-441, and Shure Beta 56.

Asked to describe one of the more memorable recording experiences at Unique, Bobby Nathan immediately mentions Steve Winwood: "He truly just couldn't get enough of the studio; he'd be working in the studio all day and then he'd book out our programming room, and he'd go in there and he'd just be playing with synths all night long. And if anybody was there to jam, he'd be there to jam. It was really a good experience." ■

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6 VIEWS ON 5.1

Everybody in the industry seems to be talking about 5.1, but how many engineers out there are actually *doing* surround mixing on a regular basis? A number of studios are building and retrofitting control rooms to handle multichannel playback, but others are more cautious, waiting to see if the volume of work will eventually overtake the hype. Everyone's excited about this or that DVD, but how many people do you know who actually have a decent surround setup in their homes? DTS discs are out there, and DVD-Audio is on the way, but does the public understand this? And why are record companies being so tentative about their DVD-A rollout plans? How

ADVENTURES IN SURROUND MIXING

many people out there are truly qualified to do authoring for 5.1, and will the dearth of same create a logjam when the floodgates for DVD-A products open?

It all feels a little bit like the early days of digital recording, when there was a palpable excitement in the air, well-spoken zealots announcing that the future had arrived, and plenty of healthy skepticism in some quarters. Here, of course, the studio-owning naysayers are not arguing that surround

BY BLAIR JACKSON

technology is suspect (as many believed/believe about digital), but that there isn't a sufficient market yet to warrant investing in the necessary technology. This much is clear, however: DVD/surround *is* coming on strong. If it's not a steamroller yet, it's at least a street tank, firing volleys at tradition as it rumbles down the middle of the road. Conventional stereo recording isn't going away anytime soon—just as analog didn't disappear—but surround is the new wave, so swim lessons are recommended.



ILLUSTRATION BY BOB SCOTT



6 VIEWS ON 5.1

Recently we spoke with a cross-section of engineers who have been involved with surround mixing (in Los Angeles, Nashville, Chicago and New York) to learn some of their techniques and to hear their thoughts about the burgeoning field.

Nathaniel Kunkel

IN LOVE WITH THE CENTER

L.A.-based Nathaniel Kunkel, whose credits include engineering work with James Taylor, CSNY, Linda Ronstadt, Little Feat, Bon Jovi, Lyle Lovett and many others, has done a number of projects in 5.1, including the music for Robert Altman's latest film, *Dr. T and The Women*, in which Richard Gere plays a gynecologist.

"Lyle Lovett did all the music, which we recorded and mixed in 5.1 at Conway [L.A.] in Studio C," Kunkel says. "We did it a little differently than a normal soundtrack. Lyle wanted all the musicians to watch the movie as we were cutting it, but not a lot of the music was scripted. The themes, which were mostly by Lyle, bassist Viktor Krauss and pianist Matt Rawlings, were written, but then the band actually improvised the music to the picture, as opposed to sort of calculating exactly how many bars and beats at what tempo it was supposed to be to make it work. It actually went incredibly fast—way faster than a lot of movie scoring projects I've seen—mostly because the musicians were so good, and because they're a band they have this intuitive relationship with each other."

It was a relatively small band—two guitars, bass drums, fiddle and steel, keyboards—and some cues required fewer players. Kunkel says, "We set it up exactly like we were doing a normal record, and for the entire recording process we stayed stereo and then as soon as we went into mix mode, we went into 5.1. But I delivered all my stereo mixes as fold-down to the 5.1. And I was always thinking of the 5.1 during the recording. For instance, I recorded all my ambience and drums as LCR.

"My concept for doing 5.1 is to do all

the things I wanted to do with stereo but was never really able to—to bring things out more to the left and to the right; pull things out to the side a little more," he continues. "So a lot of times what I try to do is a regular music mix, but instruments that are predominantly in the center I will reinforce in the center speaker, and then things that are on the left or the right I might try to pull a little more to the left or right by putting them into the surrounds. I didn't put anything *only* in the center channel, but certainly the voice [there is one song with a vocal] and the bass and the kick drum and the snare drum were predominantly center channel, and then I would diverge them into the left and right to make it sound a little more natural so the mix didn't change so much as I moved around the room.

"I'm someone who really likes the center speaker. I know a lot of my friends and colleagues don't dig the center speaker as much as I do. I'm not sure why, but I feel like I'm able to get real clarity of the things in the center without them being disproportionately loud. And I'm also able to get much

had more space for the background singers."

Kunkel raves about TC Electronic's new System 6000 effects package, designed specifically for 5.1 mixing: "It was so good I didn't send it back," he says with a laugh. "They gave me one to use and I called them and said, 'You can either call the police and say I stole it, or you can write up an invoice with the serial number, because it's not leaving!' It's got four engines in it; each engine is capable of eight channels of 96k/24-bit. Onboard it has eight channels of AES/EBU, and then you can add two channels of A-to-D/D-to-A converter to it, so you can have eight channels of analog I/O and eight channels of digital I/O. All of the analog and digital I/Os are independently assignable to any input or any output of any engine. Then, in each of those engines you can load up stereo or 5.1 or 7.1 programs, and whatever type of algorithm you load into it is how many inputs and outputs are available on that engine to be picked off of. It's based on their VSS algorithm—the same thing they have in the M3000—and they also have a multi-

For the rears I put mostly ambience, but George Massenburg hipped me to something Chuck Ainlay does, which is put the vocal in the center speaker and also in the surrounds, to kind of pull it a bit into the center of the room.

—NATHANIEL KUNKEL

better panning accuracy between the left and the center, so all of a sudden I have this space I can play with texturally, and put small percussion instruments, or reverb tails. And when you have to use a phantom center, a lot of that stuff just gets smeared out.

"For the rears I put mostly ambience, but George Massenburg hipped me to something Chuck Ainlay does, which is put the vocal in the center speaker and also in the surrounds, to kind of pull it a bit into the center of the room. But mostly I used the surrounds for reverb returns or, if I had the fiddle all the way on the left and the steel all the way on the right, sometimes I would also pull them into the surrounds a little bit just to get them more out to the sides so I

channel Finalizer in it, which I've heard is totally incredible, but quite frankly I haven't had a chance to take it off the reverb program yet.

"So you can create a 5.1 environment and then you have four inputs that you can localize anywhere you want. I ended up using two engines and running two 5.1 reverbs, since I had to print stems and I wanted the reverbs to be identical, but I wanted the vocal reverb and the drum reverb to be separate. The interface is really easy. It's a touchscreen with moving faders, so there's no buttons and it's so quick—it's like a 700-megahertz Windows NT. There's a one-rackspace Windows box and a two-rackspace unit, which is kind of like the M5000, and they talk via Eth-

It's interesting when you start to rely on the rear speakers to handle as significant material as the front speakers. It remains to be seen how it will translate into some of the more inexpensive home systems that have little satellite speakers in the rear.

—JAKE NICELY

emet. It's fantastic."

Kunkel used Pro Tools as his record and mix medium; he delivered a hard drive to the stage as his final delivery. "First they asked me to deliver it on DA-88," he says, "and then I found out they were going to transfer that to Pro Tools, so I figured instead I would mix it to Pro Tools and give them a session that represents each reel, and then they could just plug the hard drive in and load it, and it would be two generations less. It worked out really well, though the music editor called me and said, 'God, there's a lot of center speaker on some of these cues.' But some of those cues are only bass, and bass is usually in the middle, so that made sense. But it still scares people."

The mixing environment is obviously important in surround work, and it's interesting to note that Kunkel says he's found that 5.1 mixes he's done have not translated well from one system to the next. "I've mixed 5.1 at Conway and at Skywalker Ranch and I've mixed it at The Site [in Marin County], and I've never had everything translate that well to another system. I remember doing a mix at Skywalker and then bringing it down to a surround conference down here and it was totally different. The bass management was bizarre. I don't know what the problem is, but I'm concerned about it."

As an engineer who mostly works on music CD projects rather than film, Kunkel would like to see more surround work in that area "because obviously there's enormous potential to start doing really interesting stuff with surround on music-only projects. I mean, we can really do whatever we want, in a way, as long as it's good. I think the worst thing we could do to 5.1 is to say that there is any rule. There are mixers who are putting voices in

every speaker. There are some people who can't stand that. But I think we should try it all."

Jake Nicely

INSIDE THE BAND

As one of the first engineers in Nashville to get involved with surround mixing, Jake Nicely, owner of Seventeen Grand Studios, has seen interest in 5.1 skyrocket during the past two years. And now he's reaping some of the financial rewards for being a pioneer. Recently he was assigned two DVD-Audio remix projects that are set to be among the first such releases by Warner Bros. in the fall: one by the vocal group Take 6, which is a 5.1 remix of their classic first album, along with bonus tracks from

the second and third Take 6 discs; and the other a surround version of Bela Fleck's brilliant last album, *Tales From the Acoustic Planet, Vol 2: The Bluegrass Sessions* (the recording of which was covered in *Mix*, September 1999).

In the case of the Fleck disc, which put the banjo great together with top Nashville bluegrass pickers Sam Bush, Tony Rice, Stuart Duncan and Mark Schatz, and guests such as John Hartford and Vassar Clements, Niceley decided that the DVD-A work could be done most efficiently by keeping the project in Pro Tools throughout, since it was originally recorded that way by en-



Jake Nicely



The assembled musicians from Bela Fleck's *Tales From the Acoustic Planet, Vol 2: The Bluegrass Sessions* from which Jake Nicely remixed a 5.1 surround version. Pictured L-R are Jerry Douglas, Sam Bush, Bela Fleck, Mark Schatz, Stuart Duncan, Vassar Clements and Tony Rice.

6 VIEWS ON 5.1

gineer Bil VornDick, and Fleck has a setup in his home.

"I went out to Bela's house, where he has his little studio setup, and he had installed the Smart Pan Pro plug-in on his Pro Tools, which allows you do a 5.1 matrix," Nicely says. "He'd already been experimenting with surround and listening to things, and he had an idea of how he wanted the whole project portrayed: He wanted it to be as if you were standing in the center of a bluegrass jam session and all the players are around you. So that's what we went for.

"He would work on it and I'd come out and listen and we would work on it together and make decisions and try different things and experiment. Ultimately we decided that it would be better if we brought the project back to the studio here [Seventeen Grand], and I upgraded my Pro Tools system to match his. The limitations at his place were primarily acoustic: His studio is a home studio, and it had all of the inherent limitations of being in someone's home; it wasn't built acoustically. Whereas here we had a control room that was tried and true. We had done several surround projects here and knew what to expect."

Using the Pro Tools system for 5.1 was new to Niceley and he notes, "It was definitely a learning experience for me. I'm used to having a console with a panner that works a particular way and I'm used to having access to outboard gear that works a particular way, and by not having those things I had to try to adapt to the Pro Tools environment, because we decided to use the Pro Tools plug-ins [for effects, etc.] too. The disadvantages of using the plug-ins, as opposed to the real hardware, weren't much; the plug-ins sounded good. It took a long time to work that way, but it ended up sounding good. Bela emphasized from the beginning that he was interested in learning how to use his equipment better, and if he's paying for this—and he is; he's the artist and it's coming out of his pocket—then he wants to learn something along the way. So not only is he paying for a project; he's paying for an education. So there was a lot of value in staying with

BACK TO MONO

DON'T FORGET THE CENTER

By Oliver Masciarotte

Since this is the 5.1 issue, I'd like to remind everyone that mono isn't quite dead yet. Heck, it's not even pining for the fjords.

How many engineers do you know who check their work in mono? Hopefully, all those hands are up. You are the same engineers that label the tape box completely and finish your broccoli at dinner. Ah, but wait. There's another situation where monaural signal is important. In fact, it's one of the fastest-growing segments of the CE audio industry, and it's called "surround."

DTV, DVD and other d-things all carry multichannel audio into the home playback environment. Until a few years ago, multichannel distribution meant special-venue or theatrical playback. But the popularity of home theater and digital film soundtracks accelerated the adoption of 5.1-channel home installations. That center channel is there, ostensibly, to "anchor" the all important dialog to the talking head on screen. Now, picture-free, 5.1-channel material is in the wings from both the SACD and DVD-Audio camps. Who needs a center channel for music? We all do.

Go ahead, scoff. "Stereo playback is just fine, so don't gimme me no center-channel crap," you say. I agree! Given the choice of high-quality, 2-channel playback or pitiful multichannel, I'd take the stereo any day. That's not the point, though. The point is that the phantom center, which is all you get with two channels, isn't the same as *real* mono. Try it for yourself.

A fairly simple test is to listen to familiar stereo sources with and without a summed mono center channel. Of course, you'll need to carefully level match the 3-channel and stereo paths since, all things being equal, louder subjectively sounds better. Also, use identically voiced speakers for all three channels. Now, sit in the sweet spot and switch paths between 2-channel and 3-channel. Which do you like

better?

If you picked the 3-channel path then, shucks, you just found out that your ear/brain mechanism isn't as simple as you thought. You can easily tell the difference between phantom center and a real live source in front of your face. Notice the timbral disparity between the two playback methods. There's a dip in the frequency response around 2 kHz with the phantom center. You wouldn't notice so much if it was at 15.75, but 2k? Sheesh. Folks whine about the proposed watermarking standards for DVD messing with their sound and then turn around and blow off a center channel. Hello?

How about moving your head off of the "sweet spot" when listening to mono program in stereo. Image wander just a bit? Of course! Take a common playback environment, where many consumers spend one to three hours a day. It's also *the* place to go to check your mixes after a session. Perfect for DVD-A's killer app, but the layout stinks. I'm talking about your car. Since few vehicles have bench seats up front, the majority of listeners these days never receive correct mono imaging due to speaker placement. That will change as true—as opposed to synthesized—multichannel playback systems come to dominate high, and then midrange, installations.

The beauty of nailing down the mono image also applies to a home environment, where most people have a couch in front of the entertainment system. One body on the left, one on the right, with Fluffy in the sweet spot. And Fluffy's more interested in Fifi than convincing mono. His human companions may *just* notice if their fave track sounds more convincing than some other one. Just maybe.

Center channel, say it with me...improved localization and better timbre. In addition to engineering with the center channel in mind, I can only hope that professional audio production systems will finally give us some quality new tools for placement of mono sources in addition to the brute force, amplitude-only panoramic potentiometer. ■

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6 VIEWS ON 5.1

the Pro Tools system. But we still needed to come to an acoustically correct environment to make a commercially viable product. I don't think we could've gotten it right at his house."

Because of the unique perspective Fleck wanted to achieve with the surround mix, there was more discrete localization required than on most music projects, "but you don't want to make it so discrete that it sounds disjointed," Nicely notes. "It still has to meld and feel like you're in an acoustic space; there has to be an environment. So there is information from each of the instruments in each [of the main channels]. I used the center channel mainly to anchor the string bass, and I also used it to kind of help position whatever happened to be in the left and the right, as well. So I was creating a 360-degree environment. It's like there's a natural bleed, which is the way you'd hear it if they were standing around in a circle.

"It's interesting when you start to rely on the rear speakers to handle as significant material as the front speakers," he adds. "It remains to be seen how it will translate into some of the more inexpensive home systems that have little satellite speakers in the rear, but most of the ones I hear sound pretty good. I've heard this mix in a few different places, such as at the CES Show in Las Vegas, where it was in several different booths as part of a sampler disc Warner Bros. made to promote DVD-Audio. I heard it at the Toshiba booth and Panasonic and even in a car, and it sounded just like what I expected. That's great material no matter how it's released, but by having it in 5.1 you really get to hear every little nuance of every instrument."

The first Take 6 CD was originally cut on a 3324 by engineer Don Cobb. Not surprisingly, remixing for 5.1 gave Nicely the opportunity to create an interesting dimensional image of the six singers spread around the soundfield. But again, he cautions, "you still have to create a coherent acoustic space, and in the case of a record that a lot of people know and love, you have to be faithful to the original mix to a large degree or it won't sound right to people. You

have to be respectful; you can't just have everything all over the place."

That doesn't mean there was no room for creativity, however. "There's a song on there called 'I L-O-V-E You' that was 48 tracks," he says. "It had multiple voices, plus they used their voices to sound like instruments. They had two passes for each singer—the first was for the primary vocal, and on the second pass they would double the part but also they might change the part very slightly here and there. In the 5.1 mix, I separated those two parts and flipped the doubled part to the opposite speaker, so if someone was predominantly in the left front, then their double would be in the right rear. Then I also used a lot of very tight stereo delays and some longer delays to create even more space. Everything was tempo-mapped and there's a lot of panning going on in the Take 6 stuff, particularly when they're imitating instruments. I have that flying all over the place. 'I L-O-V-E You' is like a roller-coaster ride. At the end of that you're exhausted," he laughs. "But that track was more the exception; the rest is more straightforward, though hopefully still fun to listen to."

Though Nicely is certainly appreciative of the label work coming his way, he believes that for DVD-A to really take off, the record companies are going to have to quickly move beyond putting out mostly remixed catalog releases. "Unfortunately, I think the record companies are missing the demographic," he says. "I think they've assumed that it's going to be the 30- and 40-plus age range—the breadwinners who are buying big home theater systems—

when in fact it's going to be a lot of younger people. High school and college kids want surround. They're pretty sophisticated and they like new things; they like gadgets and high-tech stuff. And they *don't* want their parents' music. I think the record companies are missing a huge opportunity by not releasing current material. I mean, everyone's excited that there's a Beatles surround mix [*Yellow Submarine*], and the Eagles disc [*Hell Freezes Over*] has sold a lot of copies. But you know, if it's going to become the next thing, they're going to have to start putting things out for the younger crowd. I think it would be wise to start thinking about simultaneous releases—putting it out as DVD and CD, or just DVD, which would be playable in stereo, too.

"With DVD-A, in the mastering process, like if you're working in a Sonic Solutions system, you get to determine how the stereo is created in terms of how the rears [of the 5.1 mix] are brought to the front—maybe down a few dB, or whether they're in phase or out of phase. And the same with the center and the sub: You get to direct how the stereo is created, and that information is programmed into the DVD disc so when it gets played back in a DVD-Audio player, the stereo plays back the way you decided, instead of it being an arbitrary downmix, like with Dolby Digital. And that stereo mix will be available at the headphone jack on a DVD player. It's really a very versatile platform and we're just beginning to learn what we can do with it."

Chris Steinmetz

PERCUSSION POWER AND MYSTIQUE

In mid-1998, 5.1 arrived with great fanfare at Chicago Trax, then and now one of the leading music recording facilities in the entire Midwest (see *Mix*, November 1998). Owner Reid Hyams built the studio's surround room from the ground up, centered around an AMS Neve Capricorn digital console. Music VI, as it was called, was designed to be the crown jewel in a studio complex that also included two SSL rooms and a Harrison room, a Pro Tools suite, a dub/transfer room and a MIDI production space. Two years later, the room is still one of the most popular in the facility, but there has been a major change: The Capricorn is gone, replaced by a Rupert Neve Amek 9098i, which turns out to be a more popular and economical



PHOTO: REID HYAMS

Chris Steinmetz, Chicago Trax director of recording/project engineer, is squeezed by Dan Pritzker of Sonia Dada at a 5.1 mix.



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6 VIEWS ON 5.1

choice for a facility where there has not always been enough 5.1 work to justify the high cost of maintaining and upgrading the Capricorn (which was 20-bit and needed to move up to 24-bit).

By installing the analog Amek board, Chicago Trax chief engineer and director of recording services Chris Steinmetz has had to make a few changes in how he works on 5.1 projects, but he is ecstatic with the new console. "It's been fantastic," he says. "That board really hit the ground running. At Chicago Trax we get in a fair number of outside engineers working on things and I know they love it. I haven't had a chance to do a full 5.1 project on it, but I've put up some tapes and mixed in 5.1 on it and it's been great. You miss some of the features of a digital desk, such as independent bus routing and automating the panning. The 9098i gives you a cou-

ple of automated joysticks, and we recently installed the divergence cards, which allow you, when you have LCR, to vary the amount of the left and right so you can spread it out or into the center. On an analog board the routing is a little more complicated, so in order to

get the center only, you've got to do some specific patching and there's a little bit of extra work, but the sound of the board is worth it. We had looked at the Amek board before we got the Capricorn, so we already knew what it was capable of.

A lot of labels and production companies and even artists themselves are letting their music get released in a fold-out faux 5.1 format, where they're not actually going back in and remixing. And I'm hearing these butchered versions of songs that were never intended to be outside of a stereo field. They're splitting it out to five channels and putting a little bass management in, but it doesn't sound very good and that's going to turn a lot of people off. —CHRIS STEINMETZ

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6 VIEWS ON 5.1

Probably the most exciting 5.1 project Steinmetz has worked on to date is the forthcoming retrospective of solo work by former Grateful Dead percussionist Mickey Hart. Steinmetz first worked with Hart and his longtime engineer Tom Flye on 5.1 mixes for two songs from the 1998 album *Supralingua* (see *Mix*, December 1998). Hart was so happy with the added dimension 5.1 brought to his percussion extravaganzas that he next brought his "best of" project to Chicago Trax. This diverse and ambitious DVD-A brings together

tracks from every corner of Hart's solo career—from the 1976 Diga Rhythm Devils LP, through his soundtrack work on *Apocalypse Now*, the haunting Dafos project, *At the Edge. Mystery Box* and more.

"The tapes came in on all sorts of formats," Steinmetz says. "We transferred everything to 24-bit Pro Tools, and by the end of it we'd used 16-track analog with 2-inch heads, there was music on ADAT, there was 48-track digital, some regular 24-track and there was even some stuff we got off an old 3-track machine. It's going to be a real interesting disc when it comes out. It's an amazing array of percussion and sounds and grooves: it was *made* to be in 5.1. One of the coolest things on there is this music he did for the opening ceremony of the [1996] Olympics in Atlanta. That has something like 300 drummers playing at once, and in 5.1

it's pretty impressive.

"On the Mickey Hart stuff we focused on building the mix from the center—being *inside* the soundfield, as opposed to the live situations where they have the ambience in the back and are more conservative," he continues. "Mickey's looking for a certain power and mystique in the sound. And he loves to hear movement. One concept he verbalized to Tom and me that we tried to achieve—and I think we did—was the idea of vertical motion, instead of just left and right and around. He also pointed out that now he's starting to think about 5.1 whenever he records. So if composers start thinking in 5.1 and engineers start thinking about miking for 5.1, that's going to make it more interesting for everyone."

In the great center-channel debate, Steinmetz says, "I tend not to put the bass or heavy elements in the center in

5.1 SURROUND SOUND BASS MANAGEMENT FOR DUMMIES

By Georgia Hilton

We had been mixing in 5.1 and surround for a year or two, mostly in someone else's studio. After a rather long period of research and soul search, we decided to enter the 21st century and bring our studio, Samurai Music, over to the "other" side: We are now a 5.1 facility. Of course the first thing we did—well, the second thing we did, the first being the emptying of our checking account—was to order a solid and capable 5.1 system.

Since we owned a Pro Tools 24|MIXplus system, we selected Kind of Loud's Smart Pan Pro, the AXIS surround panner and Genelec monitors and subwoofers—five 1030As, plus a single 1092A, which is about the size of a big trash compactor. (We also have 1031As, but I prefer the 1030As for surround mixing.)

After pulling everything out of boxes and installing the software, mucking about with a new DVD player and generally adding another two miles of cable to the studio, we sat back and listened. It just sounded so...well, let's put it this way: I never want to listen to stereo again, *ever*. Until you've heard a good 5.1 system, you haven't lived, and I'm not talking about the ones in most movie theaters (i.e., blown tweeters, ripped subs, channels out, levels wrong, etc.). I'm talking about a well-tuned 5.1 system in a good listening room. Breathtaking.

Anyway, after a couple of days of listening to surround CDs and watching DVDs, we looked at the system,

shrugged and opened the hood. Most of what we found made complete sense. But the one thing that rather baffled some of our staff was bass management. After digging through manuals, the Internet, books, etc., I came up with the following simplified review of 5.1 bass management.

AN OVERVIEW

Bass management revolves around the use of sub-frequencies from the five channels (Left, Center, Right, Left Surround and Right Surround) and the Low Frequency Effects channel, which, taken together, represent the .1 channel. Low frequencies, nominally around 80 to 100 Hz, are filtered from the five main channels, routed and summed to the subwoofer. The LFE channel can add "oomph" to any mix, either in music or with effects—such as the standard Hollywood explosion, tornado, sinking ship or train wreck—and provides an independent bass path that can be used at will without affecting, or being affected by, the normal bass coming from the five main channels.

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6 VIEWS ON 5.1

part because people don't tend to have a very strong center channel at home. I like to put some snare delay or things that would triangulate from the center to the rear speakers—something that appears in the center for the first time and then triangulates past you."

Since Hart's music is so unconventional, Flye and Steinmetz didn't have to concern themselves about placing musical elements in traditional positions in the soundfield. When there's no concern for how, for instance, guitar, bass and traps are going to be spread across the front, because the instrumentation is instead low drums, Egyptian tar, dumbek, berimbau and cymbals, there are no precepts to follow. And because Hart has always been interested in the sound environment, he was anxious to experiment with the dimensionality of the soundfield. It's somehow appropriate

that someone from the trippiest band on the planet has made one of the first great surround discs for "heads."

Steinmetz, for one, is delighted that Hart and Flye have taken the time to lavish so much attention on moving tracks from stereo to 5.1. This is not, he says, what he's seeing out in the greater marketplace. "One of the dangers of 5.1 right now is that a lot of labels and production companies and even artists themselves are letting their music get released in a fold-out faux 5.1 format, where they're not actually going back in and remixing. And I'm hearing these butchered versions of songs that were never intended to be outside of a stereo field. They're splitting it out to five channels and putting a little bass management in, but it doesn't sound very good and that's going to turn a lot of people off. When you're talking about music from the past that was mixed in stereo, you have to pay a lot of respect to the original mixes. And if you do, you can come out with something pretty cool. Some of the purists were screaming about *Yellow Submarine*—they were hearing things they didn't like or parts that seemed emphasized. So you're going to get those arguments

and you have to be careful. But when the new generation gets in tune with this new format, they're so technically savvy they're not going to be worried about it. They'll be discovering this for themselves. Part of what's happening now is a generational switchover: Some people who are used to having things in stereo don't want to hear 5.1. But there are a lot of young people who love the home theater experience and they're dying to hear more in surround.

"I did a nice 5.1 mix on a song by Sonia Dada that used [the surround] really well. It's a real groove-oriented vocal track that is really strong. It's got a tight groove where the subwoofer adds something to the pocket. They have three singers in the band that you can spread out nicely and get good separation. But beyond that there were some cool loops and effects that I could position in the rear speakers that were halfway back—not discretely in the rear speakers—and there were birds flying around, so there's a point at the beginning where a bird flies from the front right to the rear left and it really feels like it flies over your head. Really, we're going to see more and more current bands that understand the potential of 5.1 as time goes on."



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6 VIEWS ON 5.1

Steven Epstein and Richard King

ORCHESTRA REMAINS UP FRONT

So far, most of the press concerning 5.1 has been about pop music projects, and that makes sense since record labels are most likely to invest in singers or groups who are likely to sell a lot of "product" (as they say in the biz). But we wondered what was going on in the world of classical music, so we contacted two of the best in the business: Producer Steven Epstein, who has won the classical producer of the year Grammy twice in the past five years, and engineer Richard King, who often works with Epstein. (Both have extensive jazz credits, as well.) Epstein and King work out of Sony Studios in New York and do most their 5.1 mixing in that facility's Oxford room.

"I've been tracking for surround since 1992," King says. "putting things on tape at high-bit—at least 20-bit; now we're all 24-bit—and waiting for [Sony executives] to say, 'Okay, now is the time,' and we can go back and reissue it all in surround."

"Like Richard, I'm hoping some recordings I've done the past few years will see release in that format," Epstein adds. "I think there is a commitment to the format here, but that's probably a question you should put to my boss," he adds with a chuckle.

"One project I've done recently," King says, "is a record of Bernard Hermann film music that originally came out in 1996 in stereo, but [at that time] we also did a Dolby matrix surround on the CD, and now we're going to reissue it as a discrete surround. We recorded it 20-bit, 44.1 at the time, but we're going to bump it up to 88, and as I mix it, it will become 24 bits. So that will be discrete DVD-A. It was recorded in L.A. originally with the Los Angeles Philharmonic. It was a 48-track, and I did stems for surround for later, so now I'm just going to refine the stems that I made in '96 for this release."

King says that for the most part he likes to maintain the perspective of the orchestra being in front, rather than completely enveloping the listener. "On that

project, the perspective is just hall ambient sound in the rears; the orchestra is all in the front. However, there are a few things that get pulled a bit outside of the front speakers, around the sides a little bit—things like harp and piano. On the *Vertigo* soundtrack [by Hermann] there's some Hammond B-3 stuff that's pretty neat, with really low chords, and for that I actually put the Leslie cabinet out in front of the orchestra, so that gets local-

thing might work is with contemporary music. I can tell you this: There are several composers I know who are thinking about the possibilities that the digital surround formats offer and they're taking that into account in their compositions, because they would like to realize spatially on disc what they're doing in a live situation."

While Epstein and King wait for those composers to push the Oxford

I'm very interested in 5.1 aesthetically, using ambient classical surround to create an accurate space. But I don't want to be in the center of an orchestra with the brass in the back and the fabric of the ensemble torn apart. —STEVEN EPSTEIN

ized in the back; that sounds good.

"I'm not a big fan of things spinning around me when I'm listening. I enjoy the notion of envelopment, but not the distraction of things moving too much. I will occasionally do a thing where if I have any instruments in the orchestra right out on the front of the stage near the conductor, [in the 5.1 mix] I'll pull them outside slightly to the sides so you get the perspective of standing on the [conductor's] podium, where it would be very natural-sounding for the harp, for instance, to be off to his left but also slightly behind his left shoulder—but not completely out of the hall. I have also placed instruments in the hall [spatially]—offstage brass, a chorus. I could do that because they were meant by the composer to be in that position. I've done that in demos but never for something that's been released."

"I'm very interested in 5.1 and I'm also interested in [Sony's] Direct Stream Digital—DSD—technique and utilizing that in a surround sound format," Epstein says. "For me, that would be the optimum. I'm interested in it aesthetically from the standpoint of rather than resorting to gimmickry, using ambient classical surround and perhaps doing material—such as Mahler's Third Symphony, where the offstage trumpet is really offstage—to create an *accurate* space. But I don't want to be in the center of an orchestra with the brass in the back and the fabric of the ensemble torn apart. Where that sort of

room to its limits somewhere down the road, there's more traditional classical music getting the 5.1 treatment. A while back there was a *Christmas in Vienna* TV special. And more recently there was the soundtrack music for Ang Lee's new film, *Crouching Tiger, Hidden Dragon*, which was recorded and mixed to stereo on an SSL 9000 at a studio in China—Shanghai Eastern Radio—and then brought back to New York for the 5.1. "That studio was very nice," Epstein comments. "Actually it was more along the lines of an American pop studio, but it was still big enough to get an orchestra in there. Here again with the 5.1, you're somewhat limited by film: You don't want to put too much activity in the back because you need to save that for special effects. So most of what we put back there was ambient material."

King says these sorts of projects are easily accommodated by the Oxford room (which is also equipped with B&W 801 Matrix 3 speakers). "It's set up really well for that kind of thing, and also, if you start a stereo mix on that console and later spread it out for surround, it's very simple to do. You're just rerouting and refining the levels.

"It's funny," King concludes. "When you work in surround a lot, your ear gets used to it after a while and you might even think it's not really working—then you flip it back to stereo and see the dimension you're missing. It's like night and day." ■

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—FROM PAGE 44, 5.1 BASS MANAGEMENT

subwoofer. The subwoofer provides three inputs and three outputs. I/O 1 is the left channel, I/O 2 is the center channel, I/O 3 is the right channel, and Input 4 is the sub input. Genelec has included a low-frequency filter that has a center frequency at 85 Hz as part of the subwoofer system. When the LCR speakers are routed through the sub, it takes all signals 85 Hz and below. Additional low-frequency signals (i.e., LFE) can be independently routed to the sub via the Sub input. If you wish to bypass the internal filter, Genelec provides a simple ¼-inch jack and a wiring diagram for a bypass/mute switch. I can hear my system without a sub or, with the flick of a switch, provide a justifiable-homicide plea for my downstairs neighbor.

BASS MANAGEMENT OVERSIMPLIFIED

Kind of Loud's software provides even more bass management capabilities, so here's a basic block diagram: A single audio signal, let's say a typical Hollywood explosion, is placed on an audio track. We route the track to the five main channels via a 5.1 panning system, or simply routing on any 8-bus console. In this case, we'll use the Smart Pan Pro and its associated software.

The input signal is routed to the panning software plug-in, where we can send the basic explosion audio to any, or all, of the five main channels and, via the LFE output, bus the same signal to the LFE channel.

The L and R channels are routed to the Smart Pan Pro LR outputs, the C channel to the SPP CS outputs, the LS and RS channels to the SPP LsRs outputs and finally, via the LFE gain control, we can send the same signal via an independent route to the subwoofer.

Left/Right Signal Path: The full-range audio is routed to the bass management, where it is filtered. The low-frequency signal is sent to the subwoofer, while the remaining audio is sent on to the L and R speakers. The low-frequency audio is then sent to the bass management module, where independent gain adjustment can be made to the overall bass levels. Following the input gain, the low-frequency audio is sent to the Bass Extension on to the Bass Redirection.

Center/Sub Signal Path: The full-range center channel is routed to the bass management, where it is filtered and the low-frequency signal sent to the

subwoofer, while the remaining audio is sent on to the center speaker. Same as above after that.

LS/RS Signal Path: The full-range audio signals of the Left Surround channel and the Right Surround channel are routed to the bass management...you get the idea.

Bass Extension: Bass Extension allows the low frequencies to be sent not only to the sub, but back to all five main channels, allowing the bass to emanate from 360°. The Bass Extension can be disabled, in which case the low frequencies are routed to the Bass Redirection module only.

Bass Redirection: Bass Redirection provides mutes for all 5-channel low-frequency signals. Un-muted low-frequency signals are then summed and sent to the subwoofer via the sub input.

LFE Channel: Finally, the Low Frequency Effects channel provides an independent path to the subwoofer. The LFE send (in this case, the LFE gain on the SPP plug-in) routes the LFE signal directly to the bass management, where its gain can be separately adjusted, muted and routed to the subwoofer. You get to decide exactly when, what and how much low-frequency material is used for precisely what purpose.

Between the monitor system's bass management and the software bass management we have the ability to add as much or as little bass as necessary to meet the needs of the moment. But, a word of caution: Bass frequencies can reach the sub from four specific ways in this system (LFE signal, Bass Redirection, Bass Extension and Genelec's internal filter). Don't overdo it!

Finally, a word regarding phase relationships with the Sub/LFE channel. Make sure you align your subwoofer correctly, since the sub and your five main speakers are now rather distant from one another. Remember, low frequencies are omnidirectional so you have a reasonable amount of "wiggle room" for sub placement. If you have a subwoofer system similar to Genelec's, make sure that you either bypass the filter in the Genelec or mute the bass redirection from the software. If you don't, you run the risk of sending low frequencies to the sub from different sources, potentially out of phase.

Now go play, and get ready to rumble! ■

Georgia Hilton is president of World Wide Audio Inc. in New York City and holds a patent in Networked Audio Technology.



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DESIGNING

THE LARGE-FORMAT DIGITAL CONSOLE



**WHERE WE ARE,
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HEADED**

BY ROGER MAYCOCK

Back in the good ol' days of analog, mixing consoles all shared a common characteristic—the bulk of the circuitry per channel was built into the individual channel strip. Hence, consoles traditionally had Trim/Pad, EQ, Aux sends, Cue, Pan, Mute, Solo and Level in an order that was fairly consistent from one manufacturer to another. This facilitated a level of familiarity that enabled mix engineers to migrate from one desk to another without much consternation. A glance up or down the channel strip told much of the console's story.

With the advent of large-format digital consoles, however, gaining an operational grasp of a board's layout and design can be quite a bit more challenging. In many cases, the one button/switch per function of yesteryear has been supplanted by a single button or switch that has multiple functions, depending upon the console's operation mode. While this is typically more cost-effective in terms of being able to offer more features and functions, it generally makes the learning curve more challenging. This is not to say that today's large digital consoles aren't intuitive or inviting, but that the approach to mixing itself has evolved.

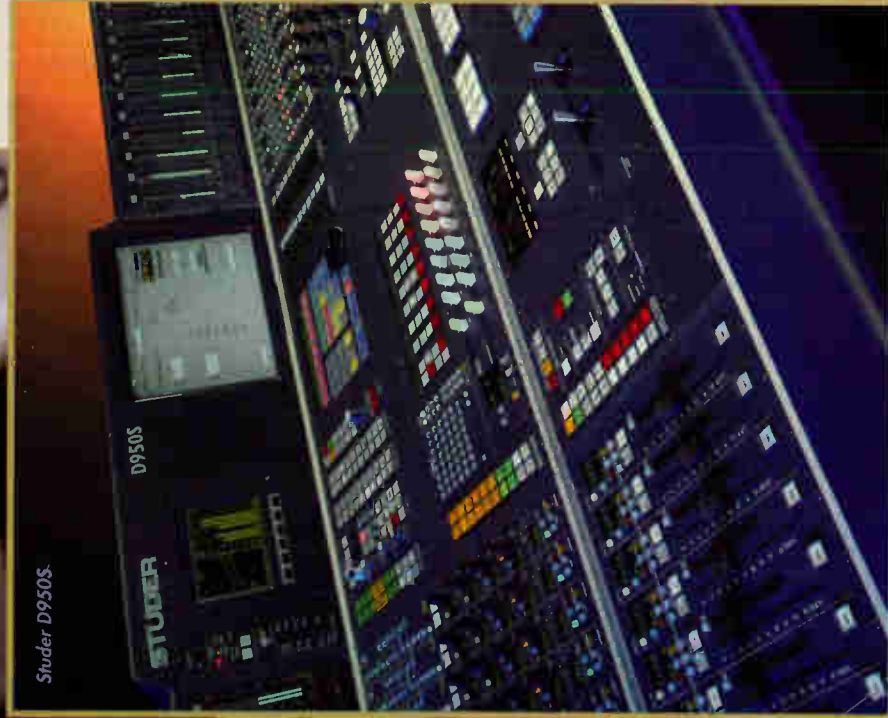
It is this evolution, both in the design and layout of current and future generations of large-format digital consoles, that makes every mixing



AMS Neve Libra Post



SSL Axiom MT



Studer D950S



"Our control surface design is often referred to as 'knob-per-function,' which encapsulates our philosophy on nested menus," continues Andrews. "In practice, varying degrees of assignability have been adopted in certain areas in order to offer more functions without making the surface uncomfortably large. For example, the Axiom-MT has 12 aux sends from both large- and small-fader paths, but only six controls are provided, selectable between 1-6 or 7-12 for each path, and the momentary EQ In switch becomes Reset when held down. The only use of assignability for a large number of controls is in channel banking or layering, which enables all 96 processing channels to be controlled by a 48-fader console surface in situations where space is restricted or cost is an issue."

Terry Murphy, design engineer for Sony, discussed his company's approach to making so much information visually accessible while simultaneously expediting access to the multitude of control parameters. "Most of the traditional analog consoles have evolved into a sea of duplicate knobs. Some digital console manufacturers have mimicked this idea. If there are eight aux sends per channel, a 96-channel console could have 768 aux send knobs. With a 4-band parametric EQ, you could have 1,152 knobs for the EQ. When you are sliding down this 96-channel console to adjust aux send 3 on channel 9, you may accidentally adjust channel 8's aux 3.

"With Sony's Oxford digital console, there are 24 aux sends and five bands of parametric EQ. This would be unmanageable with the older knob-per-function interface. In a smaller console this is not a big issue. In a large-scale console you need something else. You need one location where particular controls are located.

"In the Oxford, there is one panel for

the EQ, another panel for the dynamics, and another for aux sends," explains Murphy. "You press a solo button and turn the control you want. Your hand goes instinctively to the control—perhaps the mid-frequency boost control, for example. The control is always there. It never changes. You develop what is known as 'finger memory': Your hand can instinctively go to the control you want very quickly and reliably. We call this 'positive assignability'—a careful balance between the one-knob-per-function paradigm and the other extreme of some user interfaces with a small number of knobs and switches to be shared between many important functions."

EASE ON DOWN THE ROAD

The manufacturers of these consoles bear a tremendous burden in terms of making their products "easy to use." Without careful attention to this design characteristic, many would-be purchasers might simply go with another model they deem more friendly. On the other side of the equation, however, is the equally important need to provide a product offering the depth

equipment represents a serious investment for any studio.

Michael Tapes, Studer's senior product manager, digital console systems, shared his thoughts on this all-important aspect of console design. "In the days when we were designing analog consoles, there was a naturally imposed limitation that a function had to appear on the console surface, or else it did not exist at all. There was no real way to prioritize the weight that any specific function had, with the exception of the location, size and the color of the control. As such, the modern large-format analog console became a sea of knobs and buttons, crammed into ever-narrowing channel strips—not perfect from the perspective of ergonomics.

"In light of the above, creating the modern digital console with a control surface that I like to refer to as the 'optional remote control,' we can design a surface that is focused on the creative, yet able to accommodate the repetitive tasks that a mixer must perform day in and day out," says Tapes. "It is not a matter of setting the criteria that a given control will have only so many functions, or be only so deep. It is a matter

**High-end,
large-format consoles
reached the maximum physical
size limit in the mid-'80s. This
created a big problem: How
do we add more processing
without making the console
so big that the user can't
reach the knobs?
—Scott Silvest**

of functionality that makes it viable over the long haul. With software upgrades, DSP plug-in capability, surround panning control and a host of additional features that may be on the horizon, designers also need to focus on the console's ability to accommodate future enhancements, as this

of creating a user interface that is easy to understand, but more importantly, one that enhances the long-term operation of the console. Everyone stresses the learning curve of these new creations, and while this is critically important, mixers will face a new console for the 'first time' only once. However,

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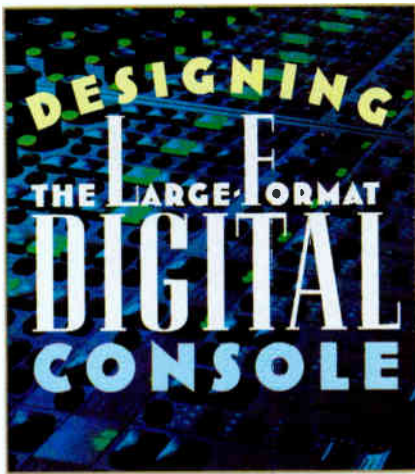
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these engineers will face the long-term operation for days, weeks or potentially even years. It is critical that a proper balance be struck between the 'instant productivity' design that yields 'I can work this right now,' and the more-important 'long term productivity' design, that after a brief period of familiarity yields a power and depth that is so amazing, the more one uses the console, the more creative, efficient and happy the operator becomes.

"Looking from some other points of view, digital console surface designs can allow us to control large numbers of channels from a small space," says Tapes. "Where this is a requirement (such as within a small mobile van), multi-layering of controls is a secondary issue—as it is when being able to stay within the monitoring 'sweet spot' while mixing is of primary importance."

KEEPING IT SWEET

Since staying within the sweet spot is such a critical concern for any mix engineer, manufacturers have focused their attention on various means of increasing the console's operational flexibility to achieve this all-important consideration. Further, the "feel" of the controls and the system's automation capabilities are equally important.

SSL's John Andrews notes, "In addition to the obvious features such as total dynamic automation and instant reset, a major digital feature enjoyed by Axiom-MT users is bay swapping. With this feature, any bay of eight channels may be 'swapped' with the bay adjacent to the center section, thus bringing all the controls within easy reach of the operator, who does not need to move away from the surround mix sweet spot."

"Just as with analog designs, the quality and 'feel' of a digital console are extremely important," says AMS Neve's Jason Power. "All of the mix controls—

knobs as well as faders—are touch sensitive, eliminating the need to press buttons and look at screens when making automated mixes.

"If a digital console's layout is intuitive, the major area for a new operator to learn is the automation system," Power continues. "AMS Neve is easing this transition by introducing a common automation system, Encore, across our range of digital consoles for music recording, TV and film post-production, and live broadcast. Encore is also available for V Series analog music consoles and will be familiar to Flying Faders users, making it far easier for mixers to move from analog to digital consoles. We also have a family of dedicated music, TV post and broadcast consoles based on the same Libra layout philosophy and hardware, offering optimized solutions for each application while also making it easy for operators to move from console to console."

A WINDOW TO ONE'S CREATIVITY

Interestingly, while several of these large-format digital wonders have LCD screens to assist the operator with the console's operational status, these displays continue to play a secondary role in the overall user interface, with touchscreen capability being fairly limited. Otari's Kris Jackson offers his company's view: "Otari is currently not using touchscreens as a console interface. I do not rule out the usefulness of touchscreens in navigating through housekeeping and file management chores, but we are sticking with buttons, knobs and faders for mixing. Advanta does make extensive use of LCD screens for status feedback and integration with outside systems, but without touch operation. On the practical side, we view a mixing console as a tool. On the creative side, it is an instrument and requires much more tactile feedback than a touchscreen offers."

Andrews adds, "The single screen on the Axiom-MT is used mainly during setup, and may be completely ignored during normal recording and mixing procedures. In our view, the pen and tablet provides a much better user interface than a touchscreen, and also offers an excellent surround panning facility."

PONDERING THE FUTURE

As the various manufacturers enhance existing products and pave the way for future generations of digital consoles, it is important not to lose sight of where we've been. In many respects, the stan-

dards and conventions set forth by previous generations of mixing consoles will continue to influence future designs. Kris Jackson offers the following: "Fortunately, analog mixing console design is a mature technology. Just like automobile design, the ergonomics have been refined and time-tested over many generations. This gives us a good starting point and imposes some practical limits on how far we can stray from the traditional and still make a successful product. Today, we also have the challenge of integrating nontraditional mixing console functions such as networking, effects plug-ins, hard disk recording and even workstation capabilities into the console itself.

"The good news with digital mixing console interfaces is that we are no longer locked into the limitations that analog circuitry imposed," says Jackson. "The bad news is that we can now create products that are so nontraditional or different, that people are reluctant to buy them or to change their working methods to accommodate the capabilities of the new equipment. Figuring out how to balance the requirements for innovation, tradition and usefulness is the biggest challenge of digital interface design."

When all is said and done, large-format digital console design will continue to draw on the experiences of the past while making forays into uncharted waters. As new models are introduced, users can expect to find an intriguing blend of the familiar and not so familiar. Like so many other products in our industry, evolution tends to be the dominant theme in terms of design.

Studer's Michael Tapes offers this closing thought: "I suggest that we should not concern ourselves initially with how many layers, or how many functions per button, or how many screens, or how many nested menus there should be within a given design, but rather, what is our user trying to accomplish? Within a design, there may be some buttons that have only one function and others that have many. This is irrelevant. The critical question is, 'Does the design as a whole allow the user to accomplish his or her tasks in an expedient manner, with enhanced creativity and minimum fatigue—all the while producing great sounding audio?' In creating relevant digital console designs, we must concern ourselves with the sum of the parts, not the parts themselves." ■

Roger Maycock is a technical consultant to Mix.



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New York Studios

Following a decade in which the studio industry was threatened by an economic recession, an explosion in home recording and rising costs in the face of stagnant rates, facilities here are reporting robust business and expressing hopes for continued prosperity.

Reap Benefits of

Industry leaders attribute the healthy vital signs to a strong economy and a proliferation of surround sound production and digital audio workstations, all of which feed the city's recording, mixing, mastering and post-production projects.

Strong Economy,

"For two years solid we have been remarkably, consistently good," says Simon Andrews, owner of three-room Right Track Recording. "It doesn't show, at this moment, any sign of abating. The economy is doing well. Record sales in the U.S. are up 11 percent, which is where the money is made. And last year CD sales

Surround Projects

were 10 percent above where they were the year before. The record companies have to put product out in the market and they're flush with cash, so I don't see a slowdown for another two years or so."

BY PAUL VERNA

TIME!



Room 309 at Sony Music Studios, New York

Across town at the Sony Music Studios complex, VP of audio operations and marketing Ian Huckabee says, "Business has been extremely good for us this year. We've hit our stride. Today, we've got Corey Rooney, Rodney Jerkins and Walter Afanador in our rooms and Eric Foster waiting to get in."

Sear Sound owner Walter Sear adds, "We're cranking away with both rooms. We're booked pretty much through the summer, and we've got some fancy people coming in, like David Bowie, and we recently had Lou Reed, Patti Smith and Paul McCartney."

In fact, success in 2000 has been a double-edged sword for Sear. On the one hand, he relishes the steady stream of high-profile clients. On the other hand, he is frustrated that he can't get into his own room until September to perform an upgrade on his custom Avolon board.

Other studio owners are finding that business is a tad behind where it was last year, but still within the range of what they consider healthy. For example, Quad Recording owner Lou Gonzalez—who operates five rooms in his flagship facility here and four in a Nashville studio he acquired last year—says, "The beginning of this year was not as good as last year. Last year was the best. There was a lot of work to be done, and people love working at Quad, so we did pretty well."

Alex Abrash, manager at downtown haunt Kampu Studios, which recently installed a Solid State Logic Axiom-MT digital console, says, "Our business is changing a lot. We're struggling to grab a different level of business. We're looking for major-label stuff and long-term projects. Maybe this year won't be our best year, but our growth in terms of the kinds of projects we're seeing has been explosive."



The all-SSL-equipped Quad Recording complex was designed by its owner, Lou Gonzalez.



Right Track Recording Studio A with its AMS Neve VX

For Abrash, leapfrogging from an SSL G to an Axiom has catapulted him into the big leagues. It's been an exciting ride, if a bit unsettling at times—somewhat akin to taking one step back to take two steps forward.

Amid the transition, Abrash has found himself living moments that only existed in his dreams. On the day he was to host production legend Eddie Kramer for a 5.1-channel mix of Jimi Hendrix recordings from the legendary Isle of Wight performances, Abrash recalls thinking: "We're mixing Jimi Hendrix material in surround today. How cool is that?"

If studio owners provide an accurate barometer of the recording industry, retailers are perhaps even better poised to measure its health, since they cater not only to the studios but also to the growing project and home-recording sectors.

Sam Ash Professional general manager Tim Finnegan says, "Business has been very good. It probably has to do with an excitement about surround sound. We're finally starting to feel the effects of people understanding that there is a business out there—or close to being out there—with DVD-Audio."

SURROUND PHENOMENON

The pickup in business resulting from multichannel production is manifested in sales of extra speakers and extra amplifiers, as well as in installations of complete systems, according to Finnegan.

At Sony, multichannel production has been a hallmark of the studio's business and a source of pride for sister companies Sony Music Entertainment and Sony Electronics.

"Surround has grown," says Huckabee. "We were definitely involved a year ago, but it's mushrooming. We're

doing a lot of DVD work for Sony Music Entertainment. Our facility has made a great investment in all the surround technologies, from amps and speakers to multichannel signal processors. We're poised to handle the demand for DVD-Audio."

Whereas surround sound pioneers had to retrofit consoles with multichannel monitoring capabilities, manufacturers are increasingly building 5.1-channel center sections into their mixers. At Quad, Gonzalez recently upgraded the software in his SSL Axiom-MT, and it now allows him to pan signals in the multichannel spectrum more easily.

"The new version of the software [PanPoint] lets you do the whole 5.1 panning thing with a pen, not even a joystick, on every channel," the beaming Gonzalez says.

DAW EXPLOSION

Another trend that is fueling business across the recording industry is the continued growth of digital audio workstations, particularly Digidesign's ubiquitous Pro Tools platform.

Finnegan says, "Pro Tools continues to be a very strong product line for us. We're still selling more full-fledged systems than [entry-level] 001s, but we're selling absolutely more 001s than we thought we would. Surprisingly, the sales of 001s are not at the expense of the larger systems."

In every recording and mixing studio polled by *Mix*, Pro Tools has infiltrated virtually every aspect of the production.

"We're seeing Pro Tools integrated at every stage of the production," says Huckabee. "It may start out in someone's living room or home studio, and eventually, those tracks make their

way over here on a hard drive. We've even had Pro Tools in on mastering sessions, where there's typically the Pro Tools operator, the mastering engineer and the artist in the room together or connected via EDNet."

Huckabee notes that Pro Tools is approaching the "commodity" level that products such as the SSL 9000J and Sony 3348 have attained. "At some point Pro Tools is probably going to be an expected piece of gear when you walk into a room," he says. "You got your SSL 9000J, your 3348, your essential pieces of outboard gear, and your Pro Tools."

Randy Ezratty, owner of mobile and post-production facility Effanel Music, recently acquired a Pro Tools system to address his clients' overwhelming requests. Although Effanel uses Otari RADAR as its primary live recording platform, Pro Tools has become critical to the studio's post efforts, which take place either in its lavishly appointed, expandable truck or in a large control room-cum-tracking area in its Chelsea headquarters.

For Ezratty, the Pro Tools installation is only the latest in a series of steps he has taken to make Effanel increasingly versatile. Other moves in that direction have included installing a 5.1-channel monitoring system in the AMS Neve Capricorn-equipped truck and adding a second Capricorn back in the studio (which also contains a surround-sound environment).

"Our clients know we're doing as much post-production in our truck as we're doing in our room," says Ezratty. "There's very little concern that it is a truck. We've managed to get past that."

Commenting on the flow of work between the truck and the studio, Ezratty says, "The concept is working—the ability to move between two systems. Even from a monitoring standpoint, we're not finding great differences in the way things sound."

MASTERS OF THEIR DESTINY

If the recording/mixing sector of the business is healthy, traditionally the mastering business hums right along. Sure enough, Masterdisk owner Doug Levine reports strong, steady business in all his rooms, which are now staffed by Tony Dawsey, Howie Weinberg, Leon Zervos, Andy Van Dette and Roger Lian. Masterdisk also operates a burgeoning DVD authoring/mastering division.

"I go to SPARS luncheons regularly," says Levine. "From the talk at the last

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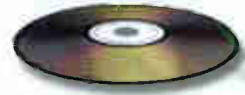
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lunch, the recording and mixing facilities seem to all be back doing well and talking about expanding. There was a while where, in New York, you just did not hear talk like that. It's a much healthier atmosphere than when people were talking about cutting rates. The economy's booming, and it spills over to everything."

One of the most lucrative niches for mastering houses is the cleaning up of hardcore hip hop tracks. This often edit-intensive aspect of the mastering workload provides a windfall for studios, since they essentially get to "work on the same project twice and create two versions," according to Levine.

Even as they supply the industry's seemingly insatiable appetite for product, mastering studios are still reeling from a tumultuous series of staff moves that had a domino effect on facilities from coast to coast.

"In my 26 years in the business, from about three years ago through a year ago was the most turbulent time I have ever seen in the mastering industry," says Levine.

However, he's quick to add that things have "quieted down. Mastering engineers don't like to move around too much. Their room is an extension of what they do."

Like other mastering studios, Masterdisk has fully embraced the surround-sound revolution. However, the studio has received less work from its core music clients than from other industries.

"Most of our DVD work has been Japanimation and feature films," says Levine. "Every once in a while we get a record industry project, but there haven't been many."

NET GAINS

Studio owners surveyed for this story have expressed surprisingly little concern about digital downloading of music and its potential adverse effect on record sales.

"The digital downloading of music hasn't affected CD sales as of yet," says Andrews.

Gonzalez adds, "I haven't heard any of my clients being afraid of their music being pirated. When cassettes were the thing, everybody could make cassette copies as long and often as they wanted to, and it didn't hurt the cassette business."

In fact, Web-based production is helping some areas of the industry,

notably retail. Finnegan says some of the growth in Sam Ash's business can be attributed to the increase in the number of studios that supply content to such Internet concerns as click radio.com.

ENGINEER GO HOME

Another industry bugbear—at least in the estimation of some observers—is the home recording explosion, which began with modular digital multitracks in the early '90s and evolved later in the decade with digital consoles, digital audio workstations and advances in digital audio resolution. However, for all the perceived dangers posed to tradi-



Sear Sound's Studio C

tional studios by home recording, owners of world-class facilities remain unruffled.

"Home recording never affects me," says Gonzalez. "If I was trying now to start out, it would be affecting me, but nobody at home is going to have a 9000J and an Axiom-MT and a 3348. Also, we have an incredible mic selection and great-sounding rooms."

Andrews adds, "I've seen project studios ever since Tascam came out with their 16-track, ½-inch recorder. I've seen high-end studios built by artists, and the media has always played that up and said, 'This is going to affect the studio business,' but it really hasn't affected us."

"Running a world-class studio is a full-time business, so the artists that open high-end studios don't realize that until the technology they put in needs to be replaced, or until they get bored working at home," he continues. "I've always compared it to people who spend \$50,000 putting in a private gym, and the first two years, they go in religiously every day. Then they end up going back to their old gym because it's the only way they can get motivated to exercise."

Other studio owners and managers say they aren't immune to the home-recording movement as much as they've found ways to coexist with it.

"We're cohabitating very well with home and project studios," says Huckabee. "We've got clients now with home studios, and some of those clients are getting finished products from their studios, but a lot are coming in for the room acoustics and to mix. They trust us and they need an accurate environment to mix in."

Elsewhere, home- and project-based recording has taken a bite out of the bottom line and forced professional studios to adjust their businesses. For instance, at Kampo, part of the rationale for installing the Axiom-MT and a new TC Electronic System 6000 multichannel effects processor was to stave off the threat of clients taking their work home.

"The home-studio phenomenon has been unbelievable in the past 10 years," says Abrash. "It certainly has had an impact on commercial facilities. We have to provide products and services that people can't do at home—not only the latest technology but the best people. We're constantly trying to innovate and experiment."

Abrash adds that the constant specter of losing business to smaller facilities has led Kampo to be more creative and flexible in its business practices. "It seems that every day in the studio business we're doing things we never did before, like transferring this format to that one, or locking up one machine to another," he says. "We've seen a bump in transfers from ADAT or DA-88 to Pro Tools or 3348. Transfer sessions are big now, and they're not simple. I recently sent my chief tech to a class on transfers."

Indeed, a cottage industry has developed to satisfy the demand for transfers, backups and audio restoration, as evidenced by the opening in 1998 of the TransferMat Studio within the auspices of high-end New York rental shop Toy Specialists.

Stocked with every imaginable digital and analog format, the TransferMat provides its customers with services ranging from file format conversions and timecode repair to editing and pre-mastering of album material, according to Toy Specialists owner Bill Tesar.

CONSOLIDATION: FRIEND OR FOE?
Another music industry dirty word that

GLEN KOLOTKIN

THE COAST-TO-COAST CAREER OF A RECORDING JOURNEYMAN



PHOTO: ELEONORA ALBERTO GROSSI

Long Island-based Glen Kolotkin is hardly a household name in the recording business, but over the course of more than three decades as an engineer and occasional producer he's worked on scores of fine albums in many different genres. Just a partial list of his engineering credits includes such artists as Moby Grape, Janis Joplin, Barbra Streisand, Santana, Captain Beefheart, Dr. Hook & the Medicine Show, Eric Anderson, Gladys Knight & The Pips, Jimi Hendrix, Joan Jett, Lionel Hampton, Paul Winter, Pete Seeger, Sonny Rollins, Taj Mahal, Vernon Reid and the Lovin' Spoonful. Acts he's produced or co-produced include the Electric Flag, the original stable of Beserkley Records bands

(Greg Kihn, Earth Quake, Jonathan Richman and The Rubinoos), The Ramones, Duke Jupiter, cellist Eugene Friesen, The Stompers and Fairchild. (You can find fairly complete credit listings for Kolotkin and hundreds of other engineers on the All Music Guide's site on the Web at www.allmusic.com.)

Kolotkin was born in Philadelphia but was raised mostly on Long Island. He was a staff engineer for Columbia Studios in New York beginning in the late '60s, later moving to Columbia facilities in Los Angeles and San Francisco before becoming an independent in the mid-'70s. He moved back to New York in the late '70s and has been

active in recording there ever since. Kolotkin's most recent engineering triumph was working on three tracks on Santana's google-Platinum *Supernatural* album.

I caught up with Kolotkin shortly after *Supernatural's* triumph at this year's Grammy Awards.

What was happening musically in Long Island when you were 10?

Doo-wop. In fact, some friends of mine and I had our own group. And this is how I first got into recording. Our group had never heard ourselves, so I bought a 78 disc-cutting machine. Tape recorders were very expensive in those days. So we started to record the group and that's where it started for me. When groups in high school found out I knew how to do this, they all wanted to record, so they'd come over to my house and we'd record them.

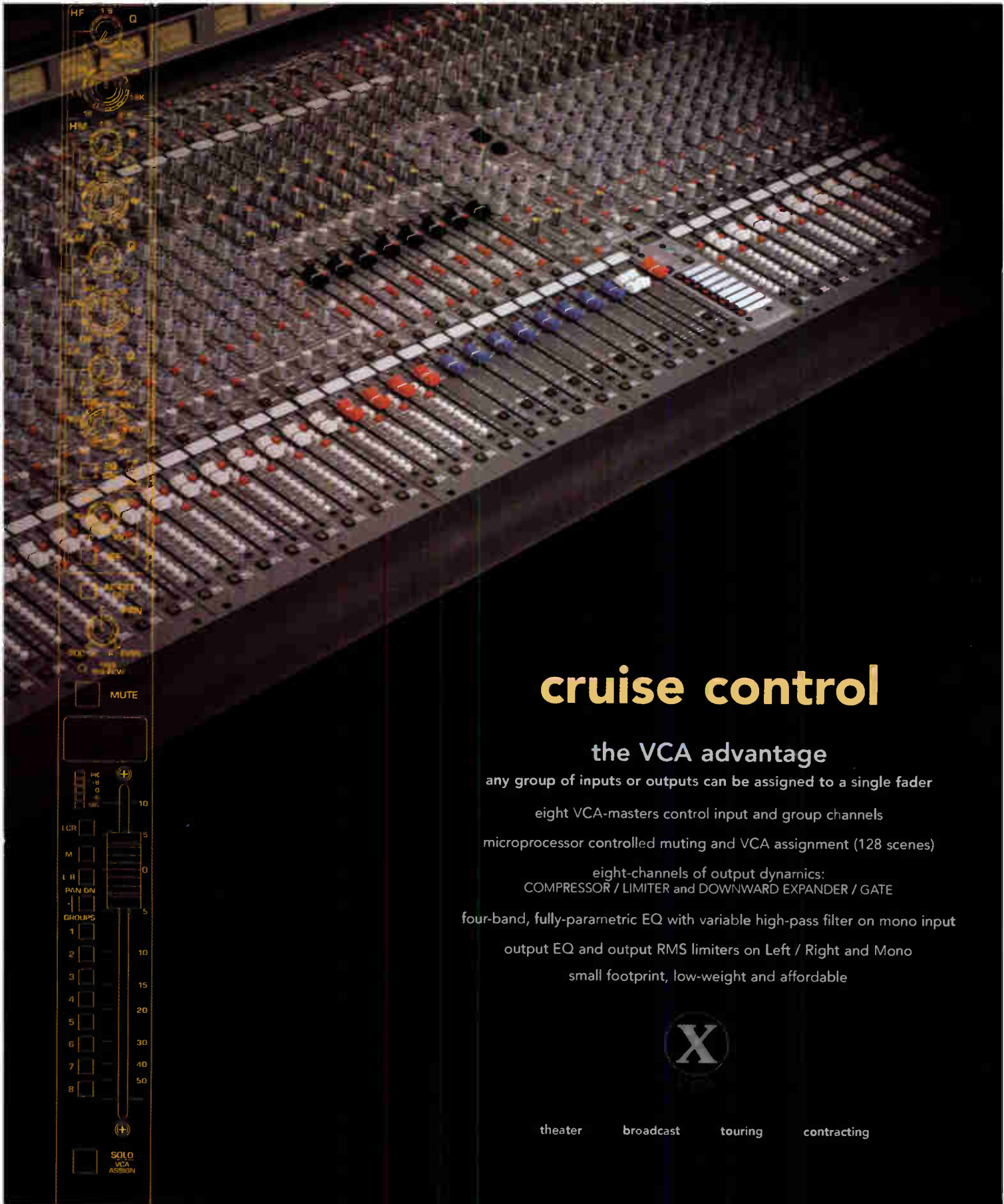
Were you technically inclined? Were you a ham radio guy?

Yeah, I was always interested in electronics, ham radios. But this was more interesting. We needed two microphones, one for the lead singer and one for the backgrounds. I got my first 2-channel mixer around that time. I think I got it at Lafayette Electronics or some place like that.

Lafayette was sort of the Radio Shack of its day?

Exactly. At this point, I didn't really think of recording as a career. But then it sort of gradually became my work. I was in the Army and they sent me to radio school, and then they put me in charge of a radio station in Germany. Then, when I got out of the service, my uncle asked me what I wanted to do and I said, "I'd like to make records." So he suggested I call some recording studios, and I did. I got out the Manhattan Yellow Pages and the first studio listed was A-1 Sound Studios, and I called up Herb Abramson over there, and believe it or not he gave me my first job in 1965.

BY BLAIR JACKSON



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Nice and easy. I assume that's the Herb Abramson of Atlantic Records fame?

Right. A-1 used to be Atlantic Studios, and when Herb broke up with Ahmet Ertegun, Herb got the studio and Ahmet got the record company. It was a small 4-track studio on 56th Street. A record Herb did around that time was "High Heeled Sneakers," and Tommy Tucker was hanging around the studio, along with various other groups coming through there. Herb couldn't do all the work, so I started doing sessions, with his training of course.

So was this was the classic three three-hour session blocks regimen?

Yes. Most of the groups we were cutting were small groups and it wasn't through the union. I remember we had the Four Tops come in. They had come from Detroit and needed to do some overdubs, so we worked on that. In fact, that was the first session I did.

After that 4-track studio I went to a 2-track studio, Nola Penthouse Studio, in the Steinway Building, where we were doing big jazz sessions. Tom Nola used to record Jerry Mulligan and Ahmed Jamal, all these jazz players. Tom Nola wasn't interested in doing rock 'n' roll, so I would do that work. We'd record the band, put the tape on again and copy that and add the vocals. Then we'd master it there; they had Scully lathes in the back.

After Nola's, I answered a blind ad in the *New York Times*: "Major record company needs experienced engineers." I answered that and I got a job in the remixing department of Columbia Studios. At that time, all the Columbia acts were already working with people they'd been with at the studios, so they started booking me with outside clients. So I ended up doing a lot of stuff for other labels, but at Columbia Studios. Like I worked with Melanie for Buddah Records.

One day they booked me with an artist and they didn't tell me who it was. They gave me the setup but not the name. They said *they* didn't even know who it was, but it was someone who needed some mixing done. So when the time came, in walks Jimi Hendrix with an armload of tapes! He'd been trying to mix the album that became *Electric Ladyland* for the longest time and he wasn't happy, so I was the last stop. So we worked on that for about two weeks and we got along really well. In fact, he asked me if I wanted to leave Columbia and join him, but I was



happy there and decided to stay.

Columbia was 8-track at this time?

Right, they had Ampex machines and Columbia built its own consoles at that time. It was funny, I saw one of those old consoles not too long ago and it looks like something that should be in the Smithsonian. It's hard to believe we worked on Jimi Hendrix on that console. [Laughs] It really looked dated. Although at least this one had sliding faders. Some of the other ones there still had rotary faders. But I remember there was a Pultec on each channel for EQ and LA-2A's, so they were pretty good.

The first record where I see your name listed as producer is Electric Flag. How did that come about?

I was working on it and I happened to get the credit. To be honest, I didn't do anything different than I had been doing, but I got the credit for it. That was in New York, too. What a great band that was. I love that record. I had done some remixing on *Super Session* [featuring EF's Mike Bloomfield, Al Kooper and Steve Stills], but I didn't get credit on it. Later I worked with Al Kooper a bit; I did *I Stand Alone*.

Why did you leave New York and move to Los Angeles?

It just seemed like time to leave. I wanted to get out of the cold. The studio manager from Columbia's L.A. studio, on Sunset Boulevard, happened to be in town and I casually asked him if they had any openings there, and to my surprise he said, "Yeah, come on out!" So I moved and I liked it a lot. They had the same custom console that they had in New York. And I was doing big dates there. They booked me with another New Yorker, producer Richard Perry, and he was working with Barbra Streisand. So we did the *Stoney End* album. We started that album in L.A. and continued it in Las Vegas. L.A. was such a record town. There were a lot of studios there and everybody knew everybody. There were a lot of 50- and 60-piece orchestra dates. It was a great time in L.A.

But shortly after this you migrated north to San Francisco?

Clive [Davis, head of Columbia Records] wanted to open a studio in San Francisco, so he asked Roy Halee to go out there from New York, and Roy asked me to join him, and we opened up Columbia Studios in San Francisco, because there was a lot happening there. They had studios in Nashville, New York, Chicago and San Francisco. Then, eventually, they closed them one by one. L.A. was the first to close, I believe.

I see you worked with Moby Grape.

I did, but actually that was in New York, not San Francisco. I worked on *Grape Jam* and *Wow*. They were good guys. Very loud [Laughs].

You also did some work on Pearl, Janis Joplin's final album.

That was around the time I moved to San Francisco. I think I worked on three cuts [in L.A.] with [producer] Paul Rothchild and then moved to San Francisco. She was great; really a talent. Very lonely person, I guess. We became really quite friendly.

By this time you're getting away from the three-hour session blocks.

Oh yeah, with rock 'n' roll bands they'd sort of camp out! That's the way Santana was. They'd have the studio booked constantly in San Francisco. They had some kind of a deal where after they'd sold a certain amount of records the studio time was free, so they'd just book the studio and move a refrigerator in the studio and stock it every day and we'd just record all the time. Actually, it was a pretty nice way to make a record.

I was reading in Joel Selvin's Summer of Love book that when you were working on Santana III, you were erasing solos left and right as Carlos Santana and Neal Schon tried to top each other.

On *Santana III* there was a song called "Toussaint L'Overture" that became like a contest between Neal and Carlos. Carlos would come in and do a solo. Then Neal would come in the next day and hear it and he'd try to better it. But we only had 16 tracks so he would have to erase over his own solo. It went back and forth like that a bit. I'm convinced to this day that we erased the best solo that Neal ever recorded! He thinks he topped it, but I didn't.

Was it difficult as an engineer to keep your nose clean, so to speak, in an atmosphere rife with recreational drug use? Well, it's a technical job and you have to keep your wits about you. Certainly it was always around. There were long sessions. There were sessions when not a lot got done. I was working mostly at

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PRODUCER'S DESK

night, it seemed. I'd get out of the studio at 3:30 or 4:00 in the morning every day. *As recording moved from 8- to 16- to 24-track, did the technical demands on you increase significantly?*

Not really. In some ways it made things easier, especially when we went to 24, because it was more tracks for everybody. There wasn't anything revolutionary happening in recording. It was just more tracks.

You were with Carlos Santana during one of his most interesting periods—Caravanserai and Borboletta really had that searching, questing spirit to them and he was showing some jazz influences for the first time.

Caravanserai was a big change for him. That was a great record. He got the guru [Sri Chinmoy] around that time.

Did it change the way he worked in the studio or how you related to him?

Not really. The band broke up a little because he wanted to go in one direction and some wanted to stay in that other direction. We also did that other album around then with John McLaughlin [*Love Devotion and Surrender*]. We did some of that in New York, I remember. And we also did *Illuminations* with Alice Coltrane around that time.

Another fine, underrated album. She was a pretty interesting player—barp and keyboards.

Right, and she played this Baldwin organ—it was a home organ with a speaker in it. Everyone else was using Hammonds, but she said she had a vision one time that she should use the Baldwin, so she did.

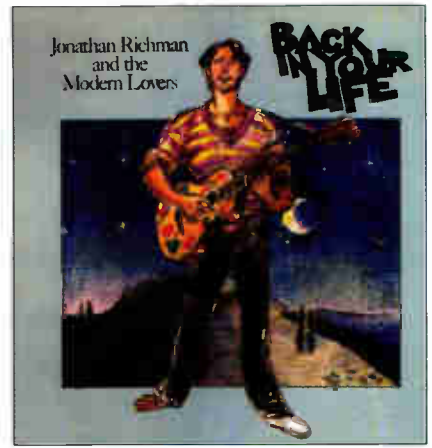
At some point you left Columbia and became an independent.

What happened was, when Clive left Columbia in the late '70s that was really the end of Columbia San Francisco. Within a year they closed the studio and I went independent. Columbia Studios became The Automatt, and they were quite successful for a number of years.

It came at a good time for me. I'd thought I wanted to be on my own more and I was interested in doing more producing, which I did.

You co-produced so many of the early Beserkley Records albums by Jonathan Richman, Earth Quake, Greg Kihn and The Rubinoos. How did you book up with Beserkley's chief and self-proclaimed "reigning looney," Matthew Kaufman?

[Laughs] I haven't heard that for years: Reigning looney! What happened was while I was still at Columbia [SF], he



brought Earth Quake into the studio and cut some tunes, and I thought it sounded pretty good so I offered to help him get a deal for them. But Matthew said he didn't want a deal; he wanted his own label. So he started bringing in all these groups and we'd record singles with them and then he put out the first album, *Charbusters*, which was all these singles, and that was the beginning of Beserkley. After that we started doing individual albums with all the artists.

What appealed to you about Jonathan Richman?

He was just so fresh and unaffected by what was going on. He wanted to do things differently. We recorded one of his records in the echo chamber at Columbia—the entire band was in there. And one song even became a hit in England, "Egyptian Reggae." He was funny and fun to work with; kind of refreshing. And his records were like that, too.

What was Matthew's aesthetic like? I was a real booster of Greg Kihn's in the late '70s because he had these wonderful pop songs that he delivered so convincingly. But I always felt that the production of his albums was somewhat flat and that Kihn's records needed some pop sheen to get them played on the radio. Frankly, I thought Kaufman was holding him back.

I had the same feeling. I think Matthew wanted a certain purity to the sound. He wanted to record a little like the early rock 'n' roll guys. But it wasn't just Matthew. They were all fascinated by Buddy Holly and the sound of those records. They had pictures of Buddy Holly sessions. Jonathan Richman wanted to record with the old microphones, and we actually set up some of those old mics in the studio, but then we kept adding microphones until we got up to the way things were done in the present time. [Laughs] He thought we could do the whole record with one microphone because that's how some records were done in the '40s.

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PRODUCER'S DESK

After Columbia closed, where did you record the Beserkley stuff?

We did some at Wally Heider's, but most of what I did for Beserkley was at Columbia. One time we even flew to New York and did some recording at Kazenetz and Katz's studio in Great Neck, New York. They were the big bubblegum producers—1910 Fruitgum Company, Ohio Express. Beserkley was trying to sign this new band—the Talking Heads—and we cut a demo of "Psycho Killer." Matthew wanted to sign them but he didn't have enough money, and what we ended up doing was giving them the tapes and then they got their deal. Actually, I liked our version better.

At some point you moved back to New York...why?

It seemed more centrally located between Europe and the West Coast. I started working with Joan Jett shortly after that [see "Classic Tracks" on page 194], and I was hooked up with [producers] Kenny Laguna and Richie Cordell, and we did quite a bit of work together. They were interesting guys. Laguna had his own ideas from the old bubblegum days. Richie had written things like "I Think We're Alone Now" and all those hits. And we became partners after that and we went around the world producing these acts. We went to England and recorded a band called Girlschool and another called Bronze. We went to Canada and did Doug & The Slugs. We also did The Ramones around that time also [*Subterranean Jungle*, 1983].

What was that like?

We did that at Kingdom Sound. That was a unique band. That was interesting because I was used to bands that played guitar solos and they didn't really do that. [Laughs] We got a friend of theirs to play some guitar solos.

What are you thinking when you take a job producing a band like The Ramones? I mean The Ramones always sound just like The Ramones...except when they worked with Phil Spector!

[Laughs] They told me stories about Phil. They were afraid of him! It's hard to say what I was thinking. With any group you work with, you're trying to bring out the best in them and hopefully bring something to it that they wouldn't themselves. With a band like The Ramones, there isn't much beyond the basic tracks—that's what they do—so it becomes a question of capturing their energy and listening for strong performances. When you go hear those guys it's like hearing the

basic tracks and vocals. [Laughs]

During this period when you were working with all these rock 'n' rollers were you also doing other kinds of music?

I was always doing a little jazz, it seems. When I was at Columbia I worked with Teo Macero. We did things with Lionel Hampton. We did a live thing with Miles Davis and this strange band he had in the mid-'70s with these Indian musicians. I worked with Charlie Byrd. I've always loved jazz.

Is there anything that's changed fundamentally in the way you record a group?

Things have changed in the way records are made because so much is done on computers, but I never got into that. Basically, I'm still doing it the same way I always have. I try to get it to sound the way I want in the studio and then I get it to sound that way in the control room on the tape. A lot of people today don't have that concept. They figure everything has to change so they're playing with computers.

I try new pieces of equipment, but I find that a lot of the old favorites still work best for me. Like the U47 from 1947 is still a great microphone. RE20s are great, and for my money they haven't been surpassed. I'm open to change but I'm not going to do it if it's not going to sound as good.

Digital vs. analog?

When digital first came out I thought it was the greatest because it eliminated tape hiss. But people started saying it wasn't as warm as analog, and that was true. Then Dolby came out with SR and I thought that was fantastic and I went back to that: 24-track Dolby SR.

Where do you work primarily these days?

I've done a lot of work recently at Sorcerer Sound, which is a very nice studio in the Village. And there's a new place I've found in Connecticut called the New England Power Station, which has a nearly identical design to the New York Power Station; you'd swear you were in the New York studio. Very nice people.

What can you tell me about your work on Santana's Supernatural, which seemed to employ every producer and engineer in the business? Of course this was a reunion for you and Carlos...

A couple of years ago my wife, Carol, called me and said, "You've got to turn the TV on because Santana's on." There was the original band being inducted into the Rock and Roll Hall of Fame. I was pointing out the different people to her: "There's Mike Shrieve, the drummer. Boy, we go back a long time," and

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PRODUCER'S DESK

so on. So my wife said, "You really seem to know these guys. Maybe you should write a letter to Carlos congratulating him." And I did and Carlos called me back right after that and asked me if I'd help him work on his new album, which was going to be his first for Arista Records. So before I knew it I was on a plane going to San Francisco and I was working with Carlos at The Plant. It was great being out there again; Marin County is as beautiful as ever.

How many tracks did you work on?

Three of them ended up on the album, but there were another four or so that didn't make it. Maybe they'll turn up some day.

How had Carlos changed in the 20 years since you'd worked with him?

Well, he really became the leader of the band. When I originally worked with the band in the early '70s, I had done two or three sessions before I even knew there was a Carlos Santana; I thought that was just the name of the band. With the original band, it felt like everyone was sort of equal, but now it's clearly Carlos' band; no doubt about that. But he's always been a good guy;

very dedicated to his music.

Did the success of Supernatural surprise you?

Of course. I think it surprised everyone, including Clive and Carlos! Before that, I think Santana's biggest record was *Santana III*, which I did. And actually, the first tune we did on the new album ["Da Le] Yaleo"] reminds me a bit of the kind of songs that are on *Santana III*. I love that sound. I knew the album had a chance because Clive Davis was involved. I feel very happy for Carlos. It was great working with him again.

What are some other projects you've worked on the last few years that you're particularly proud of?

I did some work with Paul Winter for a period of time and I really like those records. We did one called *Whales Alive*, which was songs about whales, and whale sounds and there was poetry on it. Then we did another thing with his cello player, Eugene Friesen, called *Arms Around You* which is really great. Not that many people have heard it, but it's a wonderful record. I ended up producing that with Paul and Eugene. We also did an interesting project called *Earthbeat*, with these Russian singers, and we toured the country—13 Russian

singers and the Paul Winter Consort. I did the sound for them.

Recently I've done some work with this new act called Mixx, which has a very fresh-sounding singer and songwriter.

Do you find that musicians know more technically than they used to?

Probably. There are more of them who know about sampling and they make these elaborate demos at home now, some of which are pretty good. But a lot of them have forgotten some of the basic things about making great-sounding records that *feel* good. You can't do that with machines. I really believe that when you record a band, you have, four, five, six musicians working together as one unit and you get this feel that's amazing; that one person could never get. You get them all working off each other, and that's the magic. I try to record that way whenever I can. A lot of people want to go one instrument at a time, and I'm always saying, "Let's try it as a band first." That's what we did with Santana and it came out great. I said, "Carlos, let's get the whole band in here and do it the way we used to." I don't know if that's now old-fashioned, but it's still fun. ■

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PIERRE FOLDES

POST-PRODUCTION WITH PARISIAN STYLE

Composers heading to New York to find work in this town's audio post market are often cowed by the number of well-appointed project studios that are tucked inside the city's steel canyons. But a strategy centered on staying small can also be productive, if you've got the chops and interpersonal skills that the spot and film community requires. Case in point: Pierre Foldes.

The classically trained Paris native came to America 18 months ago, knowing no one and without any job prospects. Today he's composing and arranging a steady stream of work out of his tiny West Village project studio.

"I was trying to meet people when I arrived here, and I struck up a friendship with a sound designer at Howard Schwartz Recording," says Foldes. "Visiting him one day, I met a mixer who, finding out that I was a composer looking for work, told me that she knew another French person who produced commercial music, Jean-Marie Salon. I couldn't believe it—I was in a band with this guy years ago in France! We hooked up, and I wrote some spots for him."

Back in Paris, Foldes owns a large studio with his guitar-playing brother, who uses the facility for his own projects and books it to outside talent as well. Here in the states, Pierre is keeping it simple. "I own a Macintosh laptop computer, which is necessary because I like to take my projects back and forth when I return to Paris, which I do frequently," says Foldes. "I'm looking forward to Macintosh releasing a G4 laptop. It should be powerful enough for me to run digital audio and software synthesizers on it. I tried hard disk recording straight to the computer several years ago, but there were too many limitations for me."

All his tracking is done to a Korg D-16 hard disk/mixer. "It's a very cool little box. For sounds, I rely on my E-mu Systems E4 XT Ultra sampler and a Yamaha QY-70 synth. That's it," Foldes explains. "I try to avoid recording by layering—I like to have as many sounds as I can have live, so that I can tweak as I go along. The E-mu sounds very good, and I have it maxed out to 128 megs, but given the size of multisamples these days, that's still not enough memory.



"The D-16 sounds good, better than some other recorders in its price range I've heard. It doesn't use compression," he continues. "I like to take sounds from the E4 into the Korg through the recorder's digital input, and so I bought a Doctor D universal signal converter. It accepts the AES/EBU signal from the E4 and converts it into a Lightpipe output, which is what the D-16 wants to hear. The sound that gets tracked this way is very good."

BY GARY ESKOW

The D-16 ships with 18 effects, and they're pretty good."

Foldes is building up a reel that includes a number of finals he has mixed entirely within his Korg, and others that have been built within it, transferred to a larger facility and had live parts added on. "It really comes down to using the equipment you have as creatively as possible," says Foldes. "I just bought a TC Electronic M1 effects device. It doesn't have the same quality as their 2000 or 3000 boxes, but it's pretty good, and I always try to think of how I can use all of this equipment in the most artistic way possible."

His spot reel includes scores for Microsoft, Motorola and Hertz. As the work flow increases, Foldes is slowly purchasing more equipment. "I bought a pair of Event PS-5s—that's the smallest set of powered monitors in their line. They sound very good! At first, I thought, hmm, there's nothing much happening on the high end, but I was wrong. They're very precise and have a lot of bottom. Back in Paris, I own Genelecs. Compared to them, the Events are very different, but amazing for the price."

Do some composers simply look for boxes with blow away presets and in doing so limit the individuality of their sonic creations? "Well, let me tell you about the Yamaha QY-70," Foldes says. "It's a very small module, almost the size of the hand, that has 16 multitimbre voices. It's extremely simple, and it has an on-board sequencer and effects. If you spend a lot of time on it, you can do some incredible stuff, but if you simply examine individual sounds you say, 'Well, it's not so good.' I've taken this device around the world, working on sounds as I go, and I've gotten some very good results from it."

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MIX BUSINESS

The Wheels Go 'Round and 'Round...

• M E M O R A N D U M •

Looking over the changing landscape of the studio business, I begin to know how Chaplin felt in *Modern Times* as he squirmed through the wringers of huge churning gears. Interlocking wheels are turning in this business right now, and getting more and more complex even as the gears are turning faster and faster. There are two major trends in motion at the moment, and each affects the other.

The first is the ongoing expansion at the top end of the studio business. Within the past 18 months, The Hit Factory in New York bought Miami's Criteria, effectively increasing that facility's size from 12 to 18 studios; and Quad Recording, also in New York, bought the serendipitously named Quad Studios in Nashville, adding three rooms in Tennessee to the five already online in Manhattan. Viewed along with arrangements such as the joint venture between London's Metropolis and Sterling Sound in New York, and L.A.'s Ocean Way opening a Nashville studio, the trend is clear: Large, upper-tier audio facilities are expanding geographically, in large part as a strategy to find new markets.

This is a common business strategy, but it's relatively new for the studio business, where facilities have traditionally established themselves in communities and changed as the local business environment evolved, adding consoles and equipment and design changes as the regional market demanded. With the creation of multiple-location facilities spread out over several cities, that model changes into one in which studios decide on certain technology platforms and then offer their clients the

ability to move from place to place without leaving a familiar operating and aesthetic environment. Now, the same way you can find the same products at Restoration Hardware in any of their stores across the country, you



PHOTO ©EVERETT COLLECTION

can get African slate tiles at every Hit Factory location, and New England pine walls at every Quad studio no matter which city you're in.

There's something nipping at the heels of these studios, and it's the other dramatic trend I referred to: the renaissance of the middle-level studio, driven this time *not* by the emergence of the independent engineer and producer, as it was last time, but by technology that has

—CONTINUED ON PAGE 82

QUARTERLY

ALL TEXT BY DAN DALEY

Virtually everything can now take place virtually. The transfer of audio data via copper wire and, increasingly, the ether, has been a growing trend in professional audio recording, editing, mixing and playback for the past decade. Consequently, it's only logical that the suppliers of the technology used in making music would move online, as well. But is it a better way of buying equipment?

"It's another way," says Ray Maxwell, who was recently named general manager for Digibid.com, a two-year-old online pro audio equipment auction site. (Digibid is owned by IndustryClick, the

The Emerging Business of Online Pro Audio Sales

pass.com—the list of sites that offer pro audio gear is growing. But their proliferation underscores the fact that the various levels of technology used to create, compose, record, edit, mix and manipulate music have undergone a tremendous convergence in recent years. Anyone who has been to both a NAMM show and an AES convention in the past year is bound to have noticed a significant amount of overlap of products and technology platforms. No one's selling guitars at AES, nor 120-input consoles at NAMM, but just about everything in between can be found on either show floor, and is fair game for these sites.

LOG ON, PAY UP, SOUND OFF

business-to-business Internet subsidiary of Primedia, *Mix's* parent company.) Like many in this rapidly expanding niche, Maxwell is quick to point out that online ventures are not intended to replace brick-and-mortar equipment retail operations, but rather to complement them, a sentiment voiced in the larger world of e-commerce as online retailing took center-stage during last year's holiday selling season. James B. Kersten, CEO of Iowa-based Musichotbid.com, echoes that observation in an online FAQ statement: "On the contrary, we will help retail outlets by providing them another way to reach the public. Perhaps the greatest benefit is the fact that we can offer them a variety of ways to reach the public: auctions, store front or classified ads at a comparatively low cost to going into e-commerce themselves."

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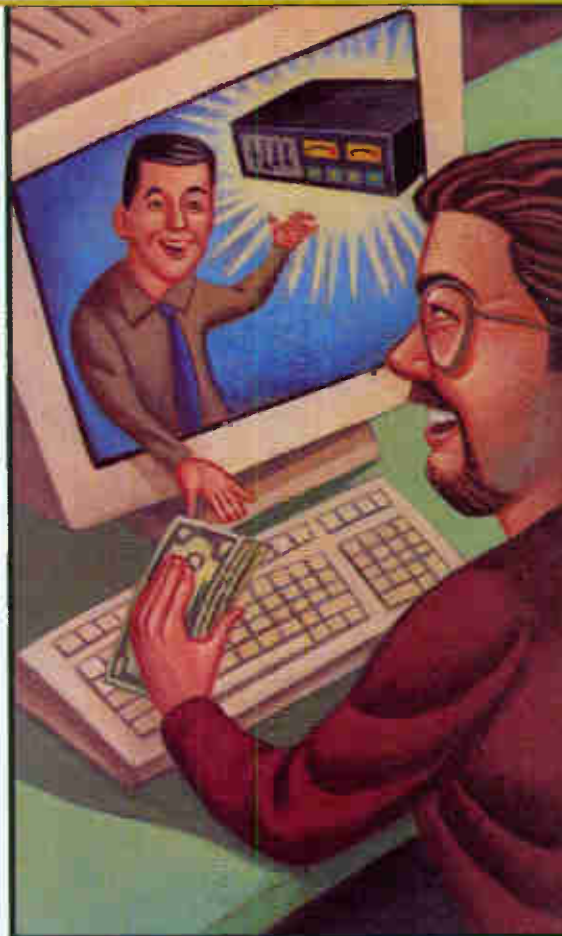


ILLUSTRATION: MIKE TOFANELLI

The sites can't seek to recreate the sense of community that conventions offer—a larger, less defined version of the cacophonous village that is a musical equipment store, like one of the half-dozen or so that line Manhattan's West 48th Street. "We don't have a showroom," says Maxwell. "But I'm convinced that this model represents the future, a significant opportunity for creating an environment in which pros can congregate."

Sweetwater Sound, a 21-year-old Fort Wayne, Ind., company that grew from a recording studio into a storefront, got into catalog sales before going online in 1995. The company now has dedicated 15 of its 200 employees to its growing Internet-based sales business, and director of marketing Dave Stewart stresses customer support and a friendly atmosphere as one reason the company has done well over the years. "We've been

—CONTINUED ON PAGE 88

—FROM PAGE 80, MEMORANDUM

propelled many recordists out of the spare bedroom and into the less familiar realm of commerce. To call this new generation of middle-level studios a more sophisticated version of the home studio fails to present the whole picture. Certainly, many of the new facilities that fit the emerging model—well-designed acoustical spaces with hard disk recording systems, inexpensive but powerful digital consoles or controllers and good outboard gear—germinated in suburban garages or urban lofts. But unlike the situation that existed a few

years ago, when gear addicts rented their personal studios to pay for their equipment jones, this new generation often saw the specific need in their markets for service centers that were more affordable than the studio palaces but more sophisticated than the project rooms. In a growing number of instances, they are not accidental tourists in the studio business, and that tells me that studio owners are now thinking more like businesspeople, rather than like enthusiastic, technically inclined artisans, which was the profile for decades.

In short, owners of the upper tier of recording facilities have expanded their studios into other regions, at least in part, because of their desire to differentiate their studios further from the low-end spawn of the digital revolution. That expansion process has created a wider void in the middle, which is quickly being filled by a rejuvenated middle class.

There's the Big Picture. And whether your facility is one of the big wheels or one of the gear teeth, understand that they will forever be interlocked and ever in motion. ■

BIOGRAPH: NORBERT PUTNAM

STILL MAKING WAVES IN THE STUDIO WORLD

Norbert Putnam has had relationships with recording studios the way big-band leader Artie Shaw had wives. Starting with Quadraphonic Studios in Nashville in 1970, Putnam, a bass player and part of the Muscle Shoals session crew brought to Nashville by Elvis Presley producer Felton Jarvis in 1965, has had a string of

facilities in Music City. He has owned The Bennett House, Digital Recorders, Georgetown Masters, and now, Cadre Studios, which opened in April in Memphis in a 1928 Art Deco-style former bank building. All of these facilities were intended to support Putnam's ambitions as a producer, and they have served him well; his production credits include records for Jimmy Buffett, Joan Baez, Dan Fogelberg, Kris Kristofferson,

—CONTINUED ON PAGE 86



YOU CAN TAKE IT WITH YOU



ILLUSTRATION: MIKE TOFANELI

It's the height of summertime, and everyone who isn't stuck behind a front-of-house position under a shed every night is either on or thinking about going on vacation. But as much as your spouse and children would like you to leave it behind, your audio career might have to go along with you. Laptop, sandals, cell phone, straw hat, sunblock, 4-track hard disk recorder (with built-in signal processing)... You're ready to roll.

There's no shortage of really, really portable and powerful audio stuff to take with you. Here are a few examples:

Tascam's US-428, a USB-supported controller for your laptop-based hard drive recorder, complete with analog and mic inputs, EQ, 24-bit D/A and A/D converters, and selectable 44.1 or 48kHz sampling rate. It comes bundled with Steinberg's Cubasis sequencing software for PC and Mac. (And it actually uses the sand that gets into the unit to add grit for simulated analog sounds.)

Roland's ED U-8 Digital Studio is a complete PC-based hard disk recording system. The U-8 front panel design includes sliders, faders, transport controls and pan pots, pro-

viding direct control of software mix and control functions. Desktop recording is made easy with an interactive four-step "EZ" recording function. Simply press the EZ record button and it will guide you through the record process from selecting an input source, adding digital effects, to adjusting your record levels. The ED U-8 is equipped with more than 130 onboard 24-bit DSP effects, including amp simulation, compression, distortion, chorus, reverb, delay, EQ and noise suppression with three assignable effect knobs on the U-8. And it has an onboard guitar tuner (really!), which is useful for sing-alongs on the beach. Years of training and experience reduced to the level of operating a Coke machine—what more could you ask for on vacation?

Fostex's VF-16 is a fully integrated digital multitrack recorder and digital mixer, offering 16 input channels, 16-track recording (24 using FDMS-3 format) with noncompressed 16-bit, 44.1kHz, CD-quality recording. Up to three hours of recording time per GB are offered, as well as 24-bit stereo A.S.P. effects, 32-bit processing and mixing, and superior digital effects. Each of the 16 input channels has

—CONTINUED ON PAGE 96

Hey, Partner

Partnerships are rare in the recording studio business. Studio ownership seems to be a highly personal, highly passionate pursuit. It's one of the few businesses in which an intense personal vision bordering on madness may actually be an advantage. But there are some productive partnerships in this business, and in talking with partners, the secrets of making the relationship work become clear. In fact, the lessons they've learned over the years can be distilled into a few simple but critical lessons.

DEFINE YOUR RESPECTIVE ROLES

Tom Nastasi joined with partners Ray Martin, John Sickett and David Seitz two years ago to open Theater 99 in lower Manhattan. Martin, Sickett and Seitz are all engineers and/or producers; Nastasi

Secrets of Successful Partnerships In the Studio Business

has a construction company that has built studios, notably Sony's New York facility and Lauryn Hill's personal studio. Each of the partners has his own area of specialty, such as Nastasi's knack for building and running businesses (he has several, including a carpentry business and a rehearsal studio). He took on the role of president and oversees the ongoing construction of the studios; Martin runs the day-to-day details of the business. "Though John

and David don't really have day-to-day responsibilities, they have pretty good careers as engineers and producers," says Nastasi. "But they also brought equipment into the picture, and they bring a certain sense of being known in the business, so they bring in business to the studio. And those are legitimate roles in any business. We realized that and agreed on it from day one, which has been one of the secrets of making this relationship work. Our roles were very well-defined between ourselves going into this. It's not a matter of how other people view our relationships—it's how we view them."

REMAIN FLEXIBLE

The importance of some roles, however, is not always immediately apparent. Bobby Guy Graziose and Ernie Lake

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have been partners for close to a decade, creating a remix team that opened a studio on Long Island and, later, one in Manhattan, Reel Tyme Productions. "Ernie is the master networker; I tend to stay at the studio and take care of things like writing the checks," says Graziose. "There were times I was stuck here and Ernie was out schmoozing and I felt a little resentful. But what you have to realize is that everyone has certain skills, and if they're not the same ones you have, it's not always immediately clear that what they're doing is actually good for the partnership. But when you stand back and look at what it does in the long run, then you begin to realize that a contribution is a contribution." Graziose and Lake have done remixes for Celine Dion, Whitney Houston and Toni Braxton in recent years.

KNOW YOUR PARTNER

"You're going to be spending a lot of time together, so you better be compatible," is how Dave Rouze puts it. "Just wanting to be in the same business isn't enough." He and partner Jeff Sheehan have owned Bay 7 Studios—the former Lighthouse Studios—in the Los Angeles area for two years. They got together when Rouze was on the road as Mick Jagger's guitar tech and he wanted someone to keep an eye on the vintage-equipped home studio he had built. That turned out to be a prelude to the partnership, which Rouze says was important in laying a foundation of trust between the two of them. "We found out we had a lot of the same interests

outside of the music business," Rouze adds. "We're both into hang-gliding and dirt bikes. In fact, it was dirt bikes that brought us together and really let us get to know each other. I don't think I could be partners with someone I couldn't be friends with, too."

Bill Cooper, who owns American Recording with long-time partner Richie Podolor, agrees. "We're both pilots and both into motorcycles," he says. "We've become like brothers in our lives both within and outside of the studio. And that's where the trust between us comes from."

KEEP THE COMMON GOAL UP FRONT

"There have definitely been some conflicts along the way," says "Void" Caprio, co-owner of Interzone Studios in Nashville. "But one thing we've learned in the year or so we've been doing this is that if you stay focused on the goal you set for yourselves in the beginning, that seems to help resolve a lot of the minor disagreements that come up along the way." His partner, Keith Spacek, adds, "Problems might seem important at the time they come up, but the reality is that most of them are nothing compared to the long-term goals you've set for yourself."

REGULAR MEETINGS HELP AVOID COMMUNICATION BREAKDOWNS

Every partnership we interviewed came to realize at one point or another that regular partner meetings were critical to maintaining a smooth working relation-

ship. Caprio and Spacek found a few months into their joint studio venture that one of them tended to work days and the other nights at the studio. "It was getting to the point where we sometimes didn't see each other for days at a time," says Spacek. "We were leaving each other notes and phone messages. So we made it a point to hold regular meetings, just the two of us, so that we could make sure we were both on the same page every day."

Theater 99's four partners talk informally often, but Tom Nastasi says they all agree on a more formal conclave every eight to ten weeks to review larger issues. "It's important to do that, even if nothing really big has happened in that time," he says. "We're all out of our 20s now, and we get pretty set in our ways. So having everyone in the same room provides perspectives that we can't get in informal meetings or in memos. I think everyone has a renewed sense of purpose after those meetings. Considering that all of us have professional and personal interests outside of the studio, it helps focus on what we got together to accomplish in the first place."

THE BOTTOM LINE: GET IT IN WRITING

The one observation that was mentioned in discussions with all of these partners was, "Get it in writing from the beginning!" Partnerships, like marriages, often break up, and if you don't have a prenup, you don't know who's going to end up with custody of the console. ■

Brewer & Shipley, Pousette Dart Band, Donovan, John Hiatt, J.J. Cale, the Flying Burrito Brothers and the New Riders of the Purple Sage. If it wasn't stone country and it wanted to come to Nashville, it usually wound up on one of Putnam's many doorsteps.

Putnam's first studio work was in Muscle Shoals, but his earliest memories are not terribly high-tech. The manager of the local movie theater would offer musicians free passes to the movies in exchange for playing on his demos, recorded in the dilapidated offices above his father's corner drugstore. They played to an old Roberts mono tape recorder with only enough microphones to record half the drum kit, and a Heathkit recording console with no volume fader—the fade-outs were accomplished by turning the console off and letting the tubes die out.

The years in Muscle Shoals, at places like Rick Hall's FAME Studios, gave Putnam a taste for the business side of recording. But Hall also imbued him with a fundamental business philosophy. "When I was young and working in Muscle Shoals, I didn't know about inventing bass parts, so I was copying other people's parts," Putnam recalls. "If a song sounded like a Drifters' song, me and the drummer would play a Drifters' part. Then one day Rick came out and said to me, 'We already have Drifters records; you need to come up with something new.' And I've tried to apply that to every studio I've ever owned."

When Putnam and keyboardist David Briggs opened Quadraphonic in Nashville in 1970, Music Row was a staid place, with label-owned studios and union engineers who, as Putnam puts it, "were lethargic and set for life; they didn't need to work at it." The pair took an old house off the Row and made it into a place staffed by young engineers whom they encouraged to work freelance, charge more but experiment and push the sonic envelope of the day. "We also charged the highest rates in the city," he says. "One hundred and fifty dollars an hour, \$165 in the evenings and weekends. And you know what? People were lining up to pay that, because we had the engineers working here who could get the rock sounds. We also had one of the first 16-track 2-inch decks and were the first to put in Dolby A. We also had the first automated MCI console in Nashville, the one I mixed [Jimmy Buffett's] 'Margaritaville' on. We brought something to Nashville that it hadn't seen before, and that made Quad work."

Putnam and Briggs sold Quad in 1980 for \$1 million to a group of doctors from Atlanta. "We paid \$30,000 for the lot and the building in 1970 and put about \$125,000 into it in terms of equipment," he estimates. "The second year we were open the business grossed \$440,000 in sales. The economics of studio ownership were great then. But after I sold it, I swore I'd never do it again."

That promise to himself lasted all of six months. He purchased an 1875 mansion called the Bennett House in the Nashville suburb of Franklin, intending to turn it into a combination residence and private studio. But soon he got calls from Kris Kristofferson, Mickey Newbury and Dan Fogelberg, all of whom wanted to work with him again. In the meantime, Putnam had hired the sous chef from Julian's to prepare meals at the studio. When singer Amy Grant went to work there in the early 1980s, she was

so taken by both the studio and the chef, she told her manager that she wouldn't work anywhere else. "The chef made that studio," laughs Putnam. "[Producer and Capitol Records head] Jimmy Bowen told me no one would go to a studio in Franklin," says Putnam. "Now, how many studios are there here?" (For the record, there are at least a dozen studios in half that many facilities in the Franklin area now, the largest being Sound Kitchen.)

Bennett House was sold eventually, first to producer/publisher Bob Montgomery, who later sold it to current owner, R&B producer Keith Thomas. Putnam then moved on to Georgetown Masters, in 1985, a mastering facility he started with mastering engineer Denny Purcell and former CBS Records executive Ron Bledsoe. "We wondered, how can we do something different here?" Putnam recalls. The answer was to create a mastering studio that combined the high-end critical listening of home hi-fi with different speakers and interior designs at each end of the room. "This made mastering more accessible to clients, who felt more like they were in their homes and less like they were in the chemistry lab," says Putnam.

Putnam sold his interest in Georgetown to Purcell in 1985 and promptly started Digital Recorders in the Welk building on Music Row. Two years later, he moved the facility around the block to the site of the former Bullet Studios. Putnam had brought Nashville its first 32-track digital machine (a 3M at the Bennett House), a format that would become the city's standard for a decade. At Digital Recorders, he installed Nashville's first SSL G Series console and first Sony 3348, among other digital items. "It was always a matter of giving the market something new, and this time it was high-end digital gear," he explains.

But like any good gambler, Putnam knew that the best strategy was knowing when to leave. And after his mixer friend Elliot Scheiner called up one day in 1991 to tell Putnam about this new thing called the ADAT he was fooling around with, Putnam saw the handwriting on the wall. "I told my wife, Cheryl, that if this thing sounded as good as Elliot said it did, then I'm getting out of the studio business," he remembers. "I got one, played with it, realized that pretty soon there wasn't going to be much difference between what I could do with two million dollars and what some guy could do with two of these in his basement. The newspaper called to ask me why I was closing the studio, and I told them that I was going to get out while the equipment was still worth something."

But Putnam can't seem to stay out for very long. His new venture, Cadre Studios, follows the emerging model of the audio industry. The three-room facility is based on inexpensive technology, such as Mackie digital mixers, and serves as a tool for Putnam's new record label venture, CDMemphis.com, an Internet-only label that specializes in Memphis music, from Booker T & The MGs through new artists in the city. It's not as ahead of the curve as his previous ventures, but the location offers little competition. "You can still make a studio work," he says, "but you have to give the market something different every time."

•••

Look for an article on Putnam's production career in a forthcoming issue of Mix. ■



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LOG ON, PAY UP, SOUND OFF

—FROM PAGE 81, ONLINE RETAIL

selling pretty sophisticated stuff over the phone for years, so we think we can apply that to Net-based sales," he says. He says that Sweetwater is the nation's largest Pro Tools dealer. Most of Sweetwater's sales are to the MI market, and mostly of new equipment.

Ray Maxwell says that Digibid is aiming at a more service-oriented level than its competitors, with more used pro audio gear available on its auction site. This, he says, is an outgrowth of the company's foundation, which was a studio liquidation service and pro audio auction service started by Digibid founder Hamm Brosious. Brosious also founded the Audio Techniques pro audio retail service (later sold to Manny's Music) and remains a consultant to Digibid while his son and Digibid co-founder, Matt Brosious, works as IndustryClick's vice president of e-commerce.

Although more focused on the upper-end of the technology spectrum than other sites, Digibid's modus operandi is similar to that of the other auction sites. Sellers register for free with the service and can then list used gear online for sale. Digibid acts as the intermediary and takes a 10% commission. Others, like Musichotbid, offer sliding-scale commission rates, taking between 3% and 5%. Digibid holds the purchase price in escrow, giving the buyer 72 hours to inspect the purchased item and make sure that it lives up to its online representation. If there is a dispute, Digibid will intervene by possibly canceling the transaction and returning the money, or by asking the seller to adjust the price.

Not all the gear is used. Digibid made a \$16 million purchase of musical instruments and low- and mid-market pro audio gear—enough to fill 700 shipping pallets—from the barter company Active International, a move that Maxwell characterized as "defensive," intended to prevent another mass merchant from purchasing the gear and possibly flooding the market, hampering Digibid's ability to grow. Maxwell says the fruits of this successful bid will be put onto the auction site for sale incrementally.

BRICK & MORTAR RESPONSE

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LOG ON, PAY UP, SOUND OFF

gonna find that out online?"

Many of Bogen's 20-plus years in the industry have been spent in retail sales and broadcast engineering. His time as a radio engineer at New York's famous WHN-AM is displayed when he asks a caller to "stand by!" instead of to "hold on." But he agrees that he is from a generation that grew up with the chummy, familiar model of knowledgeable sales people who were as intimate with which pin was hot as he was. The generation now in its ascen-

"People also put the same item up on [multiple] auction sites, then take the best bid from one of them and renege on the other bids. But people are legally bound to sell an item they put up for auction. When we find people doing that, we terminate their memberships."

The online sellers also say that auction sales are only part of what they offer members. Other perks include news services, reviews and general industry information. Many, like Music Hotbid, which published the Midwest Musicians Hotline newsletter (containing used gear classified advertising),

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-Mike Bogen, Dale Audio

dancy in pro audio was weaned on MTV and MacWarehouse, buying computers and other gear from catalogs and online, sight-unseen, except for beauty shots in the magazines. And Bogen, who says he likes to "press the flesh" as a salesman and take a personal interest in customers' needs, cautions that the virtual commercial environment not only takes the personal aspect out of the equation but also lends itself to fraud. "I like buying watches on the Internet," he says, "but I won't buy unless I know the reputation of the company. There're too many counterfeit products out there. When it comes to microphones, how do I know what shape the ribbon is in, or if all the parts are original?"

The online sellers respond that there *are* scams perpetrated occasionally. "People do misrepresent items at times," concedes Digibid's Maxwell.

grew out of the musical instrument gear publishing industry. And for their part, most of the brick-and-mortar sales operations also now have Web sites listing gear for sale, and if you were to see a microphone or a preamp that you fancied, they'll be more than happy to box it up and ship it to you upon getting your credit card information. The only difference between the transactions is that a live telephone call was made. And others, like Malekpour, are contemplating expanding the range of their Web sites in the coming months.

PART OF THE LARGER PICTURE

The MI and pro audio industries combined are estimated at more than \$15 billion in the U.S. alone; the used equipment market is unquantifiable, because much of it is based on person-to-person transactions and in-

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CIRCLE #048 ON PRODUCT INFO CARD

LOG ON, PAY UP, SOUND OFF

cludes barter and trades. But the overall numbers are potentially huge, underscoring the sentiment of many of those we interviewed that there's still room for everyone at the moment.

However, the long-term stakes are huge. Consolidation has been an overarching theme in the technology industries for several years and shows no sign of abating. Digibid was acquired by IndustryClick, and, not surprisingly, two of the FAQs on the Musichotbid Web site refer to the pos-

sibility of that company acquiring others or being acquired itself. (Kersten says that there are no plans for the former, adding, "We would consider acquiring other e-commerce companies if they have a certain number of listings and users on their site that would be complementary to ours." Regarding the latter question he says, "While we will not disclose names of possible suitors or investors, we have been approached by a number of well-known companies that recognize the growth potential of our niche." And to the obligatory question about going public, Kersten wrote that an IPO is an op-

tion later this year.)

Clearly, the Internet-based sales sites are vulnerable to both the exigencies of the Internet business as well as those of pro audio. But those are complications retailers can live with, because the Web frees them from warehouse and storefront rents, as well as other overhead expenses. In fact, most of the e-commerce sites are run with fewer than a dozen employees, including executive management. That fact alone positions them very well in an industry that has been moving undeniably and more deeply toward a commodity model for more than a decade—one in which profit margins continue to erode as competition drives prices down. In many ways, the arrival of Internet-based commerce is serendipitous with the large-scale down-marketing of the pro audio industry itself.

The easy observation is that this sounds good for the consumer. However, price is not the only consideration. The deeper implication is that the further this model progresses, the more potential it has to undermine the sometimes-tenuous pricing structure of the entire industry. Consider the development costs of certain very expensive, complex digital platforms, such as large-format consoles; these costs are often never recouped, but the fruits of the R&D are later leveraged into other, more successful products, ones with wider benefits to the industry as a whole. This is similar to the pharmaceutical industry's development of so-called "orphan drugs," aimed at very rare but critical illnesses; the research costs of developing such drugs may never be recouped by selling those specific drugs, but the collateral benefits inevitably find their way into more mainstream drug products that might never have been produced without the subsidized research that went into the less marketable products. So, the fear is that the pricing structure—often called the "minimum advertised price" or MAP—of pro audio equipment disappears, it could take with it the implicit market subsidies that support product development.

On the other hand, this sort of concern was voiced by the more than 300 auto-makers that were in business in the U.S. in the first decades of the 20th century. Then Henry Ford radically changed the way cars were developed and manufactured and became the catalyst for massive consolidation within that industry. What's irrefutable is that e-

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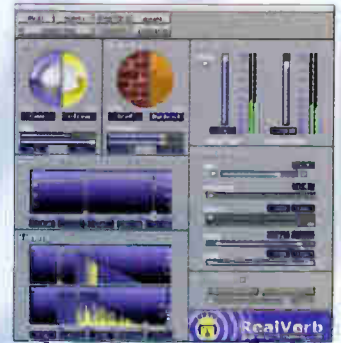
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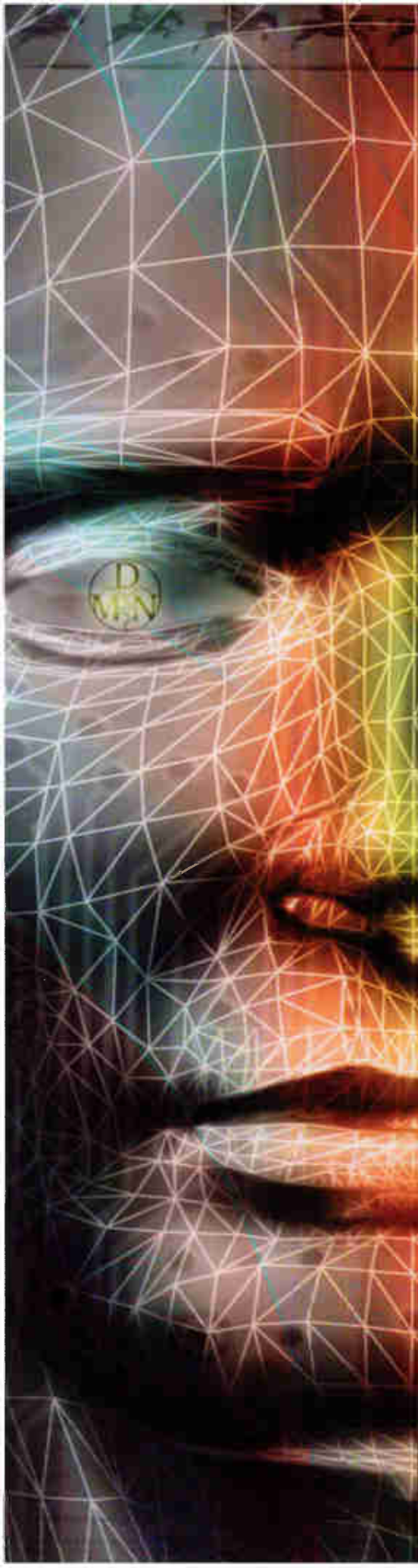
commerce pro audio sales are here to stay, and the conventional retail apparatus is going to have to accommodate it, just as conventional studios learned that there was no way to close the lid on the project studio genie once it was let loose from its bottle. ■

—FROM PAGE 83, TRAVELWISE

channel-on, pan, 3-band EQ with parametric midrange, compressor, effects send and two aux sends, which are selectable pre/post. We found that the optional Pina Colada conduit seemed to go a little heavy on the rum, but what the hell, we're on vacation!

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The best little lightweight mixer I found wasn't at MARS or Manny's, but at Lechter's, the fabulous kitchen supply place found in every mall west of the Sudan. The identity of the manufacturer was unclear, since the only specifications on the unit itself were the words "Hecho en Mexico" and a few less-than-scientifically precise measuring marks along the side (though these were helpfully imprinted in dual scales, both U.S. and metric, making the mixer compatible for both the NTSC and PAL formats). Operationally, you couldn't ask for anything simpler, based on the matchbook-sized manual that accompanies this unit (thoughtfully provided in English, French, Spanish, German and Tagalog): "Add Pina Colada mix and rum, tighten aluminum top, shake vigorously, open (bang on rock if too tight!), pour drink. Repeat often." The lack of equalization, MIDI control, serial ports and any kind of software upgrade path were initially disappointing. But after several passes through the machine's operation, we found that we couldn't care less. We're on vacation! ■



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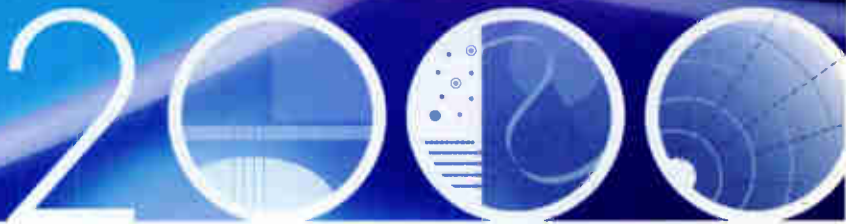
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Lexicon introduced the first commercial digital audio system in 1971. Since that time, Lexicon has continued to develop award-winning products for recording, broadcast, live performance and home theater. Lexicon systems subtly complement natural acoustics in classical recordings, and add unique and impressive effects to popular music and movie soundtracks.

More than 25 years ago, a young engineer named David Blackmer sat at his workbench trying to find something that would make music easier to record. Enter the VCA. With the launch of the dbx 160, the music industry sat up and took notice of the new company—dbx. The 165 was another turning point. The 165A has proved to be so popular that it is still manufactured today, exactly as it was 21 years ago.



Currently celebrating its 75th anniversary, Shure has long been one of the world's largest manufacturers of microphones and audio electronics. Best known for reliable, high-performing products such as the legendary SM57, SM58, and Beta Series microphones, the company is also highly regarded for its full range of wireless systems, automatic mixers, and phono cartridges. The company has expanded into studio microphones, digital signal processing, and personal (in-ear) monitors with products such as the KSM32 condenser microphone, DFR11EQ feedback reducer and PSM 700 personal stereo monitor.

Gold Sponsors



Since 1947, AKG Acoustics has pioneered the development and advancement of state-of-the-art wired, and today, wireless microphone and headphone systems for numerous applications where sound quality and performance matter most to end-users. These include condenser and dynamic microphones, UHF and VHF wireless microphones and in-ear stereo monitoring systems, professional headphones, microphone stands and microphone accessories for studio and broadcast, sound reinforcement, contracting, corporate and consumer markets. AKG is also a world leader in the development and production of OEM acoustic elements for personal and wireless cellular communications.

ALESIS

Alesis Corporation manufactures a full line of professional audio and musical instrument products, capitalizing on its strengths in digital, analog, vacuum tube and transducer technologies. For 16 years Alesis has introduced some of the most innovative and popular tools for music and audio recording, performance and composition. The Alesis ADAT digital recorder helped create an entirely new musical environment—the project studio. From groundbreaking ADAT digital recording technology to innovations in keyboard technology,

Alesis delivers revolutionary product solutions to the music and audio production industries.



audio-technica.

Audio-Technica has been dedicated to advancing the art and technology of electro-acoustic design and manufacturing since 1962. From a beginning in state-of-the-art phono cartridges, Audio-Technica has expanded over the years into high-performance microphones, headphones and other audio equipment. Best known for the 40 Series line of precision capacitor microphones, Audio-Technica strives to create innovative, problem-solving products in each new area it enters. Audio-Technica is proud to be a Gold Sponsor of this year's TEC Awards.



Cox Audio Engineering manufactures and sells the French-designed L-Acoustics V-DOSC® and the newly-introduced dV-DOSC® speaker system for North America, and also distributes the entire L-Acoustics product line. Due to the patented performance of Wavefront Sculpture Technology®, L-Acoustics products are being widely used to support important events including: The Super Bowl, The Academy Awards and The Grammys, as well as touring artists including Tom Petty and the Heartbreakers, Bob Dylan and Ricky Martin. These revolutionary products are also being installed at many high-profile venues throughout the world.



A division of **Avid**

Digidesign Pro Tools® is the system of choice for professionals who record, edit, mix and master digital audio for music and film. The company's technology has changed the way producers and artists work, combining the benefits of hard disk recording, non-destructive editing, fully automated mixing and high-quality, real-time signal processing with the flexibility of an open system architecture. With compatible products from over 100 Development Partners and full integration with Avid digital video, the Digidesign platform provides tools for creation, production, post-production, collaboration, publication and online distribution.

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Ex'pression Center for New Media is a total immersion boot camp where artists and technicians in sound arts, digital visual media and Web design and development are taught every aspect of their crafts. During an intensive 14 months of study, students are taught by and work with the best practitioners and equipment that the industry can offer. Ex'pression is a licensed, post-secondary education facility situated in the San Francisco Bay Area. Located in an imagination-inspiring 65,000 square-foot building, Ex'pression features classrooms, studios and labs designed by John Storyk of Walters-Storyk Design Group.



Founded in 1894 by Orville H. Gibson in Kalamazoo, Mich., Gibson has become the world's most respected maker of musical instruments. The traditional motto Quality, Prestige & Innovation now applies to a large family of companies that make and sell the world's finest guitars, basses, banjos, mandolins, drums, keyboards, amplifiers, MIDI hardware and software, strings and accessories.

KURZWEIL

Musical Systems

Kurzweil Music Systems is a leader in quality audio systems for professional studio use. Kurzweil's line of professional products includes the inexpensive and lightweight SP76 and SP88 Stage Pianos, the highly successful PC2 and PC2X Performance Controller, and the K2600 Series instruments, offering more power to the professional musician than ever before.

MACKIE

Mackie Designs, Inc. develops and manufactures high-quality, reasonably priced professional audio products for use in both recording and sound reinforcement environments. Mackie is now worldwide, recently acquiring RCF, a renowned audio company in Italy, and Eastern Acoustic Works, a high-end speaker manufacturer in Massachusetts.

MIX

As the leading magazine for the professional recording and sound production industry, *Mix* covers the entire spectrum of professional audio and music: studio recording, live sound production, sound for picture and multimedia, digital audio technology, facility design and construction, tape/CD replication, broadcast production, education and more. Founded in 1977, *Mix* reaches more than 52,000 professionals in over 94 countries. *Mix* also publishes Internet Audio, *Mix Master Directory*, *Sound for Picture*, and *mixonline.com*. *Mix* is the founding sponsor of the TEC Awards.

Solid State Logic

Solid State Logic is the world's leading authority in the design and manufacture of audio mixing consoles for the music, broadcast, post-production and film industries. Located in a 15-acre science park in Oxfordshire, England, with satellite offices in New York, Los Angeles, Toronto, Tokyo, Paris and Singapore, SSL's resources include R&D, manufacturing, training, service and product support. SSL's product range now encompasses large-scale analog and digital mixing consoles, with specific models for the music, broadcast, post and film markets.

SONY

Sony Professional Audio is both an inventor and manufacturer of professional audio hardware technologies, with diverse offerings that include digital multitrack recorders, DAT recorders, MD recorders, CD players, signal processors, audio and broadcast mixers, digital consoles, wired microphones, wireless microphone systems, headphones, power amps and speakers.



Soundelux defined the motion picture sound design and editing industry more than 20 years ago and is widely acclaimed for providing award-winning creative audio services to the entertainment industry. Headquartered in Hollywood, Soundelux collaborates with every major motion picture and television studio, as well as the industry's top filmmakers.

t.c. electronic

ULTIMATE SOUND MACHINES

TC Electronic is a world-leading inventor, manufacturer and distributor of high-end professional digital and analog audio signal

processing hardware, software applications and plug-ins, near- and mid-field monitors, multichannel metering equipment and digital switchers for use in recording, post-production, surround, multimedia, broadcast and live sound environments. Renowned for its innovative world-class products, TC Electronic is the exclusive U. S. distributor for several high-quality brands, including TC Works, Dynaudio Acoustics, Tube Tech and DK Audio.



Yamaha is a leading manufacturer of innovative digital audio mixers, multitrack recorders, processors, loudspeakers, amplifiers and both acoustic and electronic musical instruments. Utilizing proprietary DSP technology, Yamaha leads the market with powerful digital mixing consoles for professional recording, post-production, sound reinforcement and installed applications.

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I. OUTSTANDING INSTITUTIONAL ACHIEVEMENT

A. Acoustics/Facility Design Company

Russ Berger Design Group, Dallas, TX: During the eligibility period RBDG provided design on over 50 projects for a diverse group of clients, including: NFL Films Audio Post Expansion, WWF-NYC, KUOW/KCMU, Downstream Audio, Washington State University Music Building, WBAP/KSCS, Crescent Moon Studios, WBAA/Purdue University, Billy Oskay/Red Born Studio, Freq Mastering, WHYY-TV/FM.

Francis Manzella Design Ltd., Yorktown Heights, NY: During the eligibility period Francis Manzella Design completed work on a new 14,000 s.f. facility for Sterling Sound Chelsea, as well as two new rooms at Masterdisk in NYC. Tony Dawsey at Masterdisk also chose a prototype set of Griffin Mastering Loudspeakers from FM Design for his new room. Other projects included Sound Station Seven in R.I., Deeper Rekords and Zefer in NYC and a private-use facility for Starcycde in N.J.

studio bauton, Los Angeles: Projects during the eligibility year include Luminous Sound, Dallas; Atlantis Studios, L.A.; 4MC Studios, Singapore; Promise Studios, Taipei; Debney Productions, Burbank; 5.1 studios at The Record Plant, Hollywood. Project studios for Gregg Field, Studio City; Musik Vergnuegen, Hollywood; Chris Beck, Santa Monica. Film spaces for Cinephase, Paris; Michael Bay, Bel Air; David Vogel, Los Feliz; Philippe Sarde, Paris. New media studios for Launch, Santa Monica; WK Steiermark, Austria. Performance space for Campus Hollywood, Hollywood. Concert hall design competition, Helsinki.

Waterland Design, Los Angeles: Waterland Design completed six recording studio projects during the eligibility period. Three studios in Los Angeles, for: Michel Colombier in Pacific Palisades, Glenn Frey in West L.A. and Don Henley in Malibu. Richard Marx took possession of his private studio in Lake Forest, Ill., and Hanson took over theirs in Tulsa, Okla. Virgin Tokyo rounded the year off with the installation of two Frontwalls.

Walters-Storyk Design Group, Highland, NY: Projects during the eligibility year include: Lower East Side Studios, NYC; Ex'pression Center for the Media Arts (60,000 s.f.), San Francisco; WETA Public Radio, Washington, D.C.; Star Media Broadcasting, NYC; James Earl Jones Theater, Poughkeepsie, N.Y.; Electronic Arts, Vancouver; Kampo Cultural Center—5.1 Post, NYC; UPC Broadcasting Center, Amsterdam; Carter Burwell Studio, NYC; Digsound Studios, Buenos Aires, Argentina; and Shooting Gallery Executive Screening Room, NYC.

B. Sound Reinforcement Company

ATK-AudioTek Corp., Burbank, CA: Eligibility-year credits include the 1999 Miss America Pageant; 1999 Billboard Music Awards; 1999 Net Aid Show at the Meadowlands; 1999/2000 Ricky Martin World Tour; 2000 Crosby, Stills, Nash & Young tour; 1999 America's Millennium New Year's Eve Party at the Lincoln Memorial; 2000 American Music Awards; Super Bowl XXXIV in Atlanta; 2000 Grammy Awards; and 2000 Academy Awards.

Clair Brothers, Lititz, PA: Eligibility-year credits include Cher, Sting, Elton John, Bette Midler, Barbra Streisand, Billy Joel, Backstreet Boys, Roger Waters, R.E.M., Eagles.

Electrotec, Burbank, CA: Eligibility-year projects include Bob Dylan, Luis Miguel, Fiona Apple, Creed, Phil Lesh, Rod Stewart, Tom Petty & the

Heartbreakers, Chicago, Def Leppard, Lenny Kravitz, Aerosmith, Elvis Costello, Lionel Richie, Marilyn Manson, Olivia Newton-John, Poison, Travis, Nickelodeon and Van Halen.

Showco, Dallas, TX: During the eligibility year, Showco worked with N'Sync, Santana, Korn, Limp Bizkit, Family Values Tour, KISS World Tour, Britney Spears, George Strait's Country Music Festival, Beastie Boys, Alanis Morissette, OZZFEST/Black Sabbath Tour, Reba McEntire, Alan Jackson, matchbox twenty, Live, Willie Nelson, Counting Crows, Moody Blues, Hanson, Third Eye Blind, Alanis Morissette, Vince Gill, the Cranberries, Smashing Pumpkins, TLC, Filter, James Taylor, Lauryn Hill, and Phil Collins.

Sound Image, Escondido, CA: Eligibility-year credits include Crosby, Stills, Nash & Young; Jimmy Buffett; Melissa Etheridge; Clint Black; Brooks & Dunn; Trace Adkins; Brad Paisley; Brian Wilson; Boz Scaggs; and The Artist.

C. Mastering Facility

Future Disc Systems, Hollywood, CA: Eligibility-year projects included Sisqo *Unleash the Dragon*; City of Angels soundtrack; *Austin Powers: The Spy Who Shagged Me* soundtrack; *The Matrix* soundtrack; *Rome Rome 2000 Thank You*; Silk the Shocker *Made Men*; and Snoop Dogg *No Limit Topp Dogg*.

Gateway Mastering, Portland, ME: Eligibility-year credits include Mariah Carey *Rainbow*; Jennifer Lopez *On the 6*; Foo Fighters *There Is Nothing Left to Lose*; Marc Anthony *Marc Anthony*; Melissa Etheridge *Breakdown*; Eric Clapton *Clapton Chronicles*; Counting Crows *This Desert Life*; Filter *Title Of Record*; Tracy Chapman *Telling Stories*; Phish *Hampton Comes Alive*.

Georgetown Masters, Nashville: During the eligibility year, Georgetown mastered projects for Garth Brooks *In the Life of Chris Gaines*; Asleep at the Wheel *Ride With Bob*; Jimmy Buffett *Live Tues/Thurs/Sat*; Dixie Chicks *Fly*; John Prine *In Spite of Ourselves*; George Strait *Latest Greatest Straitest Hits*; various *Happy Texas* soundtrack; Wynonna *New Day Dawning*; Trisha Yearwood *Real Live Woman*; Neil Young *Silver & Gold*.

Bernie Grundman Mastering, Hollywood, CA: During the eligibility period the studio mastered projects for Beck *Midnite Vultures*, Joni Mitchell *Both Sides Now*, Eminem *Slim Shady*, Tom Waits *Mule Variations*, Ice Cube *War & Peace disk II*, B.B. King *Deuces*, Blink 182 *Enema of the State*, Dr. Dre *Chronic 2001*, Smashmouth *Astrolounge*, Master P *Only God Can Judge Me*, Third Eye Blind *Blue*, Do Brat *Unrestricted*, Smokey Robinson *Intimate*, Patsy Cline *Duets*, Eric Benet *A Day In The Life*, and Steve Vai *The Ultra Zone*.

Sterling Sound, New York City: During the eligibility year, Sterling Sound mastered projects for Santana *Supernatural*; Creed *Human Clay*; Tony Bennett *Bennett Sings Ellington/Hot And Cool*; Tricky *Juxtapose*; Metallica *S & M*; AC/DC *Stiff Upper Lip*; Yes *The Ladder*; Backstreet Boys *Millennium*; D'Angelo *Voodoo*; Mandy Moore *So Real*.

D. Audio Post-Production Facility

Complete Sound, Hollywood, CA: Eligibility-year projects include: (episodes) *Judging Amy*, *Popular*, *Felicity*, *MYOB*; (sitcoms) *Dharma & Greg*, *Titus*, *Boy Meets World*, *Mo'Nisha*, *Malcolm and Eddie*; (MOW) *Up, Up and Away*, *Corona Unshamed*; (game show) *Hollywood Squares*; (DVD mastering) *Titanic*, *Alien Trilogy*, *The Abyss*, *Terminator 2* (DTS), *Eagles Hell Freezes Over* (DTS); (TV feature remastering) *The Fifth Element*, *Jerry Maguire*, *Philadelphia*, *Big Daddy*; (specials) *AFI 100 Years "Movies"*, *AFI 100 Years "100 Stars"*, *Soul Train Star Fest 1999*, 14th Annual TV Academy; and (digital cinema) *An Ideal Husband*.

Skywalker Sound, San Rafael, CA: Eligibility-year credits include *Star Wars: Episode I—The Phantom Menace* (audio post, including portion of music mix); *Fight Club* (audio post); *Toy Story 2* (audio post); *Galaxy Quest* (audio post); *The Haunting* (audio post); *Titus*

(audio post); *Iron Giant* (audio post); *Bicentennial Man* (audio post); *Journey of Man—Cirque du Soleil 3D IMAX* (audio post); *Elmo of Grouchland* (feature film score).

Sound One, New York City: Eligibility-year credits include *The Astronaut's Wife*; *Bawfing*; *Bringing Out The Dead*; six episodes of HBO's *The Corner*; *The Cradle Will Rock*; *Ghost Dog*; *Mission to Mars*; *The Sixth Sense*; *Sleepy Hollow*; *What Planet Are You From?*

Soundelux Hollywood, Hollywood, CA: Eligibility-year credits include *American Beauty*, *Any Given Sunday*, *Inspector Gadget*, *End of Days*, *Tarzan, For Love of the Game*, *The Corruptor*, *Election*, *Instinct* and *Big Daddy*.

Todd-AO Studios, Hollywood, CA: Eligibility-year projects include: *Tarzan* (Disney Animation), *Double Jeopardy*, *South Park: Bigger, Longer and Uncut*, *Cider House Rules*, *Being John Malkovich*, *The Thomas Crown Affair*, *End Of Days*, *Flawless* and *Wonder Boys*.

E. Remote Recording Facility

Design FX Audio, Los Angeles: During the eligibility period, Design FX recorded: Metallica/Billboard Music Awards, Las Vegas; Hole/MTV FANatics/Palace, Hollywood; Tom Petty & Tom Waits/VH-1 Storytellers, Burbank; Kid Rock, Limp Bizkit, Sugar Ray, Chili Peppers, Orgy/KROQ Weenie Roast; Elton John, Luther Vandross, Gloria Estefan, Stevie Wonder/MGM Grand, Las Vegas; Beck, Foo Fighters, Oasis, Save Ferris/KROQ Acoustic X-mas; KISS/VH-1/UCLA; Rage Against the Machine/El Rey Theater, L.A.; Lit/Album Network/Palace, L.A.; and The Offspring/VH-1/House of Blues, Las Vegas.

Effanel Music, New York City: Effanel Music recorded and/or mixed the following projects during the eligibility year: the 42nd Annual Grammy Awards; Sheryl Crow & Friends *Central Park in Blue*; Ricky Martin *One Night Only*; Dave Matthews *Listener Supported*; Metallica *S&M*; Liza Minnelli *Minnelli On Minnelli*; The Rock & Roll Hall of Fame Induction Ceremony; *VH-1 Divas Live, 1999-2000*; *VH-1 Storytellers* and *Woodstock '99*.

Le Mobile Remote Recording Studio, Vista, CA: During the eligibility period, Le Mobile recorded Sting, Further Festival, R.E.M., Eminem, Paul McCartney, Blink 182, Cher, Page & The Black Crowes, Ozzfest, Cirque du Soleil "La Noubo," Stone Temple Pilots, Martina McBride, Eagles, Sammy Hagar, Beck, GooGoo Dolls, and multiple MTV and VH-1 projects; film scoring: *A Stir Of Echoes*, *Lake Placid*, *Castle In The Sky*, *Journey of Man* (IMAX), *House on Haunted Hill*, *Nurse Betty* and *The Contender*.

Record Plant Remote, Ringwood, NJ: During the eligibility year Record Plant Remote recorded Aerosmith, David Bowie, Woodstock '99, Mariah Carey, Korn, Collective Soul, Billy Joel New Year's Eve, Tom Petty, The Roots, Dave Matthews, Rock Fest, Wynton Marsalis, Farm Aid, Oliva Newton-John, Wyckle Jean, God Smack, Marc Anthony, Kid Rock, Live and Celine Dion.

Remote Recording Services, Lahaska, PA: Eligibility-year credits include 1999 Academy Awards live television broadcast (orchestra); Marc Anthony "The Concert from Madison Square Garden" HBO Special; Jimmy Buffett "Don't Stop The Carnival" tour live CD and Internet broadcast; Wynton Marsalis & The Lincoln Center Jazz Orchestra "Swingin' With Duke" PBS TV special and live CD; Natalie Merchant "Live in Concert" CD; "Live From The Metropolitan Opera" a season of live television shows; The Rolling Stones No Security live CD; Shania Twain CBS TV special; Barbra Streisand New Year's Eve Concert; and In

Concert at the White House PBS TV special with B.B. King; Woodstock '99 live TV broadcast and CD.

F. Recording Studio

Conway Studios, Hollywood, CA: Eligibility-year credits include Christina Aguilera *Christina Aguilera*; Sisqo *Unleash The Dragon*; Green Day *Nimrod*; Blink 182 *Enema of the State*; Foo Fighters *There Is Nothing Left to Lose*; Tarzan soundtrack; Ricky Martin *Ricky Martin*; Mary J. Blige *Mary*; Mariah Carey *Rainbow*; Cher *Believe*; and Dixie Chicks *Fly*.

Quad Recording, New York City: Eligibility-year credits include Mariah Carey *Rainbow*; Lou Reed *Ecstasy*; Bob Dylan *Blonde on Blonde* remix for reissue; Vitamin C *Vitamin C*; Jessica Simpson *Sweet Kisses*; Chris Rock *Bigger and Blacker*; Missy Elliot; *South Park: Bigger, Longer, Uncut* soundtrack; Lauryn Hill; The Roots; The Lox; DMX; Jay-Z; Eve; Tyrese; Rosie O'Donnell; Steven Marley; and The Temptations.

Record Plant, Los Angeles: Eligibility-year credits include Celine Dion *All The Way...A Decade of Song*; Enrique Iglesias *Enrique*; Elton John *The Road To El Dorado*; "Smooth" Santana featuring Rob Thomas; Puff Daddy *Forever*; Barbara Streisand *A Love Like Ours*; System of a Down *System of a Down*; "Music of the Heart" Gloria Estefan with N'Sync; 3 Doors Down *The Better Life* (including "Kryptonite"); Sisqo *Unleash the Dragon* (including "Thong Song"); Mariah Carey *Rainbow* (including "Heartbreaker"); and Luis Miguel *Amarte Es Un Placer*.

Right Track Recording, New York City: Eligibility-year credits include Mary J. Blige *Mary*; David Bowie *VH-1 Storytellers*; Brandy *Never Say Never*; Mariah Carey *Rainbow*; Natalie Cole *Snowfall in the Sahara*; Jay-Z *Life and Times of S. Carter Vol. 3: Jewel Joy A Holiday Season*; Kelis *Kaleidoscope*; Ricky Martin *Ricky Martin*; Pat Metheny *Map of the World*; Nas *Nastradamus*; Pavarotti & Friends; Q-Tip *Amplified*; Dianne Reeves *Bridges*; Sting *Brand New Day*; Barbara Streisand *A Love Like Ours*; Will Smith *Willennium*; and the Being John Malkovich soundtrack.

The Village, West Los Angeles: Eligibility-year credits include Counting Crows; Red Hot Chili Peppers; Sheryl Crow; Jennifer Lopez; Tom Petty & the Heartbreakers; Brian Setzer Orchestra; Smashing Pumpkins; The Wallflowers; Bono; Christina Aguilera; N'Sync; and Offspring; soundtracks for *Toy Story II*; *The Hurricane*; and *Stuart Little*.

II. OUTSTANDING CREATIVE ACHIEVEMENT

A. Audio Post-Production Engineer for Film

Richard Beggs: Film sound design projects for the qualifying period are *Galaxy Quest*, a sci-fi comedy directed by Dean Parisot released by Dreamworks, and *The Virgin Suicides*, a dark comedy directed by Sofia Coppola, shown at the Cannes Film Festival '99 and The Sundance Film Festival '00, released by Paramount.

Ben Burtt: Ben Burtt worked as sound designer, supervising sound editor and co-film editor for *Star Wars: Episode 1—The Phantom Menace* during the eligibility period.

Dane Davis: Eligibility-year projects included *The Matrix* (WB) sound designer/supervising sound editor; *House on Haunted Hill* (WB) sound designer/supervising sound editor (w/co-supervisor Julia Evershade); *Romeo Must Die* (WB) sound designer/supervising sound editor (w/co-supervisor Julia Evershade); and *Sand*.

Chris Jenkins: Eligibility-year credits include *2001: A Space Odyssey* (restoration); *Full Metal Jacket*

(restoration); *A Clockwork Orange* (restoration); *Rules Of Engagement*; *Wonder Boys*; *Random Hearts*; and *Tarzan*.

Wylie Stateman: Eligibility-year projects included *Any Given Sunday*, *For Love of The Game* and *Instinct*.

B. Audio Post-Production Engineer for Television

Tamara Johnson Bolm: Eligibility-year projects include *Ring of Fire*, dubbed in Indonesian (mixed in the IMAX multichannel format); *South Park: Bigger, Longer, Uncut* (Comedy Central special); *Dharma & Greg* (ABC); *Boy Meets World* (ABC); *Rude Awakening* (Showtime); *Moosha* (UPN); *Smart Guy* (WB); *Oh Baby* (Lifetime); *The Nanny* (CBS); *Titus* (Fox).

Ken Hahn: Eligibility-year projects include "Great Performances: The Gershwins' Crazy for You" and "Dance in America "Le Corsaire" with American Ballet Theater"; music editor for Walt Disney's IMAX feature *Fantasia 2000*; the HBO Children's Special *Goodnight Moon and Other Sleepytime Tales*; The ABC News Special "The Latin Beat"; *Fosse Broadway* cast album; HBO series *Real Sex*; HBO documentary *Revelations: Paradise Lost 2*; and the HBO family animated series *A Little Curious*.

Sue Pelino: Projects released during the eligibility year included: "An All-Star Tribute to Johnny Cash" (Automatic Productions) with Willie Nelson, Sheryl Crow, Emmylou Harris, Wyclef Jean, Kris Kristofferson, The Mavericks, June Carter Cash and Johnny Cash; *VH-1 Storytellers* with Tom Petty, Tom Waits, The Eurythmics and David Bowie; sound for *Monday Night Football* (ABC), designed and mixed weekly for each game's open; sound design of Super Bowl XXXIV's open; and *Sessions at West 54th* (Automatic Productions).

Paul Sandweiss: Eligibility-year projects include The 1999 ALMA Awards with performances by Christina Aguilera, Shelia E and Carlos Santana; The 1999 Blockbuster Awards, with performances by N'Sync, featuring Christopher Cross and Ricky Martin; "Garth Brooks In the Life of Chris Gaines" special on NBC; "Garth Brooks The Magic of Xmas"; "Celine Dion, A Decade of Song"; "Amy Grant's A Christmas to Remember"; "Ricky Martin's One Night Only"; *Happy Hour The Series*; and *Motown Live* with more than 100 live performances.

Adam Sawelson: During the eligibility year Adam Sawelson worked on *Angel*, *Buffy The Vampire Slayer*, *The Sopranos*, *Family Law*, *A Lady In Question* (A&E), *Ali: An American Hero*, *Excellent Cadavers* (HBO), and *The Expendables*.

C. Remote Recording Engineer

Guy Charbonneau: During the eligibility period, Charbonneau recorded Paul McCartney, Blink 182, Cher, Page & The Black Crowes, OzzFest, Cirque du Soleil "La Nouba," Stone Temple Pilots, Martina McBride, Eagles, Sammy Hagar, Beck, GooGoo Dolls.

David Hewitt: Engineering credits include: Marc Anthony "The Concert from Madison Square Garden" HBO Special (co-engineered with Mick Guzauskij); Jimmy Buffett "Don't Stop The Carnival" Tour live CD and internet broadcast (co-engineered with Ryan Hewitt); Harry Connick Jr. Big Band; Sheryl Crow live DVD; Live From The Metropolitan Opera a season of live television shows; Natalie Merchant live CD; Shania Twain CBS TV Special; Family Values Tour live video and CD (co-engineered with Ryan Hewitt); and "Live From The White House" PBS-TV special with B.B. King.

John Harris: Eligibility-year projects include Eric Clapton & Friends A Benefit For The Crossroads Centre At Antigua; Sheryl Crow & Friends *Central Park In Blue*; Eurythmics *VH1 Storytellers*; 42nd Annual Grammy Awards; Mana MTV Unplugged; Ricky Martin "One Night Only"; Rock And Roll Hall Of Fame Induction Ceremony; VH-1 Divas Live; VH-1 Hard Rock Live; and Woodstock '99.

Kooster McAllister: During the eligibility year, Kooster McAllister engineered projects for Billy Joel, Dave Matthews, Barenaked Ladies, Collective Soul, Garth Brooks (aka Chris Gaines), Peter Frampton, Woodstock '99, David Bowie, Alan Jackson, Kenny Wayne Shepherd, Lauryn Hill, Vince Gill, The Dove Awards, Farm Aid, Rock Fest, Sawyer Brown, Kid Rock, Live and Neal McCoy.

Steve Remote: During the eligibility year, Steven Remote recorded, engineered and/or mixed more than 100 artists for a variety of live concert recording and broadcast ventures. The selected list includes Carlos Santana, Marc Anthony, Red Hot Chili Peppers, Live, Sugar Ray, Silverchair, Fuel, Faith Hill, Tori Amos, Sonic Youth, Slipknot, Machine Head, Bif Naked, Blink 182, Lou Reed, Everlast, Enrique Iglesias, Joe Jackson, Paquito D'Rivera, Elvin Jones and Will Calhoun.

D. Sound Reinforcement Engineer

Robert "Cubby" Colby: Eligibility-year projects included front-of-house music mixer for: Ricky Martin world tour; 42nd Annual Grammy Awards; VH-1 Concert of the Century; 1999 Billboard Awards; Farm Aid; Phil Collins, *Tarzan* world premiere tour; and live recording and mixing engineer for 1999 Yuming Spectacle Shanghai, DVD and video.

Trip Khalaf: During the eligibility year, Trip Khalaf worked with Roger Waters and Mariah Carey.

David Morgan: Eligibility-year projects included U.S. dates for Lionel Richie's Time tour; mixing the Paul Simon end of the Dylan/Simon tour; mixing all the shows for the Bette Midler Divine Miss Millennium tour; Steely Dan while they taped their PBS special and VH-1 Storytellers; and audio consultant to the Las Vegas production of the pop opera Notre Dame d'Paris (Paris, Las Vegas Hotel and Casino).

Tim Mulligan: During the eligibility period Tim Mulligan worked with Neil Young and Crosby, Stills, Nash & Young.

Robert Scovill: During the eligibility period Robert Scovill was concert sound mixer for Tom Petty and the Heartbreakers Echo World Tour. Scovill also served as mixer for new artist Angie Aporo as well as industry staple Jackson Browne. In addition, he worked as recording engineer for a live CD release for The Peacemakers featuring Roger Klein.

E. Mastering Engineer

Greg Calbi: Eligibility-year projects include John Scofield *Bump*; Tricky *Juxtapose*; Robert Cray *Take Your Shoes Off*; Tony Bennett *Bennett Sings Ellington/Hot & Cool*; Branford Marsalis *Requiem*; David Sanborn *Inside*; Me'Shell N'degeOcello *Bitter*; Ani DiFranco *To The Teeth*; Cassandra Wilson *Traveling Miles*; and Warren Zevon *Life'll Kill Ya*.

Ted Jensen: Eligibility-year projects include Santana *Supernatural*; Creed *Human Clay*; Marilyn Manson *Last Tour On Earth*; Slipknot *Slipknot*; Macy Gray *On How Life Is*; Live *Distance To Here*; Widespread Panic *Til The Medicine Kicks In*; Tracy Bonham *Down Here*; and the *Man On The Moon* soundtrack.

Bob Ludwig: Eligibility-year projects include remastering Brian Ferry's entire catalog; Mariah Carey *Rainbow*; Jennifer Lopez *On the 6*; Foo Fighters *There Is Nothing Left to Lose*; Marc Anthony *Marc Anthony*; Melissa Etheridge *Breakdown*; Eric Clapton *Clapton Chronicles*; Counting Crows *This Desert Life*; Filter *Title Of Record*; Tracy Chapman *Telling Stories*; Phish *Hampton Comes Alive*; Elton John *Aida*; Jessica Simpson *Sweet Kisses*; Vonda Shepard and Kenny Wayne Shepherd.

Stephen Marcussen: Eligibility-year projects include "Smooth" from Santana *Supernatural*; Alice in Chains box set; Linda Ronstadt and Emmylou Harris *Western Wall*; Rage Against the Machine *The Battle of Los*

Full Sail graduate **Derrick Perkins** with **Stevie Wonder** in one of Full Sail's **Solid State Logic SL 9000 J** studios.

Derrick is **Co-Associate Producer & Programmer** for **Stevie Wonder's** platinum album, **Conversation Peace**, including the **GRAMMY® Award-winning** single, "For Your Love."

"Today's entertainment industry, more than ever before, requires employees who not only love the art, but who understand the technology that's involved in taking it to the people. Full Sail is a place where a person with dreams of working in this industry can find a way to get in. I know first-hand, because I hired Derrick, a graduate. Thanks to Full Sail, he was able to translate his love of music into a career in the studio."

-**Stevie Wonder**

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CIRCLE #053 ON PRODUCT INFO CARD

Angeles; Korn *Issues*; Al Jarreau *Tomorrow Today*; and Stone Temple Pilots *Four*.

Denny Purcell: Eligibility-year projects include Garth Brooks *In the Life of Chris Gaines*; Asleep at the Wheel *Ride With Bob*; Jimmy Buffett *Live Tues/Thurs/Sat*; Dixie Chicks *Fly*; John Prime *In Spite of Ourselves*; George Strait *Latest Greatest Straitest Hits*; various Happy Texas soundtrack; Wynonna *New Day Dawning*; Trisha Yearwood *Real Live Woman*; and Neil Young *Silver & Gold*.

F. Record Producer

Dallas Austin: During the eligibility year Dallas Austin produced Brandy *Never Say Never* (Australia limited); Goodie Mob *World Party* (clean); JT Money *Pimpin' on Wax* (clean); Monica *Boy Is Mine* (bonus tracks); N-Too *Toon Time*; Sammie *From the Bottom to the Top*; TLC *Fanmail*; TLC *Unpretty* (remixes, Germany CD); various artists *Breaking Through*; various artists *What The Funk you Waitin' For?*; and Vega *Life On Earth*.

Tony Brown: During the eligibility year Tony Brown produced George Strait *Always Never The Same*; Chely Wright *Single White Female*; George Strait *Merry Christmas Wherever You Are*; Gary Allan *Smoke Rings in the Dark*; Reba McEntire *So Good Together* (5 tracks); Alecia Elliott *I'm Digg'in' It*; Barbra Streisand *"We Must Be Loving Right"* from *A Love Like Ours*; George Strait *"The Best Day"* from *Latest Greatest Straitest Hits*; and Vince Gill *"Let's Make Sure We Kiss Goodbye"* from *Let's Make Sure We Kiss Goodbye*.

Rodney Jerkins: No credits available at presstime.

John "Mutt" Lange: Eligibility-year credits include Celine Dion *"If Walls Could Talk"* from *All The Way... A Decade of Song*; Backstreet Boys *"I Need You Tonight"* from *Millennium*; and Bryan Adams *"The Best Of Me"* from *The Best Of Me*.

Brendan O'Brien: During the eligibility year, Brendan O'Brien produced Stone Temple Pilots *No. 4*; Dangerman *Dangerman*; Big Daddy *soundtrack*; Godzilla (bonus CD) *soundtrack*; various artists *M.O.M. Vol. 3 Music for Our Mother Ocean*.

G. Recording/Mixing Engineer

Chuck Ainlay: Eligibility-year projects include Trisha Yearwood *Real Live Woman*; Toby Keith *How Da You Like Me Now*; George Strait *Latest Greatest Straitest Hits* and *Merry Christmas Wherever You Are*; Alecia Elliott *I'm Digg'in' It*; Wynonna *New Day Dawning*; Steve Wariner *Two Teardrops*; John Berry *Wildest Dreams*; and Vince Gill *The Key*.

Mick Guzauski: Eligibility-year credits include mixes on Christina Aguilera *Christina Aguilera*; Backstreet Boys *Millennium*; N'Sync *No Strings Attached*; Jennifer Lopez *On The 6*; Marc Anthony *Marc Anthony*; Ricky Martin *Ricky Martin*; Brian McKnight *Back at One*; and Lorie Morgan *My Heart*.

Alan Moulder: Eligibility-year projects include Nine Inch Nails *The Fragile*, which was co-produced, recorded and mixed by Moulder; and Smashing Pumpkins *Machina/The Machines of God*, on which Moulder mixed most of the tracks.

Jack Joseph Puig: Eligibility-year projects include Taxiride *Imaginate*; Abra Moore *"Trip On Love"* from the *Cruel Intentions* soundtrack; Hole *"Be A Man"* from the *Any Given Sunday* soundtrack; (single release) No Doubt forthcoming album; Counting Crows *"Hanginaround"* and *"Four Days"* from *This Desert Life*; (remixes) Luscious Jackson *"Devotion"* and *"Ladyfingers"* (radio mixes); Robbie Williams *Millennium* (alt. version); The Verve *Pipe The Verve Pipe*; Sparklehorse *"Happy Man"* (radio mix); Verbena *"Pretty Please"* from *Into the Pink*.

Mike Shipley: During the eligibility year, Mike Shipley worked on Faith Hill *Breathe* (int'l version); Shania Twain *"Come On Over"*; Splendor *Halfway*

Down The Sky; even and jaron, one track for the *Runaway Bride* soundtrack; Semisonic *"Delicious"* from the *Friends* soundtrack; Semisonic *"For The Love Of The Game"* from the soundtrack of *For The Love Of The Game*; Shawn Colvin one track for the *Runaway Bride* soundtrack; Dishwalla one track for the *American Pie* soundtrack; Sponge *Live Here Without You*.

III. OUTSTANDING TECHNICAL ACHIEVEMENT

A. Ancillary Equipment

Audio Precision System 2 Cascade: The next generation for AP's industry-standard System Two series, Cascade provides approximately six times the DSP power and 10 times the FFT memory of the standard System Two. Features include improved converters, simultaneous acquire and transform of FFTs, signal acquisitions up to 5.4 seconds at 48 kHz, 8k to 200k sampling rate support, extended INTERVU's jitter measurement down to 50 Hz, and saving AES/EBU interface signal waveforms to disk for later analysis.

BSS Audio "Jellyfish" Soundweb 9010 Programmable Remote Control: This Soundweb accessory lets programmers provide a completely custom control environment to Soundweb systems. The hardware features six membrane switches, LCD menu screen, a rotary controller and a built-in paging mic. Features include: "nested" menus, multi-level security and control of digital audio routing. The remote is programmed via Soundweb Designer Software.

Lucid AD9624/DA9624 Converters: These stereo 24-bit, 96kHz converters for recording, mastering and post-production provide AES-3, S/PDIF, and TosLink digital interfaces. The AD9624 supports internally generated sample rates of 32, 44.1, 48, 88.2 and 96 kHz, as well as external word clock sync and 16-bit noise shaping for mastering applications. In addition to its main analog output, the DA9624 features a monitor output with independent volume control and front panel headphone jack.

Mark of the Unicorn MIDI Timepiece AV-USB: The MIDI Timepiece AVUSB is the flagship of MOTU's new line of high-performance MIDI interfaces and synchronizers for Macintosh and Windows. All MOTU USB interfaces are equipped with MOTU's MIDI Time Stamping™ technology, providing sub-millisecond MIDI timing accuracy between the interface and the computer. Countless recording artists, engineers, producers, film composers, multimedia content developers, theme park designers and other entertainment industry pros rely on the MIDI Timepiece every day.

Neutrik Speakon NL2 2-Pole Connectors: The new 2-Pole Speakon™ connection system offers a two-conductor alternative to the industry-standard 4-pole version, while maintaining compatibility between the NL2FC cable end and the NLAMP receptacle by picking up pins 1+ and 1-. The 2-Pole series complies with European safety regulations requiring electrically touchproof connectors and carries the UL and CSA symbols.

TerraSonde Audio Toolbox2: The Audio Toolbox2 is a portable, DSP-powered, multifunction, test, measurement and acoustic analysis device. Functions include: acoustic analysis: SPL, RTA, energy-time graph, RT60, and speaker polarity; test functions: signal generator, dB level meter, VU/PPM meter, frequency counter, signal/noise ratio, impedance/THD tests, sweeps and audio sample scope; timecode reader/generator/analyzer; MIDI analyzer/generator; headphone monitor amplifier (including guitar effects); instrument tuner; tempo analyzer and metronome; hum cancellation; and cable tester.

B. Amplifier Technology

Bryston 14B Pro: The Bryston 14B is a high-quality stereo amplifier delivering 500 watts per channel into 8 ohms and 800 watts into 4 ohms. THD is below 0.007% from 20 to 20k Hz. Noise is -106 dB below full output.

C-Audio Pulse Series: C Audio's Pulse range incorporates the latest developments in lightweight amp technology and features advances in power supply design to compensate for thermal sag for high sonic integrity. The Pulse range uses a separate PSU to power the microprocessor-controlled section of the amp to warrant correct status control and monitoring when on-line with the CONNECT II network. Units are available in 4x300, 2x650 and 2x1,100 watts/channel into 4 ohms.

Hafler SR Series: Hafler's SR Series live sound amplifiers deliver continuous real power without thermal problems at any impedance. These two-rack-space amps are a new Class-G circuitry based around Hafler's patented Trans*nova platform, providing a simple gain path for quality sound, high efficiency and low heat. Features include switching power supplies, surface mount components and MOSFET technology.

Pass Labs X5: The X5 5-channel amplifier uses the Supersymmetry circuit topology that improves the performance of a balanced amplifier by using feedback to improve the matching of the two balanced halves. The amplifier uses ultra-matched components in a simple balanced circuit. The X5 accepts both single-ended and balanced inputs. The X5 is rated at 125 watts per channel into 8 ohms, all five channels driven.

QSC Powerlight 2: Designed for live sound/touring applications, the Powerlight 2 combines high-performance power with integrated signal processing. Four models deliver up to 1,850 watts/ch (2 ohms) in a 21-pound, 2U chassis. Each model is available in three versions—a standard base model, an "A" version with internal analog signal processing, and a planned "D" version with complete digital signal processing capability. Includes PowerWave™ technology and DataPort for computer control.

Yamaha XM 4220: Dedicated to the needs of the sound reinforcement and contractor markets, the XM4220 is a multichannel power amp in a three-rack-space unit. Ideal for multi-zone applications and the high frequencies of bi- or tri-amp speaker clusters, the XM4220 channels can be bridged to provide increased power. Combining channels and offering 70-volt system operation, a single amplifier can run at 70-volt as well as 4 and 8 ohms at one time.

C. Mic Preamp Technology

Aphex Model 1100: A 2-channel tube preamp with onboard A/Ds, the Model 1100 offers more gain with no pain. EIN of -135dBu with 65dB of gain adds less than 1dB of noise to a typical mic. 20dB of additional headroom is provided by MicLim, a limiter on the output of the mic before the preamp, and LoCaf, a tunable low-cut servo filter. Gain can be cranked without the pain of noise or overload distortion.

dbx 386: The 386 is the world's first professional tube mic pre with dbx's proprietary Type IV™ conversion using the latest A/D converters and up to 96kHz sampling. The 386 also offers features such as dbx proprietary TSE™ technology, AES/EBU and S/PDIF digital outputs, selectable dithering and noise shaping, and XLR and 1/4-inch analog I/O. These features make the 386 ideal for any analog or digital recording application.

Grace Designs Model 801R: The 801R is a digitally remote-controllable version of the acclaimed Model 801 8-channel preamp. Up to eight 801Rs (64 channels) can be controlled from up to 1,000 feet away by a single dedicated desktop remote. A large LCD displays channel status and metering; a pushbutton encoder offers instant access to parameters such as gain, phase reverse, phantom power, mute, etc.

PROFESSIONAL RECORDING EQUIPMENT

MANLEY

Langevin



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

NEO-CLASSIC:

MANLEY ALL-TUBE GEAR

We take a purist approach to everything we build; refining, executing, and expanding upon Manley's legacy of vacuum tube design philosophies proven over years of real-world experience, using high quality modern components, many of which are fabricated in-house. This attention to detail delivers the rich, present, and natural sound our vacuum tube designs are renowned for. Never small, sterile, or boring.

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

BIG BANG FOR THE BUCK: LANGEVIN

LANGEVIN is a legendary marque of premium electronics whose lineage goes back to World War II. **MANLEY** acquired the **LANGEVIN** brand name several years ago. With these products we offer you the different sonic flavor that **ALL-DISCRETE CLASS A CIRCUITRY** brings using fresh, original designs built alongside and to the same exacting standards as the Manley equipment.

We believe that good music and those who create it deserve the finest gear.

The choice is yours.

CIRCLE #075 ON PRODUCT INFO CARD

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Millennia Media HV-3D: Designed for critical applications requiring dynamic uniformity and timbre purity—such as large orchestra and effects recording—the HV3 offers solid, consistent performance with complex source material and extreme dynamic levels. More than 100 channels of HV-3D selected for Barbra Streisand's Y2K New Year's gala concert. Used by a "who's who" in classical music, acoustic jazz, film scoring and SR applications.

PreSonus MP20: This 2-channel mic preamp features high-quality audio transformers, dual servo gain stage, twin-FET Class-A discrete input buffers and a Left/Right summing bus for realistic stereo imaging. Servo balanced inserts support use of external processing, and the front panel provides a 1/4-inch instrument input, a high-output headphone monitoring jack and a Proprietary IDSS control that adjusts harmonic distortion for tube circuit emulation.

Summit MPE-200: The MPE-200 is a dual-channel Class-A solid state preamp/4-band parametric EQ with a transformerless signal path designed by Mr. Rupert Neve. All functions are digitally controllable from the front panel, through MIDI, via another Element 78 product, or with Pro Tools via Extension 78 plug-in software. Features include 25 onboard presets, automation and storage via MIDI, linking of up to 32 channels with a single front panel and remote control.

D. Computer Software & Peripherals

BIAS Peak 2.0: Peak 2.0, the upgraded version of this award-winning Macintosh-based waveform editing program, offers advanced features for professional recording, editing, processing and delivery; a TDM Edition, which includes all of Peak 2.0's features plus TDM support, is also available.

Cakewalk Pro Audio 9: This multitrack digital audio and MIDI software for professionals features 24-bit/96kHz audio, real-time effects processing, real-time MIDI FX plug-ins, and a suite of professional editing and mixing tools, along with optimized audio performance for Windows 95/NT, support for MP3 and Windows Media Technologies, a new Session Drummer MIDI plug-in and support for AudioX hardware.

Minnetonka Mx51 v2.0: This dedicated software for surround sound mixing, takes the user from raw tracks to creating the final 5.1 surround master, using Minnetonka's innovative build-your-own-mixer architecture for easy creation of custom surround mixes. Mx51 has an integrated interface to optional Dolby and DTS surround sound encoders and interfaces to a force-feedback joystick so users can feel surround as they hear it.

MOTU Digital Performer 2.61: Digital Performer is the first and only audio sequencer to achieve both sample-accurate digital audio editing and sub-millisecond MIDI timing accuracy, thanks to Version 2.61's unique MIDI Time Stamping technology. Digital Performer 2.61MTS also delivers the highest timing precision ever offered by a sequencer with adjustable PPQ resolution, letting users work with MIDI data at any resolution, down to one one-hundred millionth of a quarter note.

Sonic Foundry Vegas Pro: Vegas Pro is a Windows-based, nonlinear, multitrack hard-disk recording system. Its unique multi-threaded architecture is designed to squeeze superior performance from standard PCs. Vegas Pro uses multiple processors, extra RAM and optimized disk throughput to achieve optimal multitrack performance. Audio data is processed using floating-point math precision, which—coupled with the ability to output 24-bit audio at the final mixing stage—results in superb audio fidelity.

TC Works Spark: Spark, a 24/96 real-time Digital Audio Mastering Editor for MacOS, is VST plug-in compatible and includes 12 TC Works plug-ins plus support for popular samplers, AIFF, QuickTime, SD2 and .WAV file formats. Spark's Master View plug-in

matrix can operate as a plug in within the MOTU MAS or VST environments, and CD burning software is included. A TDM version and Modular Synth plug-in option are available.

E. Microphone Technology

AKG C3000B: AKG's C3000B is a 1-inch large-diaphragm side address condenser mic designed to provide wide dynamic range and low self-noise. Features include a -10dB pad and bass rolloff filter. Internal shock mounting is provided along with a rugged external shock mount (H100). The C3000B's sound quality remains consistent with AKG's fine 52-year lineage. Specifications are: self-noise: 14dB; max SPL: 150dB; and dynamic range of 126dB.

Audio-Technica AT4047/SV: The large-diaphragm AT4047/SV capacitor mic is designed to provide the warm sonic characteristics reminiscent of early F.E.T. studio mic designs. Wide dynamic range, high SPL capability and exceptionally low self-noise combine in a versatile tool that's ideal in digital recording environments, critical broadcast applications and live sound.

Earthworks SR77: The SR77 delivers a natural, time-coherent representation of sounds as they arrive at the mic, maintaining most of the "being there" quality of Earthworks' omnis. On-axis frequency response is flat from 30 Hz to 30 kHz. Sonic timbre stays uniform across the entire front hemisphere, while off-axis rejection is thorough and uncolored. From quiet whispers to 145dB SPLs, the SR77 captures the sound of the source without coloration.

Neumann KMS 105: Proven condenser capsule technology and state-of-the-art transformerless electronics combine to create the KMS 105 handheld performance mic. With an innovative wire basket structure, shock-mounted circuitry and studio-grade specifications, the KMS 105 is designed for demanding stage performers. Wide dynamic range and extended frequency response make this microphone a natural fit for precision sound reinforcement systems and in-ear stage monitoring.

Soundelux U99: Offering warmth and clarity, the Soundelux U99 brings the sonic glory of yesterday to today's engineer. With its classic tube and transformer design, the U99 features a handmade European 1-inch diameter dual backplate, dual-membrane capsule, providing high headroom, low noise and wide bandwidth.

SPL Atmos 5.1 System: This package combines Dirk Brauner mic elements in the ASMS array with the hand-built SPL Atmos 5.1 mixer. The system sets up in minutes to create discrete 5.1 recordings of the highest possible fidelity. Features include triple-stage preamps with motorized gain controls, front/surround matrix with LCR panning and divergence controls, sub bass generation matrix, remote pattern control for each mic and discrete 6-channel outputs compatible with all formats from DVD to SACD.

F. Sound Reinforcement Loudspeaker Technology

Audio Composite Engineering 1160WR: This advanced, cored carbon fiber enclosure composite loudspeaker is designed for applications requiring wide-dispersion, high-output distributed sound. Its compact size, wide dispersion pattern and high SPL capabilities make this system ideal for large-format under-balcony use, as well as other background/foreground reinforcement applications.

L-Acoustics DV-DOSC: This active, 2-way, vertically arrayable enclosure uses two 8-inch cone drivers and a 1.4-inch compression driver mounted on the proprietary DOSC waveguide in an extremely compact format for fixed installs, touring, theatrical and nightclub use. DV-DOSC array bandwidth is 100-18k Hz (± 3 dB), with 120° horizontal coverage and all the advantages of L-Acoustics' Wavefront Sculpture Technology™, including perfect coupling and a coherent wavefront from a small (70.2 pounds) enclosure.

Mackie SRM450: Delivering accuracy and performance in an easily portable and affordable loud-speaker, the SRM450 active sound reinforcement loud-speaker brings truckloads of power to any event, eliminating the need for external amplification and costly electronics (such as processors). The SRM450—the first in a series of speakers developed with RCF, which has 50 years of speaker experience—uses technology and features found in systems costing thousands of dollars.

Martin Audio WT3: This innovative system achieves true 3-way performance from an enclosure only 28 inches high. It features a powerful 15-inch bass driver, a 6.5-inch cone midrange horn and a 1-inch exit HF with matching 65x40° dispersion characteristics. The 6.5-inch midrange horn was developed to overcome the power and distortion limitations of traditional large-format compression drivers, allowing the WT3 to produce extremely high sound levels without distress.

Meyer Sound UPM-1P: This compact, self-powered, bi-amped, 3-way design incorporates dual 5-inch low/mid transducers, a 1-inch HF driver on a symmetrical 100° horn, a 2-channel power amp and proprietary phase-corrected active processing. Ideal for applications requiring high SPLs, low distortion and uniform directional control, such as vocal range reinforcement as a small P.A. system, under-balcony or front/sidefill use, or as a full-range system with an optional subwoofer.

Shure PSM700 Personal Stereo Monitor: This in-ear monitor system combines quality sound and wireless frequency agility, enabling musicians to hear themselves clearly and safely, without floor wedges. Features include Dynamic Overload Protection and several universal-fit earphone options, including the acclaimed dual-driver Model E5. With 32 selectable UHF frequencies (16 simultaneous) and the choice of stereo, mono, or MixMode™ operation, the PSM 700 affords users new levels of freedom, fidelity, and personal control.

G. Studio Monitor Technology

Genelec 1036A: Genelec's flagship 1036A goes lower in frequency than any other Genelec monitoring system. Each channel consists of a 430-liter speaker enclosure and an electronics rack, containing active crossovers, and LF/MF/HF amps delivering 2x1,100, 600, and 300 watts of short-term power. Twin 18-inch woofers reproduce frequencies to 19 Hz (-3dB). Dual 5-inch Genelec midrange and a single 1-inch compression tweeter extend the frequency response to 22 kHz.

JBL LSR25P: The JBL LSR25P is a compact bi-amplified monitoring system with a 5.25-inch woofer and 1-inch titanium composite tweeter with 100 watts for lows and 50 watts for high frequencies. The aluminum enclosure incorporates an EOS waveguide and Linear Dynamic Apertures. The LSR25Ps combine JBL's latest in transducer and system technology and incorporate the LSR design philosophies. The LSR25P provides an accurate reference for workstations, edit suites and small control rooms.

Klein & Hummel 0198: A compact, active 3-way monitor delivering extremely low coloration and distortion, the 0198 employs integrated waveguides to deliver a wider and more constant "sweet spot" than other compact monitors. Features include a 1-inch tweeter/waveguide, a 3-inch dome mid and a fast, low-mass 8-inch woofer in a sealed, mag-shielded enclosure. Designed for the pro who spends long days listening.

KRK V-6: This compact, powered system features separate amplifiers for the woofer and tweeter, active electronic crossover and internal magnetic shielding. Drivers are a 6.75-inch polyvinyl woofer and a 1-inch silk dome tweeter. Frequency response is 54 to 20k Hz ± 2 dB. Maximum SPL at 1 meter is 102dB music, 105dB peak.

World Wide Audio, without leaving your studio.

Rocket Network takes audio production beyond the boundaries of studio walls, making connections that let you work with anyone, anywhere, anytime. It's like a global multi-track.

On-line Flexibility.

Rocket Network uses the Internet to allow professionals to work together on audio productions without having to be in the same physical space. Instead of shipping tapes from place to place or renting high-capacity phone lines, you log into your Internet Recording Studio, where Rocket Network handles the details of passing your parts to others and vice versa. That leaves you free to concentrate on capturing the perfect take, using your own local system to record and edit. Whenever you're ready for others to hear your audio or MIDI parts, you simply post your work to the Internet Recording Studio, automatically updating everyone else's session.



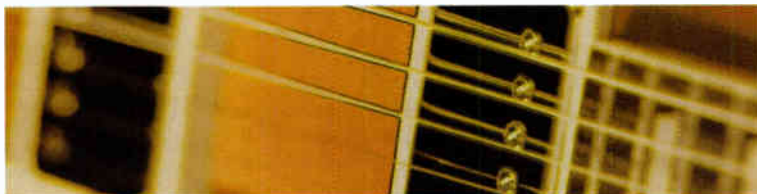
Professional Tools.

Through partnerships with leading audio developers, Rocket Network is bringing RocketPower™ to the professional tools you already use, starting with Steinberg Cubase VST and Emagic Logic Audio. A multi-level permission system lets you control access to your Internet Recording Studio. And our RocketControl™ client offers built-in chat capabilities, so everyone in the session can chime in with feedback as the project takes shape. The Rocket Network Web site offers additional resources and services for audio collaboration.



Full Audio Fidelity.

With Rocket Network, there's no compromise in audio quality—the system handles files in a vast range of formats and compression levels, all the way up to uncompressed 24 bit/96kHz. And you don't need access to a super-fast connection; DSL or T1 is great, but you can also work productively over a humble 28.8 dial-up. The system supports multiple user-defined presets for posting and receiving, and handles all conversions, letting everyone participate in their own preferred format. That means you can conduct a session in a speedy, low bit-rate "draft" mode, then move on while the final parts are posted in the background at full-fidelity.



A Powerful Connection.

Rocket Network adds a new level of freedom to creative collaboration, allowing you to choose your team—singers, musicians, voice-talent, composers, engineers, producers—based on who's right for the project, wherever they happen to be. With full fidelity, plus anytime, anywhere productivity, Rocket Network is a powerful new connection to the world of audio production.

Escape the boundaries of your studio walls.

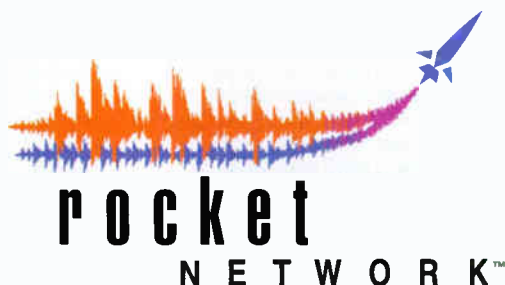
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Internet Recording Studios

M&K Professional MPS-2510/P: Based on the critically acclaimed MPS-2510, the MPS-2510/P uses the same woofer and tweeters, with an Active Phase-Focused crossover, and dual 150-watt amps in a slightly larger cabinet. User-selectable vertical directivity allows for optimization in various monitoring environments. Five MPS-2510/P monitors, along with an M&K Pro subwoofer, create a 5.1 music monitoring system, providing the reference level playback required by Dolby and THX.

Tannoy Proto-J: This monitor combines a detailed, dynamic sound with a wide, flat frequency response. A 3/4-inch soft-dome HF unit is matched to a 6.5-inch, long-throw bass unit in a vented enclosure with a chamfered front-baffle to reduce HF diffraction effects. Integral insets accommodate OmniMount™ 50 Series wall brackets for flexible 5.1 surround sound installs. Tannoy's optional PS110B subwoofer completes the package.

H. Musical Instrument Technology

Akai MPC 2000XL: The Akai MPC 2000XL is everything you would expect from an MPC and more. New creative tools include dedicated buttons for selected features. Next Sequence key, four bank keys, and Track Mute key provide instant access for recording and live performance. A hinged LCD, 32 voices, up to 32MB of RAM, multi-program playback, device naming, MIDI soft thru, multitrack recording, time stretch, and resampling take the MPC 2000XL to the next level.

Alesis DM Pro Drum Module: The DM Pro Expandable 20-Bit MIDI Drum Module features: 64-voice polyphony; more than 1,000 drum and percussion sounds; 16 trigger inputs for electronic pads, tape replacement or triggering acoustic drums; six independent audio outs; storage of 32 virtual drum kits; PCMCIA-format cards storing up to 8MB; and onboard multieffects using the same processing engine as Alesis's top-of-the-line Q20.

E-mu Proteus 2000: This 128-voice MIDI sound module features 32 MB of resident ROM sounds (with room for 96 MB more), along with four real-time front panel controls, 6-pole dynamic filters, onboard dual 24-bit effects, six analog outputs and S/PDIF digital output—all in a single-rackspace package.

Korg Triton proX: This 88-key music workstation offers Korg's HI Synthesis System, a full-featured integrated stereo/mono sampler, onboard sequencer and arpeggiator, along with six audio outputs and 838 high-quality PCM sounds. Its 16 MB of sampling RAM (nearly 3 minutes mono @ 48 kHz) can be expanded via standard 72-pin SIMMs, and the system reads stereo/mono AIFF files, Windows .WAV files, Akai S1000/S3000 (floppy or CD-ROM) and Trinity-format data.

Kurzweil K2600: Available in 88-note weighted keyboard, 76-note or rack versions, this synthesizer/sampler has 495 programs, state-of-the-art sounds, effects, a flexible architecture, eight analog balanced (or unbalanced) outputs and dual SCSI connectors. A sample option provides a 20-bit digital output and allows external analog or digital stereo signals to be processed. Reads most popular sample formats. RAM is expandable to 128 MB via 72-pin SIMMs.

Yamaha S80: Featuring an 88-note, weighted piano keyboard action combined with a high-quality, expandable synthesis engine, the S80 makes a perfect controller/synthesizer for the heart of a complex MIDI system. For the ultimate in expansion capability, the S80 has two plug-in expansion slots, which allow the unit to hold any two boards from Yamaha's extensive PLG line of Modular Synthesis plug-in expansion boards.

I. Signal Processing Technology/Hardware

Avalon Design VT-747SP: The VT-747SP is a Class-A, 100% discrete, stereo spectral opto-compressor with passive 6-band graphic EQ and built-in 2-band

parametric sidechain. The VT-747SP features TSP, enabling the choice of three dual triodes in the signal path for warm tube tone, or all-discrete Class A-transistor amps for classic opto-compression. The VT-747SP is perfect for DAW input signal conditioning, stereo bus compression/EQ, stereo keyboards and mastering applications.

Eventide Orville: With up to eight times the power of Eventide's legendary DSP4000 Series, and up to eight simultaneous channels (four AES/EBU digital and four analog), Orville is ideal for digital TV and film post-production, surround sound and music recording. Its dual-engine, 24-bit/96kHz configuration, anything-to-anything routing and onboard 174-second sampler, allows new effects such as UltraShifter formant-correct pitch shifting and FourSidedVerb multichannel reverb.

Lexicon MPX 500: A true stereo 24-bit, dual-channel processor with balanced analog and S/PDIF digital I/O, the MPX 500 has 240 presets with classic, true stereo reverb programs such as Ambience, Plate, Chamber and Inverse, as well as Tremolo, Rotary, Chorus, Flange, Pitch, Detune, 5.5-second Delay and Echo. Dual-channel processing allows control of completely independent effects on the left and right channels.

Sony DRE-S777 Sampling Digital Reverb: The DRE-S777 24-bit sampling reverbulator uses Real Impulse Response reverberation algorithms, based on actual acoustic spaces or re-creations of classic plate reverbulators, which can then be optimized for low-noise performance. Out of the box, the DRE-S777 supports mono in, stereo output and a 48kHz sampling rate. Sony's optional DABK-S703 expansion DSP board, adds 2-in/2-out stereo (up to 96kHz sampling rate) or 4-channel surround operation.

TC Electronic System 6000: TC's flagship multichannel audio signal processing mainframe is targeted toward music film/post-production, broadcast and mastering applications in surround or multichannel environments. In addition to natural 5.1 reverbs, room simulations, special effects and vintage algorithms, surround multi-band dynamics "Finalizer" processing and pitch are also available as part of the System 6000's comprehensive processing palette—all available through the touch of a screen over a powerful routing matrix.

Waves L2: Based on Waves L1 software, the most popular digital limiter in the world, Waves' L2 adds 48-bit resolution, 96kHz support, ninth-order noise shaping IDR (increased digital resolution) dithering, 24-bit/96 kHz AD/DA converters and the world's cleanest brick-wall limiter.

J. Signal Processing Technology/Software

Antares Microphone Modeler (AMM-1): Using Spectral Shaping Tool™ technology, Antares created precise digital models of a wide variety of mics, from historic classics to modern industry-standard workhorses. The user enters the microphone being used and what mic it should sound like. The AMM-1 references the stored models of source and target mics and processes the input to sound like the desired mic; other factors, such as mic distance, bass rolloff and tube saturation, can be added.

Bomb Factory Classic Compressors: Classic Compressors plug-ins look, sound and work just like the real thing, with meticulously crafted digital versions of the LA-2A and 1176, the most popular vintage compressors used in top pro studios. Proprietary modeling technology captures every tube, transformer and transistor of the originals! Plus Classic Compressors offer sidechain support and perfect stereo tracking—two features not available in the "vintage" domain.

Cycling '74 Pluggo: Pluggo is a collection of over 74 plug-ins for VST or MAS sequencing or audio editing applications. In addition to a continuum of normal to outrageous plug-ins, Pluggo includes audio routing, tempo-synchronized parameter sequencing and modulation, virtual MIDI instruments and controllers, and the ability to host and modulate any VST plug-in—even in MAS.

Kind of Loud Technologies RealVerb 5.1: A Pro Tools TDM plug-in, RealVerb 5.1 multichannel reverb features physical modeling and auralization technology to add depth and dimension to recordings. The ability to control parameters with precision, create custom rooms with control over material, thickness, dimension, shape and size and to change these controls in real-time sets RealVerb apart. To this, RealVerb 5.1 adds the ability to place reverb elements individually in a 360° soundfield.

Serato Pitch 'n Time™: This Audiosuite plug-in for Pro Tools features an algorithm that time stretches and pitch shifts audio with quality, regardless of the source material, whether it be music, speech, ambience or sound effects. Pitch 'n Time can pitch shift up or down 12 semitones and simultaneously time stretch from 50% to 200%, all without having to adjust non-intrusive parameters.

Waves C4 Multiband Parametric Processor: Designed for the Pro Tools 24|MIX system, the C4 Multiband Parametric Processor uses the compression design from the TEC-nominated Renaissance Compressor™ including ARC™, Electro and Opto bands. Features include a transparent crossover design with global-adjustable Q; true parametric control with independent threshold, range, gain, attack, release and bandwidth per band, and compression, expansion or EQ independent of the functions of the other bands.

K. Recording Devices/Storage Technology

Akai DPS-16: The DPS-16 has introduced the masses to the 24-bit/96kHz recording world. This 24-bit/96kHz 16-track digital personal studio features a 6-inch diagonal flip-up graphic display, 10GB internal IDE drive, 56-bit 4-channel effects processor, 24-bit/96kHz AD/DA converters, and no data compression. Akai's Q-Link Navigation includes real-time control knobs, providing an easy-to-use operating system.

360 Systems TCR-8: The TCR-8 is an 8-track synchronous master recorder offering 24-bit audio quality, several storage options, complete timecode implementation and VTR emulation. Providing a 20dB SNR and dynamic range improvement over conventional designs, TCR-8 is the only recorder available that offers BitForBit™ reproduction of 24-bit PCM, Dolby-E and AC-3 recordings. Recordings can be stored on internal hard disks, 250MB Zip disks or its onboard DVD-RAM drive.

Alesis MasterLink ML-9600: This mixdown and mastering system combines hard disk recording and editing, digital signal processing and CD creation in a single versatile unit. MasterLink stores, delivers and plays stereo 24-bit, 96kHz audio on standard CD-R blanks. Masterlink can also create conventional 16-bit, 44.1kHz Red Book format CDs. MasterLink features an internal hard drive with editing, digital signal processing and mastering functions, a 4x CD-R drive and 24-bit converters.

Glyph Technologies Cobra/SAN: Cobra/SAN enables audio pros to work in closer collaboration with others. Cobra/SAN's primary component is the Cobra control unit, which includes up to six fibre channel connections bridged to Ultra SCSI/LVD drives. Each Cobra enables as many as six users to share eight (up to 256) high-performance SCSI drives at speeds as high as 100MB/sec.

Roland VSR-880: The VSR-880 is an 8-track recorder with 128 Virtual Tracks in a standalone rack-mount package. Like all V-Studios, it features non-destructive editing with 999 levels of Undo, Cut/Copy/Paste/Exchange editing using the backlit LCD, Preview and Scrub functions, and various 24-bit I/O choices. An optional DSP board adds two powerful onboard stereo effects processors, with compressors, reverbs, guitar amp modeling and mastering algorithms.

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ARE YOU ON OR OFF THE BUS?

THE STATE OF THE STANDARDS

Right off the bat, let's dispel the lack of respect for our elders that we brazenly exhibit here in the States: SCSI isn't dead. It won't be toppled over by stylish Fibre Channel or bargain basement UDMA just yet. Same goes for PCI: It isn't going to be replaced

toward deployment next year. And, as the MotorWeek boys would say, there's lots to like about the new Ultra320!

Let's start with clocking, the heart of all digital prestidigitation. In next-gen SCSI, the clock rate remains the



anytime soon by cheesy ESA or shiny new Infiniband. In computer years—akin to dog years—the PCI and SCSI standards are ancient and venerable. Yet, they belie their age, continuing to outlast and outperform rival factions.

And, indeed they should. Lots of individuals work overtime to trim and tone these standards to maintain their fighting weight. Take SCSI, the Small Computer Systems Interface. According to Dataquest, currently 95% of the high-end disk drives shipped are SCSI attach devices. Pioneered by our friends at Apple Computer in the 1986 vintage Mac Plus, the original spec called for a 5MB/second transfer rate. Four generations later, the current Ultra160 tome describes, duh, a 160MB/s rate. Faster than the current generations of FireWire and USB (Universal Serial Bus). But wait, aren't both FireWire and USB destined for double-speed updates? You betcha, but so is SCSI. The sixth generation is in incubation, moving

same. Data transactions, however, can occur on both the rising and falling edge of the clock, so called dual-edge clocking. This doubles the data throughput while ensuring backward compatibility with those legacy devices with which you have a bootless and sentimental

The latest versions of SCSI, PCI and USB offer speed, stability and a host of high-performance features.

attachment.

Speaking of attachments, another new feature is domain validation. This is a nice label for enhanced, embedded bus diagnostics and expander communication. Domain validation automagically identifies problems and negotiates solutions, dealing with difficulties such as bone-headed users

BY OLIVER MASCIAROTTE

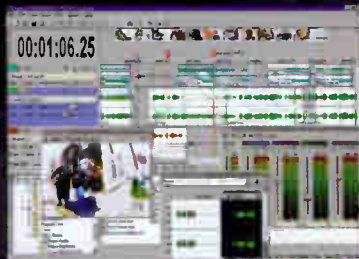
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and damaged wires. Wide drives on narrow cables, nonexistent termination, crappy cable assemblies and dreaded expansion chassis are all handled in stride. The result is that all SCSI segments operate at the maximum speed of the participant's abilities, no more

and no less. This translates into reduced frustration on the part of the poor second who was told to "get that drive with the vocal parts up fast."

Other enhancements to future generations of SCSI include intelligent testing and dynamic equalization to optimize the transmission line and a new packetized data protocol to reduce

transmission overhead. But, to maintain a position of power, you need more than attractive measurements; you need powerful friends. For Ultra320, and especially the up-and-coming Ultra640, you need PCI-X. Good ol' 66MHz PCI, with a throughput of 532 MB/s, can't deal with the 640 MB/s that two Ultra320 channels require. PCI-X, run-

NEWS BYTES

SDMI Membership Passes 200

The Secure Digital Music Initiative recently announced that its participant list now includes more than 200 companies and organizations. The coalition, founded to develop a voluntary, open framework for playing, storing and distributing digital music in protected form, is reaching the end of its Phase II screening technology. For information, visit www.sdmi.org.

Upcoming Events

This month marks the debut of the first annual Bandwidth Conference and Shindig. The event, which focuses on music and the Web, will be held in San Francisco, August 17-19. Panels and other activities will explore the interaction between the traditional music and online

music industries. Get more information at www.bandwidthconference.com.

Want to take your business online? Check out the upcoming Internet Commerce Expo, taking place September 11-14 at the San Jose Convention Center in San Jose, Calif. More than 175 exhibitors and 50 sessions will showcase the newest technologies and services for e-commerce. Visit www.iceexpo.com for details.

The Interactive Music Xpo, now in its second year, is an interactive music conference and exposition focusing on the use of technology in the creation, production, promotion and distribution of music. IMX will take place October 3-4 in Los Angeles at the L.A. Convention Center. Visit www.imusicxpo.com for program and registration information. ■

"For sheer tube magic, a realistic vintage vibe, and superb craftsmanship, the L47MP takes top honors."
EM, Brian Knave, Feb. 98

"... this is the microphone of choice for the project studio owner who wants to buy only one microphone. And at the given asking price, it is the biggest bargain in microphones today."
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"When you tuck vocals recorded with an L47MP into a mix, something magical happens. . . I cannot praise this microphone enough. Don't wait-- buy it."
Mix, Michael Cooper, May 98

"This mic is my first choice for any vocal, reed instrument, electric guitar, or organ overdub, and for any source that would benefit from the thick low mids, creamy highs, and richness that only a tube mic can deliver."
EM, Myles Boisen, April 99



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THE BITSTREAM

ning at 133 MHz, can sustain 1,024 MB/s throughput. That's plenty enough guts for two channels of Ultra320 or one channel of Ultra640.

Dressed in the most fly logo in the computer industry, PCI-X will soon be winning the hearts of all the peripheral, chip set, system and development tool vendors for the same evolutionary reasons that Ultra320 and 640 will succeed: backward compatibility with high-performance and enhanced capabilities. A 64-bit implementation running at 133 MHz delivers over 1GB/s of data throughput. That's enough meaty goodness to take on Gigabit Ethernet. There is yet another feature to look forward to that's near and dear to my heart: Both PCI-X and Ultra320 will be adding hot plugging to their spec. No down time! Yee ha, that's cavalier computing for ya!

In case you haven't caught on to the trend yet, USB 2.0 is a faster version that maintains backward compatibility with the 1.1 stuff that's out there now. The USB designers have given names to the three operating speeds that are supported: Low, Full and High speed, corresponding to 1.5, 12 and 480Mb/s. Notice two things—first, the 40x speed differential between Version 1 and 2. Also notice that I'm talking about *bits* per second, not bytes. That 480Mb/s rate, even with new, advanced data packetization, yields a maximum transfer rate of 53MB/s, respectable by budget bus standards but still not the kind of thing you'd get out of an Ultra320 device. Of course, for the hobbyist/wannabe audio market, this is the perfect attach method since the cost is low and it provides legacy compatibility.

With the exception of USB 2.0, these next-generation products will first see service in professional products, not consumer stuff. And since we're professionals, we may never have enough time to get our jobs done but we *should* have enough money to buy best-of-breed, performance-oriented products to differentiate ourselves from the wannabes, right? So, what used to require prayer beads and arcane ritual to assure reliable operation will soon be as mindless as the lyrics of next year's Top 40 hits. Buses, they just keep on rollin'...

Oliver Masciarotte is a technical facilitator and consultant on content creation infrastructure. Reach out and touch him with questions or comments at bitstream@seneschal.net.



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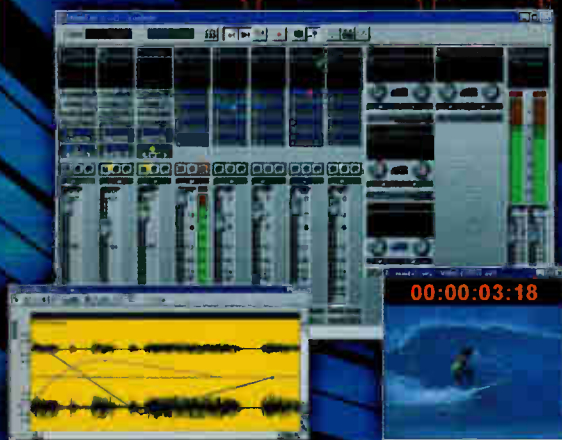


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NEW SOFTWARE/HARDWARE FOR AUDIO PRODUCTION



DISCMATIC 50-DISC DVD DUPLICATOR ▲

New from Discmatic (www.discmatic.com), the DVD DIAMOND is a 50-disc, fully automatic DVD duplicator. The unit comprises a Pioneer DVD-R drive and software that includes features such as Stream Job, for automatically copying multiple masters, and Image Job, which allows users to directly duplicate content saved as a UDF file (such as Sonic Solutions DVD Creator Imager) without the need for the master disc. The unit supports Windows 95/98, NT4 and 2000, and lists at \$13,950.

Circle 338 on Product Info Card

CREAMWARE LUNA 2496 DSP ▼

Creamware's (www.creamware.com) Luna 2496 is a 24-bit/96kHz I/O system for Mac and Windows featuring a PCI card, A/D/A converter and 24-channel mixing software. The card offers stereo analog and S/PDIF digital I/Os, and the converter has eight inputs and outputs; the system can be expanded to as many as 32 inputs and outputs. Drivers for ASIO, ASIO 2, EASI, DirectSound, MME, Triple-DAT, OMS and Sound Manager are built in, with a stated minimum latency of 2 ms. Luna offers 24 channels of mixing, with a 16-channel surround mixing package included. The system is \$998, or the converter box

can be purchased as a standalone I/O expansion for the Luna 2496 DSP system, PowerSampler and other Creamware products for \$598.

Circle 339 on Product Info Card

KIND OF LOUD DOLBY DIGITAL AND DTS ENCODER PLUG-INS ▶

Kind of Loud (www.kindofloud.com) announced the development of two 5.1 encoder plug-ins for Pro Tools. SmartCode Pro, which will be available in both Dolby and DTS versions, is an AudioSuite program that allows Pro Tools users to preview (in real time) 5.1 mixes created by Pro Tools and KOL's SmartPan Pro plug-in, then encode and decode the mix to create a 6-channel master. SmartCode Dolby Digital is \$995; SmartCode Pro/DTS is \$1,995.

Circle 340 on Product Info Card

XYTECH WEB BROWSER MODULE

Xytech Systems (www.xytechsystems.com), developer of facility management software, has introduced a Web Browser Module for its Enterprise facility management system, which lets clients such as film studios, production houses and satellite facilities access information over the Internet.

Circle 341 on Product Info Card

PROCREATION PRO TOOLS SESSION-BASED LIBRARY

The Procreation (www.procreation.co.za) Pro Tools Music Library system is a buyout package offering



limited-edition library music in the form of Pro Tools sessions, provided via CD-ROM. As each composition is saved as a session/arrangement, users can manipulate individual elements of the music. When the session/arrangement is loaded, the arrangement displays the composition BPM, and has grids to bars or measures, enabling "snapping to bar" for editing purposes. Frames per second, the key of the composition and a short description will be documented on the back tray sleeve for reference. Each track is cut in accordance with strategic loops/blocks.

Circle 342 on Product Info Card



STEINBERG MIDEX 8 USB MIDI INTERFACE

Steinberg's (www.steinberg.net) Midex 8 is an 8-I/O rackmount USB MIDI interface that's compatible with Steinberg's new LTB™ (Linear Time Base) technology. Midex 8 can be used with Macintosh and Windows operating systems running Cubase VST. Features include a single-cable USB connection, Mac and PC drivers and stated MIDI data transmission with precision down to 300 microseconds. Retail: \$399.

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RPK/REAL SECURE STREAMING MEDIA

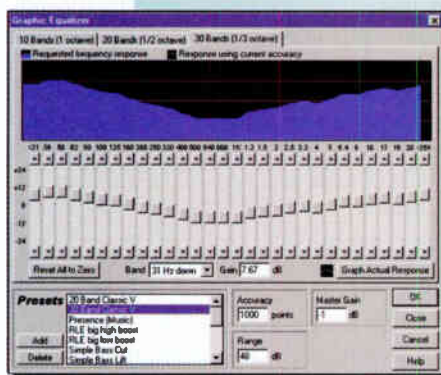
RealNetworks (www.realnetworks.com) will integrate RPK SecureMedia's Encryptonite Engine into RealServer 8 for secure, encrypted audio/video streaming and delivery on the Internet. The Encryptonite Engine is part of RPK's SecureMedia Software Toolkit, a cross-platform, scalable system allowing software developers to integrate authentication, digital signatures/certificates and key management in one algorithm. The engine will be included in the final release of RealServer 8, scheduled for the second half of this year. For more information, visit Real's Web site or www.rpk.com.

Circle 344 on Product Info Card

UPGRADES AND UPDATES

Just released: Waves' C4 multiband parametric processor for native platforms, including RTAS, Premiere, MAS and VST on Macintosh and DirectX and VST for Windows. Get details at www.waves.com...

New from Canford: a MIDI mains switcher and a MIDI distribution amplifier. The switcher features six operating modes, remote controllable settings and LED status indicators. The distribution amp feeds MIDI data simultaneously to 12 devices, and is available with either front or rear panel connections. Visit www.canford.co.uk...**ProEQ** (\$49), a new



Cool Edit Pro plug-in from Syntrillium Software, incorporates a 30-band graphic EQ, 5-band parametric EQ and a variety of filters, including notch, highpass and lowpass. Download a functioning demo at www.syntrillium.com...**QDesign** (www.qdesign.com) released Version 1.2 of its MVP application for recording



Connect ...
SpinAudio (www.spinaudio.com) now offers a pro version of its VST-DX

software. This new \$50 version supports 16- and 24-bit sound processing with any sample rate. Also new from SpinAudio is the **VST Skin-Rack 1.0**, a \$30 application that creates skin-based control surfaces to alter parameters of editor-less VST plug-ins. The applications are designed to integrate together easily and are available as a package for \$60...**The Opus music notation and publishing software package** from Sincrosoft (www.sincrosoft.com), which supports both Mac and Windows platforms, offers hundreds of scoring features, plus single- or multipart extraction, support for OMS and QuickTime internal synthesizer drivers, MIDI file export and up to 1,512 dpi print output...**Check out E-mu/Ensoniq's E-mu/Ensoniq Network**, a set of streaming Internet radio stations powered by **Wired Planet** (www.wiredplanet.com). The channels feature original compositions by E-mu and Ensoniq product users and in-house compositions and demos...**MCE Powerbook Products** has added an Audio Solutions Department to its online store, featuring products such as Digigram's VX Pocket and Presonus' Blue Max compressor. Visit www.powerbook.com. ■

from CD to QDesign Music, MP3 and MP2 files, playback of digital music and videos, and playlist management. New features in Version 1.2 (a free 30-day download is available at www.mysite.com) include conversion between audio file formats (QDesign Music, .WAV, .AIFF, MP2 and MP3); playback and encode/record support with QDesign's MP2; expanded MP3 support with mode, sample rate and bit rate control; and bug fixes and interface improvements. In conjunction with the release of MVP 1.2, QDesign has announced an online partnership with SpinRecords.com. Visit www.mvp.spinrecords.com for information...**Bit-Headz** (www.bitheadz.com) released Version 2.0 of the **Retro AS-1 software synthesizer** for Windows 95/98. Key features: optimization for Intel's SSE technology for increased performance, external audio input, support for patch name functionality within Cubase VST, Logic Audio and Cakewalk Pro Audio, and expanded options for audio and MIDI routing, plus a host of new effects. Also new from Bit-headz is Version 1.2 of the **Voodoo software MIDI drum machine**, optimized for the G4 and offering support for Digidesign's Direct-

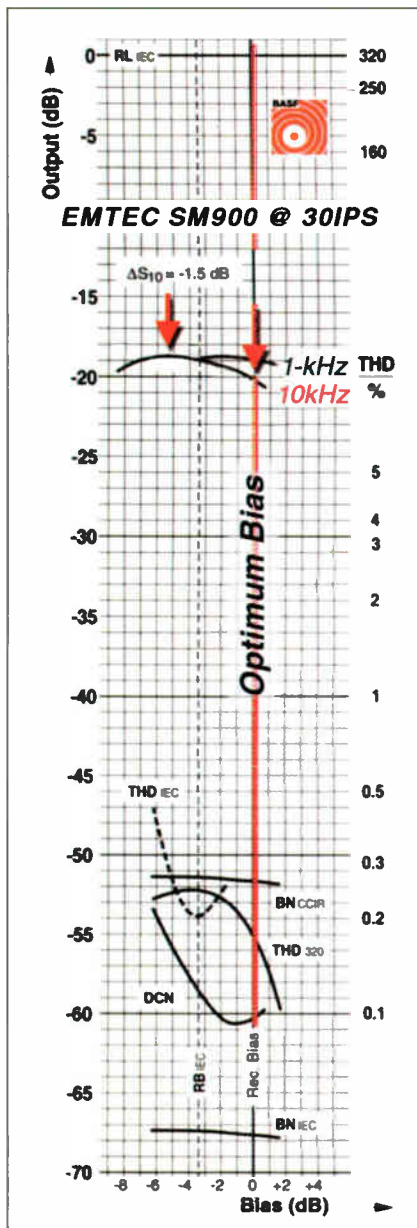


Figure 3: Bias vs. Distortion curves for EMTEC SM900 (Courtesy EMTEC Magnetics).

width, elevated levels and noise reduction in an attempt to find the best match for the material being recorded. The 15 ips 2-track on ¼-inch tape was once the norm, and noise reduction was a popular option. In the late '70s, 30 ips, elevated levels and “no-noise” were the trend until the '80s ushered in the ½-inch format, but that still wasn't quiet enough for purists who would rather not use noise reduction.

NOISE REDUCTION

It should be noted that there is nothing wrong with noise reduction (NR) other than the additional electronics required.

Be a purist if you want, but sometimes noise gets in the way. The “fault” of NR is that it does not tolerate frequency-response anomalies. Narrow tracks have exaggerated head bumps and reduced headroom at low frequencies. Headwear further antagonizes response at both ends, increasing low-frequency bumps and decreasing high-frequency response. This combination is deadly when NR is added, and narrow-format machines cannot be operated without it.

All machines have playback and record adjustments in the midrange at 1 kHz, but narrow-format machines often have no low-frequency (headwear compensation) adjustment and minimal high-frequency record EQ adjustment range. Tempting as it may be, bias should not be used to manipulate record EQ because its purpose is to minimize distortion. See Fig. 3, BASF EMTEC Bias vs. Distortion curves.

THE LAP DANCE

It is important to emphasize that head surface condition is a prerequisite to an electronic alignment. If the high frequencies waver or increase in level after applying some drag to the supply reel, look closely as the tape passes through the guides as well as between the capstan and pinch roller. Any up-and-down motion can cause the signal level to vary. More likely, a worn head has diminished tape-to-head contact. Increasing tape tension is not an option, especially when considering high head-

replacement prices.

Table 1 compares 24-track head prices from the manufacturer with those of a third-party source. Dizzy? Worn heads can be resurfaced or “re-lapped,” in this case for about 25% of the cost of a new head. To get the most head life, the machine must be well-maintained to minimize normal headwear. Poor mechanical alignment can cause the heads to wear unevenly; the “good” end is sacrificed to match the bad end in the lapping process. Head restoration specialists can determine head life, so have those heads checked before purchasing a used machine.

BASIC MAINTENANCE FOR ALL MACHINES

Use 99% (anhydrous) isopropyl or denatured alcohol on a cotton swab to clean the heads. Do not use rubbing alcohol, which is 30% water. To clean rubber parts, use only water-based cleaners such as Windex or Fantastic, dilute if necessary and wipe off the excess with a damp cloth. Formula 409 works well on ceramic capstan shafts but don't let liquid drip into the capstan bearing. Do *not* use “cleaners” designated for rubber parts or pinch rollers unless you are certain they are water-based. Some are solvents that can damage or prematurely age a pinch roller, and remember, parts are getting more difficult to find and more expensive with each passing year.

Table 1: Comparison of lapping charges to individual head prices (not a full head assembly or headstack) from the manufacturer (OEM) and from one third party (example courtesy JRF Magnetic Sciences).

Notes for Table 1:

1. All third party erase heads \$2,000-\$3,500 (except as noted below).

- 2. Erase head for 3M M79 is either Saki or PLX (\$1,850).
- 3. All third-party Ampex heads are by Flux Magnetics.
- 4. MCI, Otari and Studer heads are by PLX.
- 5. 3M head options are PLX and Saki (TDK).
- 6. Lapping charges are reduced \$135 if erase head is okay.

	Re-Lap	2-inch 24 OEM	2-inch 24 JRF
Ampex 1200	\$500	NA	\$2,000 \$2,500
Ampex ATR-124	\$615	NA	\$4,000 PB \$ 5,000 REC
MCI	\$495	NA	\$1,750
Otari	\$555	\$4,300	\$2,850
3M	\$510	NA	\$1,850
Studer	\$500	\$3,800	\$2,850
Tascam	\$495	\$1,600	NA

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*> H. D. Wells,
Bromley, England, 1899**



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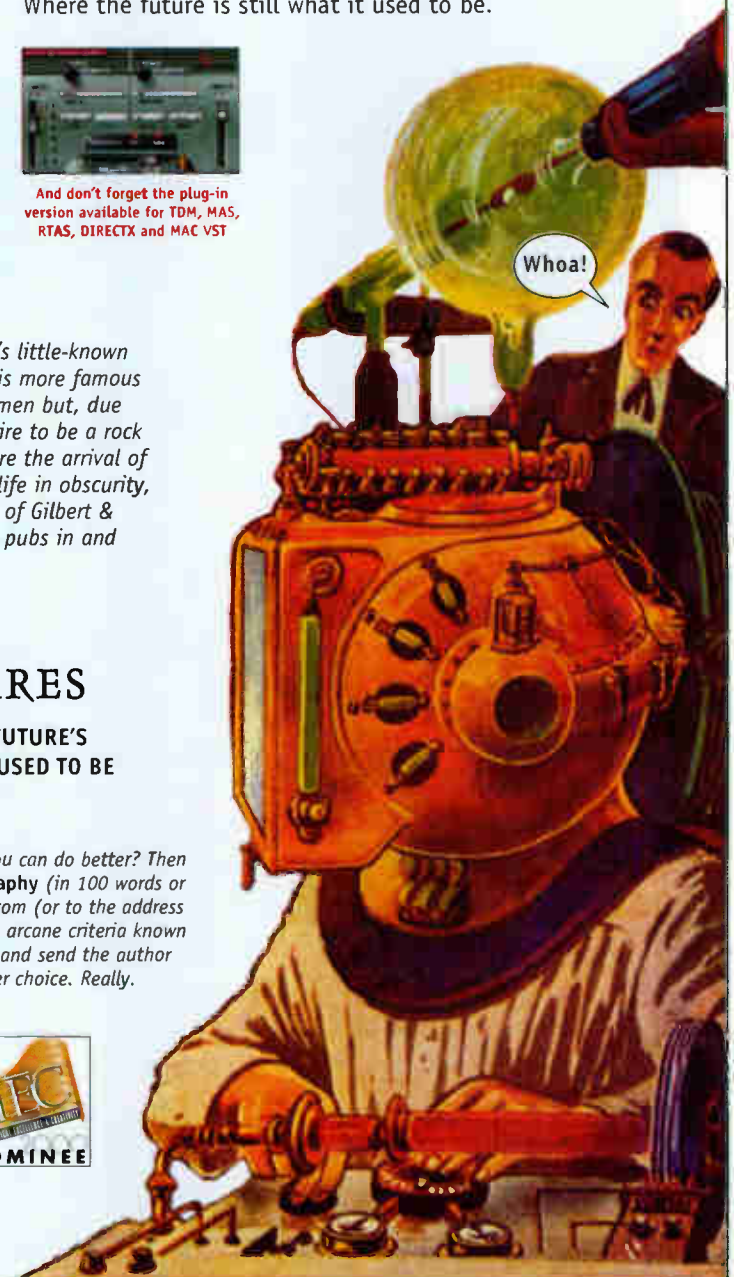
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H. D. Wells, H. G. Wells's little-known older brother, shared his more famous siblings's visionary acumen but, due largely to his futile desire to be a rock star fully 50 years before the arrival of rock, lived most of his life in obscurity, playing in a succession of Gilbert & Sullivan cover bands in pubs in and around Bromley.*

ANTARES

WHERE THE FUTURE'S
STILL WHAT IT USED TO BE

***OK, we made all that up. Think you can do better? Then send your own H. D. Wells Biography (in 100 words or less) to biography@antarestech.com (or to the address below) by October 1, 2000. Using arcane criteria known only to us, we'll pick our favorite and send the author a free Antares plug-in of his or her choice. Really.*



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DEMAGNETIZATION

The head assembly relies on electrodynamic magnetism to function. Static magnetism—as found in magnetic screwdrivers and loudspeakers—is the devil. Head demagnetization is considered routine maintenance, but only when performed by experienced personnel. Use *only* the R.B. Annis Han-D-Mag, as shown in Fig. 4. Throw away cheap demagnetizers with an on/off switch as these are extremely dangerous.

Before demagnetization, remove any tape from the machine and turn the

power off. Power-up the demagnetizer away from the machine, and do not remove power until the device is at least three feet from the machine. (I am being overly cautious, *and* I fully understand the inverse-square law.) Once powered, slowly move the demagnetizer tip toward the first head—the Han-D-Mag has a protective plastic tip—slowly moving up and down. Continue this motion while gradually pulling away from the heads until each has been demagged. Be sure



to demagnetize your tools before playing the test tape. Inexperienced demagnetization is more dangerous than doing nothing, so again, do not attempt this process unless you are confident. An experienced technician will surely show you how to safely use “the force.”



Figure 4: The R.B. Annis Han-D-Mag has a curved tip for hard-to-reach places.


TEST TAPES AND ALIGNMENT BASICS

Playback alignment requires reference tones from either a test tape or the “project” tones that accompany the master tape. A test tape is typically a full-track recording (across the full width of the tape). Unless a test tape claims “compensation for multitrack reproduction,” it cannot be used to set low-frequency playback level. *No* machine has a low-

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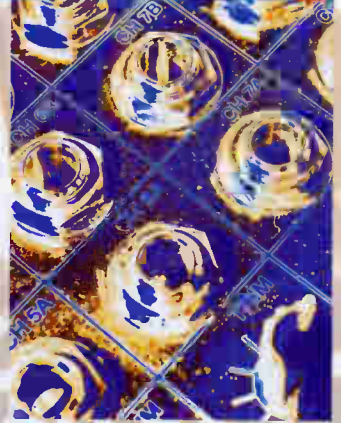
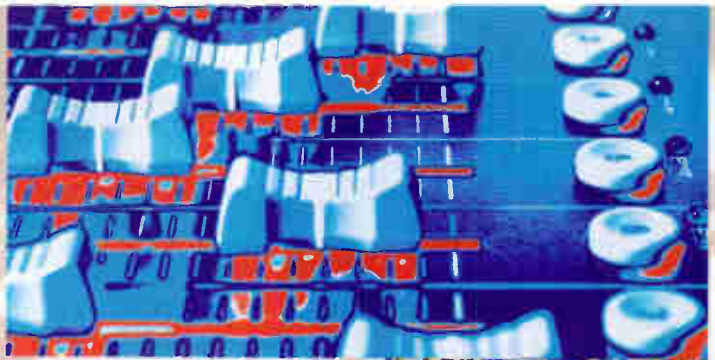
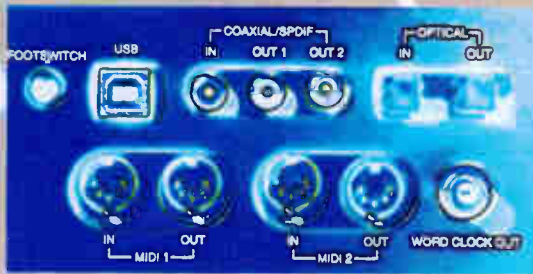
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CONDENSED SEVEN-POINT ALIGNMENT PROCEDURE

1. Check Playback Level (1 kHz)
2. Check Azimuth (8 and 16 kHz)
3. Check High-Frequency PB Level
4. Check Bias
5. Check Record Level (1 kHz)
6. Check HF EQ Level (10 kHz)
7. Record a Bass Sweep

On a three-head deck, record a bass sweep while monitoring via playback head. Align until peaks and dips fall on equal sides of “0VU,” then select a low frequency that falls on “0VU.” Print that tone, and note it on the box. Include the bass sweep if the tape becomes a Mix Master.

On a two-head deck, record a bass sweep. Check playback, noting the peaks and dips, then select a low frequency that falls on “0VU.” Print that tone and note it on the box. ■



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THE TECH'S FILES

frequency *record* adjustment. In nearly every instance, *accurate* low-frequency playback adjustments are made *after* first recording a bass sweep, which requires an oscillator capable of the same. On a three-head deck, it is possible to playback while recording. On a two-head deck, the process requires more patience. (Full alignment procedures will be detailed next month in Part Two of this article.)

The most important reference tone is 1 kHz for operating level, specified in nanoWebers per meter (nWb/m). The Equalization (EQ) Curve is specified as either NAB AES (American Standard) or IEC CCIR (European Standard). Make

sure the test tape you buy or rent is the correct speed and EQ for your machine. Most narrow-format machines are calibrated as per IEC CCIR with rare exception. The most common error is to attempt narrow-format calibration using an "American" NAB test tape.

Professional machines have a generously wide adjustment range, and many narrow-format machines have extremely limited range. Many Tascam MS-16s do not have enough range in the bias control to accurately find the peak at 10 kHz. Most Fostex machines have a continuously variable bias capacitor. Without a voltmeter or oscilloscope, it is possible to be on the wrong side of the bias peak.

Note: Modern high-output tapes are

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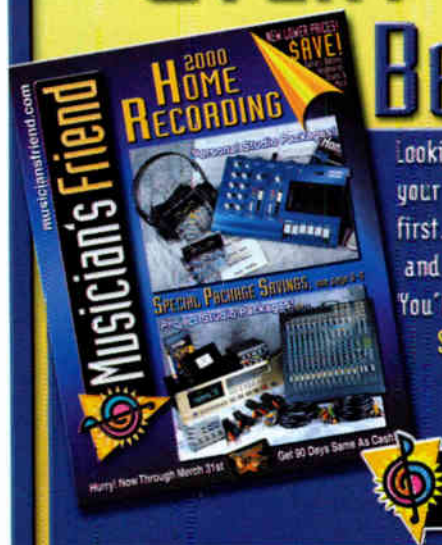
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not a good match for older pro or narrow-format semi-pro machines, which may not have enough current to fully erase previously recorded material. Compared to older generations of tape, modern tapes can be an additional half-mil thicker than the original "1.5 mils," for which the machines were designed. (One mil is 0.001 inches or 25.4 microns.) Thicker tape is harder to pull and, if tension is not adjusted, can cause more than the usual amount of headwear. Attempting to operate any narrow format machine without its integrated NR is not recommended, nor should the operating level be changed from the manufacturer's recommendation. While it may be possible to disable NR for selected tracks, there will never be enough headroom to sufficiently lower the noise floor for all tracks.

TRACK WIDTH PHENOMENA

The weaknesses of analog tape are also its strengths, but to compete with digital, the analog envelope has been pushed to new limits. The three high output tape formulations—BASF/EMTEC SM900, Ampex Quantegy 499 and the former 3M product, 996, manufactured by Quantegy as GP9—are not new, but when combined with the "recent" 1-inch, 2-track format, noise is at an all-time low and many of analog's idiosyncrasies are minimized. I won't say it's almost like digital. (Who said that?)

LAST LINKS

At this point, I have enough room to tell you to put up a new reel of tape, route an oscillator set to 1 kHz to all tracks, and press Record. (Noise reduction should be bypassed.) Observe input vs. playback, and note the differences. If input does not agree, you need a voltmeter to confirm that the incoming levels are good. Or route the oscillator to one track at a time to see if there is an improvement (much less fun). Follow the machine's instruction manual for record level and input calibration. Buy a manual if you don't have one.

The Web offers numerous useful resources. For more information about MRL and BASF test tapes, visit <http://home.flash.net/~mrltapes/> and www.emtec-magnetics.com. Quantegy (www.quantegy.com) also offers a really cool interactive site that can show you how to align for elevated levels. ■

Eddie Ciletti can be reached at www.tangible-technology.com.

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PREVIEW



M AUDIO ADAT INTERFACE ▲

The Delta 1010-AI from M Audio (www.m-audio.com) is an ADAT I/O interface for PC or Mac systems that can operate at up to 24-bit/48kHz. Containing a PCI host card, the 1010-AI may be used to replace the stock ADAT converters and also supports mixed-mode signal routing configurations between the PCI host card, 1010 external converter box, and an external ADAT. The unit supports simultaneous ADAT recording and computer playback, and all ADAT record and playback functions are via premium 24-bit converters. The computer input is analog/ADAT optical selectable; the Delta 1010-AI supports Win95/98, NT, Linux and Apple MacOS. Price: \$249.95.

Circle 327 on Product Info Card

MILLENNIA "STRAIGHT-TO-TAPE" MULTI-PROCESSOR ▲

Millennia Media's Origin STT-1 "Straight-to-Tape" mono multi-processor is a rackmount unit that merges Class-A vacuum tube and Class-A discrete circuit topologies. Offering the option of either tube or discrete circuitry in each stage—Millennia's Twin Topology—the Origin STT-1 includes mic, line and instrument inputs, 4-band parametric EQ, and compressor/limiter and

de-esser sections. A switchable audio path transformer section adds transformer coloration at the input stage. Front panel illuminated buttons engage either tube or discrete circuitry for input and dynamics/EQ sections, switch each processing section in or out, switch the EQ pre or post the dynamics section, and select EQ ranges and input gain. Additional switches select meter display (gain reduction or output level), output mute, phantom power and polarity reverse. Price: \$2,895.

Circle 328 on Product Info Card

YORKVILLE APEX MICS ▼

Yorkville (www.yorkville.com) intros four new mics in the company's APEX



line. The APEX 420 large-diaphragm condenser mic features cardioid and omni patterns, a 10dB pad and a 100Hz filter, all switchable. The APEX 420 is \$249, with

case, shockmount and pop filter. Other mics in the APEX Series include the 190 cardioid condenser instrument mic (\$119), the 165 cardioid condenser, with a shockmount gooseneck clamp for mounting to instruments and drums (\$159), and the 150 miniature cardioid condenser clip-on/lavalier mic (\$169).

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PRO CO MONITOR SWITCHER

The Switch Witch line-level signal router from Pro Co (www.procosound.com) offers a simple and effective

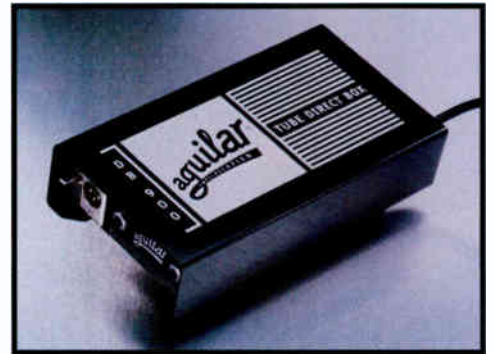
tool for switching a stereo signal among up to four pairs of powered monitors. Rear panel connectors include a pair of balanced XLR inputs and four pairs of balanced XLR outputs. Routing is selected by four front-panel

PDT miniature toggle switches. The rackmount unit is priced at \$349.99.

Circle 330 on Product Info Card

AGUILAR TUBE DI ▼

Aguilar Amplification (www.aguilaramp.com) offers the DB 900 tube direct



box. Featuring a frequency response of 10 to 40k Hz ± 0.5 dB, the DB 900 includes a single 12AX7 tube and a Jensen DBE transformer for a balanced output, ground lift switch, and $\frac{1}{4}$ -inch input and through connections.

Noise is rated at -98 dB and distortion at 0.025%. The unit operates on 110, 120 or 230 VAC. Price: \$529.

Circle 331 on Product Info Card

MEDIATECHNICS HIGH-PERFORMANCE CD-R DUPLICATOR ▼

Marcan (www.marcan.com) offers the Mediatechnics Impact IP8800 CD-R duplication system, a high-performance CD-R duplica-



PREVIEW



tor with an 800-disc capacity, automated loading and optional 12x recorders. Capable of copying up to 105 megabytes per minute per recorder (with 12x recorders, CD-ROM mode 1), the IP8800 stores up to 6 GB of master data. The scalable system may be configured with up to eight recorders and several printer options. Price for an 8x, 8-recorder system is \$13,450.

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LINE 6 RACKMOUNT POD PRO

Line 6 (www.line6.com) is now shipping the POD Pro, a rackmount guitar amplifier/cabinet and effects emulator. POD Pro reproduces the effects of playing an instrument through up to 32 amplifier models and 16 cabinet models and also includes 16 digital effects, including chorus, flange, rotary speaker, delay, reverb, tremolo and compressor. Up to 36 memory locations are available for saved amp/cabinet/effects combinations. Inputs are either instrument or line

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Circle 333 on Product Info Card

QUIK-LOK RACK STANDS ▼

Quik-Lok (www.quiklok.com) introduces the OR-110 and OR-120 Rack Stands, designed for signal processors and other rackmount gear. Features include all-steel welded construction, optional smoked glass top shelves and doors, heavy-duty casters, a wire manage-



ment system and perforated steel side panels for unencumbered airflow. Modular rear cross-bars allow for rack gear more than 21 inches deep. Available in 10- and 20-rackspace sizes,



Circle 333 on Product Info Card

SADIE EDIT SLATE WORKSURFACE

SADiE (www.sadie.com) debuts the Edit Slate Integrated LCD worksurface, a combined high-quality LCD and touch-sensitive graphics surface. Users may work directly on the LCD screen with a pen controller, which provides greater accuracy than a mouse and eliminates input delay; hot keys can be assigned for all features. The Edit Slate is a 1024x768 active TFT screen with a highly durable scratch-resistant glass surface; a PCI digital video card provides an additional monitor output. Edit Slate features 2,580 lines per inch tablet resolution and



262,133 colors in 18-bit. The 10.7x8-inch tablet adjusts to any angle.

Circle 334 on Product Info Card

CANFORD LOW-COST CONDENSER MIC ▲

Canford (www.canford.co.uk) intros the CSM41 large-diaphragm condenser mic, a budget-priced cardioid model featuring a 1-inch, gold-sputtered diaphragm; transformer output; and an internal bass roll-off switch (6 dB/octave @ 100 Hz). Supplied with elastic suspension and aluminum flight case, the CSM41 is complemented by Canford's new Pop Shield, which consists of two circular fine-mesh screens on a gooseneck stem.

Circle 335 on Product Info Card

ART GRAPHIC EQS

ART (www.artroch.com) has introduced two new, 2U rackmount graphic equalizers, the 352 EQ single-channel, 31-band, ½-octave graphic equalizer, and the 342 EQ dual-channel, 15-band, ⅓-octave graphic.

PREVIEW

Both units offer balanced XLR, balanced TRS and unbalanced RCA I/O connections and feature constant-Q filtering. Both also feature 70mm sliders (with center detents) switchable between ± 6 dB and ± 12 dB ranges. Each channel of EQ has its own signal clip indicator, output level control and meter, and the 352 EQ also offers variable highpass and low-pass filters. Both units operate over 95-250 VAC ranges, and are priced at \$389 each.

Circle 336 on Product Info Card

Z-SYSTEMS

LIGHTPIPE DETANGLER ▼ Z-Systems (www.z-sys.com) offers the z-8.8a Lightpipe Digital Detangler, a patch-bay and distribution amplifier for Lightpipe signals



that also converts ADAT optical format and eight channels of S/PDIF bi-directionally. With built-in defeatable sample rate conversion on all four S/PDIF inputs, conversion between Lightpipe and S/PDIF can be accomplished even when the S/PDIF sources are asynchronous or at different sample rates. The z-8.8a may be programmed for automated routing and provides up to 99 presets.

Circle 337 on Product Info Card

HOT OFF THE SHELF

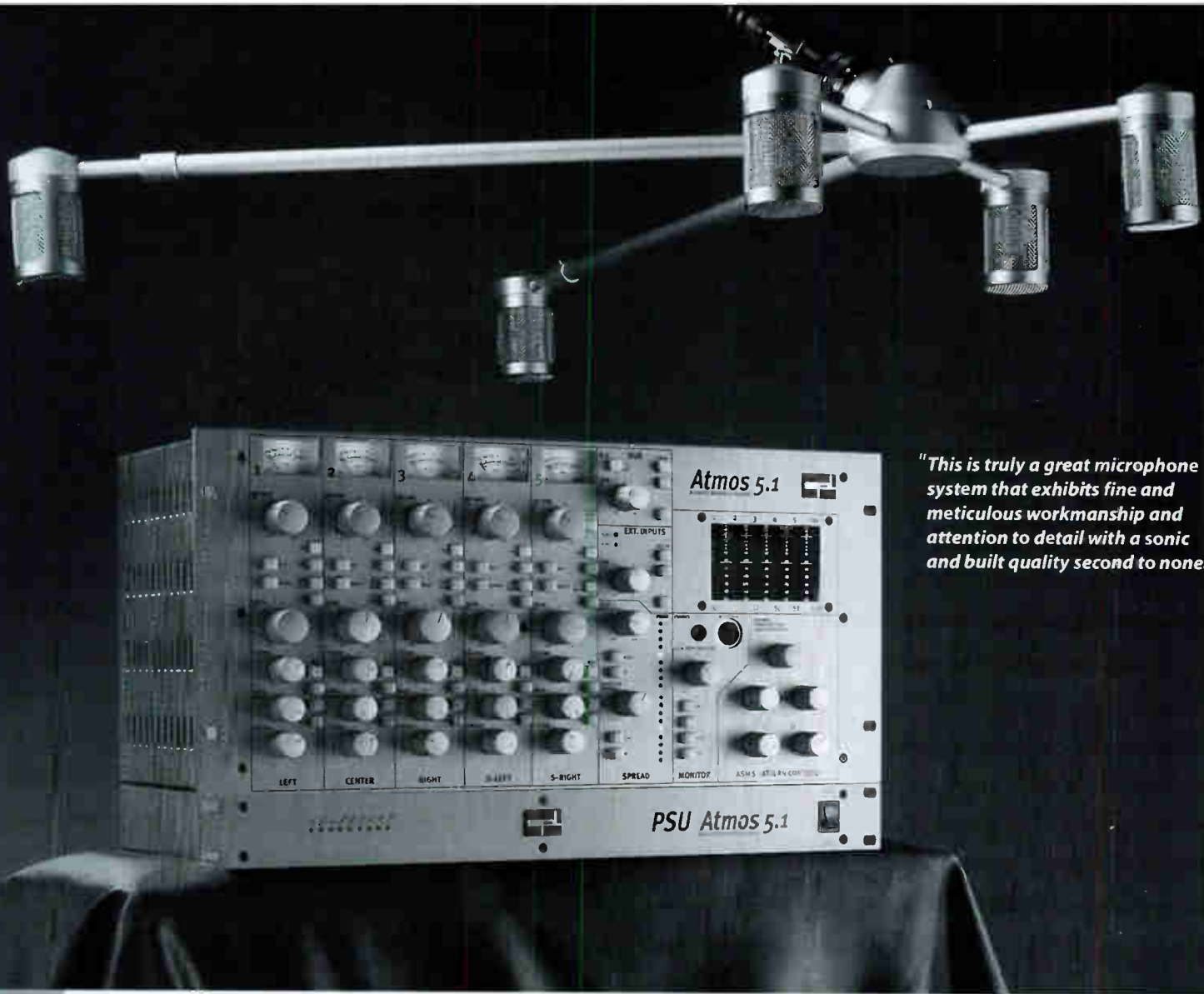
Now available from sound effects creator Frank Serafine, **The Serafine SFX Collection** is a 16-disc set of unique effects including such categories as Ambience, Doors, Electronic, Foley, Footsteps, Home/Office, Human/Animal, Industrial, Magic/Surreal, Metal, Recreation, Special FX/Sci-Fi, Transportation and Water. The full collection retails for \$1,395 (buy-out). For more info call 310/399-9279 or surf to www.frankserafine.com. TEF, a division of Gold-Line Inc., is now shipping TDS V4.0 Windows software for the TEF System 20. The software upgrade measures RT60 and %Alcons, and it speeds room reflection

analysis and delay setting. Current owners of DOS TDS software can purchase the Windows Version 4.0 upgrade for \$250 (\$450 to new users). Call 203/938-2588 or visit www.gold-line.com. Emmy-nominated 615 Music has added ten new production music releases to its Platinum series, including such titles as *Electronicity*, *Firestorm* and *Jump, jivin', Swingin'*. Each disk contains 12 to 17 themes, which are edited to varying lengths. For more information or to

listen to sample offerings, visit www.615music.com. The Comprehensive Video Group has published a 152-page color catalog detailing the company's many cable, connector, digital switch, and converter and accessory products. Call 800/526-0242 or click on www.compvideo.com. Klark-Teknik announces updated versions of the DN1414 multiple DI module and the DN1248 active splitter system: Both units now feature a rear blank panel covering a cutout measuring 140mm by 70mm, allowing users to retrofit their choice of multi-pin connector. The modification does not require extra rackspace and does not affect the price. For more info, call 616/695-4750 or visit www.klarktechnik.com. Allen & Heath is offer-

ing its new RTA software free—for a 14-day trial period. Features of the RTA software include pink and white noise generators and 1kHz, 10kHz and 100kHz tones. The Windows 95/98 application may be downloaded from www.allen-heath.com. West Penn Wire, a division of Cable Design Technologies, offers a 216-page color catalog that illustrates and describes the company's many cable products and accessories. Call 724/222-6420 or visit the Web site at www.westpenncdt.com. RackTools software from Middle Atlantic Products (MAP) al-

lows designers to quickly create professional specification drawings that incorporate MAP's studio furniture and enclosure systems. Based on the Visio design platform, RackTools allows the user to import AutoCAD room drawings and drag-and-drop MAP components to create proposal and layout drawings in minutes. Free to studio designers, the RackTools software is available at www.RackTools.com; registered RackTools users can get the latest files and updates free online. Call 973/839-1011 for more info. Sabine offers an online booklet on the hows and whys of digital delays, which discusses the acoustical concepts surrounding delay and includes examples. The booklet may be downloaded from www.SabineUSA.com. Telex/EVI and JBL Professional have joined Renkus-Heinz as distributors of EASE (Enhanced Electro-Acoustic Simulator for Engineers), a Windows-compatible software package for acoustic modeling. For more information on EASE features and functions, training seminar schedules, licensing and software updates, visit www.rh.com or call 949/250-0166. *A Designer's Guide to Instrumentation Amplifiers*, from Analog Devices is a new applications book packed with in-amp design and implementation tips for designers. For a free copy of the 66-page book, call 800/262-5643 or visit www.analog.com/in-amp-book. ■



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Bobby Owsinski / Surround Professional 2/2000



EVENT ELECTRONICS EZBUS

USB INTERFACE/CONTROLLER/DIGITAL MIXER

Digital recording systems keep getting more affordable, and the new EZbus from Event Electronics is an excellent example of that trend. Priced at \$849, EZbus combines a USB (MIDI and audio) interface for connecting directly to your PC or Mac, a console control surface for operating the onscreen mixers integrated into sequencers such as Cubase, Logic Audio or Cakewalk, and a digital mixer with 24-bit/96kHz converters. There are eight locate points, jog/shuttle wheel, recorder-style transport keys (for sequencer or MMC control) and fingertip access to volume, pans, aux sends, mutes and solos.

"Conceptually, we started from the idea that PCI-based computer recording systems were a total hassle. So USB became the obvious choice—just plug it in and go," says Event's Michael Marans. "The EZbus name stems from the fact that it's 'EZ' to use, combined with 'bus,' relating to its audio routing capabilities. We also wanted to let users get lots of audio into the system, whether they're creating a substantial mix for live, for monitoring while recording into a computer or for sending the whole shebang over USB."

Despite its affordable price, the EZbus is geared toward a variety of applications, from entry-level to gigging musicians to project studios to higher-end uses, such as a compact edit suite mixer/routers in post facilities. With that in mind, EZbus pays special attention to audio quality, offering pro touches such as 24-bit/96kHz converters, balanced inputs, low-jitter word clocking, asynchronous sample rate support and sample-rate conversion capability.

The benefits of USB interfacing—such as hot-swappable components, PC/Mac compatibility and 2-in/2-out record/playback at up to 24 bit/48 kHz over the USB link—are well known. However, EZbus is not entirely linked to computer-based audio, as the product can also operate as a full-function standalone digital mixer, featuring 18 analog inputs (16 TRS balanced line inputs and two mic preamps with phantom power); eight channels of ADAT Lightpipe I/O, stereo S/PDIF input and two independent stereo S/PDIF outs; main and alt stereo analog outs; 4-band EQ (two parametric bands and sweep high/low shelving); onboard programmable dynamics; and 32 snapshot memories of all parameters. The Lightpipe output defaults to provide direct outs of all primary channels for use as a front end for an ADAT or Light-



pipe-equipped audio card.

The architecture of the system supports eight input channels, each with level, pan, EQ and dynamics, plus four returns that can function as additional inputs. The Lightpipe or S/PDIF digital inputs can be routed through any of the eight channels, so, for example, ADAT input channels 1-2 could be routed to channels 7-8 and processed with EQ and dynamics. Four virtual sends per channel are assignable to any output. The I/O structure is essentially a matrix audio bus, with a large number of sources and destinations that can be tailored for a variety of applications.

To showcase EZbus' routing flexibility, Event's Dave Hetrick offered this scenario: "A keyboard player at a live show runs an entire synth rig through EZbus connected to a laptop—via USB—which is running Cubase VST and loaded with virtual synths. MIDI out from the player's keyboard controller connects to the MIDI in of the EZbus. That MIDI signal goes out USB and triggers the virtual synth in the laptop, with the synth's audio returning to a couple of EZbus channels via USB. That signal is mixed with your regular hardware synths (plugged into other EZbus channels). Then the EZbus Main Mix out goes to the house mixer, while the Aux out feeds the stage monitor system. Then route the output of the house mixer back into the EZbus, and send that signal out USB to the laptop to record your show."

But there's more: As a software-driven device, additional EZbus features are planned in future upgrades, loaded via USB—of course. Initial deliveries are slated to begin next month.

Event Electronics, Box 4189, Santa Barbara, CA 93140-4189; 805/566-7777; fax 805/566-7771; www.event1.com. ■

BY GEORGE PETERSEN

Digital Patching

(pun intended)

Are you caught in a tangle of AES/EBU, S/PDIF, and optical cables? Do you find yourself spending way too much time plugging and unplugging digital cables and trying to figure out how to make *this* device talk to *that* device? Then you need a **Digital Detangler**, the automated solution to your digital audio patching problems.

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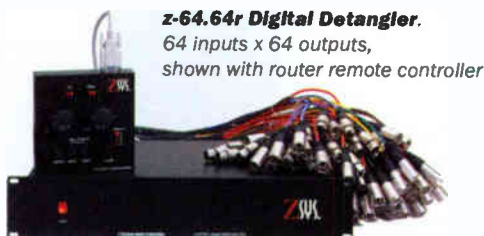
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z-16.16 Digital Detangler
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z-64.64r Digital Detangler.
64 inputs x 64 outputs,
shown with router remote controller

z-32.32r Digital Detangler. 32 inputs x 32 outputs,
shown with router remote controller



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MICROTECH GEFELL M 930

CARDIOID MICROPHONE

The sheer number of inexpensive, large-diaphragm cardioid condenser mics now available makes it hard to choose one, and the clamor caused by \$500-and-under mics has risen to such a peak that large-diaphragm cardioid condensers like the Microtech Gefell M 930 (\$795) tend to get lost. That's a shame because Gefell has been making quality mics for quite a while, and this one is no exception.

When I reviewed the Microtech Gefell M71 (the "Perestroika" mic) in November 1991, I said that for \$995, it was a low-cost alternative to Neumann, with an arguable link to the Neumann lineage. G Prime (then Gotham), had made arrangements with Microtech Gefell of East Germany to distribute three microphones—the UM 70S (\$1,150), UM 70 (\$995) and M 71 (\$795)—that were originally designed by Georg Neumann, were based on the M7 capsule and had been unavailable because the company was behind the Iron Curtain. Based on the success of those first offerings, G Prime has continued to distribute Gefell microphones that, not surprisingly, sound quite a bit like Neumanns.

The design of the M 930 is also based on the M7 capsule. Unlike the double-sided UM 70 Series, the M 930 is a single-sided capsule with one gold-sputtered membrane. The circuitry and capsule have been modified so that they remain shock-mounted in very little space. The mic is only 4.5 inches from tip to base, which makes it quite nice for getting into small spaces. It is remarkable for several other reasons. Its self-noise is a very modest 7 dBA. Its sensitivity is 21 mV/Pa, and its max SPL for 0.5% THD is 142 dB. Like the UM 70 Series Gefell mics, the M 930 employs a wedge-shaped head grille, although it is more truncated than the UM Series.

Oddly, the company logo has been placed on the back of the capsule. The body is made of steel and covered by multiple layers of electroplated finish: copper, a satin nickel finish, and then an optional bronze finish. The logo and model number are actually laser-etched into the bronze, allowing the lower layer of finish to show through.

THE SOUND

Using a pair of GML mic pre's, I found that my Gefell M 71 was about 10 dB less sensitive than the M 930. The M 71 also had audibly more self-noise. After adjusting for equal loudness, the frequency response curve of the M 71 had a bit more edge on the upper midrange and was perhaps slightly thicker in the upper bass. Maybe the thing for putting a nice edge on a voice track or muted instrument, but perhaps a bit too edgy for a horn part or an electric guitar cabinet—depending on the arrangement and intent, of course.

The fuller sound of the M 930 fell in line with G Prime's notes that showed the company had made this mic to have a fuller sound based on user requests. A quick look at the frequency response charts shows that while the bottom of the UM Series starts to roll off at 500 Hz and is down over 4 dB at 50 Hz, the M 930 doesn't start to fade until 200 Hz and is only 2 dB down at 50 Hz. On the top end, the M 71 hump is in the 4-to-11kHz range, while the M 930 hump is in the 6-to-16kHz range. In layman's terms the M 930 has less self-noise, more output, more sizzle, more thump.

I put the M 930 up against a Neumann TLM 103. At a distance of several inches or less, the mics sound remarkably similar. Their self-noise and sensitivity were vir-

tually identical. The M 930 has slightly more bottom and top, the TLM 103 a slight preference for the midrange, but slight movements and changes due to proximity effect made the differences difficult to detect. Both mics are equally prone to popping.

At a distance of two feet in a semi-damped acoustical environment, the M 930 had about four inches more reach. After I engaged a 75Hz 18dB/octave highpass filter, the reaches equaled out and the



BY TY FORD

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FIELD TEST

TLM 103 sounded slightly bigger than the M 930, a characteristic experienced as a slight thickness in the upper bass or lower midrange.

The cardioid patterns of both mics are practically identical, a generous 150 to 160 degrees, with very minor off-axis coloration, fairly tight nulls at the 90-degree marks and similar-sounding rear lobes. Sound entering the top of the head grilles was also very similar and not particularly ugly.

The TLM 103 is better isolated from external vibration and handling noise. The Neumann spider mount suspension is also more effective than the optional Gefell EH 93 suspension mount for the M 930. As a result, thumps to the mic booms were much more noticeable through the M 930.

IN CONCLUSION

The Gefell M 930 is a microphone you can sing into, speak into or put on an instrument or amp. Like most large-capsule condensers, it does have a noticeable proximity effect. It has a natural sound. It's not sparkly with lots of air, or particularly fat or thick. It's just there, and with a nice presence lift. If used in percussive environments, a better suspension mount might be needed. The M 940 hypercardioid and M 990 vacuum tube version of the M 930 are also available.

One final note: I was never able to get inside the mic to see the actual board layout, capsule and suspension parts because there was no obvious way to gain access. The seam between the body and the head grille implies that the head grille is either clamped or screwed on. After giving it a good twist didn't work, I gave up.

[Editor's note: Russ Hamm of G Prime notes that the ring between the body and head grille is threaded, and that Gefell adds a bead of glue during manufacture to seal the join.]

Microtech Gefell GmbH, Muhlberg 18, Gefell, 07926, Germany. Tel.: 036/649/82-262; www.microtechgefell.com. Distributed in the U.S. by G Prime Ltd., 1790 Broadway, Ste. 402, New York, NY 10019. 212/765-3415; www.gprime.com. ■

Ty Ford is a frequent contributor to Mix. He may be reached at www.jagunet.com/~tford.

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FOSTEX NF-1A

ACTIVE NEAR-FIELD STUDIO MONITOR

Monitors with internal amplifiers offer the luxury of bringing a fairly compact and familiar playback system to every studio in your engineering travels. The surge of 5.1 surround mixes has also created a higher demand for self-powered speakers. To fill this need, Fostex has manufactured an amplified version of the NF-1: the NF-1A. The design is as different as it is efficient.

A NEW LOOK

When I lifted one of the 25-pound monitors out of its box, I was surprised—not by the weight but by the woofer's truly unique appearance. I've never seen a speaker cone look anything like this: The cone does not have the usual uniform crater appearance, but is mountainous, with symmetry in the form of a five-pointed star. In addition, the edge of the woofer diaphragm has a novel design that is intended to eliminate unwanted anti-resonance through UDR (Up-Down Roll) construction. Upon looking at the woofer edge, I realize that "UDR" means that the woofer won't just move in and out, but that it may actually twist a bit as it moves with the sound. The elastic UDR edge may also extend the life of the



The NF-1As are two-way, active monitors, with a unique 5-point woofer cone design.

cone, while minimizing resonances returning to the cone from the entire enclosure.

There are two diffractive reflectors inside each cabinet to minimize internal standing waves. These reflectors are about 6 inches in diameter, and they, too, are pentagonal. Another unique detail is the fact that banana fibers are used in the combination of materials for the woofer, thus the off-yellow color. Fostex chose banana fibers because they are longer than other potentially usable fibers and have a

higher level of bonding strength when combined with the base pulp (wood) used to make the diaphragm. The tweeter diaphragm is urethane film laminated over cloth, touting a frequency range of as much as 40 kHz. The tweeter and woofer each receive 60W through bi-amplification.

CONNECTIONS AND CONTROLS

The back panel allows for connection via ¼-inch phone jack (-10dBV unbalanced input) or 3-pin XLR (+4dBu balanced input, with pin 2 hot). Two level control pots and three switches are recessed for ad-

BY DAVID OGILVY

Diffractive reflectors inside the cabinet minimize standing waves.



Lab Analysis: Fostex NF-1A Active Monitor

by John Schaffer and Rob Baum

PHYSICAL CHARACTERISTICS

The Fostex NF-1A active monitor's enclosure is a two-way, bass reflex design with dual, flared elliptical ports. The enclosure is made up of ¾-inch thick vinyl covered MDF on the sides, while the black painted baffle includes an additional ½-inch of thickness at the woofer. Transducers are recessed in the baffle and secured with wood screws. The interior sides and top of the cabinet are lined with ½-inch fiberglass, while the back and bottom each include "hyperbolic paraboloid" deflectors to damp standing waves and any internal back waves reflecting inside the enclosure. The amplifier compartment is isolated from the rest of the enclosure by the ¾-inch thick MDF.

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FIELD TEST

justment with a small screwdriver. The recessed design prevents inadvertent changes, although at times I felt these controls were too inaccessible. One level control is for tweeter SPL and is continuously adjustable from -3 to +3 dB, with a detent at zero. The other potentiometer is for overall power output and is also continuous in its travel (not stepped). This presented the only major drawback for me: Without a stepped level control, it is extremely difficult to exactly match left vs. right speaker volumes, especially with the pots as small as they are. Yes, I could set this output at maximum on

both the left and the right speakers (more watts equal cleaner sound), but then I end up keeping my mixer output well below unity gain to avoid getting blasted.

The switches for varying the speakers' EQ give us fewer choices than the potentiometers, but make left-to-right matching more uniform. An on/off Hi-Mid Attenuator drops the 1-to-5kHz range down by 3 dB, centered at 3 kHz. The Low-Frequency Filter Selector, with positions at -3 dB, 0 and +3 dB, affects the frequencies "around 60 Hz." The High-Frequency Filter Switch adjusts the frequencies "around 10 kHz" up or down by 3 dB. The legends on the back

panel are complete in the details of the functions of the controls and jacks, including three frequency response charts pertaining to the EQ switches. Half of the back is covered with the heat sink, which did not get overly hot after leaving the speakers powered up for a week of initial listening.

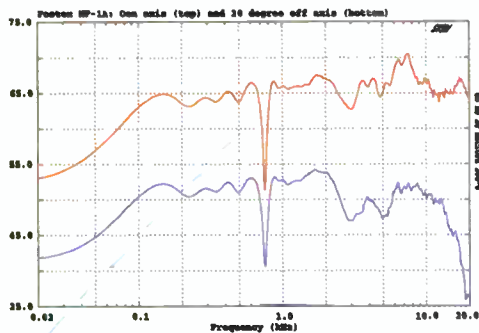
THE SOUND

I set up the speakers about five feet apart, with the tweeters at ear level. After sending a balanced pair of cables to the XLR inputs, I listened to a variety of music, checking for differences in DAT mixes that I've worked on. The EQ controls on the NF-1As were left flat

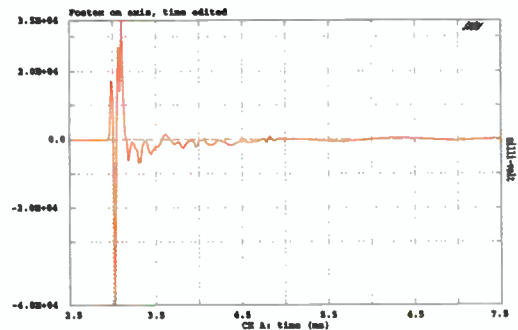
The visually impressive woofer design of this nearfield monitor blends new and old technology: The hyperbolic paraboloid cone design, which Fostex labels HP, is based on well-established structural engineering principles. Harry Olson used these principles to design a similar complex-topology loudspeaker cone for the RCA LCA-1A studio monitor and JVC also introduced a speaker system using a similar woofer cone in the 1970s. Today, in order to minimize weight but retain tensile strength, soft drink companies manufacture plastic bottles with hyperbolic paraboloid bases. The HP cone offers extended bandwidth (no puckering on

the extreme low frequencies and reduced breakup on the high end) and the cone and surround allow this transducer to operate well past 5 kHz.

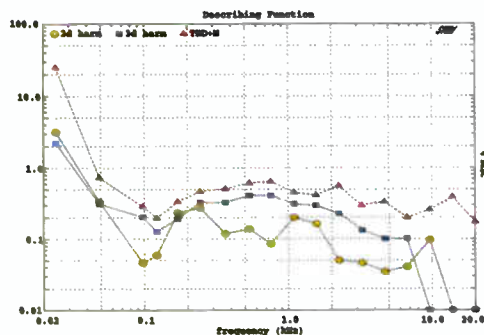
The foam surround is also well thought out. Fostex calls it a "UDR" (up down roll) tangential edge, which comprises alternating up half roll, down half roll sectors, divided by a tangential wall. (Tangential crease or pleat surrounds have long been used on tweeter and compression driver diaphragms in order to minimize diaphragm rocking modes.) Other key features on this cast aluminum frame woofer are double stacked flat 3/4-inch diameter spiders, a 1/2-inch di-



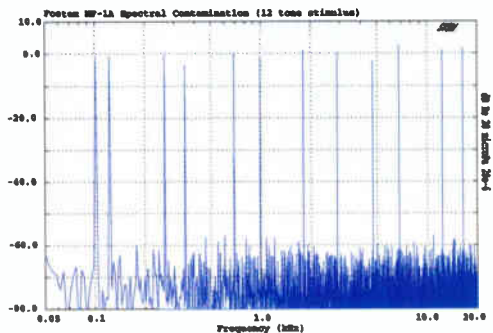
On-axis and 30° off-axis frequency response. Neither on-axis nor off-axis responses are flat. Note narrow notch at 750 Hz.



On-axis impulse response: Impulse response shows decent alignment of woofer and tweeter, but not great. Good decay, but not the smoothest.



Distortion vs. frequency. Very good distortion figures: less than 1% THD+N above 50 Hz, and mostly below 0.5%. Key: THD+N = Δ trace; 2nd harmonic = \circ trace; 3rd harmonic = \square trace.



This spectral contamination distortion test compares 12 non-harmonically related input tones (tall spikes) to the speaker output. The resulting non-linear distortion products (intermodulation, crossmodulation) are the lowest we've tested (about -60 dB).

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for these early impressions.

The sound of these monitors is pleasing—and natural in the upper frequencies. The NF-1As don't make the listener jump up shouting "everything sounds so much *better* through these!" This is as it should be; one does not want to mix with a speaker that is overly bright or makes the mix sound better than it might on a majority of systems. One needs to be able to hear details in the sound, and the versatility of the EQ controls allow one to tailor these monitors to suit their needs.

The bass is quite impressive for this size enclosure. Small speakers often overcompensate for their lack of bass with a design that allows the cabinet to resonate at about 50 Hz, pumping the resonating frequency out in an ugly way. The NF-1As steer clear of that common flaw. The bass sound is wonderful, and it's amazing how well they play back 808s and other low-frequency elements from hip hop recordings. The kick didn't pummel me over, and I enjoy the full roundness and uncolored strength of the five-string bass and 808—clear and deep. I never needed to use the +3 setting on the Low Frequency EQ (although it could come in handy to check for the effect of a potentially speaker-damaging mix, as most listeners tend to turn up the bass on their car systems).

While familiar mixes translated quite well through the NF-1As, there is still a hint of difference in the realm of the upper-mids. I heard sidesticks and clave clicks at slightly higher than the level I gave them during the mix, although this was a subtle difference. A tiny bit of hiss also emanates from the speakers when no music plays. However, the NF-1As provide enough clarity and depth to reveal the true textures of various reverbs and effects. The imaging was excellent, especially while listening to an analog recording of a New Hampshire thunderstorm, in which I could hear each raindrop fall in specific locations.

After using these monitors with all the EQ settings flat for a couple long days of overdubbing, I didn't experience an unusual amount of ear fatigue. Listeners at the session remarked that the NF-1As didn't sound "near-field," which meant that they enjoyed the detail and frequency response, even when standing back a bit. My most common complaint about near-field speakers is that the band, while standing at various distances around the control room, does not hear the details that the engineer in

the sweet spot hears. The frequency dispersion of this monitor is respectable and maintains an even tone throughout the room.

To recapitulate, I definitely enjoyed the sound of these speakers. (Yes, I wanted to keep them.) Flat response, clear bass and great imaging translate well to other speaker systems, and the extensive high frequency response can be adjusted to your taste. I only wish that the level controls were stepped, instead of continuously variable. In the past, Fostex has provided products that

are both affordable and reliable—a difficult combination. That tradition continues with the NF-1A, which at \$899 each, offers an excellent alternative to other powered monitors.

ACOUSTICAL CHARACTERISTICS

Measurements on this system were made using a SYSid test system, Earthworks M30 microphone and Lab 101 mic preamp. The speaker was supported on a K&M 21300B Crank It Up speaker stand. Our measurements showed that the frequency response of the Fostex NF-1A is not "flat," despite its very low distortion measurements. From 200 to 2k Hz, the on-axis response rises 3 dB, with a narrow band valley centered at 750 Hz. From 2 to 3 kHz, the response falls off 4 dB, and then climbs 8 dB to around 7.5 kHz. After 7.5 kHz, the response falls off again by 4 dB up to 15 kHz. The 30° off-axis response follows that of the on-axis until 1 kHz, where it falls 3-dB/octave to that of the on-axis. At 10 kHz, the off-axis response equals that of the on-axis then falls off sharply after that.

The impulse response shows decent alignment in time between tweeter and woofer, but not perfect. The decay is damped, but not smooth.

Now the good news. Besides the cone technology, the major highlight of this monitor is its very low distortion. The Fostex NF-1A studio monitor is the lowest distortion speaker we have tested to date. Above 50 Hz, the THD is less than 1%, with most of the spectrum under 0.5%. The multi-tone spectral contamination test looks at the system's intermodulation and crossmodulation products ("self noise"). Once again, the spectral contamination is the lowest we have ever tested, with the noise floor being around 60 dB down from the input tones.

The Fostex NF-1A has likely been designed to emulate commodity loudspeakers used in portable combo systems and is probably best suited to producing a reasonable impression of what mixed material will sound like in the real world. But with the judicious use of a parametric equalizer, the NF-1A can put out both a flat response and super clean sound. ■

John Schaffer and Rob Baum are engineers associated with Menlo Scientific, an independent test facility in Berkeley, Calif. For information on testing methodology, visit www.mixonline.com.

Fostex, 15431 Blackburn Ave., Norwalk, CA 90650; 562/921-1112; fax 562/802-1964; www.fostex.com. ■

David Ogilvy is a producer/engineer and enthusiastically makes field recordings of sound effects and ambiences. P.S. The Fostex woofers did not smell like bananas.



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DIGIDESIGN BRUNO/RESO

REAL-TIME EFFECTS PLUG-INS FOR PRO TOOLS

There are a lot of great TDM plug-ins available, but most of these are designed as day-to-day work tools (compressors, EQ, gates, tube emulators, etc.) and aren't suited for serious sound mangling. During those times when we need to morph, mutate and warp a track into something entirely new and different, only a truly twisted plug-in will do—you know, the kind where what goes in sounds nothing like what comes out. Although we're seeing more and more plug-ins of this ilk, really good manglers of the TDM variety are still rare. Up steps Bruno/Reso, by Digidesign, an innovative real-time plug-in dedicated to mutilating your waveforms.

Bruno/Reso is actually two separate plug-ins, Bruno and Reso, bundled together because of their similarities. The plug-ins have look-alike user interfaces and employ the same sound generation algorithm, dubbed cross-synthesis. This technique takes an audio track as its basic tone source and runs it through a variety of synthesizer-type effects (e.g., amplitude ADSR, filtering, glide, detune, etc.). The resulting sound can then be played via a MIDI keyboard, or other controller, just as you would any other polyphonic synth.

FINDING YOUR TONE

As usual, Bruno/Reso comes on a CD-ROM and is copy-protected via key disk. Running the installer program from the CD-ROM puts both plug-ins, Bruno and Reso, into your DAE folder's Plug-Ins folder. Upon booting your application, straight mono and mono-to-stereo versions of each plug-in will appear among your insert choices.

Bruno and Reso can be inserted on any audio or aux channel, just like other plug-ins. However, unlike most plug-ins, you won't hear a sound right away. A signal



Bruno and Reso look alike but treat source material in different ways.

isn't passed through Bruno or Reso until a note is received. As mentioned earlier, the note can come from a MIDI controller, assuming, of course, you have a DAE-compatible MIDI digital audio sequencer (e.g., Digidesign's Pro Tools 5.0 or Emagic's Logic Audio 4.0). If you're working in an audio-only application, not to worry, the plug-ins sport a handy onscreen keyboard. It's fine for clicking on single notes, and a Latch feature allows you to hold a chord, but forget about doing any fancy licks.

Each plug-in requires an entire DSP chip, specifically, an SRAM chip. With three SRAM chips per MIX card, this allows up to three instances at once. The plug-ins are optimized for MIX cards to provide a full 24 voices of polyphony. DSP Farm cards only provide eight voices of polyphony.

There aren't a whole lot of presets to get you started: Bruno has 11 and Reso only has six. None of them are particularly impressive, but then, what the presets sound like is dependent on your source audio track. For a quick first im-

pression, check out the demo that comes on the installation disc. It does a decent job of demonstrating the plug-ins, although it really only scratches the surface of what is possible. Ultimately, it's up to you to get down and dirty, tweaking parameters to really get the most out of this software.

FACE TO FACE

The difference between Bruno and Reso lies in the way they treat the audio source track. Bruno employs a time-slicing effect, grabbing chunks of the source track and crossfading them together. This creates a sound that is full of movement as timbres are continually smeared and blended over time, much like the old PPG or Korg Wavestation. Reso synthesizes new harmonic overtones directly from the source audio. The results range from underwater bubble tones to harsh metallic bleeps and wah-wah effects on speed.

The front panels of both plug-ins are clearly laid out into four sections: Timbre, Pitch, Amplitude and Voice. The Amplitude and Pitch parameters for Bruno and Reso are identical. In the Ampli-

BY ERIK HAWKINS

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Richard Battaglia with AD-8000 Special Edition units at Béla Fleck's Nashville studio.



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FIELD TEST

tude section, there's an ADSR envelope that you can shape by clicking and dragging breakpoint handles or through direct numerical entry. There are also controls for overall gain, wet-to-dry effect ratio and stereo spread. The envelope is used each time a note is struck and is velocity sensitive. The Pitch area contains portamento, bend amount, detune, and master tune parameters. The detune amount can be controlled by velocity—a cool performance trick—call it the detuned crescendo effect.

The plug-ins can function in either mono or polyphonic modes and feature voice stacking in numbers of two, four, eight or 24 (that, obviously, is mono by default). These parameters are found in the Voice section. Reso also sports LPF controls in this area. There are knobs for adjusting frequency, Q and envelope follow.

Reso's Timbre controls include resonance and high-frequency damping for taming the resonator's edge. Both parameters are velocity sensitive. Harmonics can be dialed in as all, odd only or toggled between these two settings. The

Timbre section on Bruno contains a crossfade dial for adjusting the rate at which slices are culled from the source track and faded together. A Switch LED flashes green when slices are butt-spliced rather than crossfaded. More switching and less crossfading makes for a choppy, more rhythmic, effect. The amount of switching is determined by the dynamics of the source track or an outside source.

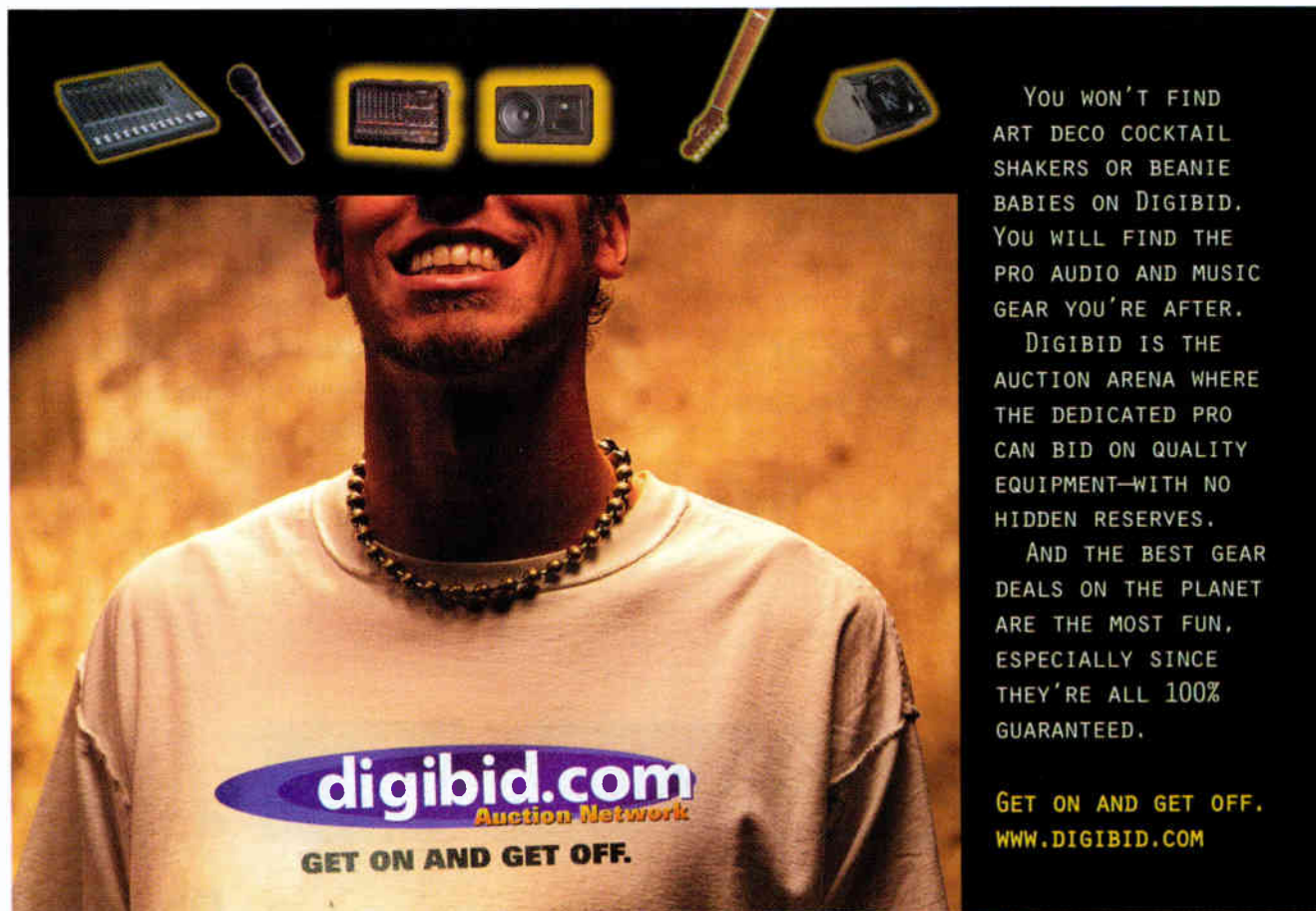
One of my favorite things about Bruno and Reso is that they respond to key input and MIDI beat clock. Bruno's time-slicing effects—the switching I just mentioned—can be controlled by these sources. These signals can also control the timing of Reso's all- and odd-harmonics switching. A threshold knob lets you adjust when the switching will take place, and another dial lets you choose MIDI note values. Note selections are $\frac{1}{4}$, $\frac{1}{8}$ or $\frac{1}{16}$ and include dotted and triplet values. I was disappointed that $\frac{1}{2}$ notes aren't included, as this is a popular division for drum 'n' bass-type riffs. Nevertheless, having all these triggering options available opens up a whole world of ambient groove effects.

RESONATING HARMONIES

The types of effects that you can cook up with Bruno/Reso are definitely useful, especially if you're into electronica or trance music production. If this is your bag, I highly recommend checking it out. Hardcore sound designers may also find it interesting, particularly for dark, droning background noises. If more traditional music production and recording is your gig, this plug-in probably isn't for you—but you never know, you might find it inspiring. At \$395, the package is a fraction of the price of a comparable hardware unit. I have a feeling we'll be hearing this plug-in more and more, whether we know it or not, in contemporary arrangements. I know I'll be using it.

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Erik Hawkins is a musician/producer working in Los Angeles County and the San Francisco Bay Area. Visit him at www.erikhawkins.com for more equipment chitchat and tips on what's hot for the personal studio.



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ELECTRIX MODS

MODULAR PERFORMANCE EFFECTS

Canadian manufacturer Electrix, a division of IVL Technologies, expands its line of performance-oriented analog effects with the half-rack-space Filter Queen and EQ Killer Modular Performance FX units or MODS. These join the three flagship Performance FX units Electrix introduced last year: the Mo-Fx multi-effects, the Filter Factory stereo filter and the Warp Factory vocoder. The MODS are half the size of the others and just as packed with special effect possibilities for the musician, DJ, remixer or engineer who wants to add an individual performance dynamic to special effect treatments. The Filter Queen and EQ Killer forego the MIDI implementation and the multi-effect capabilities of the Performance units in favor of a more stripped-down and straight-ahead approach: These units diverge from a lot of studio processors by providing quick and extremely striking results for any user at any experience level. High on the instant gratification index, they use large, momentary “engage” buttons to allow you to “play” the effect you have dialed up. You also get smaller latching engage buttons, and both buttons are surrounded by red LEDs for fun.

FILTER QUEEN

The Filter Queen is an analog, stereo high-order filter with digital control. Electrix uses the word “vintage” to describe the filter’s traditional synthesizer VCF sound. The Filter Queen uses two 2-pole filters in stereo mode—or you can chain them together for a single 4-pole filter with a push of a back-panel button. I wish the button was on the front panel, but I do like the fact that the unit automatically combines the stereo signals to mono. I also appreciated the way that the Filter Queen and the EQ Killer are powered by external

Electrix’s EQ Killer and the Filter Queen pack a sizable punch into half-rack units.



16 VAC power supplies that are on the end of AC cords instead of “wall wart” modules that can eat up three available plugs on your plug strip.

There are both RCA and ¼-inch jacks for line-level left and right inputs and outputs on the back panel, and you can switch to phono inputs for direct connection to a turntable. The unit will handle up to +18 dBu at line level and up to -20 dBV at the phono inputs. Maximum output level is +18 dBu. There are also jacks for foot switch operation of the engage buttons and a jack for an expression pedal such as the Roland EV-5. The external pedal will control the filter frequency for wah-wahing or notch filter sweeps.

There are four filter types on the Filter Queen: lowpass, highpass, bandpass and notch. All filters are 12 dB per octave, or a more pronounced 24 dB per octave in 4-pole mono mode. The filter covers a 12-octave range from 10 to 20k Hz with just a single knob (one of the advantages of digital control). There is a Resonance control with negative values that smooth out the filter just as positive values make frequency changes much more pronounced, right up to feedback whistles. I

liked the bandpass for wah-wah or Mutron effects: The notch is deep (in 4-pole) and ends up sounding like a whooshing phaser or flanger effect. The lowpass is great for rolling off superbright sounds, and the highpass is great for “lo-fi” two-way-radiolike effects in which all the low frequencies are taken away. A single, large momentary push button or a latching smaller button switches the effect on and off, and an effects mix control blends the amount of effect with the original signal.

The filter can be manually modulated with the knob or pedal, envelope follower, or LFO. All three modulation methods are possible at the same time for the wackiest effects. The knob is great for just grabbing and twisting at a given moment, as is the pedal for hand-free guitar or keyboard playing. This can be the ultimate wah-wah pedal that you can use for any instrument or pre-recorded track.

The envelope filter has just three very effective controls: Depth or threshold, Release time (or the time it takes the filter to return to an unmodulated state) and a Band Select button for choosing any combination of

BY BARRY RUDOLPH

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three frequency bands the envelope follower will trigger on. For the most part, I always use All Bands since I want the filter to follow all frequencies. A nice addition would be an external input for the envelope follower, but then the unit would start to compete with much more expensive units like the Sherman FilterBank or the Mustronics Mutator.

The LFO frequency range is from 0.05 to 30 Hz, with five waveforms available. I think the LFO waves chosen make the Filter Queen sound different from other filters I have used. There is no sine wave, and at first I thought this strange, but I soon found the sawtooth wave works the same—just more linear and a little less subtle. The sawtooth and inverse sawtooth waves give you either sudden or slow trailing, edged sweep envelopes, and the square wave is good for an on/off, gating effect. The triangle has a pronounced peak in the middle of the sweep evolution, while the random mode just mixes and matches all the waves together for a chaotic or random modulating effect.

EQ KILLER

EQ Killer, the second of the two MODS I reviewed, is a 3-band equalizer with a twist. You can boost the low, mid or high bands up to +6 dB and cut to infinity. Each of the three bands has the large momentary and smaller latching push buttons to “band kill” each band separately. There is another pair of buttons to toggle the entire unit in and out of circuit. Instead of separate frequency controls for each band, the EQ Killer uses two crossover controls called Low X-Over and High X-Over. Low X-Over adjusts from 40 to 2k Hz to set the crossover point between the low- and the mid-band sections. High X-Over adjusts from 200 to 20k Hz for setting the crossover between the mid- and high-band sections. Called me old-fashioned, but I would prefer to just have three separate frequency controls, one for each band—then you could have three distinctly separate EQ sounds ready to go without overlap. I also would have put the momentary engage buttons at the bottom of the front-panel unit instead of in the center, for better access. The EQ Killer also uses RCA jacks only, another problem for me in the studio

having to adapt to ¼-inch or XLRs.

I found the EQ Killer to be really the tool for setting steady-state filter shapes for vocal, synths and percussion sounds. The unit has an effects send loop where the killed bands can be sent to another effect, channel or speaker in the case of club mixer. Like the Filter Queen, the Killer has both input and output bicolored LED level indicators and power-on LED. The Killer has two sets of inputs you can toggle between or use has a master bypass when only one input is used.

With loads of setup examples in the multilingual instruction manuals and at Electrix's Web site, both the Filter Queen and EQ Killer offer a lot at \$299. With their powerful and unique all-analog processing, these little units should be mainstays in any DJ's or remixer's rack.

Electrix, a division of IVL Technologies, 6710 Bertram Place, Victoria, BC, Canada V8M 1Z6; 250/544-4091; electrixinfo@ivl.com; www.electrixpro.com. ■

Barry Rudolph is an L.A.-based recording engineer. Visit his Web site at www.barryrudolph.com.

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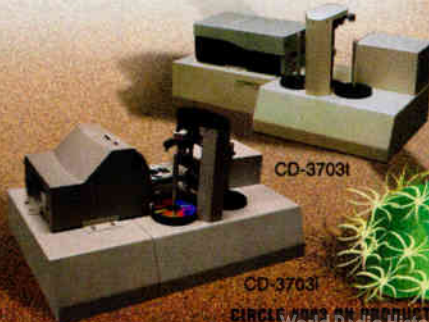
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NEUMANN SERIES 180

CONDENSER MICROPHONES

Neumann's new Series 180 condenser microphones consist of three models: the KM 183, KM 184 and KM 185. Available in either matte black or silver nickel finishes, the three mics offer a range of pickup patterns to accommodate any recording or live sound situation. The omnidirectional KM 183 and cardioid KM 184 microphones are successors to the KM83 and KM84 models (popular in the '70s but no longer manufactured). The KM 185 is the new hypercardioid variant. Unlike the KM100 Series, these mics do not have interchangeable capsules and thus sell for a lower price.

All three of the new mics are based on KM100 circuitry and are 48-volt phantom powered, although a new DC-to-DC converter changes the 48 to 60 volts and provides a more stable polarizing voltage. A side benefit is that the mic's transformerless output is more forgiving of the unbalanced inputs of consumer gear.

The KM 183 has a boost of ap-

**Neumann's Series 180 Mics (L-R):
the KM 184, KM 185
and KM 183.**



proximately 7 dB at 10 kHz in the free field but a flat frequency response in the diffuse sound field. Just like the KM140 microphone, the KM 184's response starts to lift at 9 kHz, which means that the new KM 184 is brighter than the original KM84. This characteristic has been achieved by slightly modifying the capsule's rear opening, rather than by electronic means. Compared to the KM84, the KM 184's dynamic range is increased by 21 dB, self-noise is reduced to 25 dB (CCIR), and the new mic can handle SPLs up to 138 dB.

The KM 185 hypercardioid features a 10dB front-to-back-to-side rejection—minimum sensitivity is at 120° off-axis. The pressure gradient transducers in both KM 184 and KM 185 provide for smooth frequency responses, not only for the on-axis sound, but also for off-axis sounds.

LET THERE BE DRUMS

The 180 Series mics' small size makes them perfect for miking acoustic and string instruments, or getting in and around a drum kit. I have always favored close-miking drums with condensers for light-to-moderate playing—I find that condensers pick up more of the subtleties of a drummer's technique—although they may not be the best choice for bashers. For this Field Test, I used two KM183s for overheads (one over the ride cymbal/floor tom side and the other over the snare/hi-hat side), a KM 184 for the snare drum close mic and the KM 185 for the hi-hat.

The drum recording room was small, and I found the omnidirectional overhead mics picked up a lot of reflections from the wood paneling and floors, positively influencing the instruments' tonality. The mics ended up being about two feet above the highest cymbal, but even this close, the omnis captured more

of the room sound than the pair of cardioids I normally use. To get a little drier sound, I just moved the overheads closer in six-inch increments and reduced mic input gain. A nice feature of omnis, of course, is that there is no change in the proximity effect when close-miking.

I did have to experiment with the lateral spacing of the overheads, as I heard some phasiness when I first placed them about four feet apart. Moving them closer together solved the phase problem, but I have to admit I did like the extra wide sound when they were farther apart.

I placed the KM 184 cardioid close in on the snare drum, where it provided plenty of sparkle, obviating the need for high-frequency EQ, although I did add a couple dB of boost at around 3 kHz to fit the song. If there was ever a place to test a condenser mic, two inches from a rock snare drum is it! The KM 184 had absolutely no trouble at all, even when my flailing drummer tagged the mic's body right on the Neumann logo. Aside from a loud crack on that particular back-beat, the mic kept on working. I also A/B'd the track before and after the accident and noticed no sonic differences, nor any change in the waveform (scrutiny made possible by Pro Tools). I also noticed that none of the mics got "soft" after hours of use.

The KM 185 hypercardioid worked wonderfully on the hi-hat, picking up only minor leakage from snare and the rest of the kit. Because of its pattern, I could put the mic a little farther away to pick up the total sound, which sounds better than putting the mic extra close to minimize leakage. Also, unlike a lot of other mics, the KM 185 also did not "fold up" or get strident under the dynamics of good hi-hat playing. Again, little or no EQ was required here for a crystal clear sound. As is my preference, I did roll out some low frequencies to reduce the

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SEK'D SAMPLITUDE 2496 V. 5.57

MULTITRACK AUDIO, MIDI AND CD MASTERING FOR THE DESKTOP

It's a tired subject, but the Windows vs. Macintosh debate comes up every time an audio or music program pushes either platform's envelope with a significant upgrade. Each has its devotees (and its limitations), but whether you're a Mac addict, PC purist or simply undecided, the souped-up engine and new paint job on SEK'D's Samplitude 2496 (Version 5.57, \$799) speaks volumes for the Wintel side.

SAMPLE THIS

Its name suggests a blissed-out software sampler, but Samplitude is a potent PC audio recording, editing and CD-mastering platform that has just integrated MIDI tools, GUI enhancements, expanded file support and more. With additional new features such as a 5.1 surround mixing interface, piano-roll MIDI editor, timbre-dependent color waveform displays, optimized Pentium III performance and .AIFF, MP3, QuickTime and full Windows NT support to its lengthy spec list, Samplitude is evolving into a one-stop, all-in-one PC power station.

In development since 1988, Samplitude's latest multitrack variant integrates professional CD mastering tools into an easy-to-use, precise audio and MIDI recording/editing environment. Subcode editing, adjusting track gaps and placing pause markers are standard CD features in 2496, as is a handy burn-on-the-fly mode that captures real-time edits and live audio input without going to hard disk and further straining resources.

SEK'D's extra attention to harnessing CPU resources with Samplitude's performance-enhancing utilities made for better-than-average throughput on my "aging" 200MHz Pentium, lightning quick response on a 500MHz Pentium III, and zero-latent lightspeed on a dual-700MHz P-III system with multiple RAID drives. I installed

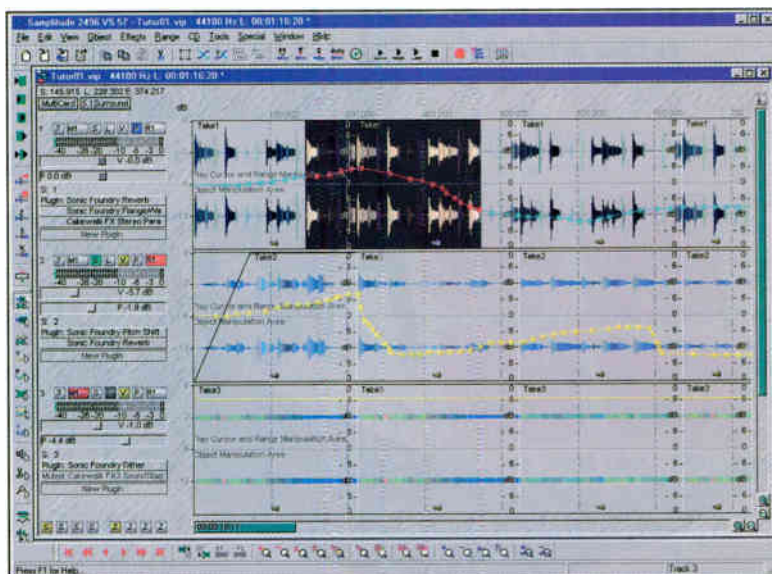


Figure 1: The VIP track window is Samplitude's main editing screen.

Samplitude and two SEK'D I/O cards (Siena and Prodig 96 Pro) in each, and though my old Gateway required several install attempts before working, everything was eventually up and running smoothly. Installation was the epitome of plug and play on the other two systems, and Samplitude ran like a rock on all three, with impressive, great-sounding audio results all around.

Sam 2496 recordings are either RAM- or disk-based Virtual Projects (VIPs) that allow as many tracks per song as the installed hardware can handle. RAP (RAM Project) songs are well-suited for looped-based composers and those working with shorter segments of audio, such as broadcast engineers, but the majority of Samplitude's tracking and editing work is done in hard-disk based projects (HDPs). Destructive and nondestructive editing modes are available, allowing the user to permanently alter raw audio files or simply modify the onscreen objects representing

them. Sampling rates of 11.025, 22.05, 32, 44.1, 48, 88.2, 96, 176.4 and 192 kHz are supported (resolution is limited only by hardware), to suit any audio requirement.

A SAMPLE 'TUDE SESSION

The VIP track window (see Fig. 1) is the heart of Samplitude, and it's quite the button-happy jumping off point to a wide range of effect, MIDI, crossfade, locate, zoom and other helpful modules. There are no fewer than 80 buttons lining the top, bottom, left and right sides of the interface on the toolbars and display, yet I found even a 15-inch monitor was room enough to navigate Samplitude's efficiently ergonomic interface. Its compact yet uncluttered design puts a lot at mousetip without going overboard, and the toolbars can be left floating in the windows or "docked" into perfect horizontal and vertical positions along the edge of the workspace.

The cool gray workspace is a good backdrop to each track's mute, solo, lock, pan/volume curve and record buttons, horizontal

BY RANDY ALBERTS

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level/pan faders and peak hold meters, and particularly to the colorful Comparisons object waveform displays (more on this later). The user-programmable screen, zoom and sample view buttons at the lower left of the VIP GUI make it very quick and easy to jump around, such as going from a microscopically zoomed-in view of a verse to a wide-angle look at the entire song with just one click.

Arming a track and punching Record brings up a handy record parameter box with L/R input meters, sample rate toggles, sound card routing options, remaining time and disk space readouts and mono/stereo mode buttons en route to recording the track. Once recorded, the audio appears in the track sequencer window as an object with five handles to change its level, fade in, fade out and left/right resize markers.

Right-clicking on any recorded object affords a dazzling array of edit options that are specific to that object only; this is one of Samplitude's strongest features, and I'll cover it in more depth below. Each VIP track channel has volume and pan automation curves (in yellow and turquoise, respectively) that are easily distinguishable and a pleasure to draw on at any screen resolution. I was pleased with the results my overchallenged Pentium achieved, and Samplitude's new mouse scrub mode is about as close to a real jog/shuttle wheel as a mouse can get on the faster systems I used. Cutting and pasting pieces of audio is very precise, and Samplitude's bendably useful fade/crossfade curve editors provide more ways to fade into and out of an audio segment than I thought possible.

WORTH THE UPGRADE

Version 5.57 offers enough major new features and improvements over 5.3 to warrant 6.0 status, but a couple of features deserve kudos right up front. SEK'D claims up to a two-fold increase in tracks-per-CPU performance with the new TrackSpeed technology in Sam 2496, something I can attest to, having used it on aging, status quo and rocket-fueled PC machines with better-than-expected results on all three. Similarly, the new Comparisons object waveform display mode bucks the notion of the bland PC audio interface (see Fig. 2). Each recorded object's sonic material can be displayed in a spectrum of colors based on pitch. New mouse modes, asymmetrical crossfades and an improved mixer inter-

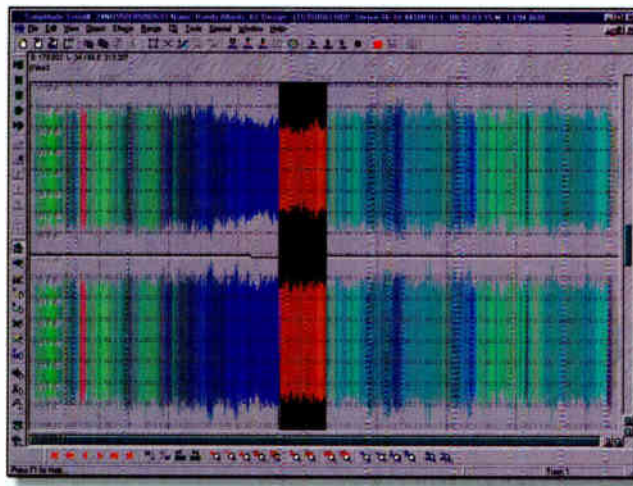


Figure 2:
The Comparisons waveform is color-coded to reflect spectral content.

face further help make Samplitude's PC GUI one of the best.

Also newsworthy is Samplitude's new surround mixer, added hardware controller support and an expanded import/export file roster. The new 5.1 mixer is Dolby ProLogic-compatible, supports joystick input and controls six discrete outputs (with individual controls over LFE channel level) or 2-channel surround playback systems. Samplitude can now be driven with Peavey's 1600, CM Automation's Motor Mix and other hardware controllers, and can now also record, edit, control and play back all Yamaha DSP Factory parameters. In addition to supporting .WAV and AVI, Samplitude now exports 16- and 32-bit AIFF files, MP3 (with an external encoding application), .WAV (in any ACM or DirectShow codec) and mono and stereo WMA (Windows Media Audio) files for the Web.

MIDI is also new for Samplitude. Faithful users of Cakewalk, Cubase and other sequencers will likely stick with their app of choice for MIDI and opt, instead, to sync it to Samplitude internally. However, Samplitude's bare-bones MIDI GUI is good enough to suit some users' needs for basic recording, graphical editing and playback of MIDI parts alongside audio tracks. There's a handy vertical scrolling MIDI event playlist with controller data and such that, according to SEK'D, will be a fully functional event editor in the next upgrade or two. Its MIDI kit may never include notation or other power-user favorites, but count on Samplitude's audio and MIDI tracks to always lock up tighter than a vault.

I wish my power sequencer's graphical editor scrolled as smoothly as Samplitude's does. No lunging screen or page leaps, the screen accepts real-time mouse-drawn and -moved note input, and it's easy on the eyes during long

tweak sessions. MIDI sysex and controller curve data can be filtered, recorded, edited and played back easily, and Samplitude can slave or master to any internal software or external hardware sequencer via MTC and MIDI clock. Sam 2496 links to and loads standard MIDI and AVI files, as well, and currently, audio tracks can be extracted and/or replaced within Samplitude. A future version will include the same spec sheet bullet for Apple QuickTime movies.

IT'S ALL IN THE INTERFACE

As much as anything else that may have surprised me about this PC program is the above-mentioned GUI. Samplitude is deep, and its countless menus are lengthy, yet logically organized and easy to understand. A right-button click provides yet more menus to a host of properties, preferences, object parameters, DirectX plug-ins and various other editor modules. Rearranging toolbars anywhere in the VIP display is a breeze and makes any top-, bottom- or left-/right-handed desktop possible.

The main mixer (see Fig. 3) comfortably displays eight channels at a time, each with a fader, peak hold meter, mute, solo, DirectX and automation record buttons, and a row of color-coded rotary pots for channel pan, EQ, dynamics, delay and aux 1 and 2 returns. The master section includes level controls for a 3-band master parametric EQ, compressor/limiter, dehisser and stereo enhancer, and there's separate L/R master level faders and meters and two aux sends for DirectX and/or external hardware processors. Down the left side of the mixer are input attenuation switches, access to preset and user-defined mixer setups, and group/ungroup, reset mono/stereo, oscillograph/phase correlation graph buttons. And new to the mixer is a surround-panorama

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FIELD TEST

miniature display on each channel showing surround position. Whew!

The MIDI Editor, though hardly ground-breaking, is a scrolling piano-roll sequencer that can edit, record and play back basic MIDI parts. Drawing, erasing and playing new notes into the editor is easy, and basic quantize and MIDI channel controls are at hand. Though a nifty scrolling event editor alongside the piano roll lists the millisecond each MIDI event occurs, its event type, MIDI channel, note value and an interface for changing all these settings, it doesn't respond to edits and there's no mention in the manual about using it to step-edit MIDI events.

One of my Samplitude favorites is the Object Editor. Right-clicking on an audio object leads the way to the editor and a wealth of ways to craft and process even the briefest of audio events for total mix control. The editor GUI displays SMPTE start and length times, fade in/out curves and intensity settings, left and right phase inverse switches, a volume fader and pan knob, and knobs for and access to Samplitude's parametric EQ, dynamics and stereo enhancer

sections. Add the ability to process each individual object in a mix with onboard, DirectX and/or external effects processing, and it's no wonder that I spend more of my time in this window of Samplitude than any other.

EFFECT THIS

High-quality effects algorithms make Samplitude 2496 a powerful effects machine that can also be used as a stand-alone 24-bit effects processor (Live Input mode). Right-clicking on any of the mixer's or object editor's EQ, dynamics, mastering, or effects level knobs brings up the corresponding effect's interface, each with standard value sliders, I/O meters, option buttons and visual graph displays where appropriate.

Room Simulator comes with a small collection of room presets and controls over reflections and high/low-frequency filters, and the FFT Analyzer/Filter module is one of the handiest onscreen tools I've ever used to display and alter a frequency response curve. Preset and user curves can be loaded and applied to a track, as well, an especially creative way to apply the curve characteristics of one instrument or mix to another.



Figure 3: The main mixer displays eight channels at once.

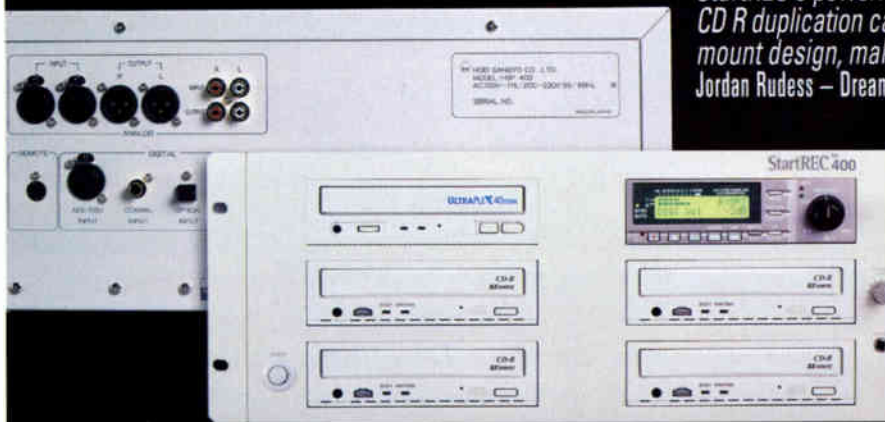
SEK'D's Michael Seltzer suggests applying a vintage Martin's curve to that of a lesser acoustic, something I was able to approximate with some success after recording the same piece on an old Gibson dreadnaught and a thin-sounding electro-acoustic guitar.

FFT Analyzer is extremely intuitive and useful for visualizing and controlling mix frequency response and enhancing or removing subharmonic bass LFE signals, but I couldn't have been more impressed with the ability to quickly isolate, zoom in on and redraw the gain of even the tiniest single harmonic. This was quite useful for isolat-

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FIELD TEST

ing and taming some unpleasantly loud finger squeaks and pops caused by new strings and bad intonation that a noise filter or gate would miss, and the analyzer was a blast to use in exploring with stereo mixes or individual tracks.

Also included in Samplitude's effects box are noise reduction; DC offset removal; re-sampling/time-stretching; delay; dehiss; graphic EQ; stereo enhancement; and both stereo and multi-band compressor, limiter, expander and gate tools. The latter provide good sound and performance with responsive

controls over compression ratio, threshold, attack, release and gate level; high- and lowpass filter settings; three graph curve display windows; and a number of voice- and instrument-specific presets. I also had great results using the dehisser to handle a noisy synth input, then taking the same mono track into the stereo enhancer module; I was able to come up with more than enough ways to spread, move and otherwise deke the ears into hearing far more than the 1-D mono synth track fed into it.

CONCLUSIONS

I recorded as many overdubs as I could

to Samplitude's stated 64-stereo-track, Pentium III ceiling, but I ran out of ideas around 50. The Play Loop feature was perfect for going back over those extended takes to locate, select and then loop sections that were worth saving, in order to create new mixes or build a perfect solo from multiple attempts. Similarly, I dug the Take Manager window for auditioning, deleting and reorganizing past takes, and its useful Statistic button conveniently creates a new VIP project window with each take, getting its own track for mutes, soloing, effects, etc.

Installation on my older Gateway was problematic, but once I got rolling I couldn't stop with Samplitude. It's an easy-to-use, yet very deep record, edit, effect and CD mastering platform that just added an entry-level MIDI front end that has room to grow. Samplitude is unstoppable when locked up with the top PC power sequencers out there (I used it with Steinberg's Cubase VST/24), and every range marker, pencil, grabber, handle, automation curve, display window, knob and fader in Samplitude is extremely precise and quite responsive to the mouse touch, as are the meters and colorful Comparisons waveform display. I'm still not sold on the utilitarian Windows-muted look of most PC audio programs, but Samplitude goes a long way in making it a whole lot more appealing.

I'd like to see an internal audio click in addition to the MIDI metronome for convenience sake, and though I'd also like to see more ways to edit and save extracted AVI soundtracks, video and audio playback in Samplitude are far tighter than in the PC program I used to create the test AVI. The Object Editor is my favorite tool for fine-tuning any mix, and every built-in and DirectX effect I used with it was fast, even when applying CPU-heavy algorithms.


Samplitude 2496 is powerfully easy to use, with a very short learning curve. It's worth considering for any PC, Mac or undecided audio user who needs everything from creative tools to Red Book audio burns under one roof.

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Randy Alberts is a Pacifica, California-based writer and musician. Special thanks to C-Tech Systems (www.musiccomputers.com) for the use of their PC audio systems during this review.

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ZAPEX ZP-100

AC-3 5-CHANNEL SURROUND ENCODER

Despite a growing surround mastering and production market for HDTV, audio and DVD releases, the number of available encoding products is relatively small. The ZP-100 from Zapex Technologies is a single PCI card solution that provides high-quality Dolby Digital (AC-3), MPEG audio and linear PCM stream encoding with a host of useful playback and encoding features for optimizing audio quality.

A real-time encoder certified by Dolby Labs, the ZP-100 system is available in either 5.1 or 2-channel (5.1-upgradable) versions. The unit consists of a PCI card for real-time digitization, control software and a breakout cable with four XLR AES/EBU digital inputs (channels 1-8). A stereo S/PDIF input, SMPTE LTC input and S/PDIF (IEC 958) BNC and XLR plugs connect the encoder's output to a Dolby Digital and/or MPEG audio player. An RS-422/232C adapter links the computer's serial port to an external transport for Sony 9-pin control.

As all DSP takes place on the card, hardware needs are minimal: a Pentium II 233 or higher processor running Windows NT Version 4.0 with Service Pack 3 or higher. Other requirements include a PCM audio player for source PCM audio stream playback and a Dolby Digital and/or MPEG audio decoder for monitoring.

The encoder's integrated capture feature eliminates the cost of a separate capture card. Capture file options include elementary stream, with and without timecode (AC-3 disc file format), and IEC 958 stream with/without timecode (.WAV file format). IEC 958 stream options include professional 32-bit, Ch-1 16-bit, Ch-2 16-bit data packing and consumer mode. The ZP-100 can simultaneously encode and capture either Dolby Digital and PCM, or MPEG Audio Layer 2 and PCM, and the encoded bitstream can be played immediately after capture. The unit offers a Region Save Editing feature, which allows segments of a Dolby Digital, MPEG Audio or PCM stream to be edited and saved as a separate file. A timecode-based batch encode feature automatically applies a set of user-

defined parameters to multiple files, and the unit can be configured for manual, semi-automatic or automatic encoding.

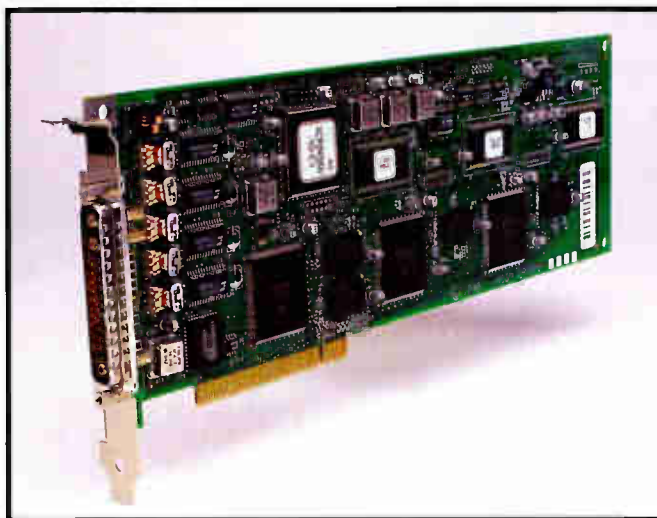
The software is divided into three applications: A GUI provides basic setup for controlling and navigating the system, the encoding software provides the means to adjust and store encoding parameters and a Playback Tool utility includes sound peak wave display, region save and bitstream analysis.

During encoding, the ZP-100 can operate in two modes. The File Capture mode is for capturing a file to disk for later play-

back, such as in DVD production. The Dynamic Encoding mode is used for creating parameter files or doing Broadcast Encoding where a PCM source is encoded and played, but not saved as a file. The system's most powerful attribute is the ability to change parameter values while the ZP-100 is encoding, providing the user with instantaneous audible feedback while tweaking settings.

Adjustable AC-3 parameters include bitstream service type (standard "Complete Main," Emergency, Visually/Hearing Impaired, Voice Over Karaoke, etc.); sampling frequency; bit rate (56,000 to 640,000 bps); LFE channel in/out; nominal down-mix levels of the surround and center channels; embedding a Dolby Surround signal into the Dolby Digital stream; copyright bit setting; dialog normalization; dynamic range compression (five presets); RF overmodulation protection; main channel lowpass filter (mainly used to improve signal quality at low bit rates); LFE lowpass filter (120Hz roll-off); DC filtering; 90° surround channel phase shift; -3dB surround attenuation (for theater applications); de-emphasis and more. Features listed above are for current ZP-100 systems offered, Version 4.0. The Zapex ZP-100 5-channel system (card, software and interface cabling) is priced at \$5,500.

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BY GEORGE PETERSEN

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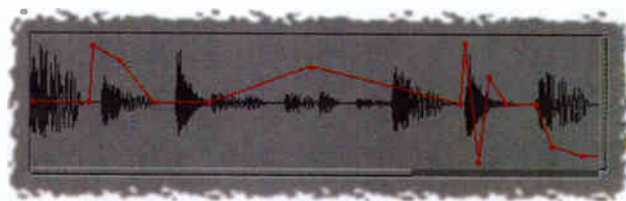
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Pitch 'n Time
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EXPLORING FIGS

TRAVELS THROUGH
POST-POST-PRODUCTION,
PART 2

by Larry Blake

Over the past few years, it's become commonplace that more than half of a U.S. film's earnings come from outside of North America. Some of this is "as shown in the U.S.," most notably in the UK and Australia, while in other territories such as Scandinavia, where English is widely spoken, subtitled prints are the

rule. A very few countries, most notably France, have a large number of both subtitled and dubbed prints.

Most "foreign-language" prints of English-language films, however, are dubbed, like it or not. Probably not, if you're an American—we have an almost inbred disdain for the dubbing of films (theirs or ours) into foreign languages. While some of the arguments will always be sound ("It's not the original film"), others are largely a function of the quality of the dubs that we have heard. Because there is a small market for the dubbing of films into English, there is a consequent lack of involvement in the U.S. of talented directors, actors and sound peo-

ple to create authentic versions of films from overseas. But such is not the case in countries such as Germany, Italy and Spain. The filmgoing public there prefers the dubbed versions, and there is a large industry in place that devotes much energy and care to quality dubs. For 11 nonstop days this winter I traveled through Europe to sit in on the voice dubbing and re-recording of *Erin Brockovich* into the major foreign-language markets: French, Italian, German and Spanish, aka FIGS.

I was surprised when my colleagues in Europe told me that they attribute many of

the other could be bicycled around Europe, functioning as a first-generation source for printmasters. (Presumably mag X copies would be made to absorb the wear and tear during editing prep, voice recording and dialog premixing.)

Although I continued to make two mags on *Erin*, in the end they served primarily to satisfy our two-studio delivery requirement (Universal having domestic distribution). We had to prepare two sets of the major delivery elements, a task that was further complicated because the Universal logo (and its music!) came first in the North American prints, while the Columbia "torch lady" was first up in the rest of the world. Therefore, each "version" (the various printmasters and M&Es) had two versions. A pain in the ass, but something that's becoming increasingly common in our industry with studios hedging their bets and minimizing their down side on expensive films and their stars.

These version-versions were delivered to their respective studio in the form of 25 fps DTRS tapes, which has become the *lingua franca* of film sound distribution. To the best of my knowledge, all of the foreign-language versions of *Erin* were done from clones of these tapes and not from mag, the lone exception being the French Canadian mix.

Aaron Glascock, who cut all the dialog on *Erin*, and I had as a goal to create a rough and natural-feeling M&E. To that end we took our standard techniques—creating a separate production sound effects (PFX) stem, splitting the center-channel dialog stem into two checkerboarded tracks—and added to them two tracks in the dialog sessions containing special preparation for the M&E mix.

Over the years, I've

—CONTINUED ON PAGE 174

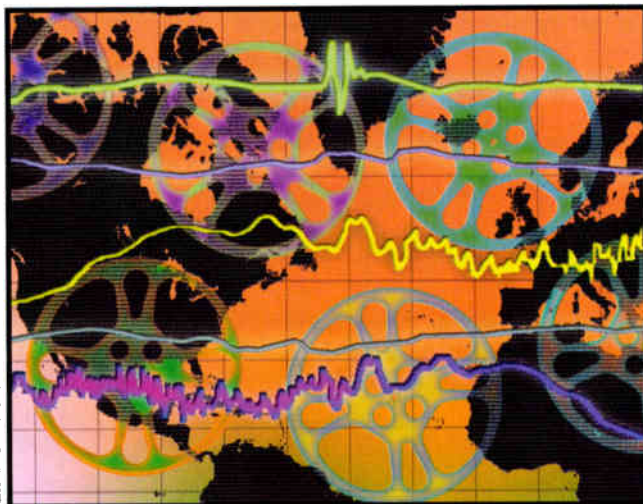


ILLUSTRATION: WENDY SHIRAKI

the problems that they have with M&E (music and effects) mixes to the fact that schedules often preclude the primary mixers on a film from doing the M&E themselves. I'm happy to report that even on tight schedules I've been able to prepare all of my films for other languages, and I shudder at the thought of giving up personal involvement in this crucial *final* mix.

In a previous missive on foreign-language versions (November 1998), I elaborated on how I was always careful to make two first-generation sets of mag M&Es (one set 6-track, the other "4+2") directly from the stems. The idea was that one would stay in the company's U.S. vaults as a "master" and

THE SQUIRREL WILL SAVE THE WORLD

CARTOON MEETS REALITY IN "THE ADVENTURES OF ROCKY AND BULLWINKLE"

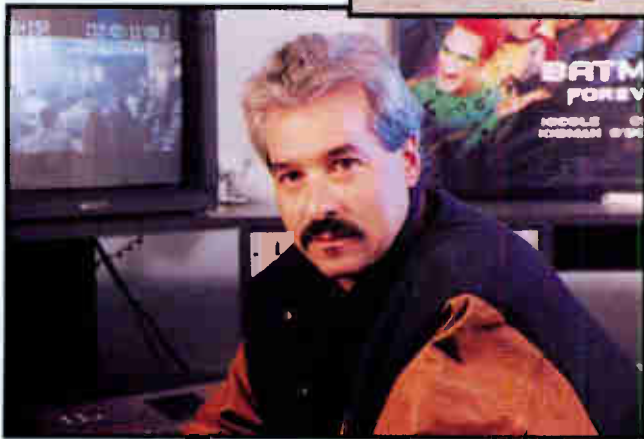
by Maureen Droney

Film sound professionals are always trying to outdo themselves. But, during the making of the soundtrack for *The Adventures of Rocky and Bullwinkle*, supervising sound editor Bruce Stambler



PHOTO: PHELIP CARUSO AND LM

Above: Renee Russo (Natasha) and Jason Alexander (Boris) with their foils, Rocky and Bullwinkle. Left: supervising sound editor Bruce Stambler.



(*Batman Forever*, *Clear and Present Danger*, *The Fugitive*) and sound designer Tim Walston (*Chain of Fools*, *Clay Pigeons*, *The Mod Squad*) didn't have to spend any time thinking up new

challenges. There were plenty inherent in the concept itself: After years of being trapped in a two-dimensional animated world, our favorite spies, Boris and Natasha, have broken a se-

cret code that allows them into the real world. Rocky and Bullwinkle, who remain CGI-created cartoons courtesy of Industrial Light & Magic, must figure out how to foil the dastardly duo across the dimensions, and the Internet.

Described as an "irreverent live-action/animated comedy adventure" and based on Jay Ward's classic cartoon, the Universal Pictures/Tribeca Productions film features Robert DeNiro as Fearless Leader, Jason Alexander as the evil Boris

Badenov and Renee Russo as the seductress Natasha Fatale.

Slated for a June 30 release, R&B was in the process of predubbing on the Neve DFC at Warner Bros. Stage 6 in Burbank when we spoke with Stambler and Walston. Also on the team were mixers Mike Caspar, dialog: Frank Montoya, sound effects: and Greg Watkins, music.

So how do you make live action work with animation? Stambler, an Oscar nominee five straight years who won a

—CONTINUED ON PAGE 170

POSTNOTES

All Things Internet: You don't need to be a think tank resident to see the impact that the Internet is having on all facets of the production post-production path. Perhaps the hottest market right now (and it's been a long time coming) is production music libraries, where we're about to witness a flood of downloadable, licensed content. Five major, major production music houses have joined forces and this month will

launch **Librarytracks.com**, a site that will essentially provide the search engine to link to the members' sites for auditioning, streaming and downloading music tracks. The members—615 Music, Manhattan Production Music, Megatrax Production Music, NonStop Music Library and VideoHelper—offer access to more than 600 CDs. Librarytracks.com will use Microsoft ASF and will watermark all cuts for reporting through ASCAP, BMI and SESAC... Meanwhile, companies providing

Web audio services continue to spring up. Last month, in our special Internet Audio



supplement (bundled with the July *Mix*), we wrote about Sonicopia, a division of San Francisco-based post house DubeyTunes that sonifies

Web sites by embedding

—CONTINUED ON PAGE 172



Brian Banks (left) opened Ear to Ear Interactive with sound designer Chip Mullaney (above) and executive producer Christie Cash.

—FROM PAGE 169, *ROCKY AND BULLWINKLE*
statue in 1996 for Best Sound Effects Editing on *The Ghost and the Darkness*, says, “Sometimes, in the same frame, it’s right-in-front-of-you reality vs. these two animated characters. So you’re dealing with

A live-action character ducks down, and we put in a whistle or a whoosh for her. We’re not making light of the film, just trying to make it as much fun as we can from the point of view of sound.

—Bruce Stambler

three entities: first, real, live-action characters; then Boris and Natasha, who were cartoon characters but are now

ing—I did all cartoon effects: boings and swishes and things vibrating by.

“We’re doing that throughout the whole movie,” he continues. “A live-action character ducks down, and we put in a whistle or a whoosh for her. We’re not making light of the film, just trying to make it as much fun as we can from the point of view of sound. It’s definite-

“I think that cartoons and cartoon-like sound effects are really kind of embedded in the pop culture,” Walston continues. “It’s almost like a language. People have a tremendous familiarity with the traditional cartoon sounds, and anything that sounds similar will kind of fit right in, kind of go in through the back door, as sound often does. When



PHOTO: PHILLIP V. CARISO AND LM



PHOTO: LM

live-action people; and finally, Rocky and Bullwinkle, who are completely animated. For me, the main focus with this kind of venue is that you want it to be fun.

“For example, there’s a scene where Boris and Natasha are throwing dynamite sticks at Rocky and Bullwinkle and the star of the movie, Karen Sympathy. Karen’s driving in her Volkswagen convertible, and they’re throwing dynamite sticks at the car, which then goes off a cliff. Reality-wise it’s explosions and possibly blowing up the car, but I don’t play it like that because that would be too scary—we’re not doing something like *Clear and Present Danger* here. Instead, it’s about making the dynamite somewhat fun in a non-threatening way. So I did a full-on cartoon crash, and even though it’s a reality visual—car off the cliff, the fireball and crash-

fect. That’s something I’m very conscious of, because generally I’m for the non-obvious. But in this case you’ve got to have comedy, and, ‘cartoon effects,’ so it was our job to make them work well.”

“I cut the car crash scene once with very realistic elements and then we had to go back and provide a different angle,” adds Walston. “It was definitely a challenge to make a fireball funny! I used a ton of stuff from various different sources to portray the action but also to keep it lighthearted.

ly a different way of working. And it can be difficult to do, because sometimes when you put in comedy effects with reality-based visuals, it can cheapen the ef-

you use a sound appropriately, it fits with what we’re used to from what we grew up with. If you use the wrong sound, or use it the wrong way, then it doesn’t work.”

Stambler and Walston couldn’t give too much away, but they hinted at a big ending sequence filled with a combination of CGI, electronic effects and Internet references. And Walston did admit

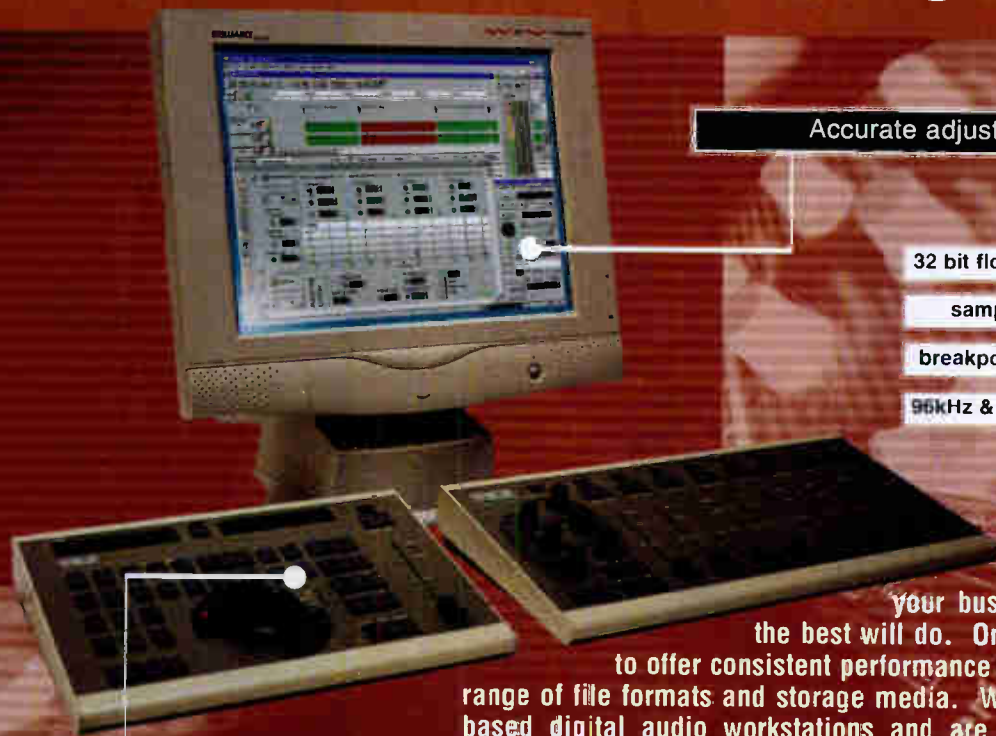


PHOTO: PHILLIP V. CARISO AND LM

that one of his secret weapons for Rocky’s flying sounds was a vacuum cleaner.

“It’s not the only element,” he laughs, “but I used an old cannister model with the motor in the closet. I processed some of the air elements, and it added the one thing I was missing.” ■

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—FROM PAGE 169, POST NOTES

audio content in the HTML. Now Ear to Ear, a music/post house in Santa Monica, has opened a new division called Ear to Ear Interactive. Headed up by Ear to Ear founder Brian Banks, executive producer Christie Cash and sound designer Chip Mulaney, Ear to Ear Interactive has created an authoring/remastering process that synchronizes old or new content with streaming video, in Rich Media Format. Visit www.eartoear.com. . . Finally, Spot-Taxi.com, a division of Central Media Incorporated built on the talent of Seattle post house Clatter&Din, has collaborated with Microsoft to integrate Windows Media into its online spot distribution system. . . Projects from Outpost: San Francisco mixer Dave Nelson is keeping busy at Outpost Film Center, where film editor Joe Bini finished a rough cut of Werner Herzog's return to narrative filmmaking, *Invincible*. Nelson will likely mix, as he did on Herzog's last two projects. Nelson also provided sound design and mixing for Kari Nevil's independent feature *Your Guardian* and Jules Beesley's DV feature *Radio Free Steve*. . . More, more, more: Expansion seems to be the name of the game as audio post houses find themselves inundated with work, much of it traditional, much of it new media. Crush Digital has doubled the size of its New York facility (to 7,000 square feet) to handle DVD authoring demand and added a Sony DVAV 1100



A Soundtracs DPC-II has been installed in Photomag's Studio A .

encoder, the first facility to do so outside of the Sony family. The authoring workstations have also been upgraded with Daikin Scenarist NT Professional and Dolby Digital encoding. Visit www.crushdv.com. . . JSM (New York City), which bills itself as a "high-tech, creative think tank" for media content and original music, will open satellite offices in Southern California, London, Auckland and Paris by the end of the year. . . Photomag, that venerable New York post house, has purchased its second Soundtracs DPC-

II, which will be run in conjunction with a Fairlight MFX-3plus system by Joe Vignoni in the uptown facility's Studio A. . . In September, KABC-TV in Los Angeles will open its revamped facilities with the city's first installation of the increasingly popular SSL Aysis Air console. . . This past spring, Pomann Sound, NYC, installed the city's largest Msoft Server Sound system. The ½-terabyte, 350-gig system will link Pomann's 12 DAWs and offer access to more than 2,000 hours of custom sound effects and 70 commercial libraries. . . Marcom company Pittard Sullivan and Goldman Productions, a music and sound design facility out of Cincinnati, have teamed up and moved to Culver City, CA, to form RipTide Music. Richard Goldman will be CEO/president. . . Scott Reed has been named director of new business development for Alan Ett Music Group and sister company Media City Sound, in Studio City, CA. . . Finally, when you watch the Opening Ceremonies of the Olympics next month, those tracks will have been recorded and mixed by SAE Institute's flagship facility, Studios 301 in Sydney. Plans called for location orchestral recording through Fairlight Merlins, then mixing at 301. Hundreds of SAE students will act as engineering and general assistants. ■

The RipTide Music team: composer David Logan, CFO Ellie Goldman, and CEO/president Rich Goldman.



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Dana Jon Chappelle, Engineer / Mixer

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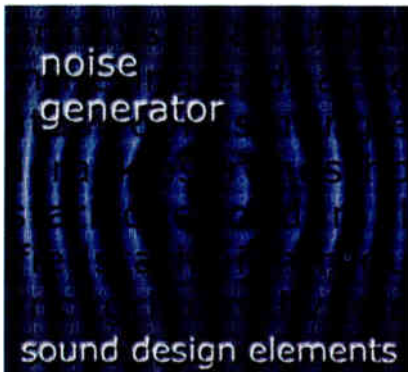
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—FROM PAGE 168, EXPLORING FIGS

evolved a very specific post-final mix schedule. First up, of course is standard 8- (on many films), 6- and 2-track print-mastering. This usually takes a little more than a day, and I then spend another day creating a compressed home video printmaster, while at the same time printing new stems that reflect the moves. (More on this next month.)

These two-plus days give us (in this case, Aaron) the time to carve out the remaining, salvageable effects from the final dialog stems. He also had the group walla stem and filled over any English words that jumped out. Finally, he cut scene-length room tone, either library elements or bounces that he had made during dialog editing, to add back in the air and presence of Tommy Causey's magnificent original production tracks.

I should point out that since we take our dialog from the original Avid files, the sample rate of our dialog sessions was 47.952 kHz, while our premixes and final mixes were at the digital video standard of 48 kHz. This was no problem since there were analog consoles in the middle (when recording premixes from units and final mix from premixes), so no sample rate conversions were needed. This strategy could bite one on the tail if there are multitudes of picture changes that require original cut sessions to be conformed alongside premixes and final mixes. Such was not the case on *Erin*, thankfully.

However, because Aaron had done so much work during dialog editing, and because all of our other edit sessions were at the pulled-down 47.952 rate, we had to transfer the dialog and group stems at 48.000 while re-recording (and cross-resolving) them at the "correct" speed of the session. Enough of this techno mumbo-jumbo, and back to the M&E mix.

We ended up sticking with the original, uncut group walla stem for the whole film because once everything was thrown together, the minuscule amount of English that poked through was deemed acceptable, and would almost always be covered completely by the new dialog.

To this end it was very good to have a representative from the studio (in this case George Hively of Sony, which distributed *Erin* outside of North America) at the M&E to sign off on the decisions that we made. As we mixed the M&E (it took one 11-hour day), George took notes as to the decisions that we had made and passed these along to all of

the territories.

These notes are crucial because if you have a scene when an actor's mouth moves but nothing comes out—intentionally—then you need to tell the various territories that they should not stick words in. If a scene had very loud background noise, but you decided to stay with the production track because of the performance, they should not regard the lack of a similar background noise in the M&E as an omission. Scenes that play with no dialog or music should always remain so—etc., etc.

George's notes also reflected what material we put into the "extra" track, also known as "optional," "controversy" or "questionable" material. I have generally been of the philosophy to make decisions on the stage when mixing the M&E, to leave as little to chance with the foreign-language printmasters. However, as we are all figuring out, there is a definite time and place for the extra track.

Once in Europe, my guides into the world of FIGS were Jeff Davidson, who is in charge of foreign-language dubbing and translations for Sony, and his associate, Candace Whitman. Although they are both from the U.S., they have lived in Europe for decades and between them speak enough languages fluently to run a United Nations session.

Jeff's position in supervising all of Sony's product is a rarity in this industry. More often than not, the local representatives from the distributor will hire the dubbing directors (who supervise the translations, voice casting and recording) and book the studios, but there is no single person who lords over all versions, ensuring continuity and consistency. In this case, I had *two* such people, and I felt like I was on the team with Babe Ruth and Lou Gehrig (or Michael and Scottie).

Candace came up with a quote of the day when, at the German mix, I asked her at what point I should "raise my hand" and stop the proceedings. She told me that I was in charge and didn't have to salute to anyone because "you are the flag."

It was nice of her to put it that way, but had I not been there, we were in good hands with her and Jeff. Beyond the obvious issues of catching bad translations and making sure that the actors were properly cast, they were extraordinarily diligent in ensuring that the new dialog matched the rhythms and beats in the original track. Overlaps in dialog, where there had been none in English, drove Candace particularly

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crazy. Typically, they would have caught this at the original voice recording, but because Jeff and Candace are already required to be at four places at once, sometimes this was not possible.

It is certainly interesting to be at a mix where you know every syllable of the film...but not in the language at hand! It was actually quite easy to spot "mistakes" in emphasis or performance. For example, during the Spanish mix in Barcelona, I was bothered that the Spanish-speaking Ed Masry was not projecting his lines properly to an assembled crowd. Candace agreed, and even though printmastering was supposed to begin ASAP, they were on the phone trying to locate the actor as I was heading out to the door to fly back to the States.

I was generally pleased at the work that we had done in preparing the M&E, although I was quite embarrassed to find out that two missing effects—a baby's fist in potato chips and a simple, stupid door close—had sneaked past all of us in the mix back in Hollywood. The former was easily stolen from the English guide dialog track, and the latter was flown in from an FX library. I'm told that this is a pretty good batting av-

erage and that much more work usually has to be done to fix M&Es.

Each territory has its own approach to creating a new version of a film, and I venture that the "best" system would blend techniques from many countries. You can expect to find a sound editor on the stage at all times in Germany, a reassuring sight to the editor in me. In Italy there is a check screening of the cut dialog just prior to the start of the mix, allowing us to catch any big problems that would require bringing in actors. (We did indeed need a quick fix session with the Italian loopers for Julia Roberts and Albert Finney.) I was pleased to see that the Spanish mixer would play the whole scene in English, to get a feel for the intent of the original mix, just prior to doing his dialog premix.

One procedure, common to many of these countries, that I found somewhat disturbing was that they didn't regard the sync pop on the M&E as "god," using it during printmastering. To be fair, they all cited horror stories of sync pops that were six frames long (!!!!) or that were clearly, absolutely out of sync. While I sympathize with them, even these problems can be solved and when the correct sync of the M&E is

marked, it should be used. Just as head tones have to represent the program and operating levels, and cannot simply be tacked on, so must the pops represent the sync as viewed at the original final mix by the director and post sound team. The pop on the M&E indicates the correct sync for backgrounds (in terms of POV and scene changes), Foley and hard-sync effects. To use a "generic" pop coming off of a unit, regardless of whether or not it is coming at exactly 01:00:06:00 or not, is simply bad sync hygiene because that, de facto, reflects no program. As to using the pop from the dubbed dialog, well, it's never *exactly* on, *never*.

In other words, even if the M&E does not phase with the original English mix on the film print that is being projected, for whatever reason—threading up or system timing error—when the track negative goes through the leadering process, you *will* have the same sync as in the original mix.

I was also surprised to find out that many mixers will use the 6-track mix to create the 2-track printmaster, instead of the 4-track mix provided for that purpose. More often than not my 4-track M&E will have some sort of manipulation

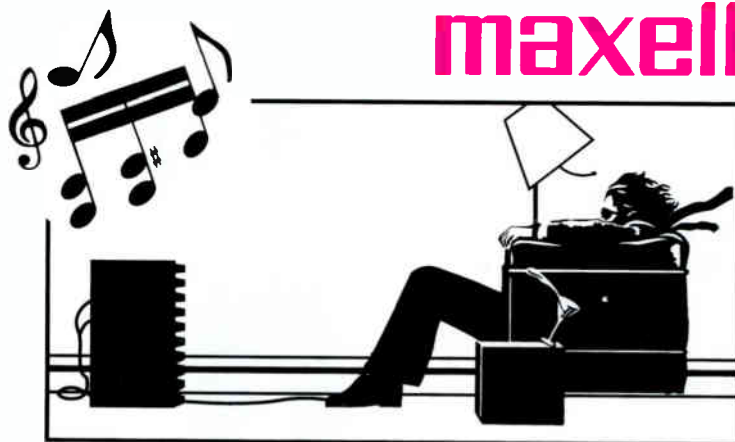


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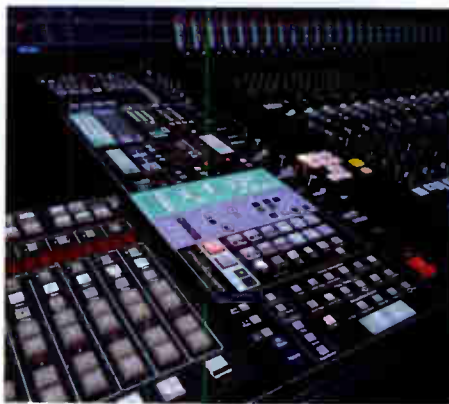
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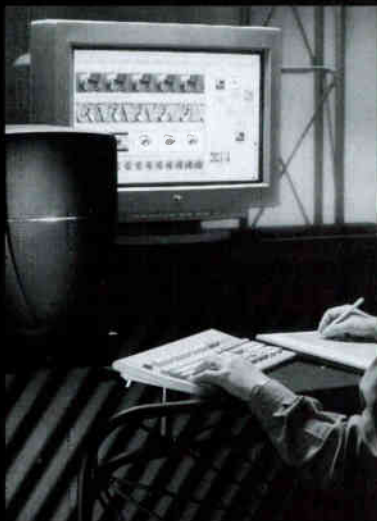
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to help the 4:2:4 matrix situation, and I am surprised that more mixers overseas don't assume that to be the case.

I was quite thrilled at the lengths to which the dubbing director in France went to have the actors move in relationship to the microphone and to attempt to simulate production recording. Furthermore, the ticker-type system that is standard in French dubbing stages, in which the lines scroll like a stock-market ticker under the screen, seems to free the actors from the cobra of the words on the page. Watching a scene on the dubbing stage, with the mixer flying in reverb just as a guide and with the dialog unedited, was quite impressive, to say the least.

I was, conversely, less than pleased with the technical aspect of the voice dubbing in other territories. I have been on many film sets, and I've never seen a U87 sit in a stationary position three feet directly in front of an actor. In the future, I will hope to become more involved with the foreign-language versions early enough to try to wield some influence on this crucial part of the process. There's only so much you can do with reverb during the mix to try to polish the turd of unnatural mic position and the effect that it has on the actor's performance.

The film that I'm working on as I write, *Traffic*, will present us with a different challenge. One of the three stories in the film takes place in Tijuana and is spoken almost entirely in Spanish. To be precise, it's in Northern Mexican Spanish, using idioms and slang that would be found in border towns. (We shot these sequences in Nogales, Sonora, just across the Arizona border.) In the final mix I'll be recording a separate Spanish stem, to allow for the possibility that these recordings might be carried through even to dubbed versions. I'm going to have to ask Candace and Jeff about this...

This month's column is the second of three concerning my post-post-production on *Erin*; tune in next month for a look at the head-spinning variables involved in the creation of the multitude of video versions of a theatrical film. I can be reached at P.O. Box 24609, New Orleans, LA 70184, or via e-mail: swelltone@aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be is that heart is pronounced "hawt."

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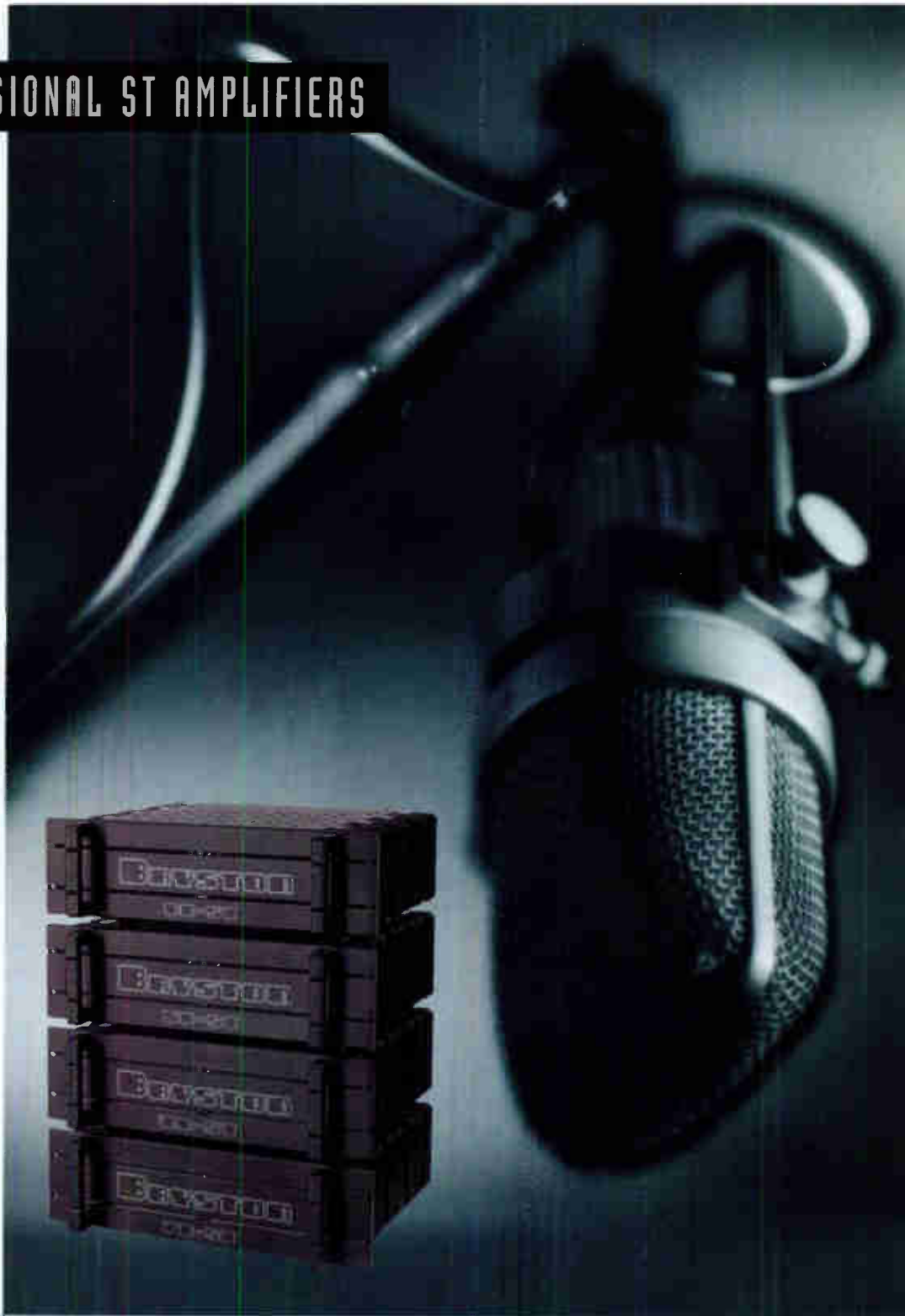
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TIME FOR A CHANGE IN THE ORCHESTRA PIT

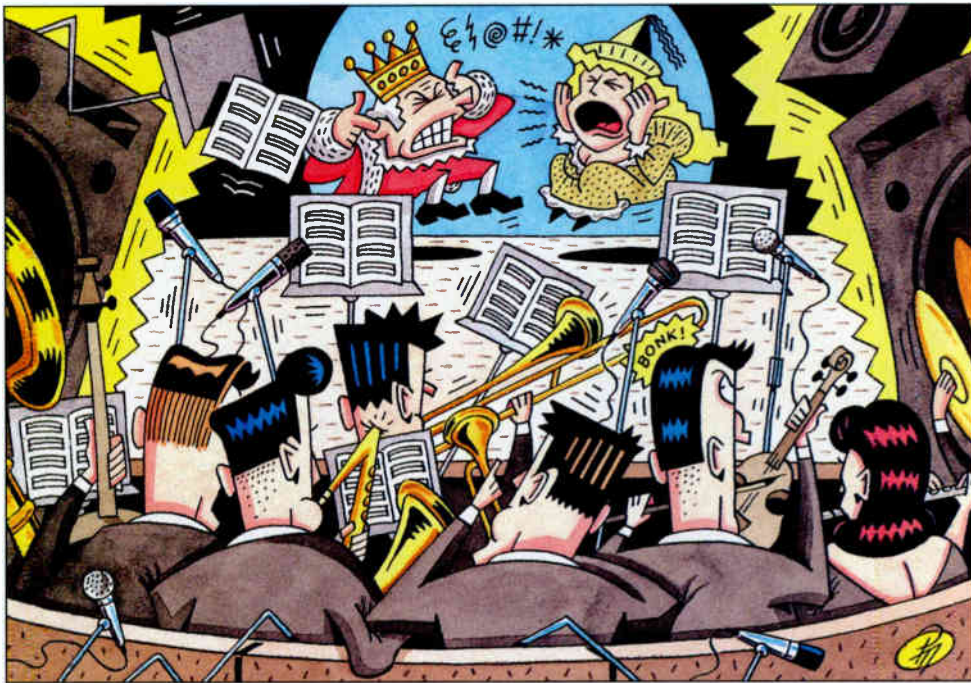


ILLUSTRATION: PAUL MOCH

Modern musical theater has been strikingly successful in adapting and refining the modern sound reinforcement technologies that blossomed in the '70s. In fact, many of today's most sophisticated sound system designs can be found on Broadway, where it is not uncommon for a production to include dozens of loudspeaker locations, scores of wireless microphones, and hundreds of cues being triggered by automation, MIDI control and even humans.

At the same time, the audience for musical theater is becoming increasingly sophisticated. "CD quality" sound systems are ubiquitous in the home and car, and most members of today's theater audiences have heard 5.1 or 7.1 surround sound in movie theaters. As home theater installations continue to siphon off a growing percentage of the entertainment dollar, theater sound designers must strive to deliver the best sound quality possible. If they fail, that part of the audience that cares about sound will go elsewhere.

Fortunately, good sound quality

is now more dependent on the correct application of currently available tools than on the development of new technology—the components for most musicals can be ordered from stock. So the problems that remain are often a result of the mismatch between the principles of sound design and the traditions of live theater. Some of these problems are inescapable, and much of the satisfaction of sound design comes from finding an appropriate way to solve the problem within the artistic and budgetary constraints of the production. But some recurring sound design problems are largely the result of outmoded thinking on the part of producers and designers.

THE ACOUSTIC MODEL

In most musical productions the actors are onstage and the musicians are in the pit. The audience sits in the auditorium and, in the case of a popular show, has probably paid dearly for the privilege of

hearing both singers and musicians in something approaching a reasonable balance. This is the traditional format for musicals, and it has remained, with some exceptions, unchanged for decades.

Traditionally, the balance between musicians and singers has been controlled by the conductor; if the singer's projection is weak, the conductor holds the orchestra back. Or so goes the theory. However, because of the natural limitations of actors' voices, an acoustic balance between voices and orchestra balance can rarely be achieved.

But progress waits for no man. Enter the sound designer, with red cape flapping and blue tights a-chafing. Advances in sound equipment technology and practice have made it possible to amplify either the vocalists, or the musicians, or both. Weak singers now have careers in musicals, and musicians "can" (and sometimes do) play without regard to their surroundings, knowing that the FOH mixer will balance their instruments in mix.

BY JONATHAN DEANS

—CONTINUED ON PAGE 184

TOUR
PROFILE

SLIPKNOT
AGGRESSIVELY HEARD



PHOTOS: PAUL NAYKIN/PHOTO RESERVE INC.

When Slipknot first emerged from Middle America in 1998, the press had a field day with the fact that its nine bandmembers, with their surreal rubber masks and industrial coveralls, were from (of all places) Des Moines, Iowa. After all, their music, which has been described as an amalgam of the sounds of traditional metal, death metal, hip hop and L.A.'s exponentially cruel and ruthless school of new metal, definitely gives the finger to heartland sensibilities in a big way. So negative were the vibes from some fellow Iowans that the members of Slipknot say they came up with the idea of wearing their grisly-homemade getups to maintain anonymity. Presumably the same is true for the alias number assignments 0, 1, 2, 3, 4, 5, 6, 7, 8, which translate respectively (and pathologically, Slipknot likes to add) to DJ Sid Wilson, drummer



FOH engineer Eddie Oertell

Joey Jordison, bassist Paul Gray, percussionist Chris Fehn, guitarist James Root, sampler Craig Jones, percussionist Shawn Crahan, guitarist Mic Thompson and vocalist Corey Taylor.

Slipknot's rise to stardom is a classic Cinderella story, albeit a scarier one. The band (or "the family unit," as they say) was originally formed in 1995 and quickly found a local following, which eventually led to their first album in 1996, the self-produced and disturbing *Mate. Feed. Kill. Repeat.* Within

a year of the disc's release, Slipknot was approached by several labels anxious to sign them up. Ultimately, the band inked a deal with Roadrunner Records through producer Ross Robinson's I Am Records (Korn, Limp Bizkit) and packed off to Indigo Ranch Studios in Los Angeles to record

BY GREGORY A. DETOGNE

—CONTINUED ON PAGE 188



Robert Smith

Simon Gallup



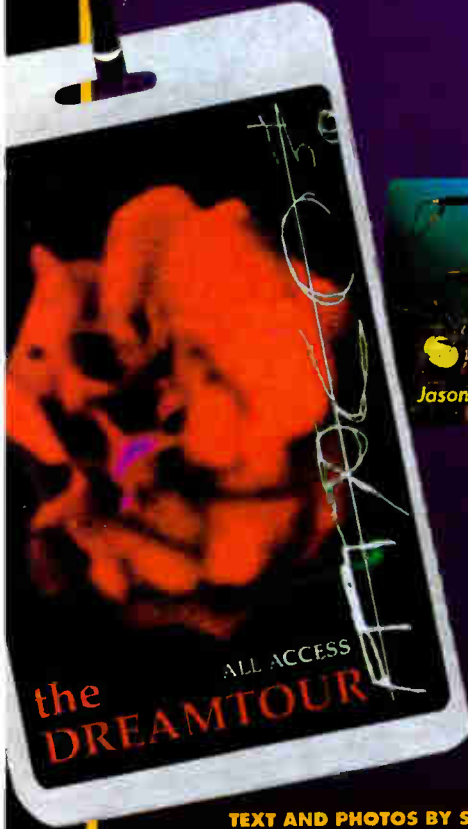
Perry Bamonte



Jason Cooper



Roger O'Donnell



TEXT AND PHOTOS BY STEVE JENNINGS

For any Cure fan, this tour was not to be missed. After a short run of club dates earlier this year—which were priceless for the lucky few who attended—the band headed out for a full-fledged arena and shed tour that stretched across North America and Europe. The band turned in a solid three-hour set that included a number of classic Cure gems, rarities and b-sides, and new material from the band's current CD, *Bloodflowers*. *Mix* caught up with the band at the Greek Theater in Los Angeles and the Shoreline Amphitheater in Mountain View, Calif.



FOH engineer Dave Bracey counts this as his third tour with The Cure, but his first mixing FOH. His other credits include a world tour with Depeche Mode and a three-year stint with Robbie Williams. Bracey is mixing on a Midas XL4. "Absolutely my board of choice," he says of the XL4. "I was an XL3 man until these came out, but there's so much more for me. Sonically, the Midas sounds fantastic, and it has all the headroom that you ever need. I use the automation in the show. I've got 49 songs programmed into this board, and they play about 46 songs regularly. They change the center part of the set and the encores quite radically every night."

Bracey's FOH rack includes a Tube-Tech CL-1 compressor for Cure lead singer Robert Smith's vocal and a Roland SDE-330 for the numerous vocal delays and rotary effects. For dynamic control, Bracey patches dbx 160As across electric guitar channels, uses two Summit DCL200s on keyboards and acoustic guitars, and assigns Drawmer gates to drums. For effects, he has two Yamaha SPX990s which he runs in stereo on toms and an Eventide H3000 for flanging and phaser effects on vocals and (occasionally) on guitars. "I don't need to do much on non-vocal effects or non-drum effects because the guitarists do so much themselves," notes Bracey.

ALL ACCESS



The Cure is using a V-DOSC P.A. system supplied by Audiotek of Los Angeles. "The V-DOSC system throws further with more full frequency range than any other P.A. system that I've heard," says Bracey. "We have fourteen V-DOSC boxes per side, and I'm using six subs a side, which are proprietary boxes from Audiotek."



Robert Smith sings into an Audio-Technica 89R, and all of the guitars are miked with A-T 4050s. Drum mics include a Shure Beta 52 on kick, Beta 56s on the snare top and an SM57 on the bottom, A-T 4041s on hi-hats, Shure 98s on the rack and floor toms and A-T 4050s on overheads.



Monitor engineer Sarnie Thorogood is running 23 mixes (four sets of in-ears) from a Midas Heritage 3000. "The only compression I use is on the keyboards left and right, bass, and I do a split of Robert's vocal—one's for the in-ears and one's for his wedge," explains Thorogood. "On Robert's vocal I use a BSS 901 dynamic equalizer, and that's the only insert I have on him, apart from on the split vocal which is a dbx 160X. On [drummer] Jason Cooper I'm using two thumpers in the seat, and he's got in-ears as well. Both the keyboard setups are in-ear, as well as the keyboard tech's." Wedge monitors, which contain 2- and 15-inch drivers, are from Firehouse Productions, New York.



Guitar tech Tony Boatman, pictured here with one of Smith's favorite guitars, has his hands full each and every night. "Because we have so many guitars I have bass tech Jez Webb help divide it down during the show," says Boatman. "We have something like 30 guitars on the road because the set list is so huge—the band can pull out 50 odd songs—so you have to be able to cover that all the time. We don't know what the set list will be until about a half-hour before the show." Smith and guitarist Perry Bamonte both use Line 6 Flextone amps.

Tour Personnel

Daryl Bamonte: Tour Manager

Wob Roberts: Production Manager

Gary Currier: Stage Manager

Dave Bracey: FOH Engineer

Sarnie Thorogood: Monitor Engineer

Tony Bateman, Jez Webb: Guitar Techs

Steev Arnold, Derek Simpson: Keyboard Techs

Keith Prior: Drum Tech

LIVE SOUND

—FROM PAGE 180, THE ORCHESTRA PIT

However, there are some problems associated with this otherwise sunny scenario. First, the theater's acoustics usually cannot be much improved; most productions only rent the space for a matter of months, so any inherent acoustical problems have to be worked around. And though some houses have better acoustics than others, all theaters more than a few decades old were originally designed to naturally amplify any and all sounds coming from the pit and stage. This unchangeable acoustic character is not always helpful.

For example, a pit orchestra will often put out an average level of 74dB SPL, unamplified. To supplement or overcome the sound of the instruments' acoustic mix, which is often blurred and muffled by being reflected from scenery, the theater walls and ceiling, the sound system has to rise above the orchestra, to an average level of 80dB SPL. Since today's audience expects 95% intelligibility, actors generally use wireless microphones, and the vocal level rises to an average of 86dB SPL, leaving the sound designer with little room for vocal

nuance, especially when the actor's microphone is buried under a wig or hat.

And that is the best-case scenario. In many instances, the producer reduces the size of the orchestra pit in order to cram in more seats. The production's scenic designer may place beams and other devices in the pit. Sound and music departments are faced with the task of cramming the musicians into the remaining space, regardless of the pit orchestra's preferred positioning for internal acoustic balance.

As there is often no room in the orchestra pit for baffles, instruments leak into other instrument's mics. An acoustic instrument mic soloed can sound like the entire orchestra mixed on acid. Contact mics and clip-ons can help, but sound quality tends to suffer.

A MODEST PROPOSAL

My answer to this problem is to remove some of the orchestra players from the pit. Placing the musicians in another location that is isolated from the auditorium will fix the musician's seating problem and greatly improve the quality of each instrument's amplified sound. The overall sound mix will be completely controllable throughout the audi-

torium, since there will no longer be any direct sound from the pit (most of which is detrimental to the final mix anyway). Further, the actors' voices can now be mixed at a level that matches the scene.

How will the orchestra conductor, used to keeping the musicians balanced with the actors onstage, maintain that balance once the two are performing in separate spaces? No problem. A well-planned video and monitor mix system will allow the conductor to cue the musicians to the actors' performance.

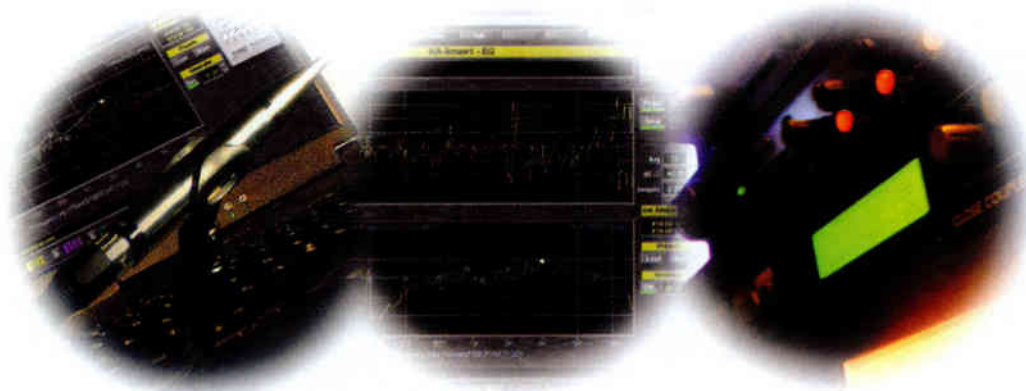
Monitor systems for musical theater are already commonplace: My recent sound design for *The Music Man* includes eight different monitor mixes for the musicians in the pit. Looking over my sound designs for the last few years, I noticed that I wound up with an average of six monitor mixes for musicians alone. For a rock or music concert system, this number of monitor mixes seems minimal, but theater systems traditionally only have one mixing board, at the FOH position in the auditorium. Eight monitor mixes means that many aux bus sends are not available for effects sends and other uses, a severe limitation in the sound design.

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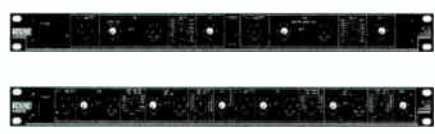
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LIVE SOUND

shackles of "conventional" theater sound design and place a full-on monitor console backstage. The deck/backstage sound person can control all orchestra monitor and stage foldback requirements from this additional console; it's a plan that is far more workable than current practice, which usually involves a lot of messages to the FOH engineer from backstage via intercom. The FOH engineer would then be free to focus on mixing for the audience, undistracted by having to deal with backstage or pit mixes.

But perhaps I'm barking up the wrong tree. As theater sound buffs already know, the most recent Tony Award winner for Best New Musical is a show called *Contact*. This show is truly a brilliant production and deserves the many accolades it has already received. But *Contact* is a musical with 100% pre-recorded music; there's not a single live musician in the production. If the future of live musical theater is going to depend on the reproduction of needle-drop music, then my proposals for separate FOH and monitor mixers may prove moot.

But, for the moment, I choose to believe that live musical theater, accompanied by live musicians, has a future and that audiences will become more discriminating and more demanding. In that case, it is time for theater sound to abandon the conventions surrounding pit orchestras and single-console sound designs and apply the lessons learned by touring bands over the past few decades. I predict that the future of sound design for musical theater will include multiple mix positions and off-stage, or isolated, orchestra positions, where instrument mics may be positioned for the best sound, not just where they will fit.

Jonathan Deans has designed musicals, plays, operas, concerts and Las Vegas spectaculars. Recent theatrical credits include Music Man, Fosse, Parade, Ragtime, Candide, and Disney's King David and Beauty and the Beast. He has also provided sound design for Las Vegas venues and productions including EFX, Siegfried and Roy, Masquerade Parade, and Cirque du Soleil's "O" and Mystere. For several years, he taught MFA students theater sound design at UCLA. Currently, he is working on a new production called Seussical and a sound system upgrade for Mystere.



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—FROM PAGE 181, SLIPKNOT

Slipknot in 1997. This sophomore effort, which included “Spit it Out,” “Wait and Bleed,” “sic,” “Eyeless,” “Surfacing,” “Scissors” and “Prosthetics” became an overnight success.

Joining the 1999 Ozzfest summer line-up put Slipknot over the top. They say it was a dream come true to actually share a gig with two of its all-time favorites and early influences: Black Sabbath and Slayer.

By the time you'll be reading this, Slipknot will be headlining the Tattoo the Earth tour, which launched on July 15 at Portland Meadows. Joining the band this time around are Sevendust, Coal Chamber, Soulfly, Nashville Pussy and Mudvayne. Self-billed as an “alternative lifestyle festival which combines top hard music bands with world-renowned tattoo artists,” Tattoo the Earth is “a passport to another way of living,” at least according to the tour's promoter, BeatCo's Scott Alderman. After covering the U.S., the tour will come to a temporary halt on August 6 at Birmingham, Alabama's Sloss Furnaces before starting up again in Hasselt, Belgium, on August 25. Slipknot will also appear in England at the Leeds Festival (August 26) and the Reading Festival (August 27).

Slipknot's sound reinforcement gear is being supplied by Thunder Production Group, the Grand Rapids, Mich., branch of Detroit-based Thunder Audio. Regular industry observers will instantly recognize the name of the Thunder Production Group's manager, Paul Owen. A seasoned veteran with 22 years of experience, Paul Owen is probably best known as Metallica's monitor engineer, a gig that has kept him busy since 1986. A native Englishman from Kingswinford, the 42-year-old audio gearhead and engineer is hardly a stranger to the colonies, having lived in both Minnesota and Florida before taking up residence for his latest gig with Thunder Audio on the eastern shores of Lake Michigan.

“I like Michigan,” he says of his move to the meteorologically malleable Midwest. “There is a distinct spring, summer, fall and winter here. It's as seasonal as the P.A. business, you might say... This is the first time in my life I haven't worked as an independent. In the past, I've always been the one telling sound companies how to do things. Now I'm on the other side of the fence. It's a big difference really, but

certainly not one outside of my range of experience. Over the years, I've grown with companies like SSE, so I know how things are put together, packaged and made efficient.”

For the Thunder Production Group, making things efficient for Slipknot was a process, which began in earnest just prior to the band's departure for Europe not long ago. That's when Paul Owen convinced the band's FOH engineer, Eddie Oertell, that he should try out a Nexo system while abroad. After using an SSE-supplied Nexo rig in the UK, Oertell returned Stateside and instantly gave the Thunder Production Group a call to outfit him for the band's next tour leg, which ran from April 5 to May 28.

Happy to comply with Oertell's urgent request, Owen quickly assembled a Nexo rig for Slipknot using 18 stacks per side of the French manufacturer's M3 mid/high boxes and B1 low/mid enclosures. Operable from 175 to 19k Hz, each bi-amped M3 is outfitted with double 10s and a 3-inch horn assembly to produce a 35°x35° pattern. Conversely, a single 15 serves as the heart and soul of each B1. Six double-18 S2 subwoofer systems per side bring up the low-end, while Nexo's TD controllers manage the task of routing and processing signals. For times when the system is flown, Nexo's Crossbow hardware is called in.

“The Nexo rig works well for this band on a number of levels,” Oertell relates. “First and foremost, you have to realize that there are nine musicians on-stage, so you naturally have a fairly intense mix to deal with right there. Add to their sheer numbers the fact that this is aggressive, in-your-face hardcore music with a lot of samples, three drummers and seismically irresponsible amounts of kick drum, and the need for a P.A. which can accurately reproduce this huge wall of sound becomes even more apparent. The Nexo boxes have a way of managing it all from bottom to top. At the low end, we can drop down to 43 Hz with 140dB peaks to really move some air. Then, from the low/mids, we can cross over all the way up to 19k with virtually the same performance. That's really the meat of the system right there. I mix at FOH C-weighted between 115 and 118 dB totally distortion free, with no problems, hands down.”

“That's one of a Nexo rig's strongest attributes,” Owen concurs. “It's actually faultless from top to bottom. With many systems out there today, the high end and the mids are wonderful, then the


low/mids and the subs fall apart. For those of us who've found that the flexibility of some line arrays is really not all that wonderful, there is Nexo.”

A total of 29 stage inputs are routed to Oertell's Yamaha PM4000 at FOH. For Slipknot's headlining tour dates (before the band joined forces with Tattoo the Earth), Oertell relied on an inventory of Shure microphones, including SM91, Beta 52 and Beta 58 models for drums and even a number of empty beer kegs in one of the percussion sections. Vocal mics were Beta 58s, and BSS DIs were used for bass, the DJ and the onstage sampler.

For processing, Oertell is using the new D2 delay from TC Electronic. “I use it on really long delays,” Oertell explains, “like haunting screams and whatnot which need to trail off considerably beyond their normal duration.” Other effects devices at FOH include an Eventide H3000 Harmonizer and a Korg flange program for vocals on Slipknot's hit “Wait and Bleed.” “I bring out accents on that song to duplicate the sound on the album by using a 50/50 mix of the Korg flange program and the H3000,” Oertell explains. For drums, Oertell's reverb of choice is a TC Electronic M5000 while on vocals he opts for a Yamaha SPX990. Also in his rack are DN360s from Klark-Teknik and Drawer gates and compressors.

Working at a Midas XL250, monitor engineer Kevin “Kevo” Moran joined up after Slipknot's UK tour at the beginning of the year. Supplementing a Spartan assortment of processing, including his own K-T DN360s with Behringer gates and compressors, he serves up an earful to the band each night with the help of Nexo Alpha E Series components for drumfill and sidefill, and custom wedges from the Thunder Production Group.

While touring with Slipknot, Oertell has found himself in just about every live sound situation imaginable, from theaters and clubs to festivals and sheds. “This system is very economical, compact and efficient,” he says of the Nexo system. “It has no problems—and I beat the crap out of it. Gear aside, if there's any secret to mixing this group, it's that you have to properly blend the two percussion sections with the drums. Once I get the percussion to fit into the pocket, I use the drummer to accent it all; it's sort of a tribal thing. That done, I make sure the guitars are on top, keep the vocals clean, and it's there. Every element in Slipknot's sound is aggressive. My job is simply to sort it out and make sure that everyone is heard.” ■



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cables, DI boxes, batteries, etc. Price is \$180.

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COIL'N'CARRY CABLE HANDLER ▼

The new COIL'N'CARRY™ handle/strap from Toleeto Fasteners International (www.cordlox.com) holds bundles of coiled cable up to 9 inches in diameter and up to 50 lbs. Supplied with a rubberized handle and heavy-duty brass grommet for storage, the COIL'N'CARRY is made of polypropylene webbing; an adjustable nylon side-release buckle keeps cables strapped tight and tidy. Price is \$9.95.

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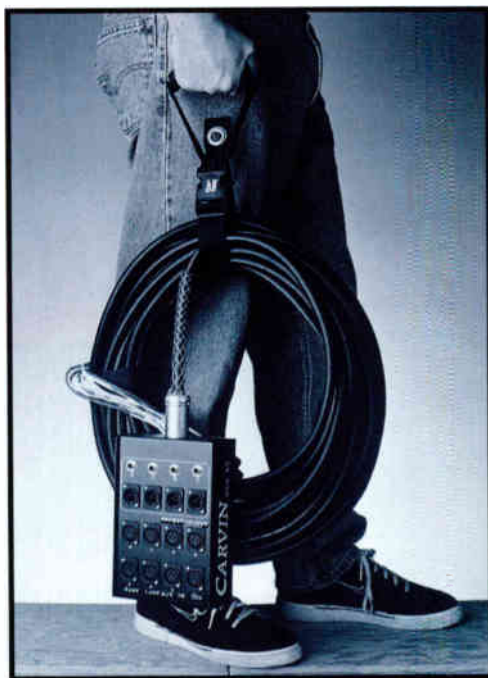


pair of 15-inch drivers with 4-inch voice coils. Frequency response is 45 to 200 Hz, ±4 dB, and the enclosure measures 32.9x20.1x24.9 inches. The TQ-425SP is also available in a non-powered format. Price is \$5,130.

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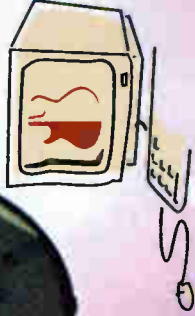
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RETURN TO "MERMAID AVENUE"

**BILLY BRAGG AND
WILCO COLLABORATE
WITH WOODY GUTHRIE
ONCE AGAIN**

By Kimberly Chun

Woody Guthrie left behind such a large body of unpublished lyrics that Billy Bragg and Wilco could probably spend the rest of their careers writing and recording music for them. That was the problem when British punk/folk singer/songwriter Bragg took a look at the 40 songs charted on a big piece of paper on the wall of Totally Wired Studio in Dublin, Ireland, in January 1998.

Surrounded by moody musicians enduring six weeks of perpetual rain in a chilly warehouse studio, Bragg could see the writing on the wall: There were obviously too many good tracks to fit on one disc. A double-CD was out of the question for Wilco, who had just released the critically acclaimed but financially punishing *Being There*. And so *Mermaid Avenue* and its recently released follow-up, *Mermaid Avenue, Volume 2* (both on Elektra) were born.

"I remember saying, 'Geez, we're going to have to stop,'" Bragg recalls during a phone interview from his London home. "So when we were actually figuring out which tracks would go on *Mermaid Avenue*, I think all of us felt in our hearts that there would be a volume two because the songs that we recorded were all so strong. So it was okay to



PHOTO: KEN SCHLES

Billy Bragg (right) with the members of Wilco

leave a song as powerful as 'Hot Rod Hotel,' 'All You Fascists,' or 'Blood of the Lamb.' It's not as if they're the second best."

Nothing in modern musical history quite compares to the *Mermaid Avenue* project, but then few figures in American musical history compare to Guthrie. On both *Mermaid Avenue* albums, Bragg and Wilco took on a task that would probably intimidate most musicians: Set a long-gone legend's 40- to 50-year-old lyrics to music. "I wanted to work with people that *knew* they didn't know Woody Guthrie. And I include myself in that group of people as well," Woody Guthrie's youngest daughter Nora Guthrie says with an

earthy laugh. She began to delve into the boxes of her father's little known writing when she started the Archives eight years ago. "I mean, I knew my dad, but I didn't know his writing. And I felt very comfortable working with Billy and Wilco: They knew something but not too much; it wasn't part of their generation, and I knew that as artists they would be free. You know, that they would just make the best damn music they could."

The thousands of lyrics, accompanied by no notated or recorded music, at the Woody Guthrie Archive on 57th Street in New York City are a testament to a particularly prolific period in the

—CONTINUED ON PAGE 198

THE BASS BROTHERS AND EMINEM

BREAKING THE RULES, BREAKING DOWN BARRIERS

By Gary Eskow

Marshall Mathers—better known to his legion of fans as Eminem—is the music industry equivalent of basketball player Jason Williams. The Sacramento Kings point guard breaks down racial stereotypes: White players can be technically sound and are *always* dull, but not

to be released days after we spoke to him and to the production team that has overseen the creation of much of this work and the artist's debut CD, *Slim Shady*. Advance projections estimated that as many as 750,000 copies would be sold during the first weekend of its release, so the Bass Brothers were feeling pretty good. (Indeed, the CD has proven to be another enormous hit, exceeding projections.)

Growing up in Detroit, 39-year-old Jeff Bass and Marky, four years his junior, were exposed to a wide variety of musical influences. "We grew up in a mixed racial neighborhood and schools, and the most interesting musicians were black,"



Left to right: Mark Bass, Eminem and Jeff Bass.



Mark Bass of the Bass Brothers and Marshall Mathers, aka Eminem

Williams, who breaks down defenses with dazzling cross-over moves and no-look passes. Mathers uses withering wit, slamming rhythm and tons of 'tude in a fashion not generally associated with pale faces. Along the way he's forcing hip hop fans and industry insiders to reconsider some fundamental assumptions.

Eminem's new CD, *The Marshall Mathers LP*, was due

says Marky. "At age 8, I was called by Sylvia Moy to audition with Jeffrey for a national Greyhound commercial. Sylvia, who wrote 'My Cherie Amour' with Stevie Wonder, thought we were the funkiest white kids in Detroit; she was really a mentor and encouraged us to stick with it. At age 15, my mother let me leave high school to go on the road with my brother's band, Dreamboy. They had a

Top 20 album at the time on Warner Bros./Quest Records. The project lasted for three years with no real returns financially—actually my brother went broke in the process! After that, I thought maybe college was a better route to take, but I kept getting pulled back into the business.

"In 1990, Jeffrey and I landed a deal to produce a hip-hop rap project called Tycie & Woody for Elektra Records, operating for the first time as the 'Funky Bass Brothers.' We met George Clinton and started working as a production team for George and for his label, Westbound Records. Unfortunately, most of the acts that we produced for Westbound were never released, and we feel it was some of our best work. Generally speaking, we always worked with black artists, although not intentionally. That changed, of course, when we heard a white rapper freestyle on a local radio show in 1992."

Marshall Mathers grew up poor, without much guidance and, in large measure, bitter, but he also had an iron will and a caustic, corrugated tongue. By the time he was 15, the Detroit native was rapping in clubs throughout

town. One night, Mark Bass tuned in to open mic night on a local radio station. "I used to cut demos and go on the radio to rap," says Mathers. "Mark heard the shit on the air and called the studio on the spot. We met later that week. The Bass Brothers had a connection with Elektra, but they turned down the project, so I stopped working with them.

"I started making a name for myself around Detroit and so I took my income tax check to make a single," Eminem continues. "Marky and Jeff liked that; they thought it was cool. 'What about a production deal?' they asked. I said 'Yeah.' I started winning rap battles around Detroit. By this time we'd been apart for about four years. They had to continue with what they were doing and I had to get my shit together; I was only 15 when I met them! By this time my voice had matured, my raps were better. I'm not smart—really, I'm not playin', I'm not good at math or reading; I don't have the attention span. I don't know how I put words together, I guess I'm *Rain Man* smart—I can do one thing and that's it."

—CONTINUED ON PAGE 206

JOAN JETT'S "I LOVE ROCK 'N' ROLL"

by Blair Jackson

Joan Jett turns 40 this September, a milestone that seems almost unimaginable to anyone who still remembers her at 17 strutting the stage, all rock star poses and crunching power chords, as a member of L.A.'s beloved/derided jail-bait group, The Runaways. Actually, The Runaways were pretty good the night I saw them in a San Francisco club in 1977. They put on a high-energy show that had the place rockin', and the girls were easily more proficient on their instruments than most of the punk bands that were springing up like weeds in the Bay Area at that time. But everyone treated them like a joke, and as a concept—glam-tramp rock?—the group seemed doomed to failure from the moment in 1975 when Sunset Strip rock Svengali Kim Fowley sprang them on an unsuspecting world.

Still, The Runaways turned out to be just an early stepping stone for guitarist/singer/songwriter Joan Jett. A native of Philadelphia, she moved to Baltimore while still in grade school and then, at age 12, to Southern California. She was a bit of a wild child and had trouble fitting in at her new school, so it's not too surprising that she fell in with a fast crowd that frequented various Hollywood rock 'n' roll clubs. She loved the early '70s glam scene, with the theatrical make-up and platform shoes—her idols were T. Rex, David Bowie, Slade and hard-rocking Suzi Quatro, who is all but forgotten now but was influential on a generation of girls who wanted to plug in and play electric guitar.

When she was just 15, Jett met Kim Fowley at the Starwood club, and he enticed her to form The Runaways, which he both managed and produced. Fowley had imagined the group as a sort of female Ramones, and many of their early gigs were on the punk/new wave circuit—for instance, their New York debut in 1976 was at CBGB's on a bill with Television and Talking Heads.

Though lingerie-clad singer Cherie Currie became the group's focal point, and lead guitarist Lita Ford was the only one with much previous band experience, Jett distinguished herself early on as someone who was serious about music and songwriting.

The Runaways made a couple of mediocre albums that few people bought, but at least they got the thrill of touring for a few years, enjoying the rock 'n' roll lifestyle and seeing the world. Critically lambasted from the get-go, they never



really rose above being a novelty act, but they *did* get to do a cool tour opening for The Ramones in 1978! On New Year's Eve 1978-79, the group played what turned out to be its final performance, in San Francisco.

Jett traveled to England the following spring and cut some tracks with former Sex Pistols Steve Jones and Paul Cook, but only a single in Holland resulted from the sessions. By summer she was back in L.A., producing an album by the punk band The Germs and starring in a not particularly memorable film based on the brief career of The Runaways called *We're All Crazy Now*. That didn't establish her as an actress, but one positive aspect of the experience is she hooked up with producers Kenny Laguna (Jonathan Richman, Greg Kihn, Bow Wow Wow) and Ritchie Cordell (writer of many of Tommy James' hits, as well various bubblegum groups in the '60s), and they offered to produce her first solo album.

Joan Jett combined the tracks she'd cut in England with new ones featuring

Blondie's Clem Burke and Frank Infante, among others. Initially, all the major U.S. labels passed on the record and it was released in Europe only. Eventually, after a spate of good reviews and some buzz in Europe, Boardwalk Records in the U.S. picked up the LP, renamed it *Bad Reputation* (an apt title) and released it in early 1981. It didn't sell very well, but it got some radio play, and Jett and her band, The Blackhearts—bassist Gary Ryan, guitarist Eric Ambel and drummer Danny O'Brian; all New Yorkers—managed to tour steadily behind it, building a following as a tight and explosive live act.

Around the middle of the year, the group (with new drummer Lee Crystal replacing O'Brian), Laguna and Cordell went into ODO Soundworks Studio in New York City to begin work on Jett's second LP. The engineer was Glen Kolotkin (see this issue's Producer's Desk), a veteran who had worked with Laguna on various Beserkley Records albums and was now the de facto house engineer for the production duo. "We recorded all these songs that were pretty good, but I didn't hear any hits," Kolotkin remembers. "I kept saying, 'What are we going to do for a hit?' So Kenny Laguna said, 'We have one song that could be a hit, but I don't know if we're going to record it, because [producer] Roy Thomas Baker wants to record it. I hadn't heard it at that point."

"I had produced Journey's second album, *Look Into the Future*, and I was supposed to do their next album, but Roy Thomas Baker ended up doing it after Journey got their new singer, Steve Perry. I knew that album would be a hit, but he ended up doing it. So when I heard Roy Thomas Baker's name mentioned again with Joan Jett and this song, I immediately went in and got the band to play the song one morning in the studio. And they *really* played it! That was 'I Love Rock 'n' Roll.'"

Written by Alan Merrill and Jake Hooker of an obscure mid-'70s band called The Arrows, the song had been a favorite of Jett's since she saw The Arrows perform it on British TV during a Runaways tour of England. In fact, she had unsuccessfully tried to convince The Runaways to cover the tune. For all intents and purposes, it was unknown in the U.S. at the time Joan Jett & the

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Blackhearts recorded it. And Merrill and Hooker couldn't have envisioned the big, booming production treatment the team of Kolotkin, Laguna and Cordell came up with for the song. With its stacks of vocals, thunderous hand claps and anthemic rock guitar, the song fairly resembled a production by Roy Thomas Baker, who was riding high with The Cars, Queen and others.

Kolotkin chuckles when I make the comparison. "Well, it *was* an obvious way to do it," he says. "I knew it was going to be a hit and I wasn't going to let it slip away. We wanted the vocal overdubs to be almost like an audience."

When Ricky Byrd joined the Black-

hearts as lead guitarist that summer, replacing Eric Ambel (who's now a successful producer), Laguna and Cordell decided to re-record most of the album at Kingdom Sound, a 24-track, Harrison console-equipped facility in Syosset Long Island. Though he'd only been with the band a week when recording at Kingdom began, Byrd fit in immediately and the recording went quickly and smoothly.

"It took us almost no time to get a basic track on 'I Love Rock 'n' Roll,'" Kolotkin recalls. "I thought it was a smash hit from the beginning. Then Laguna came in and Cordell came in and they were as knocked out as I was, and

Cool Spins

The Mix Staff Members Pick Their
Current Favorites

Sonic Youth: *NYC Ghosts & Flowers* (Geffen)

Sonic Youth's latest recording starts with the sound of snores—but this CD is far from a bore. "Free City Rhymes" sets the



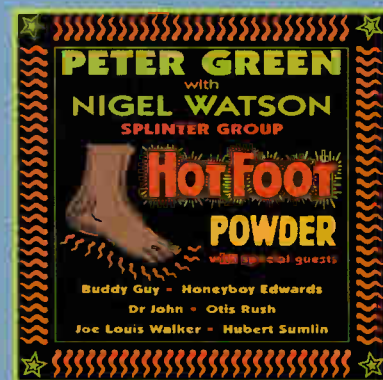
scene with an ambient, rhythmic drift of a song that conjures the mood of a city street shimmering with late-afternoon sun. Drummer Steve Shelley grounds the delicate chug as echoes of Thurston Moore and Lee Ranaldo's guitars bounce off into musical tangents, like reflections shooting off concrete and metal. There's plenty of crash and burn for noisemongers to enjoy as well. The Velvet-y "Renegade Princess" is vintage Sister, motoring along with hot rod guitars before vaporizing into free-form feedback and reverb. It's nice to know that the good ol' Youth haven't given up the ghost of demon rock, contrary to recent obituaries. Other songs, such as "Nevermind (What Was It Anyway)" and "Small Flowers Crack Concrete," show off what Sonic Youth does

best, among those bands that worshipped at the altar of noise. They could make feedback sound filigreed, dreamy and even pretty, with detuned guitars plucked to sound like falling flower petals. With help from Jim O'Rourke, SY go with that strength on *NYC Ghosts & Flowers*, straining against the conventional flesh of pop song structure, while maintaining a solid skeleton of rhythm.

Producers: Sonic Youth and Jim O'Rourke. Engineers: Wharton Tiers and O'Rourke. Mastering: Greg Calbi/Sterling Sound (NYC).
—Kimberly Chun

Peter Green with Nigel Watson and Splinter Group: *Hot Foot Powder* (Artisan Recordings)

This CD is a companion to Green and Watson's W.C. Handy Award-winning 1998 release, *The Robert Johnson Songbook*. Together, the two discs include every song recorded by the legendary '30s bluesman, and they show that there's still a lot of life in these old tunes. British and American guitarists have been interpreting Johnson's



songs since the mid-60s blues explosion, yet Green, the original lead guitarist for Fleetwood Mac in the '60s, and fellow gui-

—CONTINUED ON PAGE 212

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we finished the record up in one day. It just came together." The basic track for the song was live, but then there were numerous overdubs, including doubling certain guitar lines and, of course, the layer upon layer of voices and hand claps, magnified by EMT plates "and maybe some Lexicon" reverb, Kolotkin says. "We just kept building it up and up and up. I knew it was right when the hair stood up on the back of my neck.

"I'll never forget, we were mixing it and we had used the automation on the Harrison console they had there, and we mixed it for a few hours and we had six mixes which I know Laguna and Cordell were happy with, but I wasn't that happy with. To me, something was still missing, or it didn't feel quite right. So I said, 'Let me just try this other approach.' And I pulled out the patches and in 15 minutes I came up with another mix which was completely different, *without* the automation. I got Laguna and Cordell to come in and they liked that one, too, but they decided to let the band pick out what they wanted to use. So we put that mix in the middle of the other mixes and brought the band in and when it came to the 15-

minute mix they all jumped up and said, 'That's the one!' It wasn't perfect, but it was very exciting.

"On the other mixes, I felt like we'd lost a lot of the energy. Everything was in a perfect place, everything was shaped perfectly, but I heard it in my head as more raucous, with all that echo on there that should sound like a big coliseum. So that's what I emphasized. Joan's voice gets lost here and there, but so what—it doesn't matter. It needed a rougher sound."

The finished album, also called *I Love Rock 'n' Roll*, came out shortly before Christmas in 1981 and immediately caused a sensation—not because of the title song but because of a hard-rocking version of "Little Drummer Boy," of all things. (That tune was deleted from the LP after Christmas and was replaced by Jett's "Woe Is Me.") That opened the door for radio to play "I Love Rock 'n' Roll," and it soared all the way to Number One in early 1982, remaining in the top spot for seven weeks. The album also yielded another smash: a fine version of Cordell's Tommy James hit "Crimson and Clover." After those successes, people stopped talking about The Runaways and accepted Jett as the

tough and talented bandleader she had become. And to date, *I Love Rock 'n' Roll* album has sold more than 10 million copies worldwide.

Through the years, Jett has had several other hits and has proven to be quite a road warrior, and through it all Laguna has remained her manager and producer. Her most recent album, with the re-formed Blackhearts, was 1999's *Fetish*. But beyond Jett's commercial success has been her unquestioned influence on the current crop of Riot Grrrl bands, who view the trajectory of Jett's career as an inspiration. ■

—FROM PAGE 192, BILLY BRAGG AND WILCO
 songwriter's life, speculates Wilco's guitarist/keyboardist/songwriter/engineer Jay Bennett, who sifted through lyrics at the Archive with Wilco lead vocalist/songwriter/guitarist Jeff Tweedy. "The Joe Klein book [*Woody Guthrie: A Life*, 1980] has one of Woody's lists, and one of the top things on his list was 'write a song every day.' His list was 'drink less,' 'smoke less,' 'womanize less' and 'write a song every day,'" the Chicago resident drawls. "I don't know if there's any other

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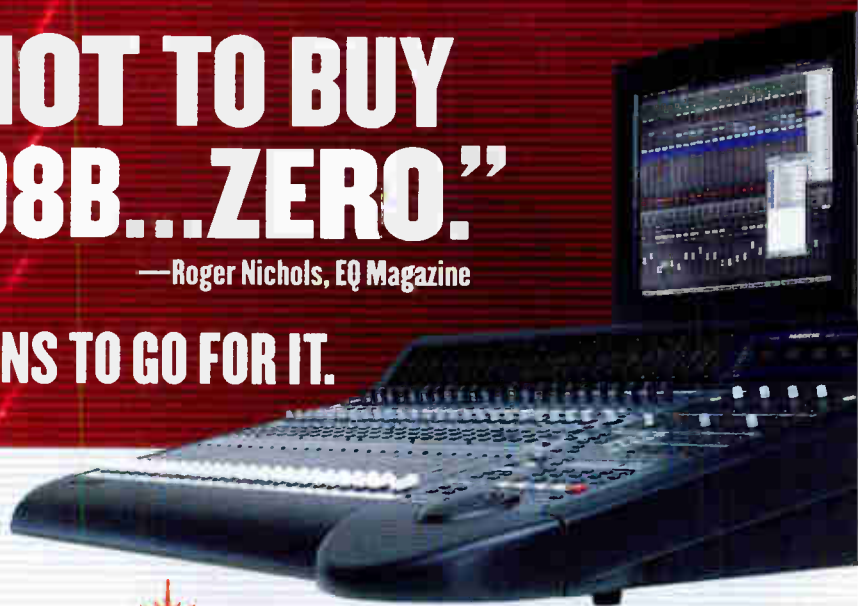
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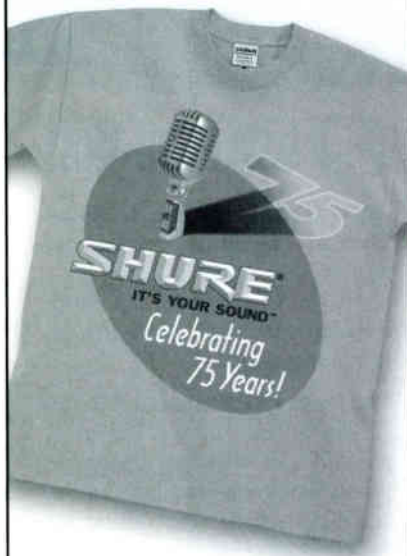


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artist with that many lyrics that the music was lost for. There's probably close to 10 years of Woody's life where he couldn't set words to music, physically, during the last few years of his life. [Guthrie suffered from Huntington's disease and died in 1967 at 55.] So, you have all this material from a career that really wasn't focused on recording."

The first *Mermaid Avenue* album introduced folk and country old-timers and No Depression country, rock and alternative newcomers to a new kind of Woody Guthrie: less the icon that wrote "This Land Is Your Land" and more the man who wrote eloquently about lust, loss, politics, pop culture and spirituality.

That was a major consideration in structuring the first album, says Bragg. "The picture we're trying to paint is of a contemporary Woody Guthrie. So therefore it's important that you have a song on there like 'Ingrid Bergman,' which draws him away from being a political icon and more into a flesh-and-blood character who's having fantasies about a film star of his day. I had a very clear idea of the Woody Guthrie that I wanted to portray, as opposed to the classic Woody Guthrie that you Americans have in some ways constructed over the past 40 years since his death, first by Bob Dylan and then by people who came after," he says.

Mermaid Avenue was universally acclaimed by critics, nominated for a Grammy and, Bragg says, sold more than all of his own records combined. On *Volume 2*, Guthrie's lyrics go uptown and urban, tackling recognizably modern subjects with impassioned or whimsical twists on "Airline to Heaven," "My Flying Saucer," "Hot Rod Hotel" and "Joe DiMaggio Done It Again." The 1942 "All Your Fascists" rages against race hatred in blunt, sing-along verses and ragged guitars. The stunning, literary lyrics of songs such as "Remember the Mountain Bed" are given simple musical settings so that they might shine. Lyrically bare-bones tunes like "Someday Some Morning Sometime" provide an open canvas for Wilco's sonic experiments with, say, tape delays.

The journey to *Mermaid Avenue* began at a 1992 concert celebrating Guthrie's 80th birthday in Central Park in New York City. Bragg played the Guthrie song he knew best, "Pretty Boy Floyd" and met Nora Guthrie. A couple years later, she wrote to Bragg and outlined her idea. She wanted to find some musicians to write music for the lyrics at the Woody Guthrie Archive, which she and

Woody Guthrie's manager Harold Leventhal direct. "Very, very cleverly, she actually sent me in that letter some photocopies of some of the lyrics, which, when I realized how powerful and vivid these lyrics were, how complete they were, I was very interested to go and see her in the Archives," Bragg says.

Digging through the papers at the one-room archive, Bragg found lyrics he was interested in. Nora Guthrie would fax those she found intriguing, and four years ago, the singer/songwriter began demoing tunes at a friend's house. Part of the deal was that Bragg would be able to choose the musicians he worked with. Nora Guthrie could choose the title—which is named after the street the Guthrie family lived on in Brooklyn and the address stamped on many of the lyrics—and even the songs. But Bragg had specific ideas about the sound. "Trust me with the musicians," he recalls saying to her, "because I want to pitch this in a way that people just don't dismiss it as a Billy Bragg record—too political—or a country or folk music record—too acoustic."

In 1997, Bragg enlisted Wilco as his house band, and eventually fellow songwriters, because, he deadpans, "I felt it would be wrong for me as an Englishman to keep all this for myself. I thought that was a bit unfair, being a foreigner and all."

But seriously, he explains: "Nora's initial suggestion was that there would be a number of different singers for every track, and she had a list of folk artists who would all love to contribute. But I was afraid it would sound like a...tribute album. Tribute albums are a fine idea, but very often, they're about the artists that perform rather than the songs that are being recorded. So I thought that it would good if there was just like a house band that played all the songs so there was a continuity of feel, and so when I thought about what band that might be, Wilco really were my prime objective. All those Americana bands suddenly turned up, but none of them for my money could play in the various styles that Wilco obviously could on *Being There*. I knew Jeff Tweedy from when he was in Uncle Tupelo, and I knew that if I could explain this project to him, he would get it."

As for Bragg, it was easy to come up with music for such well-crafted lyrics: "The songs are so sturdily constructed in their imagery but also in their internal rhythm, that you could play them all sorts of speeds, all sorts of ways. The lyrics shine, really. It was an

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absolute pleasure, for me as a musician, to do these songs, and as a songwriter, it's even greater, because I didn't have to put my soul into the lyrics that I write myself. These lyrics were already there, and they had soul—they had Woody's soul. All I had to do was to put them, if you like, in a frame. We were finding beautiful portraits and making nice frames for them, so they could be displayed."

Eventually Bragg invited Wilco to go to the archives and pick out lyrics for themselves. "It occurred to me that I was choosing songs that reflected my own point of view," Bragg observes. "Then it became very, very important for me to get some other songwriters involved, to get them into the Archive to choose their own songs—that it wasn't just *my* version of Woody Guthrie that was coming out. I never would have chosen 'California Stars,' for instance, off the last album, and that has been one of the standout tracks from that album. But it didn't ring a bell with me, whereas it rang a bell with Jeff and Jay."

Bragg and Wilco together recorded demos of several songs at King Size Sound Laboratories in Chicago in the fall of 1997 with engineers Dave Trumfio and

Mike Hagler. Some lead and backing vocals were recorded by guest artists Corey Harris and Natalie Merchant at Fort Apache in Boston. Recording moved in the winter of '98 to Totally Wired in

I was afraid it would sound like a...tribute album. Tribute albums are a fine idea, but very often, they're about the artists that perform rather than the songs that are being recorded.

—Billy Bragg

Dublin, where Wilco, Bragg and Bragg's longtime producer Grant Showbiz produced. Jerry Boys, fresh from *Buena Vista Social Club*, engineered.

Working as they would as Wilco,

Tweedy and Bennett first learned the songs on acoustic guitars and then looked for appropriate other instruments, which ranged from a resonator guitar (which Bragg had never played previously) to an electric sitar owned by Bennett. Separate iso booths were built around drummer Ken Coomer, Bragg and Tweedy. "Actually, one of the reasons there might be any sonic continuity to this record at all is the fact that Totally Wired is actually a very similar room to our studio [The Loft in Chicago]," says Bennett. "We attempted to get some isolation on the vocals and acoustic guitars, but you're only halfway successful doing that in a big room. There's always drums coming through the piano mic and drums coming through the acoustic and vocal mic. We just set up in a little circle, and we actually used very little of the giant room. We just kind of moved our little semi-circle from one part of the room to the next to vary the sound." Vocal mics were Shure SM7 and SM57s

At Totally Wired they recorded to 24-track analog at 15 ips "to get a little more stuff on a single reel and give it a little bit of a lo-fi, warm sound," says Bennett. Bragg would record one of his songs,

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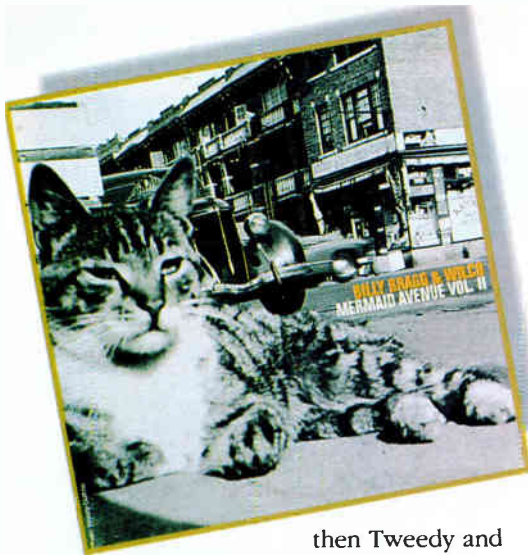
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then Tweedy and Bennett would record one of their own, sometimes playing the same song in three or four different styles before settling on one. In the group's song-a-day approach, they'd start with basic tracks and end with a rough mix, recording everything live with as few overdubs as possible, since as Bragg says, the songs were fresh and deserved "to be captured in that moment of creation."

Mixing happened around the corner at Windmill Lane in Dublin, and this process proved to be somewhat combustible. "I've never made an album where someone else had a veto on mixes, nor had Jeff Tweedy," says Bragg. "His ideas and my ideas weren't the same, but we managed to find a compromise. We had to go back and say, 'Look, you mix your tracks and I'll mix my tracks, and you can comment on mine, and I'll comment on yours, but in the end, I'll accept that you'll be happy with your tracks and I'll be happy with my tracks. And if there's any dispute, Nora will come in and make the decision.' She had the final say—much against her will, I must say; she didn't want the grief! She wanted everyone to be friends."

But as Bragg notes, they cared enough about the project to overcome any personal difficulties that arose, and eventually, they put together *Volume 2*. Bragg went back in the studio to redo a vocal or two, which he called a "bit flat. Shh, don't tell anyone," he cackles. And this spring, Tweedy and Bennett returned to The Loft, their 4,900-square-foot, cement storage facility-turned-rehearsal room-turned-project studio, to record nine more tracks, four of which made it onto *Volume 2*.

"We built some gobos and used some of our anvil cases and stuff to build walls and put up some curtains but it's essentially still a giant cement room, and you can only get away from it sounding like a giant cement room so

much," says Bennett. "We actually kind of like the sound of the room, and, in fact, on the tracks that we recorded there, we never used any reverb because we got all we needed from the space itself. What's good is that it makes you not put a lot of mics on things, because if you put 11 mics on a drum kit, that's just 11 more mics picking up the sound of the room. It makes us take real minimalist approaches, recording the drum kit with three mics." They often relied on the Shure KSM32 and Bennett's favorite "all-purpose mic of all time," the AKG 414. "It just records the entire frequency spectrum relatively flat, damn near any instrument in any context with it."

For these sessions, Amek loaned Wilco a 56-channel Recall RN console and they recorded to ADAT, which gave them the "insane amount of flexibility" they needed to burn as much

It became very, very important for me to get some other songwriters involved, to get them into the Archive to choose their own songs—that it wasn't just my version of Woody Guthrie that was coming out.

—Billy Bragg

tape as they wanted and to experiment. "The thing about ADATs is that if you're unsure about what you're doing, or if you're spontaneous or experimental in your approach to music like we are, you might want to roll tape for an hour and not have to decide which take is the best until a week later," he says. "I think you have to be careful with ADATs: You have to use them in conjunction with other gear. Sometimes you want things to come back at you a little bit saturated or a little bit duller or a little bit thumpier or warmer."

Neve preamps, a UREI compressor, old ribbon mics, and other outboard gear lent by their friend, engineer Jonathan Pines of Private Studios in Urbana, Illinois, helped warm up the sound. "I've

also got a whole collection of old Altec tube preamps that I use a lot," says Bennett. "The Altec stuff is about the only old stuff that's affordable anymore. The 1567A sums several tube mic pre's to one master output so you can put a couple mics on a guitar amp and then combine them to one output. That gives you tube warmth, and on something like 'Airline to Heaven' we used one to get some distortion on the vocal. We had a bunch of that gear for our basic tracking sessions and then we set up one or two really good signal paths, and we did a lot of our overdubs on our own with my little Mackie board."

Some of those recent tracks, such as the airy, ambient "Someday Some Morning Sometime" are strikingly different from the Dublin tracks. "We really worked to get a kind of weird, airy track where you can't really define what the instruments are. They all kind of blend together into one—this kind of atmospheric thing," says Bennett, who engineered that song as well as "Airline to Heaven."

On "Someday," Bennett got to use the Delayaphone, an instrument Wilco invented, for an offbeat, echoey effect. It consists of a little set of vibes sent through a Roland Space Echo, which has a sound-on-sound tape loop feature that keeps going around and recording everything on top of what's already there. "It's a good way of adding an unpredictable atmosphere to a song, because you don't know when what you recorded will come back around. We goofed around with the delay, and then I played it, miked it up, and Jeff messed with the knobs on the delay and he did all this tape distortion in delay and we did a couple of tracks of that," explains Bennett.

Other offbeat instrumentation included Bennett's two-tiered Farfisa keyboard, used in part for its weird percussion effects, Mellotrons, a saw and a Helpinstill Roadmaster piano, which was converted to a tack piano for two songs. "I'd put tacks on the hammers, and we'd use a combination of the direct pickup sound and then we'd mike it," Bennett says. "There's a bit of delay between the pickup and the mic, and that combination of delay and the sound of the tacks hitting the strings gives it an almost harpsichord-like quality."

The most recent recordings were mixed by Pines and Wilco at Private Studios. Greg Calbi pulled *Volume 2* together further during the mastering at Sterling Sound in New York City. Bragg and Wilco plan to tour together this summer,

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and Wilco is currently working on their next album at The Loft. Bragg also plans to record his next album this summer, perhaps playing with a band in the studio in a *Mermaid Avenue* style. And as a result of *Mermaid Avenue*, Nora Guthrie says her father's work will also be getting more attention in a few more projects: *Til We Outnumber 'Em*, a compilation of Woody Guthrie covers performed by Bragg, Ani DiFranco, Bruce Springsteen, the Indigo Girls, Dave Pirner, Ramblin' Jack Elliott and Arlo Guthrie on DiFranco's Righteous Babe label. A Rob Wasserman project highlighting Woody Guthrie's prose will also be released on Atlantic in a few years.

But as the first ones to tackle the daunting task of putting a legend's words to music, *Mermaid Avenue's* players are in a somewhat privileged position to perhaps get to know Guthrie a little better than many others. Bragg notes, "The one time I did still feel very, very close to him was when we recorded a song that was on the first album called 'Another Man's Done Gone.' There's a line in that that says, 'I don't know I may go down or up or anywhere, but I feel like this scribbling will stay.' And when we recorded that

song, right at the end of the session—I wrote the music, Jeff sang it, Jay Bennett played it on the piano, and Nora Guthrie was in the room; she'd brought the lyrics that morning from America to Dublin—I felt like we were at least saying back to Woody, 'Yeah. This scribbling will stay. These words are immortal.'" ■

—FROM PAGE 193, *THE BASS BROTHERS*

Jeff Bass says that he uses Pro Tools to tighten up live performances on instruments, but never a rapper's phrasing. "We capture them exactly as if it were a live performance. Marshall is amazing. He's got no idea where 'one' is, but he just locks into the kick and pours out the most incredibly rhythmic raps. His time is phenomenal.

"One of the things that gives the Bass Brothers a production style is the fact that we don't use any samples other than taking our own performances and sampling them—we don't ever take horn lines off of an old record, for example," he continues. "I'm a huge fan of the old Motown records and I've learned how to capture a lot of what

was on those records by using some of the same techniques they used back then, instead of just sampling licks. For example, I keep a set of old bass strings around. When I want that fat, dead sound I'll put them on my bass. I worked closely with a couple of engineers that actually worked on a lot of those old Motown records and they gave me some great tips. Another tip is to throw away your electronic tuner and tune the guitar by ear. You'll never match the exact intonation that you get when you do use the tuner, and that's the point—neither did the people playing on those old records."

The Bass Brothers approach is to cut parts all the way through a tune onto multitrack rather than simply play a verse and chorus and cut and paste. "That's where Pro Tools helps a lot," says Jeff Bass. "We'll throw all the parts into Pro Tools—we generally go about 16 tracks deep—and then start tightening the time to get it locked right where we want it. Playing live and then using the computer this way keeps the live feel and I think it gets the listener to subliminally wonder, was that a sample or not?"

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feel helped him get to the top of the pile. "I knew how I wanted the first records to sound, they knew how to get 'em to sound that way," he says. "They came up with fatter, thicker-sounding beats than anything I'd had before. How? Well, for one thing Jeff's a genius with the guitar, bass and keyboards. Once he did a few strums of the bass, added some other live parts, it made the songs sound like real records, more produced."

Between the two of them, the Bass Brothers have a total of one month's formal training in the recording business. "I went to a recording workshop

in Ohio; that was it," says Jeff. "The key with us is we're not very technical people. We end up feeling and being able to achieve a sound the way we want to hear it, breaking rules along the way—'You can't put too much 40k on this or that.' We don't listen to any of that stuff because we don't *know* the rules! When we feel it's right, that's it: our sound!"

"The only thing that I could tell you about my knowledge of recording is that we use a process that myself and my brother describe as '8 Mile Style,'" adds Mark. "Our first commercial studio was located on 8 Mile Road, which is the border that literally segregates all of Detroit

from the suburbs. We really had no formal training whatsoever, basically picking up our recording style totally by feel. Of course, we do rely on gear and have developed more conventional techniques, though we believe that ultimately 'it's not in the gear, it's in the ear.'"

Both brothers lived in the Los Angeles area for several years, but Jeff has now moved back to Michigan. How has this affected their work process? "The move came about recently," says Jeff. "When I was living in California we were together and it was a lot easier for us to work. Now that I'm here in Michigan I'll lay down tracks, put them into Pro Tools and FedEx him files. I also send him MIDI files and a CD burned off of the Pro Tools material. We try to have some of the same equipment, but if I've cut something on a synth that he doesn't own, I'll send him a CD or DAT of the actual part and sound. By the way, I have to say that I love the way Digidesign has implemented MIDI into Pro Tools. It makes life a lot easier. I don't get that deep into MIDI, though—if it works, it works!"

"We used the Kurzweil K2000 and Pro Tools mostly on the *Slim Shady* album. Since then I've gotten a Nord II and I think it's a great keyboard; the feel is great, almost like an old Mini Moog. Having all the oscillators and filters on top is great for achieving funky sounds immediately—I like to grab knobs and see what happens. My two main keyboards are the Nord and a Korg Trinity. I also rely heavily on old Roland MC-50 sequencers. It's so fast and easy to use. I bought one and then a few more. I don't use any software synths. Mostly I like to use real pianos and Rhodes that we mike."

Their production routine consists of Jeff creating the tracks and Marky handling most of the engineering. The brothers have a production studio at L.A.'s The Mix Room that's centered around a Mackie 32x8 console and a Pro Tools system. "The Mackie is a great board," says Jeff. "Very user friendly. The dual fader function is something we take advantage of a lot—each channel can be split to double your available inputs. We have one 32x8 board and a pair of 24x8s. Let me do the math...48 plus 32 times 2 gives us a possible 160 inputs!"

"We really like the sound of this board as well. It's very clean and transparent. In rap music that can actually be a disadvantage, though, because hip hop often sounds better with some dirty edge to it. The SSL 6000 is better for hip

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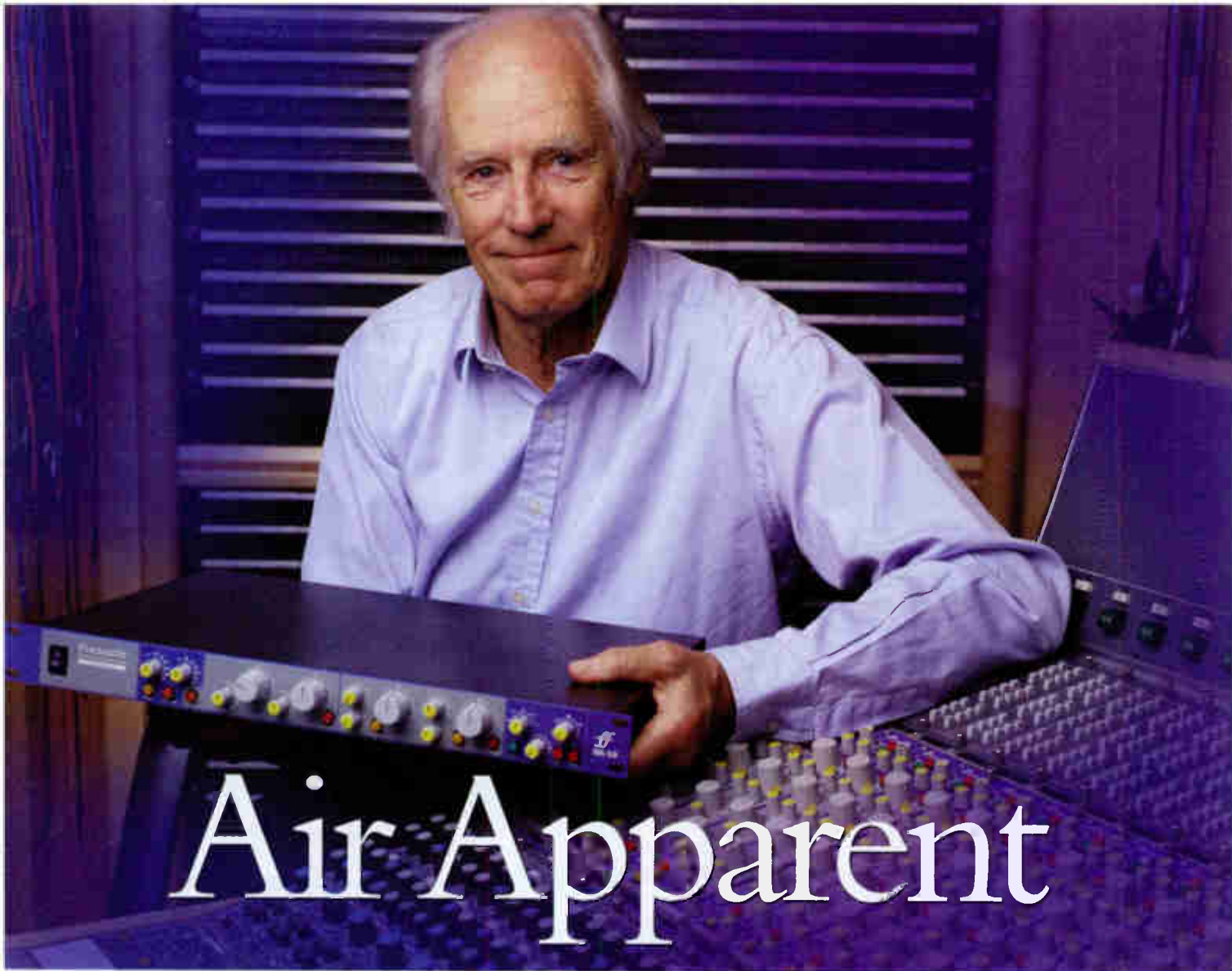
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hop than the 9000, because it's more bottom heavy. If we're staying with the Mackie to track and mix this kind of work, we'll get the extra bottom by busing in outboard gear. We like to mix tracks on three different boards and compare them. Which one feels better? We generally find that the big boards sound better on vocal tracks because of the extensive onboard EQ, but as far as music, believe it or not, the Mackie gives us the fullness and roundness of the instruments that we played. Marky has a really good way of achieving the bottom end on that Mackie. A lot of artists comment on it."

A lot of times we'll actually be told that it's impossible for two white guys to write and produce hip hop music. We have a multi-Platinum-selling artist in the field, though, and that's the proof that we can.

—Jeff Bass

Aaron Lepley is a staff engineer at The Mix Room. "We hit it off right away," says Jeff. "His first real gig as a head engineer was *Slim Shady*. We were working 22 hours a day and he was able to hang with us. Mark's and my work habits are just *go go go*, 20 hours a day 'til it's done, and Aaron was on top of everything. Once I tracked my guitar for example, that was it. The next time I plugged it in Aaron went right to the sound I like. He was great."

Lepley returns the round of compliments. "Mark and Jeff have been great to me—like a small family. Em is cool to work with, too. He knows what he wants, and there's not a lot of sitting around. I also engineered some tracks on the new album."

Do the Bass Brothers ever experience tense moments due to their color and the area of the industry they work in? "Hip hop is a culture," says Marky. "It should have nothing to do with

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race, color, breed, whatever, but of course it does. As white producers working with black artists, it was always hard to be taken seriously by our peers and by the record companies. Eminem changed that to a great extent; however, we will always have to overcome the fact that we are seen as an anomaly."

"A lot of times we'll actually be told that it's impossible for two white guys to write and produce hip hop music," says Jeff. "We have a multi-Platinum-selling artist in the field, though, and that's the proof that we can. The media plays a part in all this, too. They make the assumption that there's a black-white issue and play it up.

"I grew up listening and playing R&B. Just because I was white and Jewish had nothing to do with it," he continues. "To be honest, I think Eminem has broken a lot of that prejudicial barrier; he's well-respected in the black community. He has massive skills in rhyming and is a metaphoric genius. All races are picking up on that fact. We live in a society that's racist, but Em's a true pioneer in breaking down the stereotype and we feel we're part of that as well. We share production responsibilities with Dr. Dre, and we all get along."

Yeah, but do the two brothers always get along? Who ends up threatening to tell Mom when things get ugly? "Working closely with your own brother has its moments," says big brother Jeff. "Most of the time we pretty much agree on everything we do. It's an uncanny kind of connection. We'll be playing parts to a song and neither one of us will have to speak—we'll instinctively know what we want to do. I'm still the big brother, though! Marky and I bring different things to the party. He has the mixing ear; I'm more of the musician, the one writing the chord progressions and handling the basics of the song.

"Take the *Slim Shady* album. I'd come up with a musical track, Marky would redo percussion. That's how it works 90 percent of the time. Eminem was involved to a certain extent. At that time he really couldn't hold a tune! He'd hum something, then I'd try to pick his brain to figure out where he was trying to go. That's how a few of the bass lines evolved."

"A lot of times, there's huge disagreement, but the disagreement usually ends with something better off musically for it" adds Marky. "Fighting, compromising, and then back to work. Sometimes our communication in the

studio is so bizarre that we don't even have to look at each other and we know exactly what we're both thinking at the same time. The greatest thing of all is that we were both able to become successful at the same time, enjoying the unique history together as brothers."

Speaking of family, Jeff has a 10-year-old son. I ask him if he lets his son listen to rap without imposing any barriers on the material he's exposed to? "Listening to hip hop? I don't mind it at all," Jeff replies. "I make a living off of rap so it would be hypocritical if I didn't let him listen to it. I *have* taught him not to repeat words he hears on these CDs at other places! We have conversations about lyrics and he understands what expression is. I expose him to all styles of music—jazz and pop, as well as the kind of stuff that I work on. He knows that Eminem is pure entertainment."

Has success mellowed Marshall Mathers—or changed the kind of record he makes? Jeff Bass says that Em's sense of outrage has not diminished, even though his debts have. "Success seems to bring out more anger and pain in Eminem. It's almost like it's settling in his brain that he experienced this tremendous pain early in his life."

"This new album is better, but could anything be as fun as making my first album?" asks Mathers. "We were pounding out the hours, drinkin' and smokin', makin' an album. I knew what I was doin' more on this album, was more experienced at it; so were Jeff and Marky. Every album is a learning experience." ■

—FROM PAGE 196, COOL SPINS

tarist/singer Watson have managed to come up with some bold and original interpretations for a number of these chestnuts. Songs such as "From Four Until Late" and "Cross Road Blues" might belong to Eric Clapton in some rock fans' minds, but here they have been reimagined in fresh settings that work beautifully. Playing electric and acoustic axes, Green and Watson tastefully front a strong rhythm section and are joined by an impressive list of guests, including Dr. John on piano and an army of great blues guitarists from different eras: Buddy Guy, Otis Rush, Hubert Sumlin, Joe Louis Walker and even an 84-year-old former musical associate of Johnson's, Honey Boy Edwards. Far from being some flashy guitar wank CD, *Hot Foot Powder* always shows deep respect for Johnson's songs, which look to be an important cornerstone of the next century's musical foundation, too.

Producers: Roger Cotton, Peter Green, Nigel Watson. Engineers: Matt Oliver, Roger Cotton. Mixed by Bill Hill. Additional engineering: Tim Donovan, Kat, Larry Sturm, Van Christie, Howard Johnson. Studios: Roundel Studio (England), Jacobs Studio (England; mixing), Battery Studios (NY), Zero 1 (England), Chicago Trax, Different Fur (San Francisco).

—Blair Jackson

Dwight Yoakam: dwaytwaykamacoustic.net (Reprise)

There's nothing fancy about the new album from Dwight Yoakam (as you can see), and nothing cutting-edge about it, either, despite the silly Web site title. This is an acoustic, singer/songwriter-with-a-guitar collection of favorites, recorded in the project studio of Yoakam's longtime producer, Pete Anderson. The idea for this album was developed while Yoakam was touring to promote his previous studio album, *A Long Way Home*, and his '90s hits compilation, *Last Chance for a Thousand Years*. The concerts included acoustic sets of some of these songs and received rave reviews and enthusiastic audience response. Like those performances, the album gets to the core of Yoakam's talent: his beautiful singing



and great writing. If you usually associate Dwight Yoakam merely with big hats and tight slacks, listen to this album and reconnect with his wonderful work.

Producer: Pete Anderson. Recording engineer: Sally Browder. Recording studio: Dog Bone Studio (Los Angeles). Mixing engineer: Judy Clapp. Mixing studio: Track Record (North Hollywood). Mastering engineer: Stephen Marcussen. —Barbara Schultz

Air: *The Virgin Suicides* Original Motion Picture Score (Record Makers/Astralwerks)

One of director Sofia Coppola's sawiest choices for her film *The Virgin Suicides* has to be the selection of Air as the creators of the score. What could have been a kitschy, trendy take on '70s girlhoods-gone-terribly-wrong turns into the stuff of utterly weird yet haunting mystery. Airmen Nicholas Godin and Jean-Benoit Dunckel crib a little of the rock and AM radio



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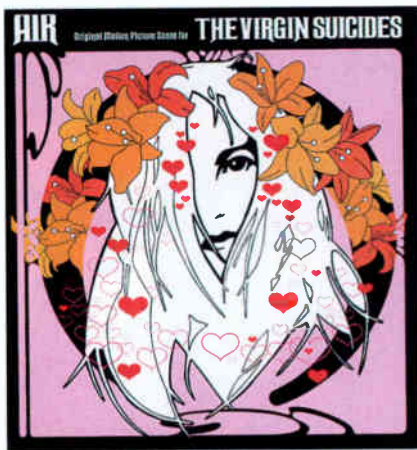
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that made up the soundtrack of the '70s. There's a little of moody Pink Floyd, a little of Queen, a little Kraftwerk. The end result is a disc that captures the moody rhythms of teenage daydreams, the throb of surging hormones and the eerie otherworldliness of the film's family of girls (at least from the viewpoint of boys). Viva le Air!

Producer: Air. Engineers: Air, Pascal Garçon and Stephane Briat. Other technical information unavailable—bjs —Kimberly Chun

Paul van Dyk: *Out There and Back* (Mute)

While no ground-breaking artist or scene has managed to surface in popular music so far this year, the dance scene is buzzing that 2k may come to be known as the year trance broke into the mainstream—with DJ/producer Paul van Dyk certainly helping the cause. Van Dyk—fresh from a year in the undisputed ground-zero of the trance scene, Ibiza, Spain—comes off on *Out There and Back* like a slickly engineered virus let loose on an unsuspecting world. His skills as a producer have become so well-honed and infectious that it's downright scary. Unlike last years electro-phenoms Underworld and their critically acclaimed *Beau-*



coup Fish, van Dyk sidesteps art-over-craft pretension, keeping things dirty and just plain fun. His vision never strays from the sweltering dance floors of the world as he leads imagined hordes of chemically-enhanced revelers through a 78-minute excuse to party. Van Dyk pushes all the usual buttons and adds a few

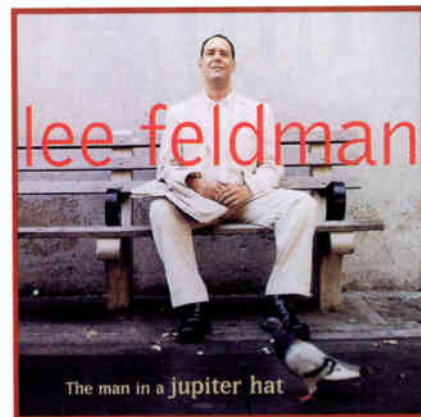
new tricks to the mix as well, ranging from percussion-free moments of layered sweep pads and vocal blips to sine-wave basslines and upper-register breaks. Some of the stand-out tracks are "Alive" and "Tell Me Why (The Riddle)" which features guest vocalist Sarah Cracknell of Saint Etienne. *Out There and Back* is an easy listen from the first synth-wash to last filter sweep and considering the shelf-life of dance music, this might still sound good six months from now.

Producer/engineer: Paul van Dyk. Studio: Van Dyk's project studio. Mastering: Dan Burnett at Node Recording Services (London)

—Robert Hanson

Lee Feldman: *The Man in a Jupiter Hat* (Bonafide)

It's hard to know how to characterize singer/songwriter/pianist Lee Feldman. His writing is all over the map—from sharp, sometimes witty observational songs about both strange and mundane subjects, to obviously personal reflections. He can seem innocent, even child-like on one track, and world-weary on the next. There's something in his songwriting



that reminds me of both Randy Newman and Bob Dorough, yet he sounds like neither. He's a little bit more cabaret/theatrical in his approach; it's easy to imagine the New York-based Feldman someday writing a musical revue for off-Broadway. Beyond the always sturdy voice-and-keys skeletons for his tunes are some lovely and imaginative arrangements in a number of different styles: Irish instruments here, a flugelhorn solo there, small string sections, horn lines out of some '30s nightclub; there's plenty of variety. Some might find Feldman too cute and clever for his own good occasionally, but his tenor voice serves both his wry and serious songs well, and I've found myself returning to this CD often lately.

Producer: Roger Peltzman. Engineer: Peter Beckerman. Mixers: Peltzman and Beckerman. Studios: Water Music (Hoboken, NJ), Spa Recording (NYC), Bear Tracks (Suffern, NY; mixing). Mastering: Greg Calbi, Steve Falone/Sterling (NYC) —Blair Jackson ■

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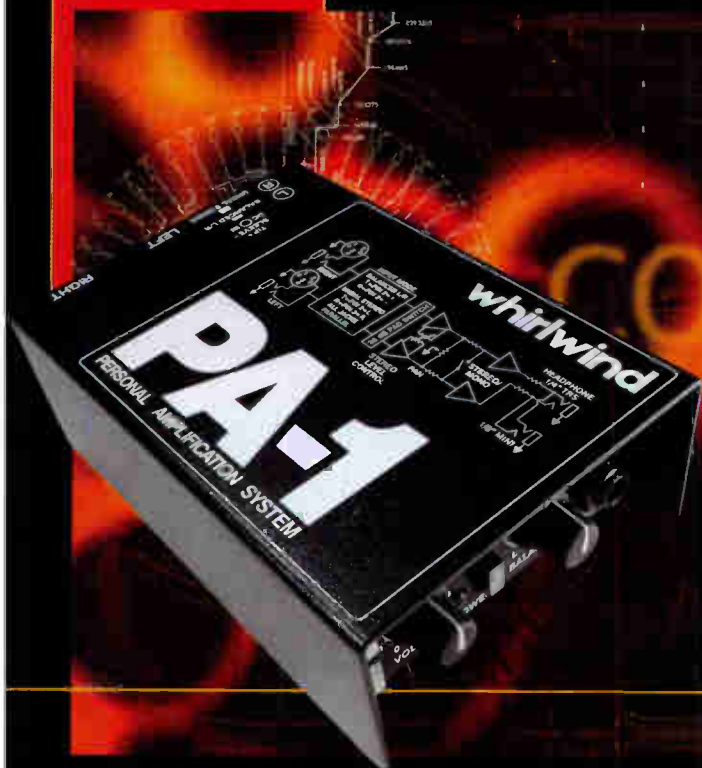
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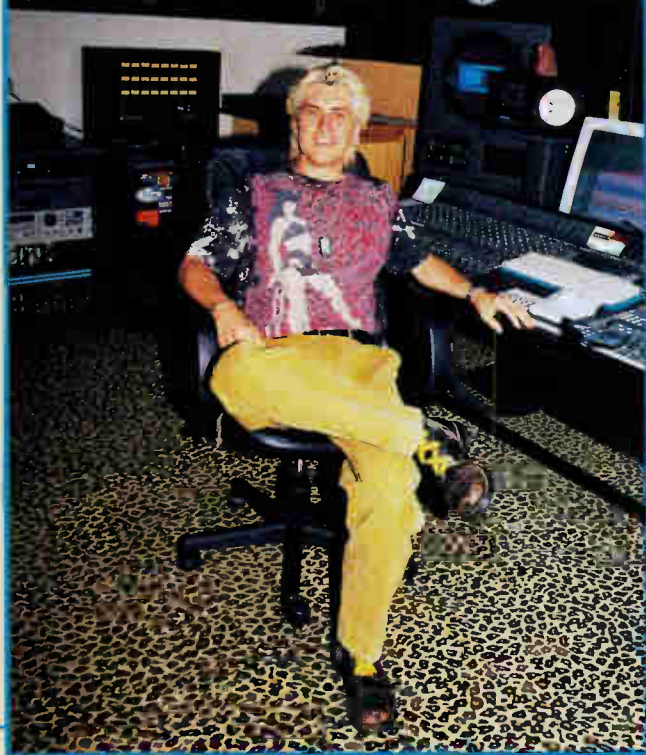


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COAST TO

Producer/engineer Geza X in his new Satellite Park studio



L.A. GRAPEVINE

by Maureen Droney

Taking a break from triple-digit Valley heat, I headed over the hill to Satellite Park, the Malibu studio of producer/engineer Geza X and his partner, musician/songwriter Joscy Cotton. Located just north of Topanga Canyon, and a couple of miles into the hills east of PCH, the studio sits square in the middle of a nature preserve. While the secluded site, with its mountain and ocean views, is spectacular, the studio itself is quite unpretentious. It's stylishly simple, designed with a particular focus on ergonomics that fosters creativity with a minimum of hassle. X is known for his

early work with bands such as Dead Kennedys, Germs and Black Flag, as well as his production of Meredith Brooks' 1997 smash single "Bitch." and recent projects for 1000 Mona Lisas, Saboteur and Soak. Also, he previously owned City Lab studio in Hollywood.

"City Lab, which Josey and I were also partners in, was more like a converted garage," he recalls, "although I did a lot of major-label records there, including 'Bitch.'"

This time around, X and Cotton spent a year building the studio and enlisted the help of designers Ken Goris and Stephen Klein. "Ken did a lot of the architectural touches," X continues, "and Stephen was very good with the overall dimensions and the soundproofing. For the

—CONTINUED ON PAGE 218

NY METRO REPORT

by Gary Eskow

Every time studio owners think they have things figured out, the ground shifts. Take the project studio phenomenon. New York facilities have found ways to form partnerships with them, and that's been working nicely, thank you very much. However, the possibility of DVD-Audio technology catching on with consumers poses some interesting questions, particularly since the art of multichannel mixing is in its infancy. Can rooms designed for stereo monitoring be jerry-rigged for multispeaker work, or does new construction necessarily factor into business plans?

Either way, studio owners have some big-bucks decisions to make. Is it necessary to scrap the speakers that have served so well in favor of an integrated monitor system for what might turn out to be a limited amount of

bookable hours? We checked in with Sony Music Studios and River Sound (Donald Fagen's studio) to get perspectives on where we are in the development of 5.1.

Bob Wolff is a senior recording engineer in charge of all of Sony's DVD-A authoring. He points out that, while not exactly a Tower of Babel scenario, different formats are fighting to establish primacy in this young area of the business. "The surround formats are very much in their infancy at this point," he says. "We're seeing a good deal of interest from the artists we deal with in multiple-speaker mixing. One example would be James Taylor. Frank Filipetti recently remixed his *Hourglass* album for surround, and James was involved with every step of the process."

No rules exist for multi-speaker mixing yet. Wolff's take on the *Hourglass* remix is that subtlety was the goal. "My impression is that enhancement of the material was what was being sought, not a radical remixing of the

—CONTINUED ON PAGE 222

Donald Fagen's River Sound has a KRK 5.1 monitoring system.



COAST

NASHVILLE SKYLINE

by Dan Daley

Tennessee and Nashville are both facing significant budget deficits for the fiscal year that began July 1. At press time, the State Assembly was wrangling over how to address an estimated \$300 million shortfall in state revenues.

Most representatives and senators have resisted Governor Don Sundquist's call for a state income tax, and most pollsters agree that voters won't go for it, either, which points toward other new taxes, mainly on business. The Senate's plan gives consideration to an entire range of new taxes on services, including recording services and motion picture production.

At a time when studio rates in Nashville are under extreme downward pressure, the possibility of an 8.25% sales tax on studio time could be crushing to some. Under existing state law, studios charge sales tax on goods sold, such as tape and CD-Rs. But those sales are a tiny fraction of overall studio revenues; the vast majority of revenues comes from selling studio time. If a tax is imposed on that service, studio owners, like other business owners, would be faced with the

PHOTO: A. KAMMAY



K.T. Oslin (center) worked closely with SoundShop owner/engineer Mike Bradley (left) and producer Raul Malo at the SoundShop in Nashville.

choice of either passing the tax on, which effectively raises rates, or absorbing the tax themselves, which would be difficult considering the overhead burdens many of them already carry. Applying the tax to a typical \$1,200 daily rate increases the cost nearly \$100.

An assessment of the situation was offered by Lou Gonzales, who owns Quad Recording, which has locations in both New York City—where studios are required

—CONTINUED ON PAGE 224

SESSIONS & STUDIO NEWS

NORTHEAST

Suzanne Vega tracked with producer Rupert Hine at Sear Sound (NYC). Engineer Michael Tudor and assistant Todd Parker also helped. Max Weinberg of the E Street Band and the Conan O'Brien show did the final mixes for his new album with engineer Dave Fisher. Tom Wopat, star

of *Annie Get Your Gun* on Broadway, was also in, recording with producer Russ Titelman for an Angel release. Dave O'Donnell engineered; Parker was the second... Philly jazz/funk/hip hop band Princes of Babylon slid into Indre Studios (Philadelphia) to finish their upcoming Philadelphonic recording. Barb Adams and Bogdan Hernik engineered... Eastman School of Music (Rochester, NY) recently broke in its renovated main control room with a recording of the Eastman Jazz Ensemble. A Euphonix CS2000 console was installed in the refurbished space... Mixer James Krieger mixed the *Mission: Impossible 2—Movie Special* for MTV at Image Group Post in NYC... New York engineer Christos Tsantilis recently completed the *Cuban Link* album for Atlantic... The Pet Shop Boys tracked new material at City Sound Productions (NYC) with producer Peter Rauhofer and assistant engineer Bill Bowen...

—CONTINUED ON PAGE 228

Producer Rupert Hine (seated) was at Sear Sound, working on sessions for Suzanne Vega. Standing, L to R: Studio owner Walter Sear, engineer Michael Tudor and chief assistant Todd Parker.



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—FROM PAGE 216, L.A. GRAPEVINE

cosmetic stuff, Ken describes it as a jam session where we all contributed ideas and it came out improvisationally."

The clutter-free, extra-large control room houses a Euphonix CS2000 console and a variety of new and old gear, including a well-maintained Stephens analog 24-track, and Pro Tools. X designed the console and Pro Tools layout to provide good visual contact into the recording room—something that can be a challenge to achieve these days.

"I work with Pro Tools almost exclusively lately," he explains. "I have many channels of it going into the Euphonix. I also need to be able to handle live tracking and the techno type of electronica, because I combine all of those into my rock productions. I wanted to harness all those things, keep the Pro Tools located at the center of the console and still be able to look through the control room glass. That took arranging right down to inches.

"Most people are moving to a larger-frame Euphonix, but the small frame of the CS2000 made this setup work," X continues. "The channels are the same, but the center section is different and the meter bridge is lower. It allowed me to put Pro Tools controls in the center section, and the external monitor front and center. I've also pushed everything up close to the control room glass, more like you might usually find in a mix room, because I

like feeling that I'm right there with the musicians."

In fact, that visual contact into the tracking space is most often made with the drummer, as the 17x22-foot control room is spacious enough to fit most bandmembers.

"I do most of my guitars, etc., directly into Pro Tools using amp simulators and Amp Farm," X notes. "Everybody plays in the control room, and I have the tracking space pretty much tuned for the perfect modern drum sound. It's a very fast room to work in; everything is arranged to have a clockwise information flow from the recording to the mixing stages."

A musician himself, X plays guitar and bass, so he had a vision of the kind of creative space that he wanted Satellite Park to be. "I've had many bands of my own," he says, "but more recently I've settled into producing. I decided to create my dream environment, which is a studio with open windows, in a nice place where I could work at the level of quality, energy and vibe that I always wanted. There really is an unmistakable energy that happens here. Everyone feels it. We don't know exactly what it is, but we attribute it to the Indian history of the area and the environment itself."

Even though the studio's location seems remote, it is actually not far (for L.A.!) from the airport, restaurants and other amenities, so there's plenty of action and no danger of too much isolation. Satellite Park also has available on-



In Rumbo Recorders Studio C (L to R): chief engineer Shawn Berman, producer/engineer Ross Hogarth, studio manager Vicky Smith, assistant engineer Sam Story and "Pro Tools geek" Mark Binder

site living accommodations.

"I've always been into creating environments and scenes," X continues. "In the punk days I worked as a sound man, but I was also instrumental in setting up clubs and events. My vision is of a kind of creative oasis, maybe like a latter-day, West Coast version of Andy Warhol's Factory, but with an element of nature rather than the urban element. To that end, I've been known to cut local bands outrageous deals because I want to keep the scene alive!"

"And it's working. People come here and they do their best work. We've been open since January first, and I can't believe how fast it's growing. I was expecting the typical two-year business startup, but we've been booked solid."

Although he records digitally, X is a fan of vintage gear. "Let it be said here that I like the sound of digital," he laughs. "It's a totally legitimate sound on the musical palette. But I use whatever sounds good, and I have some unbeatable analog stuff. Our old Altec 438A compressor is a monster on the snare, and the RCA BA6A is great for vocals. I've got an Altec V8 multichannel amp that I use to overdrive things, and a really nice Pultec mic pre that was modified by the San Francisco naval shipyard; it rocks on bass guitar."

Another favorite piece of gear is the Alesis MasterLink 9600, which X has been using for mixdown, calling it a "surprisingly good mixdown box, on a par with half-inch tape and better-sounding than DAT."

Satellite Park's freestanding mains are somewhat surprising: UREI 811s enhanced with a subwoofer. "I'm very fond of them because they sound identical to NS10s, just bigger," X asserts. "This is kind of a new approach to 811s: to use them freestanding with the subwoofer. It gives them the thump that they have in a soffit, but you hear them dead on and they don't suffer from being up in a corner where they may acquire too much of the sound of the room."

X just finished and is particularly excited about a CD for Michael Aston of Gene Loves Jezebel fame. "It's almost like beatnik poetry set to jams, but with pop hooks," he says. "The songs are fantastic—very stylistically original. And we used a lot of reverb, which is practically illegal these days! I don't know what to call it; it's just totally different and great."

The ever-busy Rumbo Recorders in Canoga Park has figured out a way to get

even mo' busy, with a digital upgrade to Studio C. I dropped in to check it out, and Rumbo manager, Vicky Smith, along with chief engineer Shawn Berman, gave me a tour.

Studio C, long known to be an economical overdub room fitted with a Trident Series 80 desk, is now surround-ready, housing two Mackie D8B consoles.

"With the demands of digital, 5.1 surround and everything else that's going on," explains Berman, "we felt it was time to start moving in the digital direction with the installation of the two cascaded D8Bs. We've had our own Pro Tools rig for about a year; now we are also offering it at a discount with Studio C bookings. It's a 24-mix, 24-I/O system, with three 888s running off a 9600, two 9-Gig removable Glyphs and a 25-Gig AIT drive. We've also added some high-quality preamps to the room; Studio C now has two GMLs and four Focusrites.

"All of the assistants at Rumbo know how to use Pro Tools," Berman continues. "But most projects seem to have their own Pro Tools engineer. They'll rent our rig, and either the main engineer knows how to use it, or they'll bring in their own operator. In fact, there probably hasn't been a session here in two years that hasn't had a Pro Tools rig attached. Right now, all three rooms are running, and all three have at least one Pro Tools system."

"We find that most sessions don't go straight to Pro Tools," adds manager Smith. "What seems to be the most popular format is for people to track analog, then go to Pro Tools for fixes, etc. Then they bounce back and forth as needed. It does seem, though, that we're heading to where every room will have to have a Pro Tools system, in addition to analog multitracks."

Studio C comes with the two Mackies (dubbed Hal and Spock), a Studer 827, a nice complement of outboard and that discount rate on Rumbo's in-house Pro Tools. According to Berman, in order to install the Mackies and reconfigure the room, a wiring upgrade was necessary. "Basically, the room had to be rewired," he comments. "We put in a new Bit Tree patchbay and all Mogami cables. We also set up our Elco system to have 96 tracks. A lot of our clients are running 24 tracks of Pro Tools, plus 24 tracks of analog, and they need to be able to make transfers at the same time. Now, we've got our Elco system set so everything can transfer into everything else. We also now

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AUGUST 2000, MIX 219

feed this room with both video and word sync throughout.

"Since each one of the Mackies has 72 channels," he laughs, "we've never even really had to fire the second board up yet. But we're ready!"

Berman also notes the changes that have occurred in SMPTE standards, from the old 30 non-drop-frame SMPTE to the current 29.97 with video reference. "All of our rooms now have Horita black boxes running to the Lynxes," he states, "since every session goes back to Pro Tools, which wants to see a video reference."

Rumbo has already developed busi-

ness with several Web companies. "Hits magazine does all the sound here for their Daily Double.com segment," comments Berman, who engineers those sessions. "Because broadband and DSL have allowed higher sample rates, Web companies are realizing that they have to go with higher-end audio. Hits is a good example; they made that move immediately. We do the audio here and upload to their site. It's definitely the way things are going. Right now the process is a little slow, but, for example, once everything hits broadband, a producer will be able to go online right from the studio and let somebody from

the record company hear the mix as he's doing it."

Also new at Rumbo is Soul Kitchen Rentals, a joint venture with producer/guitarist Neil Geraldo that features outboard gear from Neve, Pultec, Focusrite and others. "We've got Neil's great vintage Neve modules, worked on by Brent Averill, three sets of 8058 pre-amps and three sets of 31102s, as well as the compressors from that board," Berman notes. "We've also got available Fairchilds, Tube-Techs—just about anything you can imagine."

The rest of the three-room-plus Rumbo complex continues its tradition of being a "down home" and fun work environment, with half-court basketball (used by some clients lately for roller-hockey), private lounges for each studio, and a large common lounge with a full kitchen and patio.

"Clients have privacy when they want it, but they do tend to mingle with each other on barbecue days," says Smith with a laugh.

The 2,300-square-foot Studio A remains a favorite for large tracking sessions with its Neve V/Flying Faders console and five to six iso booths. For most of the past two-and-a-half years, A has been base camp for a well-known "mystery" band. I'm sworn to silence about the group's identity, but let's just say their final mixes are very eagerly anticipated.

Studio B, with its 40-input Trident 80C, has recently been lightened with new cosmetic treatments and sonically brightened with new wood paneling to make for a bit more of a live sound. B also has that tiled, airlocked bathroom that's been used as an echo chamber on more than a few recordings.

In business for more than 20 years, Rumbo is owned by Darryl Dragon of Captain and Tennille fame. Berman and Smith have both been there for the past 12 years and have been instrumental in developing the family-style atmosphere that's created a loyal clientele, including producer/engineers Matt Wallace, Mike Clink, Ron Nevison, Lee DeCarlo and Ross Hogarth. Recent projects have included Flybanger, Ruth Ruth, Pete, and Zakk Wylde's Black Label Society—all clients who appreciate recording in a comfortable facility with affordable rates, plenty of secure parking, and (very important!) the largest studio menu notebook in town. ■

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—FROM PAGE 216, NY METRO

stereo images. Everything's just a bit more clear, with more space for the important aural elements. The 5.1 mixes offer distinctly different experiences from the stereo ones."

The soon-to-be-approved DVD-A standard supports sampling frequencies up to 96 kHz. Sony recently remixed the *Titanic* soundtrack, in part to take advantage of the higher sampling rate. "We took the audio elements from the original multitracks as 6-channel programs on Genex machines. Genex is a good container because the newer recorders use a 5.2-Gig MO disk. We're also seeing a lot of interest in Tascam's DA-78HR recorders."

Sony has been anticipating multi-channel mixing for several years. The company has, in fact, been developing its own delivery format. Construction of new rooms here in their New York complex has been a part of their strategy for some time. "We have rooms that were originally built as surround mix and mastering rooms. We've also adapted several other rooms by reworking the speakers and monitoring systems. It's definitely more complicated than simply throwing extra speakers into a room. Your monitor channels have to be six channels wide, not two. Where do you put the surrounds? How far should the spread be? There's no specific standard that studios can refer to yet. As an industry, we're going to have to address this issue."

How convinced is Sony that DVD-A or some other format will catch on with the public? "There's a lot of promise there. Our clients are major record labels. At least in the short run, most of them have DVD-A releases scheduled, and we see that their intention is to go forward with surround records, so it's something we have to address."

Phil Burnett is the chief engineer at River Sound. He participated in Elliot Scheiner's 5.1 remix of Steely Dan's most recent album, *Two Against Nature*. "The stereo mixes were laid to a variety of media," says Burnett. "We went 96kHz/24-bit to Genex, with 48kHz/24-bit safeties as well. We also backed up to Pro Tools and half-inch analog tape."

Steely Dan's *Gaucho* has been remixed to 5.1, and Burnett says that the possibility of remixing *Two Against Nature* in this format was on everyone's mind during the initial tracking sessions, but no special setups were used to create tracks that could be mixed differently for surround.

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"The interesting thing about the 5.1 session was that we had planned to track using a 6-channel, 24-bit/48kHz setup," Burnett says. "The day before we were to start mixing, the label called and asked for a 96kHz version, to take advantage of the DVD-A spec. That's when the problems started! We got a Genex recorder in here because it can track at 96 kHz, and, to be honest, we had a lot of problems with it. You'd assign material to tracks 1 and 2, for example, and when you went to playback, this material might be showing up on tracks 5 and 6! Or you'd play back a mix and it was fine, only to come back two hours later and nothing was there! We had to find another way of working."

The solution centered around tracking to a Tascam DA-78HR. But wait—this machine tops out at a 48kHz sampling rate, and the label required tracks delivered at 96 kHz, right? "That's right, so we came up with a get-around. We locked up two of these 8-channel recorders and split each of the six channels into two. Using three Apogee PSX 100 96kHz converters, we split each of our tracks, sending, for example, the left channel into tracks 1 and 2 on the Tascam, which recorded the information at

48 kHz. On the way out of these two recorders, each of the channel pairs was summed into a single 96kHz track. The process worked flawlessly.

"As far as the construction issue goes," Burnett continues, "our control room is 650 square feet—plenty large enough for a surround sound mix. We brought in a KRK E-8 monitor system for this project, and they sounded great. Elliot feels very comfortable using them. There's definitely a difference between the stereo and surround mixes. The fun part about 5.1 mixing is that we're still in the experimental phase; there's no rules. You can place the listener in the drummer's space or in the horn section, whatever you want. Elliot started out mixing this project with the drums and bass up front, but Donald and Walter felt that the mixes weren't lively enough, so Elliot spread this material all around so that it comes at the listener from different angles. These mixes sound great!

"One point I would like to make is that you don't have to run out and buy all new technology to begin mixing in surround. We've got an old Neve 8078 board, not some newfangled digital console. We did have to do some work

on the Neve in order to get a 6-channel mix to go out the way we needed, but other than that it worked fine. People are going to figure out that they don't always need a million-dollar console; I expect great surround mixes to come out of an 02R some day soon." ■

E-mail New York news to Gary Eskow at scribeny@aol.com.

—FROM PAGE 217, NASHVILLE SKYLINE
to collect sales tax on studio time sold—and Nashville. "In New York, the major record labels can provide a resale certificate, which defers the taxes," Gonzales says. "So studios that are dealing with large businesses don't have [sales] tax as an issue. It's the smaller studios, which are dealing with individual bands and producers, that have to pay the tax. I can see the situation developing the same way in Nashville, and that's going to push studios that rely on independent clients closer to the edge."

Gonzales also agreed that a particular strategy could emerge in which studio owners with deeper financial resources could absorb the tax for a

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period of time by discounting the rate an equal amount—something that Gonzales himself says he might consider. Studio owners without the financial ability to absorb the tax would be, perceptually at least, seen as raising studio rates, a potential death knell for some in this competitive environment.

Denise Lawrence in the office of state Sen. Joe Haynes (D-Davidson) was not certain how comprehensive any services tax measure would be. However, putting such a tax on the table means it becomes a possibility at some point down the line, if not for the immediate future.

Emerald Recording has a new CEO, and he may be the model for the new Nashville. Just as Capitol Records brought in a New York marketing guru in Pat Quigley to run its Nashville division, Emerald has hired ex-New York and L.A. advertising and marketing veteran Joe Romeo to be the CEO of Emerald Entertainment, which encompasses audio recording, audio post, broadcast and a new artist sponsorship division. Joe Romeo—even his name has that *My Cousin Vinny*, big-city hot shot hitting Twang Town ring to it—wrote jingles for Madison Avenue, including the national campaigns for Levi's 501 Blues and Skittles "Tastes Like a Rainbow." He was named Ad Man of the Year by *Advertising Age* in 1988. Romeo also ran a music production house, Harmony Holdings, in L.A. and says he has worked around recording studios since he was 11.

Like a lot of other Los Angelenos in the mid-1990s, he was seduced by Nashville's lifestyle and the boom in country music. But even as country falls off the charts, Romeo remains a big fan and a booster of Nashville as a recording center. "We really do have the best musicians and producers in the world here," he says. But he also believes that the old model of studio ownership is over at the upper levels. "Engineers are fabulous people, but you have to do more than run a console these days. You have to market it, as well. A business is only as good as it's run, not as good as its technology."

Romeo sees the diversification of Emerald from its core business of music recording into areas such as artist sponsorship and tour booking as necessary to compete in a broader entertainment environment. "[The studio] now has to make the artist the focal point," he says.

"You can't just sell one service and expect to build a relationship long-term. The studio business of the future is based on making sure the artist is successful in everything they do from the moment they book their first day in your studio."

Romeo has even coined a new marketing catch phrase to reflect Emerald's newfound comprehensive approach to the music industry: the "Emerald Advantage." And if that sounds a little like Madison Avenue, Romeo counters, "Hey, what do you expect from the guy who brought you 'Nothing Beats a Bud?'"

The continuing saga of Milan Bogdan: The Nashville studio marketing whiz has moved on yet again, taking the position of general manager at East Iris Studios. Normally, the movements of studio managers are primarily of local interest. But Bogdan has been integral to the workings of several of the city's major facilities, and he's brought significant changes to all of them during critical times in Nashville's evolution, starting with his co-ownership of Masterfonics and his seven-year stint as general manager of Emerald Studios. He left Emerald in December of last year after implementing some unique business strategies, including post-production and broadcast divisions. More recently, Bogdan did consulting work for the newly refurbished Quad Recording. As of June 5, he took the reins at East Iris, purchased earlier this year by Ocean Way/Nashville co-owner Gary Belz.

Bogdan's take on that facility is that it has an inherent imbalance. Its major-league tracking room is fitted with an SSL 9000 J console, and its B room holds a Pro Tools system and a Mackie mixer. "What needs to happen here is to expand the B room into a higher-end overdub studio," he explains. "That way, an entire project can be done here, with tracking, overdubbing and mixing all accommodated within the same facility. It will keep more of the work within the studio."

Bogdan is currently surveying the facility's major clients regarding what type of console they'd like to see in the B studio. "We want to capitalize on the fact that this studio offers clients a lot of privacy," says Bogdan. "With a higher-end second studio, they don't have to leave to do overdubs." ■

E-mail Nashville news to Dan Daley at danwriter@aol.com or fax 615/646-0102.



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SOUTHEAST

DMX darted into Doppler Studios (Atlanta) to work on a new Def Jam song with producer Nokio, engineer Ralph Cacciurri and assistant Steve Fisher. Prodigy also snuck in to write music and edit a track with engineer Cacciurri and assistant Fisher. Kandi Burris worked on vocals with producer Poke, engineer Cacciurri and assistant Jerome James...Gloria Estefan recently returned to her Latin roots and recorded a mostly acoustic album at Crescent Moon in Miami. Engineers Sebastian Kryz, Mauricio Guerrero and Javier Garza used a Sony DRE-S777 Sampling Digital Reverberator to add a natural sound to the acoustic instruments...East Iris (Nashville) has been on fire of late: Matchbox Twenty mixed their latest, *Mad Season*, on Studio A's SSL 9000 J. Matt Serletic produced. David Thoener, Noel Golden and Mark Dobson engineered. Kevin Szymanski assisted. Bob Seger was also in Studio A, working on a self-produced release with engineer David Cole and assistant Szymanski...Producer Dallas Austin recorded overdubs for Mercury artists Texas at Stankonia Recording in Atlanta. Carlton Lynn engineered, and Vincent Alexander and Warren Bletcher assisted. Sevendust were also in, tracking a remake of LL Cool J's "Goin Back to Cali" with engineer Sean Johnson, Pro Tools wiz Matt Still and second engineers John Frye and Bletcher...The Thunderhawks flew into Record Camp Studios (Nashville) to track and mix their first album. George Tutko engineered; Tony Sarno produced. Additional recording was done at Purple Dragon Studios in Atlanta...

NORTH CENTRAL

Engine Music Studios in Chicago revved up and celebrated its grand opening with more than 300 stalwarts from the music community. Rupert Neve, designer of Engine's Amek 9098i console, partied with producer Brad Wood, studio manager John Humphrey and facility owner Jep Thornton...Producer Ben Obi completed a CD for R&B artist G.C. Cameron at Savannah Street Music in the Twin Cities, MN. He also started developing Full Body, a new R&B ensemble, and remixed releases by Maxi Priest, Grenique and Alexander O'Neal...NineDollarMelonBaller tracked their third alt-rock CD at Catamount Recording in Cedar Falls, IA. Tom Tatman produced, engineered and mixed. Catamount also retained Carl Yanchar of Wave:Space Inc. in L.A. to design its new 4,000-square-foot facility. Groundbreaking happens in August...At Streeterville Studios (Chicago), Ray Seay and Brian Jensen mixed the upcoming Big Tymers album for Juvenile and Cash Money Records. Mannie Fresh of Cash Money produced. Chris Tucker assisted...

SOUTHWEST

It's destiny: Destiny's Child came home to Houston to take a break from touring and popped into SugarHill (Houston) to record "Independent Women" with engineer Ramon Morales for the *Charlie's Angels* movie...Guru tracked a song for his next CD, *Jazzmatazz*, at Palmyra Studios (Palmer, TX) with Erykah Badu. Chris Bell engineered the Badu-

produced track. Michael Verdes assisted...Edmond, OK, punk band Charlie Car Tragedy tracked and mixed their first full-length disc at AKS Recording (Oklahoma City, OK) with producer/engineer Wes Sharon...At Colorado Sound Studios (Westminster, CO), Mollie O'Brien tracked and mixed her latest Sugar Hill project, *Things I Gave Away*, with producer Nina Gerber and engineer Kevin Clock...

SOUTHERN CALIFORNIA

Plenty of powwows at Cherokee Studios (L.A.): Short Khop mixed his upcoming Heavyweight solo album with engineer David Henszey and assistant Anthony Gillespie. NBA MVP Shaquille O'Neal dropped in and will be featured on a track. Jonathan Davis of Korn, Richard Gibbs of Oingo Boingo, Sam Rivers of Limp Bizkit and Monkey and Head of Korn tracked for the *Queen of the Damned* soundtrack. Vinnie Colaiuta and Terry Bozzio were the featured drummers. Nick DiDia engineered with help from Sander DeJong and Dan Scala. Jazz legend Ronnie Laws produced his new CD with engineer Henszey. Engineer Phil Griggs could also be spotted mixing Morrissey's live recording with assistance from Israel Hernandez...The Vertical Jazz label got up and going at Ocean Way (Hollywood): A series of trio, quartet and quintet albums were recorded live to 2-track dur-



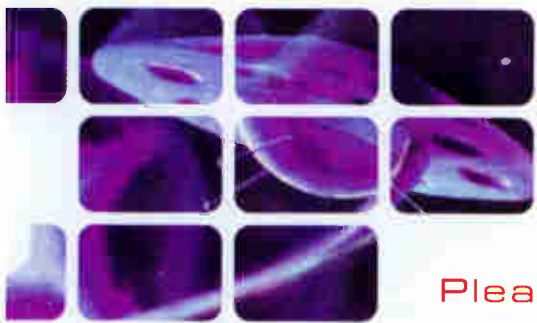
L to R: Producer Brad Wood, Rupert Neve, studio manager John Humphrey and owner Jep Thornton celebrated the grand opening of Engine Music Studios in Chicago.



Master House, a new facility catering to the mastering needs of the domestic and international Latin music market, opened last month in Miami. The facility, designed by Toronto-based acoustical firm Pilchner Schoustal, features a custom Crookwood mastering console, Weiss digital EQs and limiters, Apogee 24/96 converters and Dunlavy SC-4 monitors.



L to R: Shaquille O'Neal, Susan Donaldson of Cherokee Studios and Short Khop at Cherokee in L.A.



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Vertical Jazz label booked two weeks at Ocean Way. Foreground, L to R: pianist Patrice Rushen, drummer Ndugu Chancelor and executive producer Suzanne Helton Severini. Standing, L to R: associate producer Michael Clark, producer Jeffrey Weber, engineer Clark Germain, assistant engineer Darren Mora and bassist Stanley Clarke.



PHOTO: DAVID GOGGIN

ing a two-week period for a series of six CDs...Heavy metal thunder rolled into Record Plant in Hollywood: Producer Tom Werman and engineer Eddie Delena recorded and mixed original music for the upcoming film *Metal God*...Rock band Palo Alto were far from their Silicon Valley stomping ground, recording and mixing their American Recordings debut at The Village (Los Angeles) with producer Rick Rubin and mixer Rich Costey. Evan and Jaron holed up working on a new folk/pop CD produced by T-Bone Burnett and engineered by John Fields, Bradley Cook and Rick Will. Mick Fleetwood, Burt Bacharach and Dan Wilson of Semi Sonic got involved in the project...Mix engineer Rob Chiarelli mixed "Good Love" and other tracks by RCA artist Sygnature at Encore Studios in Burbank. Robin Thicke and Gass produced. Chiarelli also mixed songs such as "Sunshine" and "This Is How We Roll" for MCA artist Damozel at Enterprise Studios (Burbank)...At Track Record (North Hollywood) Motley Crue tracked and mixed their forthcoming Beyond Records CD produced by Crue crewmember Nikki Sixx. Matty Spindel engineered; Eric Williams assisted. Nouveau soul diva Angie Stone finished

recording and overdubbing her next Overbrook/Interscope release with engineer Williams and assistant Kip Smedly. Sen Dogg of Cypress Hill was also in, overdubbing and mixing the upcoming Cleopatra CD by his rock/rap side project, SX-10. Lanny Cordolla produced, and Kevin Smith engineered...Design FX Remote Recording (L.A.) rolled out to track Wango Tango 2000, a KIIS-FM event at Dodger Stadium. The ten-hour event included performances by Lenny Kravitz, Sugar Ray, The Goo Goo Dolls, Enrique Iglesias, 'N Sync and Hanson. Design FX manager Scott Peets, general manager Michael May and technician Jeff Keese were on hand...Producer/engineer R. Chris Murphy tracked a new Bozzio, Levin, Stevens album at Stagg Street Studios (Van Nuys) with group members Terry Bozzio, Tony Levin and Steve Stevens. Erich Gobel assisted...

NORTHWEST

Paul Stubblebine ordered in and completed mastering on *The Pizza Tapes*, the bootlegged 1993 jam sessions of Jerry Garcia, David Grisman and Tony Rice, at his mastering facility in San Francisco...Studio D in Sausalito, CA, recently hosted the mix for Shana Morrison's new album. Big Bad Voodoo Daddy was also in to track for an NBC TV program...

STUDIO NEWS

At Georgetown Masters in Nashville, Sony recently unveiled its new DMX-R100 digital mixing console. Owner and lead mastering

engineer Denny Purcell ran a series of A/B comparisons, running audio at an 88.2kHz sampling rate, to what he describes as "pretty fantastic" results...Kampo Audio/Video (NYC) recently installed a new Genelec surround monitoring system in Studio C...National Public Radio purchased three Studer D950 Digital Mixing Systems for its facilities in Washington, D.C. E! Entertainment Television also bought the D950 for its on-air studio in L.A...OffPlanet Studios (San Francisco) is giving Studio B a post facelift: They will add another Pro Tools rig and video editing software...Turner Studios in Atlanta purchased an all-digital SSL Aysis Air Mobile for its 53-foot production truck...Two Calrec consoles were bought by NBC Inc.: A 60-channel Q2 will be used for NBC Olympics, and a 32-fader Alpha 100 digital desk will go to Station WTVJ Miami...Crawford Audio (Atlanta) inte-



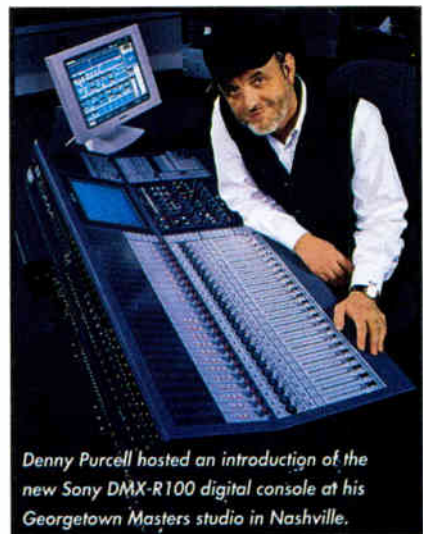
Motley Crue at Track Record, L to R: Nikki Sixx, engineer Matty Spindel, Vince Neil and assistant engineer Eric Williams

PHOTO: ALAN MORPHEW

grated three SSL Avant digital consoles with an SSL Hub Router to form an audio network for television productions...Three Otari Elite+ consoles were purchased by Pacifica Media Affiliates in L.A...Ekul Aquarium Studios (Dallas) recently purchased an Amek 9098i 56-channel console.



The rock band Palo Alto visited The Village to work on their debut CD, produced by Rick Rubin for Rubin's American Recordings label. Left to right: Mixer Rich Costey, The Village's second assistant engineer Atom and Palo Alto vocalist Jason



Denny Purcell hosted an introduction of the new Sony DMX-R100 digital mixing console at his Georgetown Masters studio in Nashville.

PHOTO: RON NELSON

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014	058	102	146	190	234	278	322
015	059	103	147	191	235	279	323
016	060	104	148	192	236	280	324
017	061	105	149	193	237	281	325
018	062	106	150	194	238	282	326
019	063	107	151	195	239	283	327
020	064	108	152	196	240	284	328
021	065	109	153	197	241	285	329
022	066	110	154	198	242	286	330
023	067	111	155	199	243	287	331
024	068	112	156	200	244	288	332
025	069	113	157	201	245	289	333
026	070	114	158	202	246	290	334
027	071	115	159	203	247	291	335
028	072	116	160	204	248	292	336
029	073	117	161	205	249	293	337
030	074	118	162	206	250	294	338
031	075	119	163	207	251	295	339
032	076	120	164	208	252	296	340
033	077	121	165	209	253	297	341
034	078	122	166	210	254	298	342
035	079	123	167	211	255	299	343
036	080	124	168	212	256	300	344
037	081	125	169	213	257	301	345
038	082	126	170	214	258	302	346
039	083	127	171	215	259	303	347
040	084	128	172	216	260	304	348
041	085	129	173	217	261	305	349
042	086	130	174	218	262	306	350
043	087	131	175	219	263	307	351
044	088	132	176	220	264	308	352

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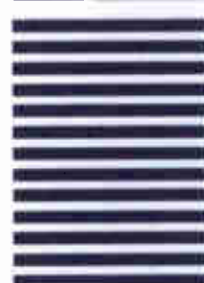
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—FROM PAGE 30, DOCTOR, IT HURTS

caused by overuse and repetitive tasks. Probably the best known (and scariest) is Carpal Tunnel Syndrome. This is common among pianists and typists, and it's what destroyed Leon Fleisher's career. The nerves that run through your wrist go through a relatively small conduit between some fibrous tissue and the wrist bone, called the Carpal Tunnel. If any of the tissues around the tunnel get swollen or change position, the result is a pinched median nerve—the nerve that controls the thumb and first two fingers. You feel tingling, burning, cramping, numbness or "pins and needles" as if your hand has fallen asleep. In severe cases (like Fleisher's) surgery is necessary to remove some of the tissue pinching the nerve. Needless to say, it's very delicate surgery.

A related syndrome is Ulna Tunnel Syndrome—the ulnar is the elbow, and the affected area is the "funny-bone" nerve. This is often caused by over-reliance of armrests on office chairs; ironically, the armrests are sup-

posed to relieve strain on the wrist and forearm, but actually they end up pinching the ulnar nerve.

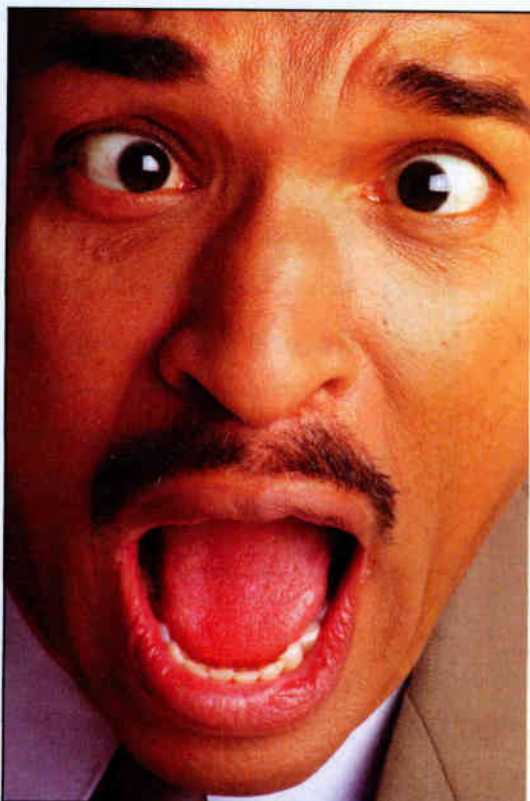
A more common problem—since it has a wide variety of causes—is tendinitis. In tendinitis, one or more tendons—the cords that attach the muscles to the bones—get inflamed and cause pain, usually a dull ache over the wrist and forearm. This is a common problem among guitar players, drummers and tennis players (most cases of "tennis elbow" are tendinitis), and it's what Max Weinberg and I have in common.

Tenosynovitis is similar to tendinitis, but the inflammation is in the sheath surrounding the tendon, which lubricates it and keeps it moving smoothly. Other RSIs include adverse mechanical tension, or neural tension, which can be a reaction to muscle spasms in the shoulders where the pain travels down the arm, and Thoracic Outlet Syndrome, which is a compression of the nerves in the neck and shoulder. (It's what happens if you hold the phone there too long; it can also affect the arm.) There's also Myofascial Pain Syndrome, in which compression of the muscle tissue

causes it to stiffen, creating painful "trigger points" that can move around and be very debilitating.

So what can you do to prevent and/or treat any of these conditions? I'm not a physician, and I've never even played one on TV, so I can't give you medical advice, but what I can do is relay some of the guidance that I've received on these issues and point you to various resources that might help you. Next month, I'll list a bunch of Web sites that provide information and advice on RSIs—if you can't wait, I'll be posting that list this month to Mixonline.com (click on "Insider Audio" from the front page). In the meantime, perhaps the best principle to follow if your hands, wrists, arms or back hurt during a heavy editing or mixing session is to stop what you're doing and take a break. "No pain, no gain" may sometimes work for bodybuilders and linebackers, but for the rest of us, it's really lousy advice. Better to paraphrase the old hippie motto: "If it feels bad, don't do it." ■

Paul Lehrman still has the sound of 16 player pianos ringing in his ears, despite the use of earplugs.



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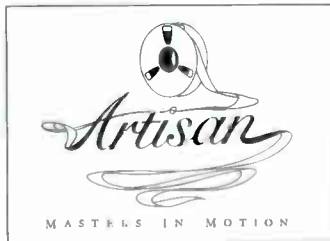
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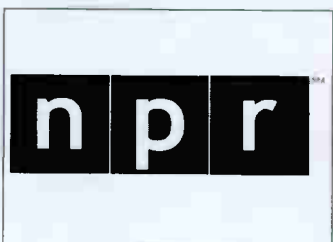
Some projects you may have heard on CD & vinyl... Cat Power, Dub Tribe, the Evil Tamborines, the For Carnation, Groovie Ghoulies, Isotope, Liz Phair, Modest Mouse, Replicants, Sam Prekop, Sleater-Kinney, Sunny Day Real Estate, the Lonesome Organist, The Mopes and Tortoise. And on vinyl only... The Arsonists, Cornelius, Da Shorties, Guitar Wolf, Jon Spencer, Pavement, Pizzicato 5 and Yo La Tengo. Visit our Web page for a gear list and additional credits.



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Located 15 minutes from San Francisco in Marin County, Laughing Tiger Productions offers two beautiful 48-track studios designed with the artist in mind. Our studios provide excellent aesthetics, isolation, variable reverb time and accurate monitoring. Equipment: Yamaha C7 7'4" grand piano, vintage keyboards, SSL G+ 4052 console w/E Series EQs, Total Recall & Ultimatum, Studer, Otari, Pro Tools | 24 MIX+, ADATs, Neve, Neumann, EMT, API, etc. For pictures and a complete list of equipment, visit our Web site.



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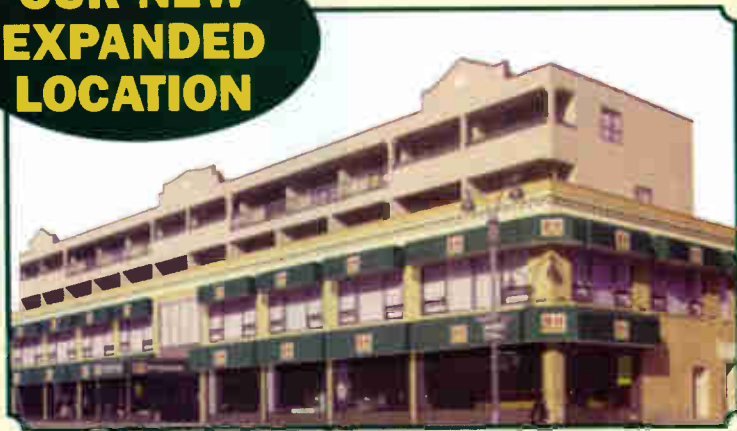
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HARD DISK RECORDING



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DIGI001 Digital Audio Workstation For Mac And PC

A completely integrated digital recording, mixing and editing environment for the Mac and PC, the DIGI-001 offers a 24-bit multi I/O breakout interface along with Pro Tools LE software—based on Digidesign's world renowned ProTools software. The DIGI-001 interface features 18 simultaneous I/Os made up of 8 analog inputs and outputs—two of the inputs are full featured mic preamps with phantom power, and digital I/O including standard S/PDIF as well as an ADAT optical interface that can also be used as a S/PDIF I/O. ProTools LE supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks and also features RealTime AudioSuite (RTAS) effects plug-ins. For ease of use, MIDI and audio are editable within the same environment and all mixing parameters including effects processing can be fully automated.

FEATURES—

- 18 simultaneous, 24-bit ins and outs with support for 44.1 and 48 kHz sample rates
- 20Hz - 22kHz freq. response ± 0.5 dB
- 2 channel, XLR mic/1/4" line inputs with -26 dB pad, 48v phantom power, gain knob, and HP Filter at 60Hz
- 6 ch. line inputs (1/4") TRS balanced/unbalanced w/ software controlled gain
- +4dB balanced 1/4-inch Main outputs
- Balanced 1/4" monitor outs with front panel gain knob
- 1/4-inch unbalanced line outputs channels 3-8
- Headphone output with independent gain control knob
- 2 channel S/PDIF coaxial digital I/O
- 8 channel ADAT optical I/O can also be used as 2 channel optical S/PDIF

Pro Tools LE

- Supports 24 tracks of 16 or 24-bit audio and 128 sequenced MIDI tracks
- Sample-accurate simultaneous editing of audio & MIDI
- Real-time digital mixing capabilities include recall of all mixing parameters, support for edit and mix groups and complete automation of all volume, panning, mutes and plug-ins.
- Route and mix outboard gear in realtime
- MP3 and RealAudio G2 file support (Mac)



- Two plug-in platforms offer multiple options for effects processing—Real-Time AudioSuite (RTAS) is a host-based architecture that allows an effect to change and be dynamically automated in realtime as the audio plays back—AudioSuite is a file-based format, that renders a new file with the processed sound.
- Bundled RTAS plug-ins include: 1 and 4-band EQ; Dynamics II compressor/limiter, gate and expander/gate; Mod Delay - short slap, medium and long delays with modulation capabilities for chorus or flange effects and dither. AudioSuite plug-ins include Time Compression/Expansion, Pitch Shift, Normalize, Reverse.

MIDI Functions

- MIDI functions include graphic controller editing, piano roll display, up to 128 MIDI tracks and editing options like quantization, transpose, split notes, change velocity and change duration.
- MIDI data can be edited on the fly



MOTU AUDIO Hard Disk Recording Systems

The MOTU Audio System is a PCI based hard recording solution for the Mac and PC platforms. At the heart of the system is the PCI-324 PCI card that can connect up to three audio interfaces and allows up to 72 channels of simultaneous I/O. Audio interfaces are available with a wide range of I/O configurations including multiple analog I/O with the latest 24-bit A/D/A converters and/or multi channel digital I/O such as ADAT optical and TDIF I/O as well as standard S/PDIF and AES/EBU I/O. Each interface can be purchased separately or with a PCI-324 card allowing you to build a system to suit your needs. Includes drivers for all of today's hottest audio software and AudioDesk, multitrack recording and editing software for the Mac.

THEY ALL FEATURE—

- Mac OS and Windows compatible
- Includes software drivers for compatibility with all of today's popular audio software plus AudioDesk, MOTU's sample-accurate audio workstation software for Mac OS
- Host computer determines the number of tracks that the software can record and play simultaneously, as well as the amount of real-time effects processing it can support
- Front panel display metering for all inputs and outputs
- AudioDesk Audio Workstation Software for Mac OS features 24-bit recording, multi-channel waveform editing, automated virtual mixing, graphic editing of ramp automation, real-time effects plug-ins with 32-bit floating point processing, crossfades, support for third-party audio plug-ins (in the MOTU Audio System and Adobe Premiere formats), background processing of file-based operations, sample-accurate editing and placement of audio, and more



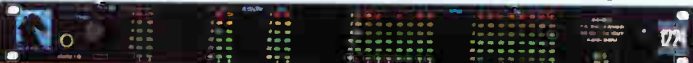
1296 24-bit/96kHz Interface Features—

- 24-bit, enhanced multi-bit 128x oversampling 96kHz converters
- A-weighted signal-to-noise ratio of 117 dB
- 12 Balanced XLR inputs and outputs can support two simultaneous 5:1 mixes
- AES/EBU I/O with sample rate conversion both in and out
- Compatible with existing PCI-324 cards (requires new PCI-324 driver)
- Connect up to 3 1296 interfaces to one PCI-324 card for a total of 36 inputs and outputs or mix and match the 1296 interface with up to three of the other MOTU audio interfaces



2408 mkII FEATURES—

- 7 banks of 8 channel I/O: 1 bank of analog, 3 banks of ADAT optical, 3 banks of Ta cam TDIF, plus stereo S/PDIF
- Custom VLS chip for amazing I/O capabilities
- Format conversion between ADAT and DA-88
- 8x 24-bit 1/4" balanced analog I/Os
- 24-bit internal data bus for full 24-bit recording via digital inputs
- Standard S/PDIF I/O for digital plus an additional S/PDIF I/O for the main mix
- Sample-accurate synchronizer with ADATs and DA88s via an ADAT SYNC IN and RS422



1224 FEATURES—

- 24-bit analog audio interface
- State-of-the-art 24-bit A/D/A
- Simultaneously record and play back 8 channels of balanced (TRS) +4 dB audio
- 24-bit balanced +4 XLR main outputs
- Stereo AES/EBU digital I/O
- Word clock in/out
- Dynamic range of 116 dB (A-weighted)
- Front panel displays six-segment metering for all inputs and outputs
- Headphone jack with volume knob

CD RECORDING/MASTERING



Masterlink ML-9600 High-Resolution Master Disk Recorder

The Alesis MasterLink ML-9600 is a 2-track 24-bit recorder that combines hard disk recording, CD burning, digital signal processing, and mastering functions to create compact discs in the standard "Red Book" 16-bit/44.1kHz format, or high resolution CDs that utilize Alesis' revolutionary CD24 AIF-compatible technology. MasterLink is capable of recording and playing up to 24-bit/96kHz resolution CDs using the inexpensive, readily available CD-R media. The amazing sonic quality, powerful built-in tools and CD24 technology offers a uniquely versatile and affordable solution for everyone from large commercial audio facilities to project studios and recording musicians.

FEATURES—

- 24-bit 128x oversampling analog to digital and digital to analog converters
- Supports 44.1, 48, 88.2, 96 kHz sample rates and word lengths of 16-, 20- and 24-bit
- 20Hz-20kHz frequency response at 44.1/48 kHz sample rates
- 20Hz-40kHz, frequency response at 88.2/96 kHz sample rates
- 1130dB signal-to-noise ratio (A-weighted)
- Matsushita ATAPI CD-Rome drive allows up to 4x CD burning using standard CD-R discs.
- Built-in sample rate conversion & noise shaping to change sample rates & bit resolution as needed
- Reads and Writes 16-bit 44.1kHz Red Book Audio CDs
- Alesis' exclusive CD24 is a high-

resolution mastering format that reads/writes files up to 24-bit 96kHz in the ISO 9660 disc format. AIF compatible file format that can be read by Mac OS, Windows and Unix computer platforms.

- Built-in 3.2GB IDE hard drive
- Hard disk max recording times 95 min. @ 24-bit/96kHz 310 min. @ 16-bit/44.1kHz
- Create and store up to 16 playlists containing as many as 99 tracks

Analog Inputs and Outputs

- Balanced XLR connectors (+4dBu input and +19dBu max. output)
- Unbalanced phono (RCA) connectors (-10dBu input and +5dBV max. output)
- 1/4-inch TRS headphone output with level control

Digital Inputs and Outputs

- AES/EBU balanced XLR inputs and outputs
- S/PDIF unbalanced phono (RCA) inputs and outputs

Editing

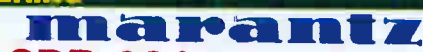
- Gain control
- Cropping allows adjusting start and end points.
- Join and Split features allow combining and separating song sections.

DSP Finishing Tools

- Equalization, Compression, Normalizing and Peak Limiting

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- Infrared remote control and rackmount brackets



CDR-631 Professional CD Recorder

The CDR631 offer all the features and functions of the CDR630, its popular predecessor, but adds many features and functions that were previously unavailable. Its full complement of digital and analog connections lets you record your own CDs from audio sources such as CDs, LPs, cassettes, DAT, or even a computer.

Features—

- Pro and consumer CD-R and CD-RW compatible
- Track titles can be saved and edited in CD-TEXT format that can be read on CD-TEXT compatible CD players
- Memory buffer that prevents the beginning of tracks from getting cut off
- Menu selectable SCMS copy protection
- Digital and analog record level and balance control
- XLR-Balanced and RCA unbalanced analog inputs
- AES/EBU (XLR), Coaxial, and Optical digital inputs
- Unbalanced (RCA) analog and Coaxial digital outputs including Coaxial loop-out for unprocessed connection to other digital equipment
- IR remote control included



MICROBOARDS

StartREC Digital Audio Editing/ CD Duplication System

The Microboards StartREC is the first digital audio editing system combined with a multi drive CD recordable duplication system for professionals. Audio is recorded to the internal 6.2 GB IDE hard drive using analog or digital inputs. Sample rate conversion is automatic. Tracks can be edited and sequenced using the StartREC's user friendly interface and up to 4 CDs can be recorded simultaneously. StartREC is the ideal solution for studio recording, mastering, post production or any pro audio environment requiring digital audio editing and short run CD-R duplication.

Features—

- 2X, 4X, or 8X recording speeds
- 6.2GB IDE hard drive
- Editing functions include move, divide, combine or delete audio tracks, add or drop any index or sub index, and create track fade in or fade out
- Coaxial S/PDIF or AES/EBU digital input plus optical S/PDIF I/O
- XLR balanced and RCA Line inputs and outputs
- Automatic sample rate conversion from 32 and 48kHz
- Automatic CD Format Detection feature and user friendly interface provide one touch button operation
- Front panel trim pot and LCD display provide accurate input signal and time laps metering
- SCMS (Serial Copy Management System) is supported, regardless of the source disc copy protection status
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DIGITAL MULTI-TRACK RECORDERS

TASCAM

MX-2424 24-Bit 24-Track Hard Disk Recorder

Co-designed by TASCAM and TimeLine Inc., the MX-2424 is an affordable 24-bit, 24-track hard disk recorder that also has the editing power of a digital audio workstation. A 9GB internal hard drive comes standard as well as a SCSI Wide port that supports external LVD (Low Voltage Drives) hard drives from up to 40 feet away. An optional analog and several digital I/O cards are available so the MX-2424 can be configured to suit your work environment. SMPTE synchronization, Word Clock, MIDI Time Code and MIDI Machine Control are all built in for seamless integration into any studio.



- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz, or 12 tracks at 88.2 or 96 kHz. Up to 24 tracks can be recorded simultaneously using any combination of digital and analog I/O.
- Supplied 9GB internal drive allows 45 minutes of audio across all 24 tracks
- Wide SCSI port on the back panel allows you to add multiple drives. A front 5-1/2" bay available for installing an additional drive, or an approved DVD-RAM drive for back-up.
- ViewNet MX, a Java-based software suite for Mac and PC offers DAW style editing of audio regions, dedicated system set-up screens that make set-up quicker and easier and track load screens that make virtual track management a snap. Connects to a computer via a standard Ethernet line.
- Can record to Mac (SDII) or PC (.WAV) formatted drives, allowing later export to the computer. The Open TL format allows compatible software to recognize virtual tracks without have to load, reposition and trim each digital file.

Transport Controls-

- Jog/scrub wheel
- MIDI In, Out, and Thru ports are built-in for MIDI Machine Control.

Editing-

- Built-in editing capabilities include cut, copy, paste split and ripple or overwrite
- 100 levels of undo
- Supports destructive loop recording and non-destructive loop recording which continuously records new takes without erasing the previous version.

Built-In Synchronization-

- TBUS protocol can sample accurately lock 32 machines together for 384 tracks at 96kHz or 753 tracks at 48kHz.
- Can generate or base SMPTE timecode or MIDI Time Code.
- Word Clock In, Out, and Thru ports

I/O Options-

- Optional analog and digital cards all provide 24 channels of I/O. There is one slot for analog and one for digital.
- IF-TD94 - T/DIF module
- IF-AD24 - ADAT Lightpipe module
- IF-AE24 - AES EBU module
- IF-AN24 - A-D, D-A I/O module with DB-25 connectors

Software Updates-

- System updates are made available through a front panel Smart Card slot or via computer directly from the TASCAM web site.

DA-78HR Modular Digital Multitrack

The DA-78HR is the first true 24-bit tape-based 8-track modular digital multitrack recorder. Based on the DTRS (Digital Tape Recording System) it provides up to 108 minutes of pristine 24-bit or 16-bit digital audio on a single 120 Hi-8 video tape. Designed for project and commercial recording studios as well as video post and field production, the DA-78HR offers a host of standard features including built-in SMPTE Time Code Reader/Generator, MIDI Time Code synchronization and a digital mixer with pan and level controls. A coaxial S/PDIF digital I/O allows pre-mixed digital bouncing within a single unit, or externally to another recorder or even a DAT or CD recorder. Up to 16 DTRS machines can be synchronized together for simultaneous, sample accurate control of 128 tracks of digital audio.



Features-

- Selectable 16 bit or 24 bit High Resolution audio
- 24 bit A/D and D/A converters
- >104dB Dynamic range
- 20Hz - 20kHz frequency response ±5dB
- 1 hr. 48 min. recording time on a single 120 tape
- On-Board SMPTE synchronizer - chase or generate timecode
- On-Board support for MIDI Machine Control

- Internal digital mixer with level and pan for internal bouncing, or for quick mixes
- Track slip from -200 to +7200 samples
- Expandable up to 128 tracks (16 machines)
- Word Sync In/Out/Thru
- Analog output on DB25 balanced or RCA Unbalanced
- Digital output on DIF or 2 channels of S/PDIF

A TO D CONVERTERS

APOGEE Rosetta 24-bit A to D Converter

The high-end quality analog to digital solution for the project studio. With support for both professional and consumer digital formats you can now record your audio at a higher resolution and with greater detail than standard converters found on MDAs, DATs and DAWs. Ideal for mastering or tracking.



FEATURES-

- 24-bit, 44.1-48, 88.2-96 kHz Sample Rate (±10%)
 - 116dB dynamic range (unweighted)
 - Improved UV22HR for 16 and 20-bit A/D conversion
- FRONT PANEL:**
- Power switch • Sample Rate (44.1, 48, 88.2, 96kHz) selector • 16-bit (UV22), 20-bit (UV22) and

- 24-bit resolution selector • S/PDIF-ADAT optical selector • Soft Limit on or off • 12-segment metering w/ over indicator & Meter Clear switch • Level trim
- REAR PANEL:**
- XLR balanced inputs • 2 x AES/EBU for 88.2/96kHz 2 channel path, Coaxial S/PDIF, switchable S/PDIF or ADAT optical outputs • Wordclock out

LUCID AD 9624 24-bit A to D Converter

Transparent analog to digital conversion designed to bring your music to the next level. XLR balanced inputs feed true 24-bit converters for revealing all the detail of the analog source. 16-bit masters can take advantage of the AD9624's noise shaping function which enhances clarity of low level signals.

FEATURES-

- 24-bit precision A/D conversion • Support for 32, 44.1, 48, 88.2 & 96kHz sample rates • Wordclock sync input • Selectable 16-bit noise shaping •



- Simultaneous AES/EBU, coaxial and optical S/PDIF outputs • 20-segment LED meters w/ peak hold & clip indicators • **ALSO AVAILABLE:** DA9624 24-bit D/A converter

DIGITAL MIXERS

Roland

VM Basic 72 Digital Mixing System

The all digital Roland V-Mixing System, when fully expanded is capable of mixing up to 94 channels with 16 stereo (32 mono) onboard multi-effects including COSM Speaker Modeling. Utilizing a separate-component design, comprised of the VM-7200 console and VM-720C rackmount processor, allows the V-Mixing System to be configured to suit your needs. Navigation is made easy via a friendly user interface, FlexBus and EZ routing capabilities as well as a large informative LCD and ultra-fast short cut keys.



- 94 channels of digital automated mixing (fully expanded)
- Up to 48 channels of ADAT/Tascam T-DIF digital audio I/O with optional expansion boards and interfaces
- Separate console/processor design
- Quiet motorized faders, transport control, total recall of all parameters including input gain, onboard mixer dynamic automation and scene memory
- 24 fader groups, dual-channel delays, 4-band parametric channel EQ + channel HPF
- FlexBus and "virtual patchbay" for unparalleled routing flexibility

- Up to 16 stereo (or 32 mono) multi-effects processors using optional VS8F-2 Effects Expansion Boards (2 stereo effects processors standard)
- COSM Speaker Modeling and Mic Simulation technology
- 5.1 Surround mixing capabilities
- EZ Routing allows mixer settings to be saved as templates
- Real-time Spectrum Analyzer checks room acoustics in conjunction with noise generator and oscillator
- Digital cables between processor and mixer can be up to 100 meters long- ideal for live sound reinforcement.

- VS8F-2 Effects Expansion Board** -- Provides 2 stereo effects processors including COSM Speaker Modeling. Up to 3 additional boards can be user-installed into the VM-720C processor, for 8 stereo or 16 mono effects per processor.
- VM-24E I/O Expansion Board** -- Offers 3 R-Bus I/Os on a single board. Each R-Bus I/O provides 8-in/8-out 24-bit digital I/O, totaling 24 I/O per expansion board.

- DIF-AT Interface Box for ADAT/Tascam** - Converts signals between R-Bus (VM-24E expansion board required) and ADAT/Tascam T-DIF. Handles 8-in/8-out digital audio, 1/3 rackmount size.
- VM-24C Cascade Kit** -- Connects two VM-Series processor units. Using two VM-720C processors cascaded and fully expanded with R-Bus I/O, 94 channels of audio processing are available.

EFFECTS & PROCESSING

Lexicon

MPX-500 24-Bit Dual Channel Effects Processor



The MPX 500 is a true stereo 24-bit dual-channel processor and like the MPX100 is powered by Lexicon's proprietary Lexiclip and offers dual-channel processing. However, the MPX 500 offers even greater control over effects parameters has digital inputs and outputs as well as a large graphics display.

- 240 presets with classic true stereo reverb programs as well as Tremolo, Rotary, Chorus, Flange, Pitch Detune, 5.5 Second Delay and Echo
- Balanced analog and S/PDIF digital I/O
- 4 dedicated front panel knobs allow adjustment of effect parameters. Easy Learn mode allows MIDI patching of front panel controls.
- Tempo-controlled delays lock to Tap or MIDI clock

t.c. electronic

M-One Dual Effects Processor



The M-One allows two reverbs or other effects to be run simultaneously, without compromising sound quality. The intuitive yet sophisticated interface gives you instant control of all vital parameters and allows you to create awesome effects programs quickly and easily.

- 20 incredible TC effects including Reverb, Chorus, Tremolo, Pitch, Delay and Dynamics
- Analog-style user interface
- 100 Factory/100 User presets

- Dual-Engine design
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing

D-Two Multitap Rhythm Delay



Based on the Classic TC2290 Delay, the D-Two is the first unit that allows rhythm patterns to be tapped in directly or quantized to a specific tempo and subdivision.

- Multitap Rhythm Delay
- Absolute Repeat Control
- Up to 10 seconds of Delay
- 50 Factory/100 User presets

- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing

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MICROPHONES



C414 TLII "Vintage TL"

Combines the best of old and new: legendary C12 acoustics and the latest generation of C414 transformerless FET electronics. Although similar in design and shape to the C414BULS, the TLII features a capsule that is a faithful sonic recreation of the one used in the classic C12 tube mic combined with computer-aided manufacturing techniques that assure greater uniformity in response from microphone to microphone.

FEATURES-

- Cardioid, hypercardioid, omnidirectional and figure 8 polar patterns
- Warm, smooth microphone that is suitable for high-quality digital recording
- Frequency response 10Hz to 20kHz



C4000B ELECTRET CONDENSER

This new mic from AKG is a multi polar pattern condenser microphone using a unique electret dual large diaphragm transducer. It is based on the AKG SolidTube design, except that the tube has been replaced by a transistorized impedance converter/preamp. The transformerless output stage offers the C4000B exceptional low frequency

FEATURES-

- Electret Dual Large Diaphragm Transducer (1st of its kind) • Cardioid, hypercardioid & omnidirectional polar patterns • High Sensitivity
- Extremely low self-noise • Bass cut filter & Pad switches • Requires 12, 24 or 48 V phantom power
- Includes H-100 shockmount and wind/pop screen
- Frequency response 20Hz to 20kHz



RØDE NT-2 Condenser Mic

The RØDE NT2 is a large diaphragm true condenser studio mic that features both cardioid and omnidirectional polar patterns. The NT-2 offers superb sonic detail with a vintage flavor for vocal and instrument miking. Like all RØDE mics the NT-2 is hand-assembled in Australia and is available at a breakthrough price.

FEATURES-

- Dual pressure gradient transducer
- 1" capsule with gold-sputtered membranes
- Low noise, transformerless circuitry
- Omni and cardioid polar patterns
- 135dB Max SPL
- High pass filter switch and -10dB pad switch
- Gold plated output connector and internal head pins
- Shockmount, Flight Case, and Pop Filter included
- 20Hz-20kHz frequency response



audio-technica AT4047 Cardioid Condenser

The AT4047 is the latest 40 Series large diaphragm condenser mic from Audio Technica. It has the low self noise, wide dynamic range and high sound pressure level capacity demanded by recording studios and sound reinforcement professionals.

FEATURES-

- Side address cardioid condenser microphone for professional recording and critical applications in broadcast and live sound
- Low self noise, wide dynamic range and high SPL
- Switchable 80Hz Hi Pass Filter and 10dB pad
- Includes AT849/SV shockmount



POWERED STUDIO MONITORS

VERGENCE A-20 Studio Reference Monitor System



Incorporating a pair of 2-way, acoustic suspension monitors and external, system-specific 250 watt per side control amplifier, the A-20 provides a precise, neutral studio reference monitoring system for project, commercial and post production studios. The A-20's control amplifier adapts to any production environment by offering control over monitoring depth (from near to far field), wall proximity and even input sensitivity while the speakers magnetic shielding allows seamless integration into today's computer based studios.



- Type Modular, self-powered near/mid/far-field monitor.
- 48Hz - 20kHz frequency response @ 1M
- Peak Acoustic Output 117dB SPL (100ms pink noise at 1M)
- XLR outputs from power amp to speakers
- Matched impedance output cables included.

- 6dB LF Cutoff @ 40Hz
- 5 position wall proximity control
- 5 position listening proximity control between near, mid and far-field monitoring
- Power, Overload, SPL Output, Line VAC and Output device temperature display.

Amplifier

- Amplifier Power 250W (continuous rms/ch), 400W (100ms peak).
- XLR, TRS input connectors
- Headphone output
- 5-position input sensitivity switch with settings

Speakers

- 2-way acoustic suspension with a 6.5-inch treated paper woofer and a 1-inch aluminum dome tweeter
- Fully magnetically shielded with an 18" x 11" recommended working distance

MICROPHONE PREAMPS

AVALON DESIGN

VT-737SP Mono Class A, Vacuum Tube-Discrete Preamp-Opto-Compressor-Equalizer



The VT-737SP is a vacuum tube, Class A processor that combines a mic preamp, instrument DI, compressor and sweepable 4-band equalizer in a 2U rack space. Like all Avalon Design products the VT-737SP utilizes a minimum signal path design with 100% discrete, high-bias pure Class A audio amplifiers and the best active and passive components available. Used by renowned artists and studios world wide and the winner of the Electronic Musician 1999 Editors' Choice Award for Product of The Year

FEATURES-

- Combination of TUBE preamplifiers, opto-compressor, sweep equalizer, output level and VU metering in a 2U space
- Four dual triode vacuum tubes, high-voltage discrete Class A with a 10 Hz to 120kHz frequency response ±0.5dB
- The Preamp has three input selections- The first is a high performance XLR balanced mic input transformer with +48v phantom power, the second is a high impedance instrument DI with a 1/4" jack located on the front panel and the third is a discrete high-level Class A balanced line input.
- High gain switch boosts overall preamp gain and a passive- variable high pass filter, hardware relay bypass and phase reverse relay is available for all three inputs
- The Opto-Compressor uses a minimum signal path design and features twin Class A vacuum tube triodes for gain matching. A passive optical attenuator serves as a simple level controller. Variable threshold, compression ratio and attack and release offer dynamics control from soft compression to hard-knee limiting.
- The dual sweep mid-EQ can be side chained to the compressor allowing a broad range of spectral

control including de-essing. The EQ can be assigned pre and post compressor from the front panel to add even greater sonic possibilities.

- Two VT-737 SPs can be linked together via a rear panel link cable for stereo tracking
- The Equalizer utilizes 100% discrete, Class A-high-voltage transistors for optimum sonic performance.
- The low frequency passive shelving EQ is selectable between 15, 30 60 and 150Hz with a boost and cut of ±24dB
- The high frequency passive shelving EQ is selectable between 10, 15, 20 and 32 kHz with a boost and cut of ±20dB
- The low-mid frequency is variable between 35 to 450 Hz while the high-mid frequency is variable from 220Hz to 2.8 kHz. Both mid-band frequencies offer a boost and cut of ±16 dB and a hi-/lo-Q switch
- When the EQ to side chain is used, the low and high EQ is still available for tonal adjustment
- The Output level is continuously variable and utilizes an another dual triode vacuum tube driving a 100% Class A, high-current balanced and DC coupled low noise output amplifier.
- Sealed silver relay bypass switches are used for the most direct signal path

PS-5 Bi-Amplified Project Studio Monitors



The PS-5s are small format, full-range, non-fatiguing project studio monitors that give you the same precise, accurate sound as the highly acclaimed 20/20 series studio monitors. The use of custom driver components, complimentary crossover and bi-amplified power design provides a wide dynamic range with excellent transient response and low intermodulation distortion.

FEATURES-

- 5-1/4-inch magnetically shielded mineral-filled polypropylene cone with 1-inch diameter high-temperature voice coil and damped rubber surround LF Driver
- Magnetically shielded 25mm diameter ferrofluid-cooled natural silk dome neodymium HF Driver
- 70 watt continuous LF and 30 watt continuous HF amplification per side
- XLR-balanced and 1/4-inch (balanced or unbalanced) inputs

- 52Hz-19kHz frequency response ±3dB
- 2.6kHz, active second order crossover
- Built-in RF interference, output current limiting, over temperature, turn-on transient, subsonic filter, internal fuse protection
- Combination Power On/Clip LED indicator
- 5/8" vinyl-laminated MDF cabinet



Hafler

TRM-6 Bi-Amplified Studio Monitors

Offering honest, consistent sound from top to bottom, the TRM-6 bi-amplified studio monitors are the ideal reference monitors for any recording environment whether tracking, mixing and mastering. Supported by Hafler's legendary amplifier technology providing a more accurate sound field, in width, height and depth.

FEATURES-

- 33 Watt HF & 50 Watt LF Amplification
- 1-inch soft dome tweeter and 6.5-inch polypropylene woofer
- 55Hz - 21kHz Response
- Magnetically Shielded
- Electronically and Acoustically Matched

Also Available- TRM-8

- 1-inch soft dome tweeter and 8-inch polypropylene woofer
- 45Hz - 21kHz frequency response ±2dB
- 75 Watt HF, 150 Watt LF Amplification



TRM-10s And TRM-12s Active Subwoofers

Combining Hafler's legendary amplifier technology with a proprietary woofer design, the TRM10s and TRM12s active subwoofers provide superb bass definition required in today's studio and surround sound environments.

TRM-10s

- 10-inch cellulose fibre cone down firing woofer.
- 200 watt low frequency amplifier
- 30Hz to 110Hz frequency response ±2dB
- 24dB/octave Linkwitz-Riley crossover variable (40Hz to 110Hz)

TRM-12s

- 12-inch cellulose fibre cone down firing woofer.
- 200 watt low frequency amplifier
- 25Hz to 110Hz frequency response ±2dB
- 24dB/octave Linkwitz-Riley crossover variable (40Hz to 110Hz)



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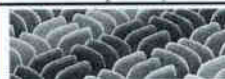
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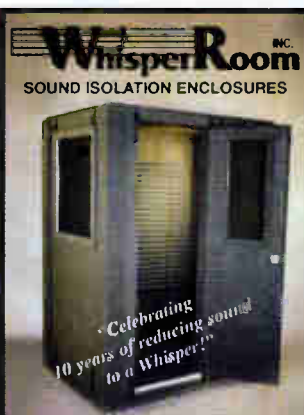
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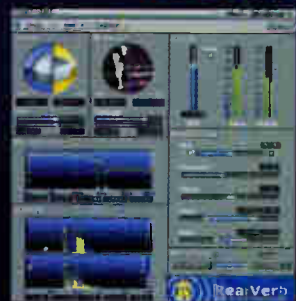
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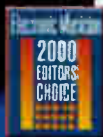
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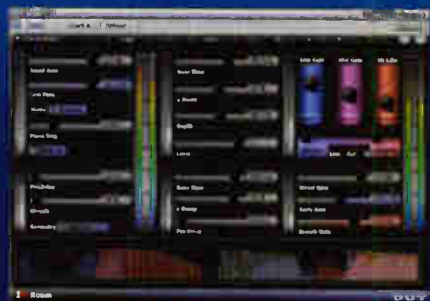


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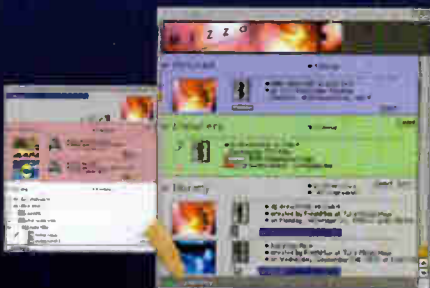


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project-based backup of your data. A DP project can contain hundreds of separate audio files – generic backup programs can't track these files on a per-project basis, but Mezzo can. And with full background operation you can backup or restore while you compose! With its intuitive, drag & drop interface and practically hands-free operation, Mezzo makes the job of managing the daily flow of data a simple and painless task.



HI-PERFORMANCE DRIVES

T-Project™ external hard drives

Why should you choose Glyph external drives? Because you get enhanced performance and higher track counts. Glyph drives are optimized with custom mode page settings designed for AV use. Glyph drives are cooler (than internals), producing greater longevity & smoother operation.

And because they're SCSI, they last longer than ATA/IDE drives, making them a better investment over time. Most importantly, there's Glyph's Herculean service & crushing technical support — from people that live and breathe digital audio. If your T-Project™ needs warranty service, our typical turnaround time is less than 48 hours. You even get Overnight Advance Replacement for your T-project in the first year of its warranty. What discount HD vendor does that?



HANDS-ON MIXING

HUI™ (Human User Interface)

The Human User Interface (HUI) from Mackie is unmatched for advanced, yet affordable control surface technology for audio workstations. HUI is so tightly integrated with Digital Performer, it's like placing your hands on Digital Performer itself. Sculpt your mix with HUI's silky smooth motorized faders. Tweak effects parameters with firm, yet responsive V-Pot rotary encoders. You can even

call up plug-ins on-screen directly from HUI. Keypad and transport controls let you locate Digital Performer's main counter instantly, just like the familiar keypad on your computer keyboard. HUI is a complete hardware workstation console, with the user-friendly ergonomics that Mackie mixers are known for. For serious professionals who work day in and day out with Digital Performer, HUI can significantly boost productivity through direct hands-on control.

MACKIE.



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World Radio History

MACKIE DIGITAL 8-BUS CONSOLE

SHORTCUTS AND "STAYING IN TOUCH"

You did your research. Applied for some new credit cards. Checked out the competition one last time, and you now own a Mackie Digital 8-Bus (D8B) console. The D8B features many ways to accomplish a single task. After owning it for a year, I'm still finding new shortcuts, and now's a good time to acquaint yourself with the online support that's in place, as the D8B's software will be undergoing numerous upgrades/improvements and added features in the foreseeable future.

KEYBOARD SHORTCUTS

Simply by opening the manual (ugh—do I have to?), you'll find some of my favorite keyboard shortcuts: F1 thru F4 toggles through the fader banks. The Escape key closes windows. Double-clicking the shift button on the board selects all faders in the active bank, and some windows. Ctrl+8, Ctrl+9 and Ctrl+0 open Mackie FX cards A, B and C, while Ctrl+ opens card D. Ctrl+, used for Go To Unity, and Ctrl+[, for Go To Off, are good ones too. You can fade out a selected fader by typing the letter F, or fade in with letter G. Save your fades in Channel>Edit Fades (Ctrl+K).

SHORTCUT TO THE FAT CHANNEL

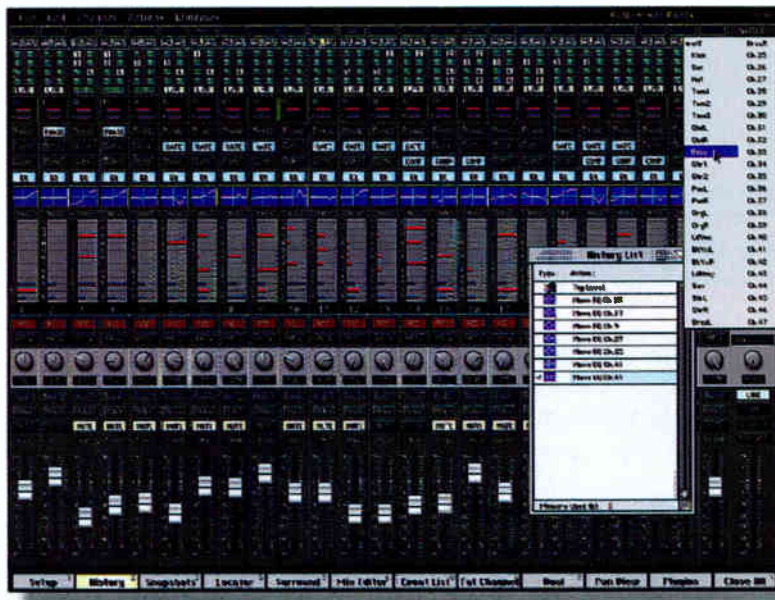
Double-click a Select button (on the board or with the mouse) to bring up the Fat Channel. If you double-click again, the Fat Channel goes away.

REMOVING ALL AUTOMATION

To remove automation, bring up the Event List window. There, check the All box, Press Ctrl+A to select all the automation events, then press Ctrl+X to delete them.

TWEAKING LEVELS IN A MIX: SEVERAL METHODS

The D8B offers many ways to ad-



The D8B's main mix screen shows console parameters at a glance.

just levels; here are some you know about, and perhaps a few new ones.

1. Rewrite with fader automation.
2. Edit fader nodes manually in Mix Editor and/or Event List.
3. Mark the region in the Mix Editor (with the I-Beam button) and use up-down nudge arrows to tweak up or down globally within the mark. Each click corresponds to about 0.3 dB near the sweet spot, and the dB level gets coarser toward the bottom of fader travel range.
4. Rewrite digital trim with v-pot automation ("All" mode).
5. Edit digital trim nodes manually in Mix Editor and/or Event List.
6. Mark and nudge digital trim in Mix Editor as in #3.
7. Rewrite compressor output level with v-pot automation (in "All" mode—comp has to be turned on for this to work).
8. Edit comp output nodes manually in ME or EL.
9. Mark and nudge compressor output in Mix Editor as in #3.
10. You can also assign your faders

to the virtual group masters and overdub volume changes as well.

READY...SET...ONLINE!

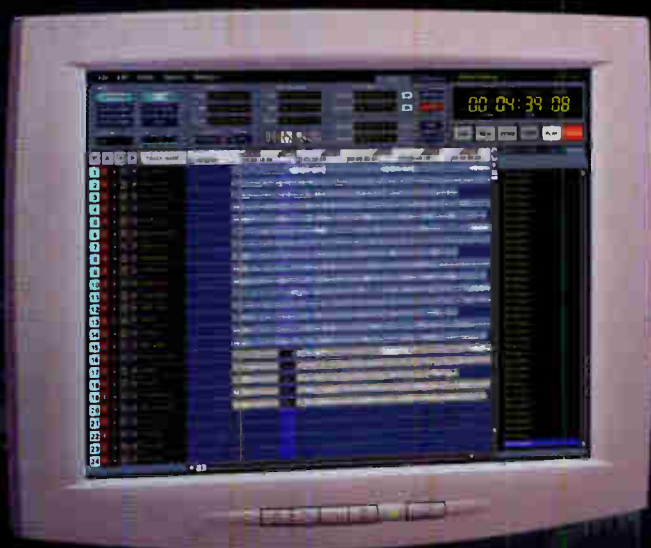
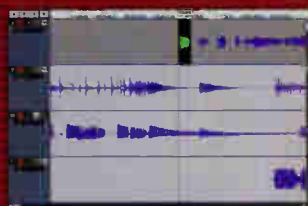
Visit www.d8bexchange.com, a site sponsored by Mackie, which pays the bill to support this open—no censorship—forum. Maintained by user Mark Hopkins, it's a great place to troubleshoot your setup, ask questions or post wishes for features you'd like to see implemented in future software revs. You can also download or upload EQ, compressor and FX files from/to this site. The Keith Olsen EQ and compressor patches are a must-have; the MPX_1_LikeVerbs (30 presets in all) are also definitely worth having and certainly worth the (free) price of admission.

More D8B secrets can be found at www.d8bexchange.com/faq.htm, but meanwhile, thanks to Mark Hopkins, Rick Powell and Jon Chase for their suggestions and tips presented here. ■

Boston area producer/engineer Chris Lannon started his career tweaking knobs on an MXR flanger and Dynacomp and hasn't looked back since.

BY CHRIS LANNON

HDR24/96. MACKIE'S NEW 24 TRACK RECORDER. WORKS WITH ANY MIXER. NO EXTRA COMPUTER OR SOFTWARE NEEDED.



- 24 tracks...24-bits
- Built-in full-feature digital workstation editing
- Affordable pull-out media
- Built-in SVGA, mouse & keyboard ports
- Built-in 100BaseT Ethernet

New hard disk recorders are popping up all over the place. Our new HDR24/96 is the only recorder with built-in nondestructive graphic waveform editing. Just plug in a mouse, keyboard and SVGA monitor to view all recorder parameters on screen in real time. Enjoy complete editing control with unlimited levels of undo, drag-and-drop cross-fades with 9 preset combinations plus fade/crossfade editor. And look forward to DSP time compression/expansion, pitch shift and lots more!

The HDR24/96 was the only recorder that uses pull out Ultra-DMA hard drives, so affordable that you can keep one for each project—over 90 minutes of 24-track recording time costs less than a reel of 2-inch tape!

Call or visit our website for preliminary info on the new HDR24/96. Shipping soon from Mackie Digital Systems.

HDR24/96 editing features include:

8 takes per track with nondestructive comping, nondestructive cut/copy/paste of tracks, regions or super-regions, drag-and-drop fades & crossfades, 1x/2x/4x/8x/24x waveform views, bidirectional cursor scrub and unlimited locators and loops... with unlimited undos — but without requiring an external computer! Coming soon: DSP time compression/expansion, true waveform editing with pencil tool, invert, pitch shift, normalize and much, much more.



- Built-in 20-gig Ultra-DMA hard disk plus front panel bay for additional easily available pullout drives
- Intuitive analog tape deck interface and monitoring
- Syncs to SMPTE, MIDI, Black Burst, PAL & NTSC without extra cards
- Unlimited HDR24/96 linking! Sync 48, 72, 96, 128 or more tracks sample accurately
- 96kHz recording via software and new PD1 • 96 I/O
- Digital 8 • Bus I/O cards — mix and match!
- 3.5-inch disk drive for software upgrades & tempo map importing
- Fast Ethernet port built-in
- Remotes available.

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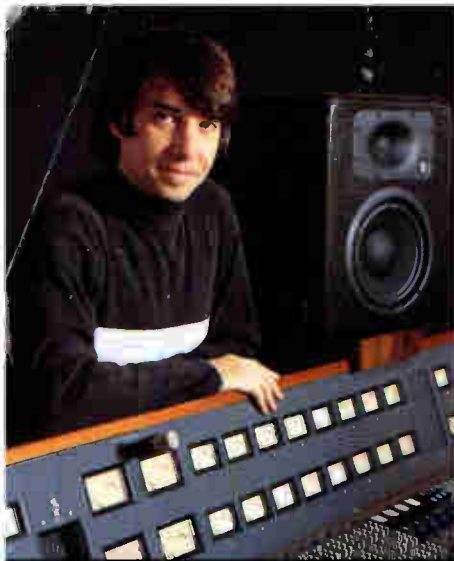
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William Wittman is a multi-platinum Producer/Engineer, former Staff Producer/A&R Vice President (RCA / BMG Records and Columbia / Sony Records), Musician and Songwriter. His career truly covers all the bases.

“I’ll tell you a secret; I’ve always had a love hate relationship with near-field monitors. But these LSR’s have changed all that. First, they’re just easy to listen to. They’ve got plenty of full, real bottom, great stereo imaging, and they go loud enough to feel right. Plus, they translate incredibly well to the rest of the world. They’re just *musical*. Wow; good sounding speakers I can trust! It’s love-love.”

LSR. Profiles

The world’s most noted recording professionals discuss the world’s most advanced monitoring systems.

The Three Best Performing THX® Monitoring Systems Are Also The World’s Most Applauded.

Since its introduction in 1997, the system-engineered JBL LSR Series has become a favorite choice of engineers, producers and performers, many of whom have also become its most loyal advocates. More important, this acceptance is found in every major geographic area of the recording industry; from Los Angeles and New York to Nashville and London.



LSR 32

LSR 28P

LSR 12P

Monitors Whose Performance Profile Was Determined By Science, Not Opinion.

During a half century of building the most technically advanced studio monitors, JBL has developed a long list of working relationships with key recording professionals around the globe. As a direct result of this unique collaboration, these industry leaders have chosen JBL monitors more often than any other brand. Not once or twice, but consistently for decades. In fact, JBL monitors are a part of the history of recording itself. Consider as examples, the now fabled JBL 4200 and 4400 Series that, at their launch, actually defined an entirely new standard and new category of monitor. Such is the case now with the entire LSR line.



Joel Jaffe is an award winning Engineer/Producer/Composer and co-owner of Studio D Recording, Inc., home to a long list of platinum and Grammy Award winning albums and artists. Currently, Joel is working on DVD surround mixes for some of the industry’s top touring acts. LSR surround systems are his choice for stereo and 5.1 channel multimedia projects.

“The THX Approved 5.1 JBL LSR28P with the JBL LSR12P subwoofer provide an extremely linear response, great transients and full-frequency monitoring in a near-field set up. In addition, the LSR speakers allow us to be able to go between stereo mixing and multi-speaker formats, which is absolutely necessary today in a state-of-the-art studio.”

ALL NEW LSR 25P



The Only Workstation Monitor Good Enough To Be Called LSR.

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