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Mick Guzauski, Producer • credits include:
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"I have relied on Tannoy point source Dual Concentric loudspeakers for several years. Their resolution of time and space put them in a league of their own. Now with the advantage of state of the art filtering and amplification, the overall precision of the image and critical damping factor makes them an unbeatable combination at any price."

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photo courtesy of Royaltone studios

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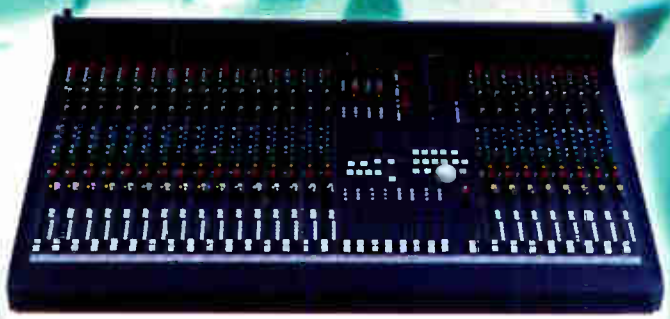

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● "I just sold my Mackie 8-bus and purchased the new Ghost console. The difference is amazing. The Ghost is the warmest sounding board I've ever used." - Mike Perkin (The Lab Recording Studio, Emmaus, Pa)

● "I replaced a console that was more than 3 times the price, and got a quieter, more transparent, and sweeter sounding console! Big console feel, with an amazing price!" - Kurt Bevers, Brownell Sound, Oregon.

● "An incredibly musical console, ultra flexible with a real usable EQ. It is absolutely the best sounding project studio board that I've heard". - Howard Givens, Spotted Peccary Studios."

● "I love the desk, the EQ is just marvellous. Ghost is the best 8 bus recording desk on the market." - Lee Hamblyn, Engineer.

● "Intuitive handling, flexible routing, great Soundcraft sound." - Melvin Fernandes, Recording Engineer, CMM Studios, India.

● "I use the Ghost for several radio shows doing live performances. The EQ is amazing, I'm on air in 5 minutes! Doing dance stuff is one, doing live stuff is another. But I use only one board for both of them, The Soundcraft Ghost." - Barney Broomer, Sonic One Rotterdam.

● "Ease of operation and the numerous in-line inputs for my synthesizers and samplers is why I purchased the Soundcraft Ghost console." - says President of Saban Entertainment and producer of Mighty Morphin Power Rangers Shuki Levy.

● "I didn't know how useful mute groups could be and how good the EQ had to be until we used the Soundcraft Ghost." - Stefaan Windey, La Linea Musicproductions b.v.b.a., Belgium.

● "It sounds great and the EQ is very precise which makes it very easy to pin-point the frequencies I need to work on. Ghost enables me to finish mixes on the console at home, without having to use any other studio." - Phil Kelsey (Remix Engineer)

● "The console is very user-friendly and is constructed so well that it can easily withstand the rigors of even the most hectic of production schedules." - Corey Dissin, Producer at Paul Turner Productions.

● "Both myself and our Production Director Jeff Thomas used the console for PowerStation and were equally very, very impressed. For the money, the console is fantastically versatile, has good headroom and a very impressive EQ." - Alex Lakey (Engineer for PowerStation)

Ghost

"Let us know what you think about the Soundcraft Ghost by visiting our web site at **http://www.soundcraft.com** or via e-mail to **info@soundcraft.com**"

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MAY 1997, VOLUME 21, NUMBER 5

AUDIO

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AUDIO POST-PRODUCTION

World Radio History

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PRODUCTS

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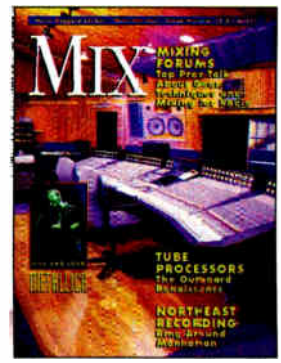
LIVE SOUND

DEPARTMENTS

Cover: Electric Lady Studios, New York City, legendary home of Jimi Hendrix, recently installed a one-of-a-kind purple 80-input SSL 9000J into the Purple Haze Room, originally designed in 1983 by Brett Thoeny of BOTO Design. Chief technical director for the renovation was Jim Gillis. The 17x27-foot control room features custom Augspurger monitors with TAD components and an endless supply of outboard gear. The first audio through the board was producer Eddie Kramer playing back Hendrix tracks from the upcoming remastered releases on MCA, according to studio manager Mary Campbell. **Photo:** Julian Jaime. **Inset Photo:** Paul Natkin.



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MIX 1977 - 1997

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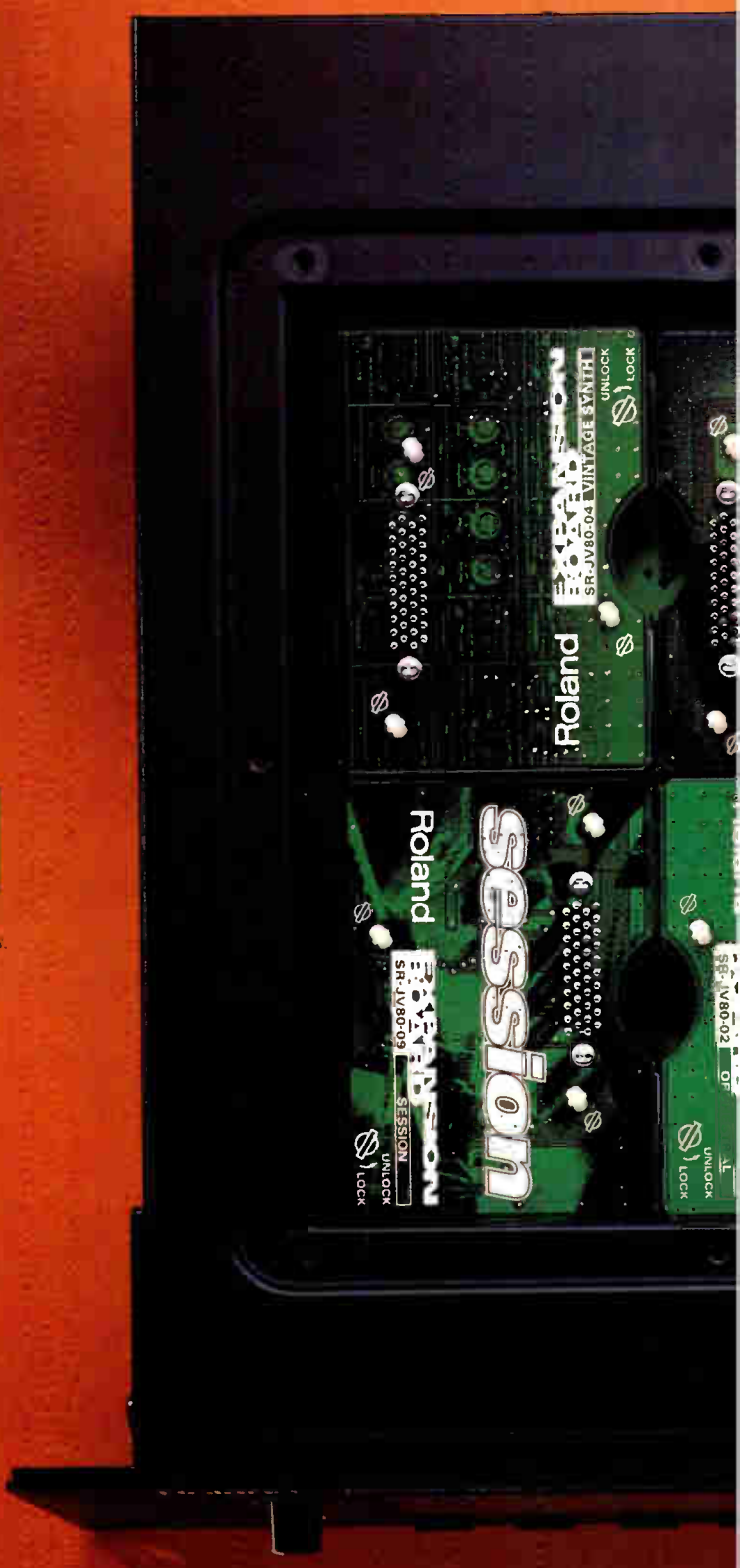

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FROM THE EDITOR

HAPPY BIRTHDAY, MDM

Ten years ago, Akai was completing the development of its prototype A-DAM (Akai Digital Audio Multitrack) recorder, which was unveiled to a few insiders at the New York AES in 1987. Priced at $35,000 and housed in an 80-pound, seven-rackspace chassis, the 12-track (expandable to 24 or 36 tracks) A-DAM was crude by today's standards, but it initiated the concept of modular recording. In 1989, Yamaha debuted its DMR8, a 20-bit 8/16/24-track system priced from $34,000.

On January 18, 1991, Alesis showed its original ADAT 8-track, priced at a then-astounding $3,995. Suddenly, all the rules had changed: With a 24-track digital system falling to $11,985, ½-inch analog 8-track sales came to a virtual standstill. By 1992, other affordable digital multitracks surfaced from Tascam (DA-88) and Fostex (RD-8), followed by Sony and Panasonic models in later years. Soon, modular digital multitrack became the accepted term for this new genre of technology.

As the first ADATs were delivered to retailers, SPARS recommended that record labels abandon the ADD, DDD, etc., codes on CD releases. Did low-cost digital threaten the allure of a DDD sticker?

Today, tens of thousands of MDMs later, the market has matured: Alesis went upscale with its ADAT-XT. Tascam went downmarket with the low-cost DA-38. Fostex dropped out of the MDM race, in favor of low-cost disk recorders. So with numerous 8-track disk systems available—stand-alone and workstation—in every price category, have we seen the last of tape-based MDMs?

Hardly. Three new MDMs have debuted in the last six weeks. Profiled on page 154, the Alesis Meridian and Studer V-Eight are the first ADAT Type II (20-bit) recorders. Both feature onboard synchronization, XLR interfacing and a robust, fast transport. Unveiled at NAB, the $5,999 Tascam DA-98 (more on this later) is a 16-bit machine designed for audio post, with built-in SMPTE/MIDI sync, dither switching, LCD status display screen, film pull-up/down adjust and confidence monitoring.

And MDM sales continue to grow, fueled by a massive user base, combo disk-based/MDM systems and the economy of videotape as a recording medium. S-VHS and 8mm tapes have a potential storage of 3 GB, are available everywhere, are easily removable and are priced around $10. In contrast, low-cost disks—such as the Iomega Jaz—cost about $100, have one-third the capacity and won't be found at Walgreen's at midnight. I have a feeling that MDM recording will be with us for some time to come.

Happy birthday, MDM. Here's to ten more.

George Petersen
Editor

BPA INTERNATIONAL SPARS ABP American Business Press

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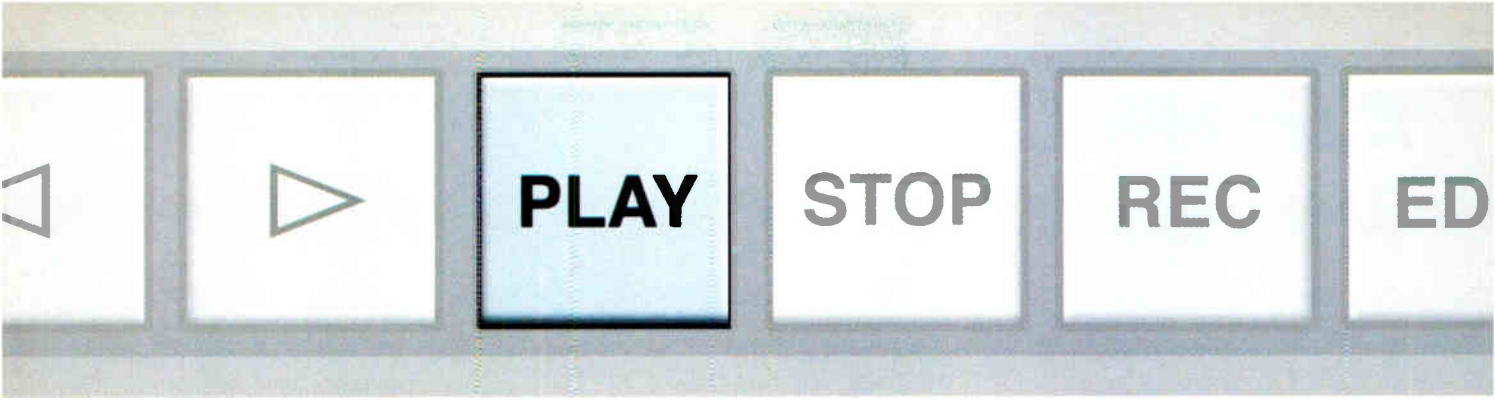

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CURRENT

MARK IV AUDIO NOW EVI

Greenwich Street Capital Partners announced it has completed the purchase of Buchanan, Mich.-based Mark IV Audio. The company will now be called EVI Audio. The formation of EVI comes nearly a year after Mark IV Industries announced its intention to sell the audio division and focus on its industrial and automotive markets.

"This association with Greenwich brings a positive conclusion to months of speculation, and it promises exciting developments for the company and its customers," says EVI Audio president Bob Pabst. Brands under EVI Audio include Altec-Lansing, Electro-Voice, DDA, Dynacord, Gauss, Klark Teknik, Merlin, Midas, University Sound and Vega.

LEXICON, STEINBERG FORM STRATEGIC ALLIANCE

Lexicon Inc., based in Bedford, Mass., and Steinberg (Chatsworth, Calif.) announced a technology agreement: Lexicon will support Steinberg's Cubase VST™ software with its recently introduced Lexicon Studio™, a line of hardware components for computer-based audio production systems. The joint announcement was made by Bob Reardon, director of product management, Lexicon desktop products; and Manfred Rürup, Steinberg's general manager.

TELEX, GREENWICH PARTNERS SIGN AGREEMENT

Telex Communications Group Inc. (Minneapolis) announced it has entered into a recapitalization agreement and plan of merger with Greenwich II LLC and GST Acquisition Corp., affiliates of Greenwich Street Capital Partners Inc. The transaction, under which Greenwich Street will purchase the majority of outstanding Telex shares, is valued at $375 million.

"This transaction concludes the board's efforts to maximize value and provide liquidity for its shareholders," says John L. Hale, Telex chairman, president and CEO. "Telex will continue to have the necessary resources to pursue its growth strategy, including acquisitions, new product development and international expansion."

ATI ACQUIRES UPTOWN AUTOMATION

Audio Toys International, based in Columbia, MD, recently acquired Uptown Automation Systems Inc. The purchase reflects the confidence of ATI management in the future of high-end live sound mixing consoles and the expanding market for automation technology in live sound environments. Says ATI president Larry Droppa, "The potential synergy of our two firms working together seemed obvious. Our purchase of Uptown will make that synergy a reality."

Uptown Automation Systems has moved its operations and manufacturing to ATI's facilities. "Uptown has a large customer base," adds Droppa, "which we intend to continue to support and expand. We're very excited about the plans for developing new designs and products, which result from the merging of our collective strengths."

LIQUID AUDIO, PROGRESSIVE NETWORKS JOIN FORCES

Liquid Audio of Redwood City, Calif., entered into a technology partnership with Progressive Networks. Under the agreement, Liquid Audio will enable its music software products to support the RealMedia open standard delivery platform for multimedia over the Internet.

"Liquid Audio's support for the RealMedia platform is a significant step toward building an open environment for Internet audio," says Progressive Networks president Bruce Jacobsen. "Liquid Audio is showing leadership in music commerce applications, making them an invaluable partner for the music industry."

MR. HOLLAND'S OPUS FOUNDATION ESTABLISHED

Inspired by his work on the 1995 movie *Mr. Holland's Opus*, Grammy Award-winning composer Michael Kamen has established the Mr. Holland's Opus Foundation to help improve declining school music programs nationwide. The foundation has already received contributions from major corporations and organizations including Apple Computer and BMI; and new instruments have been donated by manufacturers such as Pearl Corporation, Yamaha and Avedis Zildjian Co. The foundation is also accepting used instrument donations from the general public; drop sites are being established throughout the U.S. For more information, contact Gillian Baylow, executive director, at 818/760-7349 or visit www.mhopus.org.

UPCOMING EVENTS

SPARS is hosting its Biz/Tech 97 conference this month, from May 16-18, in New York City. The conference brings together industry leaders and business innovators to present attendees with new strategies to manage growth in today's complex audio business. For more information, call SPARS at 561/641-6648.

—CONTINUED ON PAGE 12

INDUSTRY TEES OFF FOR H.I.P.

The Second Annual Mix L.A. Open will be held on Monday, June 16 at the Brookside Golf Course in Pasadena, Calif. The popular event provides an opportunity for the audio community to get together in a relaxed, social atmosphere. This year's honorary chairman is engineer/producer Ed Cherney.

Proceeds from the tournament will be distributed to Hearing Is Priceless (H.I.P.), co-founded by the House Ear Institute and *Mix* magazine and other beneficiaries of the Mix Foundation for Excellence in Audio.

Confirmed sponsors include Alesis Corporation, Ocean Way, Record Plant, Audio-Technica, Euphonix, Group One and Tape Specialties. A limited number of sponsorships and individual spots are still available. For more information, contact tournament director Terry Lowe at 310/207-8222. ■

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INDUSTRY NOTES

EVI Audio (formerly Mark IV Audio), based in Buchanan, MI, appointed **Martin Conn** as director of sales and marketing, digital products; **Tom Anderson** as national sales manager, EVI Audio Canada; and **Scott Schneider** as market development manager, commercial sound products...**Lucasfilm Ltd.**, in San Rafael, CA, hired **Kurt Schwenk** as director of professional THX operations... Novato, CA-based **Sonic Solutions** opened a European sales office, headed by **Kirk Paulsen**. Sonic Solutions Europe, located in London, will service Middle Eastern, African and European regions...**Sue Imhoff** was named vice president of marketing and **Kip Garlow** was named vice president of sales at **Cakewalk Music Software**, based in Watertown, MA...**Beyerdynamic** (Farmingdale, NY) appointed **John Cardone** as applications specialist. In other beyerdynamic news, **Rick Brown** of **Great Lakes Audio** was named sales representative of the year, rep firm **Full Compass Systems** was given an award for outstanding sales performance and **Michael Tremain** of **Marketing Concepts** earned an award for most improved territory...**Stage Accompany** (Hoorn, The Netherlands) announced it is back in business after a short technical bankruptcy following a hostile takeover threat by an American company. Stage Accompany celebrated its 20th anniversary last month...**James Murray** was brought onboard as manager of market development at **Eastern Acoustic Works** in Whitinsville, MA. In other EAW news, **A&T Trade Inc.** was appointed exclusive distributor to Russia, and **World Marketing Associates** was named EAW's exclusive representative for eastern Europe...**TC Electronic Inc.** has a new address: 790-H Hampshire Road, Westlake Village, CA 91361; phone 805/373-1828; fax 805/379-2648...**Meyer Sound**, in Berkeley, CA, named **Dan Khanna** as vice president of operations, **Lisa Van Cleef** as director of communications, **José Rivera** as director of worldwide customer service, **Mike Mann** as European sales and marketing manager and **Erica Eusebio** as media relations manager...Alachua, FL-based Sabine Inc. hired **Bob McPeek** as export manager and **Chris Gilmartin** as sales and customer service representative... **Liquid Audio**, headquartered in Redwood City, CA, brought onboard **Stephen Klein** as vice president of marketing and **Bill Woods** as marketing communications manager. In other Liquid Audio news, the Monster Music record label, a division of **Monster Cable Products Inc.** (South San Francisco, CA) will use Liquid Audio's products to deliver CD-quality, copyright-protected music over the Internet...**Nagra USA** expanded its office in Cashville to accommodate **Canorus Inc.**, formerly located in Acton, MA...**Matt Welty** joined Millburn, NJ-based **Zero International** as national sales manager...**Natalie Stocker** was promoted to the position of associate at **Keith Hatschek and Associates** in San Francisco...Brisbane, CA-based **Power Technology** appointed **Audio Associates**, **Ricky Brown Sales**, **Rick Parent Sales** and **Sirius Sales & Marketing** as its newest sales representative firms...**The Media Resource Group**, in Cleveland, TN, announced plans to move to new, expanded production facilities, designed by the **Russ Berger Design Group** (Dallas)...**Bardy Hayes** joined International Sales Inc. in San Diego as account manager...**Thorburn Associates** (San Francisco) added **Christopher D. Thompson** and **Christine L. Lundquist** to its consulting/design team...Singapore-based **EASTWEST Communications** was recently incorporated as EASTWEST Public Relations Pte Ltd...**Sennheiser** (Old Lyme, CT) appointed **Elrep Sales Co.** and **Taub Sales Inc.** as its newest rep firms. ■

—FROM PAGE 10, CURRENT

This year's SHOWBIZ Expo features more than 500 exhibiting companies, and is expected to attract more than 20,000 participants from the feature film, broadcast and theatrical production community. The show takes place June 13-15, at the Los Angeles Convention Center. Phone 800/840-5688 or visit www.showbizexpo.com for details.

The ninth annual Pro Audio & Light Asia show will take place in Singapore, from July 14-16, at the World Trade Center. This year several new events are planned, such as the PALA DJ competition, lighting shoot-out showcase and live performances by local and international artists. For more information, call 65/227-0688.

NEW WEB SITES

Beartracks Recording's home page, at www.beartracks.com, includes facility information, lodging and the studio newsletter.

Visit Cox Audio's home page at www.cwd-net.com/vdosc to find information on V-DOSC and ACRS loudspeaker systems.

Equi=Tech's site, at www.equitech.com, features product information, white papers and a "Studio of the Month."

The Francis Manzella Design Ltd. home page, at www.fmdesign.com, has information on current projects, client references plus studio photos.

Giles Communications offers public relations for musical and high-tech companies; visit the home page at www.giles.com.

Grace Design's new home page features general product information, technical data and a dealer list. Visit www.gracedesign.com/pre.

The Rolls/Bellari home page, at www.xmission.com/~rollsrfx, features information on Rolls and Bellari products, news and dealer information.

CORRECTION

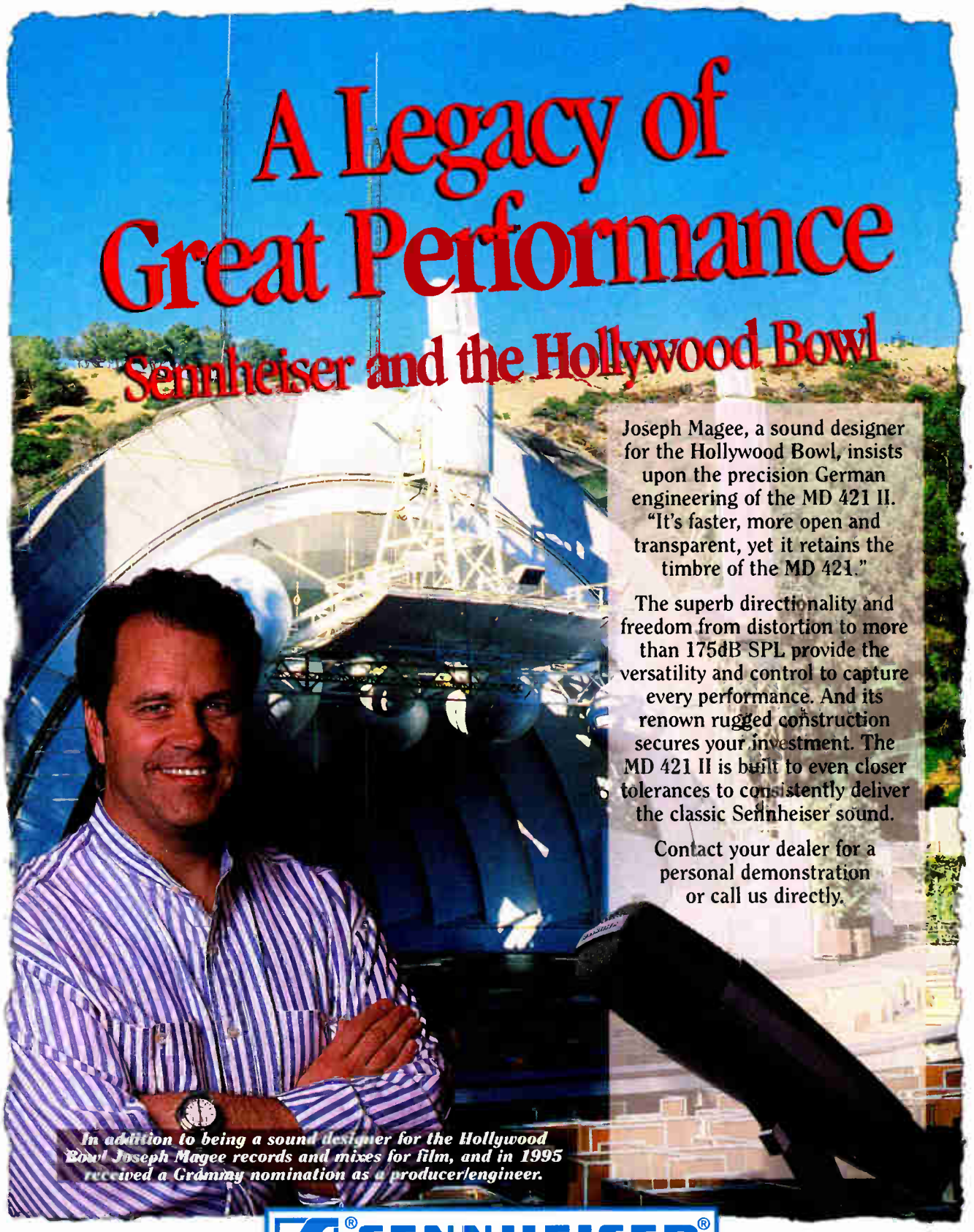
In the International Update section of April *Mix*, the facility spotlight on Studio 52 included some errors. One of the engineers is named Rowan Jarl; the studio releases three *Nu Music* samplers per year; and Studio B also includes 24 tracks of Alesis ADAT. ■

CHECK OUT THIS MONTH'S MIX ONLINE!
http://www.mixmag.com

World Radio History

A Legacy of Great Performance

Sennheiser and the Hollywood Bowl



Joseph Magee, a sound designer for the Hollywood Bowl, insists upon the precision German engineering of the MD 421 II. "It's faster, more open and transparent, yet it retains the timbre of the MD 421."

The superb directionality and freedom from distortion to more than 175dB SPL provide the versatility and control to capture every performance. And its renown rugged construction secures your investment. The MD 421 II is built to even closer tolerances to consistently deliver the classic Sennheiser sound.

Contact your dealer for a personal demonstration or call us directly.

In addition to being a sound designer for the Hollywood Bowl Joseph Magee records and mixes for film, and in 1995 received a Grammy nomination as a producer/engineer.

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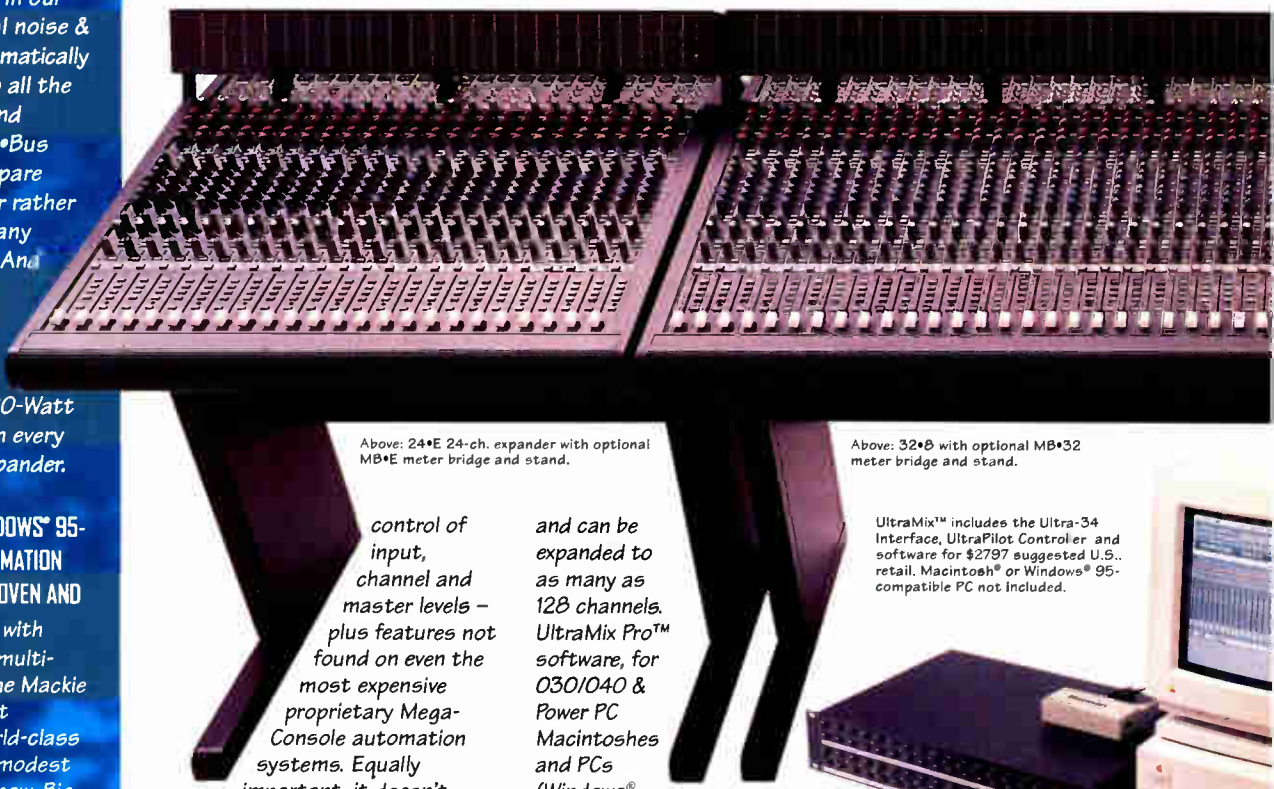
7 REASONS TO BUY OUR TO MIX MORE CREATIVELY,

1 VLZ CIRCUITRY FOR ULTRA-LOW NOISE AND CROSSTALK. *A fancy new name for the same old circuitry? Nope. VLZ (Very Low Impedance) is a Mackie innovation based on solid scientific principles. Through the careful deployment of high operating current and low resistor values at critical points in our consoles, thermal noise & crosstalk are dramatically reduced. Open up all the channels, subs and masters on an 8•Bus console and compare what you hear (or rather don't hear) with any Brand X console. And because VLZ circuitry needs loads of high current, we ship a humongous, 220-Watt power supply with every 8•Bus & 24•E expander.*

2 IT EXPANDS ALONG WITH YOUR NEEDS AND BUDGET. *You'd be surprised just how many 8•Bus console setups like the one below are currently in use. But you don't have to start out this way. Start out with a 24•8 or 32•8 and then grow your 8•Bus console 24 channels at a time with our 24•E add-on modules. 1, 2 or even 3 of 'em connect in minutes. They come with their own 220-watt power supply; optional meter bridges are available.*

3 IMPECCABLE MIC PREAMPS. *A console can have motorized dooflammers and an optional MIDI espresso attachment, but if the mic preamps aren't good, you don't have a fully-useful production board. Our discrete preamps with large-emitter-geometry transistors have won a critical acclaim for their exceptional headroom, low noise (–129.5dBm E.I.N.) & freedom from coloration. VLZ circuitry in the preamp section also reduces crosstalk.*

4 THIS CONSOLE JUST PLAIN SOUNDS GOOD. *Sure, you may be able to buy a Brand X console for less. But you end up with a console that sounds like...well...a Brand X console. Granted, we're getting into a pretty subjective area here...but we have tall mounds of 8•Bus warranty cards that rave about our consoles' "clarity," "sonic purity," "sweet sound," "transparency," "lack of coloration" and a lot of other superlatives we wish we'd thought of first.*



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

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

7 MAC® & WINDOWS® 95-BASED AUTOMATION THAT'S RELIABLE, PROVEN AND AFFORDABLE. *Along with affordable digital multi-track recorders, the Mackie 8•Bus has made it possible to do world-class productions on a modest budget. But until now, Big Studios have still had one remaining and unattainable creative "secret weapon"... computerized level automation. That's why we developed the UltraMix™ Universal Automation System. It gives you fully editable and recallable control of input, channel and master levels – plus features not found on even the most expensive proprietary Mega-Console automation systems. Equally important, it doesn't degrade sound quality, introduce zipper noise or cause audible "stepping." UltraMix is currently being used to mix network television music themes and on several major album projects – by seasoned engineers who grew up on Big Automation Systems. Their verdict is that UltraMix is a serious automation solution – stable, reliable and frankly easier to use than more expensive systems. The basic system controls 34 channels and can be expanded to as many as 128 channels. UltraMix Pro™ software, for 030/040 & Power PC Macintoshes and PCs (Windows® 95 required), includes a wealth of features like editable fader curves, built-in level display, up to eight subgroups, SMPTE time code display, event editor with pop-up faders, optional control of outboard effects devices, and the ability to play Standard MIDI files from within the program.*

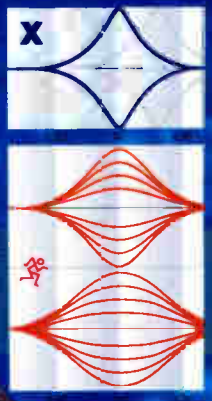
UltraMix™ includes the Ultra-34 Interface, UltraPilot Controller and software for $2797 suggested U.S.. retail. Macintosh® or Windows® 95-compatible PC not included.

World Radio History

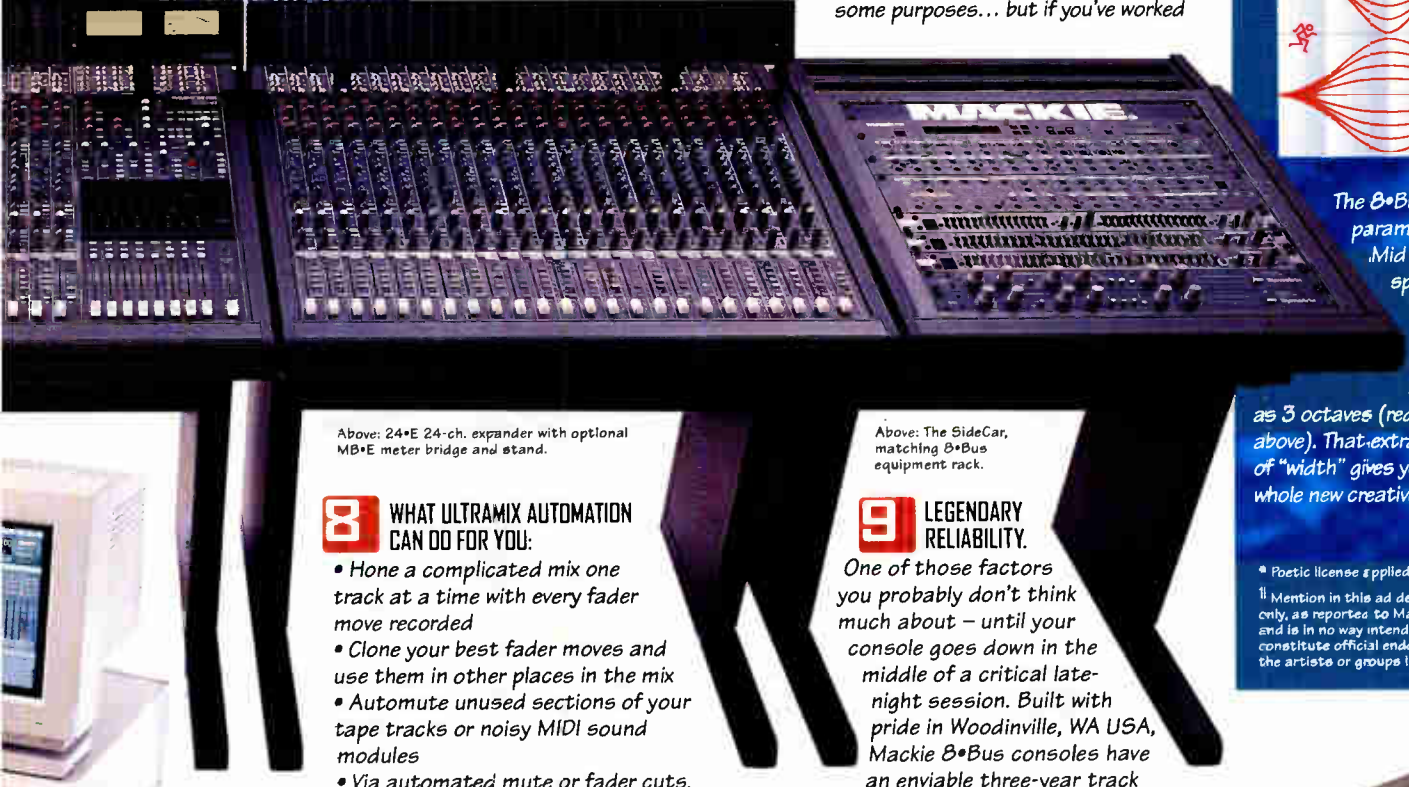
8-BUS CONSOLE... AND 2 TIPS ON HOW TO USE IT EFFICIENTLY AND, WELL, MORE FUNLY.*

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

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



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



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

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

8 WHAT ULTRAMIX AUTOMATION CAN DO FOR YOU:

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

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

* Poetic license applied for.

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

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WIRE WE ALL HERE?

TWISTED THOUGHTS ON A CLEAN IMAGE

ILLUSTRATION: NATHAN DIA

Wire. No, sir; don't like it. My experience has been that wire is a lot like dating a super-beautiful model: something everybody acts like they want so that you think it's something you need—something that looks straight enough on the outside but may be in fact totally twisted on the inside. I've certainly experienced both in my past, and it always ends up the same—you eventually get to the point of wanting to unplug them.

Now this is *not* a sexist statement. It is merely an observation that slick, smooth, attractive outer skins may well hide twisted, dangerous insides. That's all. I also want to point out that when I refer to a "model," I mean any model or model-like person—female, male or any of the 14 other sexes available in today's brave, new, modern, open-minded world.

And all that twisted intro is just one example of twisted values that nobody can explain. If you are curious and would like to catch a demo of this twist, just turn on your TV. You will see that sex is strictly forbidden, while in one short hour you can easily catch a good 50 ways to torture, maim, cripple and murder (including gratuitous use of wire) for land, money, power or even the very same sex that you can't see on that very same TV.

Wondering how I am going to pull this column together after such an extreme side trip into the time-honored art of soap boxing? Let's see. We have two themes I have to glue together: television and twisted values. And what I really want to talk about is wire. But I think I can take yet one *more* side trip first...

BY STEPHEN ST.CROIX

A month ago, I got DSS because a friend with ears of gold told me that the audio quality was actually acceptably good, as opposed to the horrendous crushed mush from the local cable provider in my area (some of you may remember the column I did on how bad MTV sounded). He was right. And all these years I just *knew* in my heart that "stereo" meant there were two channels of audio with different material on each. I remembered reading that somewhere when I was a kid. But in all these years of watching "stereo" cable TV, I could never be really sure that I had experienced real 2-channel audio (kind of like those dreams that are in color, but very, very muted color).

Well, it *is* real stereo after all, and it never was MTV sending out that horribly smashed and slurred

—CONTINUED ON PAGE 226

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The Bag End Quartz, Crystal and Sapphire combine the fidelity and efficiency of the ELF™ and Time-Align® technologies to bring studio quality sound to the concert venue. The low frequency extension and unprecedented sound quality offered by the ELF™ technology is even more incredible when the small size of the Quartz 4 x 18" enclosure is revealed. The Crystal and Sapphire offer highly directive Time-Align® mid/hi systems designed for smooth arrayable coverage, bringing point source clusters to their physical limits. Call us for the details.

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SUMMER READING

LESSONS FROM THE BIRTH OF ELECTRIC MUSIC AND TELEVISION

BY PAUL D. LEHRMAN

I read a lot of books over the summer. I know that makes me tragically un-hip and old-fashioned, but until they come up with a laptop you can read in bright sunshine and then leave open, upside down, on top of a blanket on a sandy beach, and a few minutes later drip salt water and ice cream all over it, all the time not worrying about whether you'll ever be able to use it again, I'll stick with books.

A formal summer reading list, however, is not my style. I know other people who compile those, and they never get more than a couple of items into the list before they get totally distracted by something else, like life, and so in September they end up mad at themselves.

Since I don't need to find any more reasons to get mad at myself (I do that enough already), I use a different method for choosing books, one which relies more on serendipity. Just before I'm about to go away on vacation, I visit my local library and see what's new. Then I go to a huge used bookstore in my neighborhood and browse for an hour or two. I occasionally end up with some real turkeys (sometimes you really *can't* judge a book by its cover), but I've also found some gems that, had I found them when they were new, I would have missed because I would have been way too cheap to pay for them. Last year, for example, I bought "experienced" copies of Fred Dannen's stunning indictment of the record industry, *Hit Men*, in which we learn that disco not only sucked, it snorted; Abbie Hoffman's touching (really!) autobiography, *Soon to Be a Major Motion Picture*, which answers the age-old questions, "Did Pete Townshend really sock Abbie in the mouth onstage at Woodstock?" and "Did Abbie and Grace Slick really plan to spike the punch with LSD at a Nixon White House Party?"; a collection of Art Buchwald essays from the post-Watergate years, which are still tremendously funny and totally relevant; and a replacement for my 20-years-lost copy of Jerome Agel's *The Making of Kubrick's 2001*,

ILLUSTRATION CHARLES STUBBS

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The EVENT you know...

(and love :-))

Even if you've never heard of Event (possible—especially if your last name is van Winkle), you already know us very well. Because Event is made up of folks who've been major players in the music and audio industries for a long, long time. Folks who've designed and manufactured some very highly respected and innovative pieces of gear—some of which you may very well own (all the cool people do).

EVENT ELECTRONICS

We founded Event on the principal that "the customer is precious." That means we make only those products that our customers want, need, and can afford. Products that provide access to new levels of musical expression. Products that put high-end, professional tools in the hands of us mere mortals. (That's right. We use the gear we make, so we build the stuff that we want in our own setups.)

We began our business with the microphones and speakers you see pictured on this page. Thanks to you—and to the kind support of the industry at large—these products have been tremendously successful. We want to give our heartfelt thanks to all of you who have bought a set of our speakers or a RØDE™ microphone. We hope you've gotten as much pleasure out of using them as we have.

...is just getting started. And now...

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Affordable Digital Recording Hardware

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

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

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

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

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

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

Precision Monitoring Systems

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

RØDE™ NT1

Large Diaphragm Condenser Microphon

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

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wn to 35Hz, resulting in
full bandwidth audio reproduction that is as accurate, precise, and pleasing to the ear as our award-winning 20/20*bas* system. You simply must hear **Tria** to believe it. Even then, you may not believe the price: $849. (Yes, that's for the *entire* system.)

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

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

SW-1 Speaker Switcher

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

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

EMP-1 Microphone Preamplifier

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

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

EVENT ELECTRONICS

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

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

Specifications and features are subject to change.

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World Radio History

which is not only a comprehensive primer on state-of-the-art film techniques of the late '60s, but also includes full instructions for using the zero-gravity toilet.

Another way I get books is the time-honored custom, practiced by journalists the world over, of collecting freebies from publishing companies. I get offered lots of these, but the majority of them are pretty boring. They tend to have titles like *How to Make Million$ on the World Wide Web (includes floppy disk)*, or *Record, Master, Press, Package, Distribute, and Collect Royalties on Your Own Platinum Grammy-Winning Record*, or *Everything You Need to Know About Studio Design (in 24 Fact-Filled Color Pages!)*. Journalists know that Sturgeon's Law, named after sci-fi writer Theodore Sturgeon, which states—I paraphrase here—that 99% of everything is ca-ca, is very much alive and well in the publishing business. (The only place it isn't, by the way, is on the Internet, and that's only because those "9"s need to be carried out at least three more decimal places—but that's another column.)

In the past few months, however, three new books have been sent to me by their publishers that would definitely make it onto my summer reading list, if I had one. They're entertaining, enlightening, well-written and well-organized. I highly recommend them for anyone with even a tangential interest in the subject matter—and I'm sure most of you have more than that. I'll talk about two of them this month and save the third, a "multimedia" experience in the best sense of the word, for next month.

Electronic music, contrary to some people's beliefs, did not instantly spring into being the day that Yamaha released the DX7, or even, for those whose memories go back a little further than that, the day that *Switched-On Bach* was released. It's actually been an entire century since composers started using electronics to stretch their sonic vocabularies. The stories of the composers, engineers, physicists and marketeers who were responsible for the electronic music medium—both their successes and failures—is fascinating. And you won't find a better re-telling of that story than *Electric Sound*, by Joel Chadabe, published by Prentice Hall.

Chadabe is a pioneering composer who was making music with computers back when all most of us knew about computers was that they screwed up our bank statements. For a while, he ran a company called Intelligent Music, which brought to market some of the first algorithmic composition programs for personal computers and MIDI synthesizers. Today he manages the Electronic Music Foundation, a resource center for distributing books and recordings of important historical and present-day electronic music, and he is on the faculty at the State University of New York at Albany. I've known Chadabe and his work for a long time. I've always known him to be a talented musician and technologist, with a well-developed sense of history, but it's a pleasant surprise to also find that he writes very engagingly.

His story starts exactly a century ago: 1897 was the year that Thaddeus Cahill took out his first patent on an electronic musical instrument, the Telharmonium, which synthesized music using dynamos and "broadcast" it to subscribers over telephone lines (which also makes Cahill, as Chadabe points out, the inventor of Muzak®).

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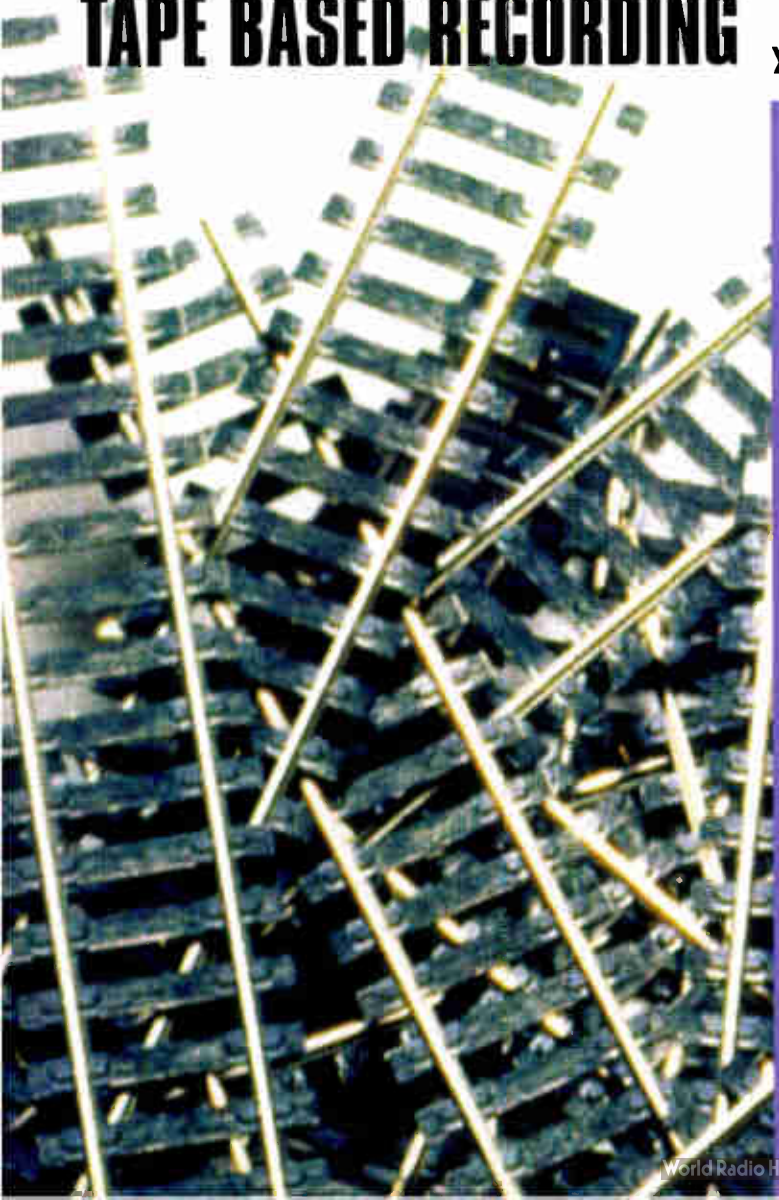

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Four years later he had a prototype, and six years after that an instrument was installed in a theater in midtown Manhattan, and Rossini overtures were coursing through the streets of Gotham. But soon thereafter Cahill ran into trouble with his delivery platform, his subscription base faltered, competition reared its head, and the whole enterprise fell apart in 1914. (Why does this sound so familiar?)

The stories of the Theremin, the Electronic Sackbut, the Mixturtrautonium and the RCA Mark II synthesizer are equally fascinating and equally instructive. Chadabe also goes into detail about the evolution of tape music, live performance with electronics, computer music, the replacement of analog with digital electronics, MIDI, automated composition and human-machine interaction. The story of electronic music involved hundreds of people, working in a dozen or more different countries. Chadabe does an admirable job of tracking the often-parallel paths of these explorers and placing them in context. Most impressive is how he manages to balance the technical, artistic, commercial and human aspects of the development of the various technologies so that we can see everything in a broad perspective.

He organizes the book not by chronology or geography, but by the type of music that was being created, and so each chapter examines the development of a particular sub-genre over time. It doesn't always work, in that there's just too much overlap between the different categories to make the distinctions stick, but it's probably as good an approach as any. And it's fascinating to see the variety of disciplines and philosophical schools that found a home in the new medium.

I've been fascinated by this field since I was a teenager, and so I found a lot of old friends in *Electric Sound*, but I also found a lot of names, stories and connections I didn't know and was delighted to discover. All of the important figures are here, from Oskar Sala, Pierre Henry, Karlheinz Stockhausen, John Cage and Edgard Varèse, to Robert Moog and John Chowning, to Max Mathews, Tod Machover and Peter Gabriel. Although I knew that Greek composer Iannis Xenakis started his career as a civil engineer and architect, I never realized he worked for the brilliant French architect Le Corbusier. Moreover, the Philips pavilion at the 1958 World's Fair (a shell in the shape of a cow's stomach, which inspired Varèse's seminal *Poème Electronique*) for which Le Corbusier is always given credit, was primarily designed by Xenakis.

Some of the anecdotes Chadabe has dug up are priceless. We can all take inspiration from the story of how Morton Subotnick and Ramon Sender got equipment for their San Francisco Tape Center in 1963: They bought the inventory of a burned-out hi-fi store from the insurance company, paying for it with a bad check, and sold off enough of what they didn't need to cover the check before it bounced, leaving them with a bunch of free stuff, some of which worked. Another prophetic tale has California composer Pauline Oliveros walking into her studio one morning after Don Buchla had just installed his very first synthesizer there, and her technician had been up all night programming it to play "Yankee Doodle." Says the technician, after she turns the power on and it starts to play, "She

—CONTINUED ON PAGE 228

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MIXING IT UP WITH

BY RICK CLARK

In the October 1995 issue of *Mix*, several of the music industry's top producers and mixers discussed what it takes to create a recording that sounds great on the radio yet at the same time maintains enough sonic integrity to sound good on an average consumer home sound system.

After the article appeared, a number of readers suggested that it would be helpful to hear from the radio end. After all, who is better qualified to offer insight on how to make a record sound truly great for broadcast? To discover how artists, mixers and producers can avoid having their records "remixed" by the processing chain in today's highly competitive radio market, *Mix* contacted a group of station engineers and broadcast signal processing designers, all highly regarded in their respective fields.

DONN WERRBACH

When *Mix* began hunting down recommendations for experts with hands-on knowledge of broadcast signal processing, one name that kept getting mentioned was Donn Werrbach, VP of engineering for Aphex. Werrbach has overseen the development of such classic Aphex products as The Compellor, The Dominator and Digicorder, each regarded as standard processing devices for broadcasters. Before Werrbach worked for Aphex, he spent a number of years as a successful contract broadcast engineer for a number of radio stations in Hawaii.

"Absolute fidelity is not the most pressing concern for most broadcasters," says Werrbach. "A lot of the broadcast engineers would like to strive for the best fidelity and so on, but they are not allowed to by the station owners. The station owners will usually say, 'Smash it and get it up in the face of the listener.' This is especially true if you have drive-time car radio listeners being the bulk of your commercial audience. Since there is a lot of background noise in cars, the station just smashes the audio to keep things at the same level at all times, so that the listener doesn't have to fight with the volume all the time.

"If you have one song that is real bright and punchy and has an extended high and low end, and you back it next to a song that is all midrange-y, the listener gets irritated and feels that there is something wrong with the radio station. To combat that, most broadcasters re-equalize the music in order to get them all to average around the same spectral or tonal balance of frequencies. That is done by what is called a multiband audio processor. Almost every FM station has one of one sort or another. They will break up the audio frequency spectrum from three to...typically four or five bands of frequencies and run them through individual compression and then add it back together. So what it will do is, if you have a song that is really heavy on the bass and no high end and dark-sounding, it will tend to bring up the high end and knock down the low end and balance it back out. If you are excessively bright and real tinny, with no bottom end, it will bring up the bottom end and throw some punch in it for you. This re-equalization is what most of the record producers are hearing on their music, that either they like or

PHOTOS BY MARK KOEHLER

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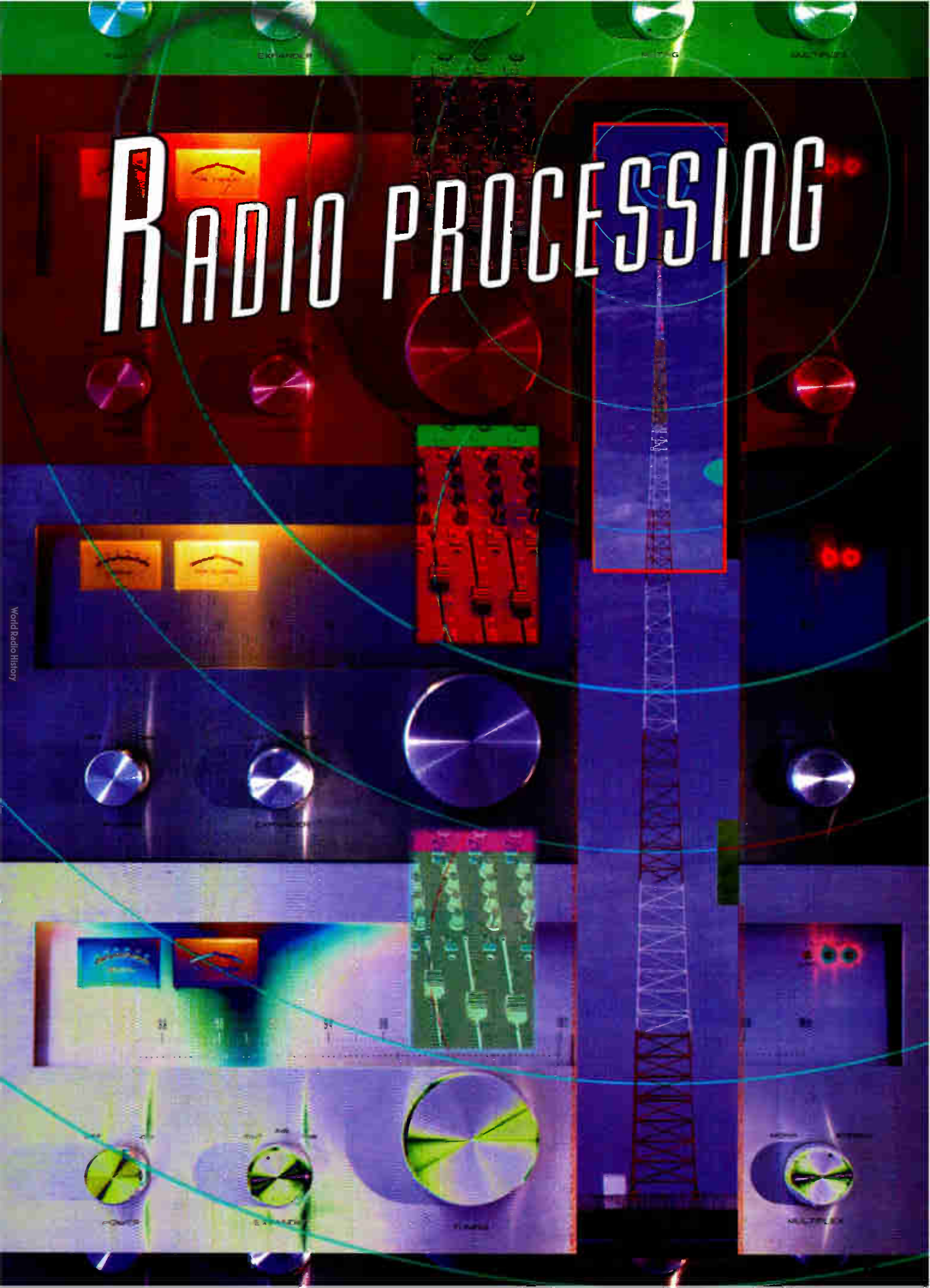

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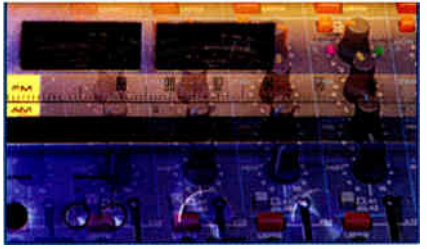

it back out. If you are excessively bright and real tinny, with no bottom end, it will bring up the bottom end and throw some punch in it for you. This re-equalization is what most of the record producers are hearing on their music, that either they like or don't like. A lot of times this multiband compression actually enhances the song on the air because it does something to the mix that just can't be done in a studio very easily with conventional audio equipment.

"I have heard lots of people say that they wished that they could get that radio sound on tape. On the other hand, I have heard people say, 'God, I wish I could hear it the way I made it!' Sometimes it is a good thing, and sometimes it is a bad thing, but it is there. You have to expect it.

"To me, one of the most annoying things about CDs is that there isn't a standard reference level for the loudness, of where the average level of the signal should be. With digital, everybody records so that they don't go over the top on the peak, but that doesn't address how fat their recording is—that is, how loud it is below that peak reading. On an analog system, there is basically a reference level for the average, and the desire is to keep enough headroom to accommodate any peaks that come along. With digital, it is a whole different attitude. They don't use VU meters. So all of these records come out at different levels, and the audio processors at radio stations are doing a lot of work to segue from one CD track to the next. There could be a 6dB difference in the average level.

"If you record really hot to digital, you are going to have to smash all of the peaks out of your signal. You may get a really fat sound, and it may be the sound that you want for your kind of music, but if you are doing it just to make the music louder because you think it will play louder on the radio, you could be very wrong.

"I think you are better off sticking with average ordinary standards. Don't try to make your record sound louder. I've heard some people say that, as hard as they have tried to punch up their stuff, it gets lower and lower and lower on the radio. I say, 'Just give the damn audio processor at the radio station some peaks.' Let it see them, because it computes what it is doing based on the waveform that it sees. If it sees something that is all fat and topped off already, it may just push it down in the mud, because it already thinks it is too compressed. If it sees something that is real open and has lots of dynamic range, it will squeeze the heck out of it.

"Usually, the broadcast processor on the air can do a fairly nice job of squeezing. You would almost rather let it do the job, rather than you do it. I have heard the opposite, and some people would rather do it and not have the station have to do it. I have found that the best thing that you can do is be kind of moderate—go in there and do a little bit of peak control. The last thing you want is to have most of your record—let's say on a peak meter—looking at like -20 dB, and then suddenly you have some 'zeros' up there. Some really kick-ass toms, or something that can bite your ear off might sound great on your home stereo, but on radio it will poke a hole in the loudness of the signal because it is going to have to gain-reduce on that sudden 20dB peak, and the whole level is going to be knocked down 20 dB for a few instances around that hole. So you want to keep those peaks down and under control.

"I would say that the optimum for radio is to have the peaks in a range of around 10 dB and then keep your average level as consistent as you can, but not using a lot of compression to do it. You just do it by doing a good mix.

"There are a few other tricks to making a mix sound good on the air, like using general compression on some of the tracks. It is usually better to compress an individual track than to compress the whole mix, because most compressors will hear the artifacts of it on a whole mix. By doing that, it'll help to keep that track down a little bit more constant on the air."

ANDY LAIRD

Dallas-based Heritage Media Corp. is one of the broadcast industry's most successful companies, with stations spread from New York to Oregon. VP of engineering Andy Laird, an expert on radio signal processing, fine-tunes the signals and sonic characteristic of the company's many formats, which run the gamut from nostalgia and smooth jazz to modern rock, AOR, AC and country.

"There is a big push by several companies to change the way music is distributed to radio stations," he says. "The way this is getting started is that there is always a fight for a radio station to have the breaking songs ahead of your competitor, and it is a nightmare for record companies to avoid playing favoritism. Let's say that Garth Brooks has a new song, and program directors will assume that, 'Hey, I've got to be the first one on my block to have it.' There is a new movement from certain people that is aggressively selling music distribution in real time at 128 kilobits per second. Now these people may think that 16-bit audio is a problem, but take 16 bits down to 128 kilobits! The producer who thinks that his music is getting stepped on badly by broadcasters hasn't heard anything till that stuff starts getting on the air. I understand the need to distribute product at the identical time to a bunch of radio stations, but don't stop there. If I could make any statement to the music industry, it is to make sure that the stations still get a high-quality disc.

"I would also say that they should pressure the distributing company to have at least 256-kilobit distribution. Now, the ISDN non-real-time systems are 256. DG Systems and Digital Courier are bit-rate-reduced systems, but they are at least 256 kilobits. The company that is fighting 256 and wants it at 128, which is half the bandwidth, is also the one that is aggressively trying to convert the music distribution to their system. A

The transcoding issue of digital bit rate reduction has become a big issue in broadcasting. There really is no agreed-upon industry standard.

—Andy Laird

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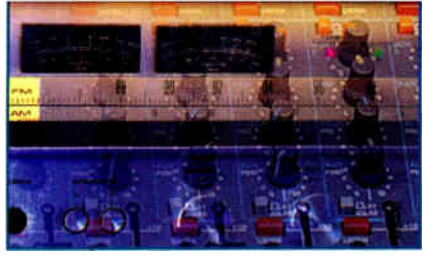

number of us broadcasters, directors of engineering and vice-presidents, have really put the pressure on them, when they were not offering anything greater than 128 kilobits. We told them we wouldn't allow the hardware to be installed in our stations. We have gotten them to redesign the system so that it can be used at 256. Now the important thing is that the music distributors use it at 256.

"The transcoding issue of digital bit rate reduction has become a big issue in broadcasting. There really is no agreed-upon industry standard. There are at least three different forms of coding going on out there, and it is not surprising to go into a station that has all three doing something here in this room and using a different one somewhere else. On top of that, sometimes it is required that you build some kind of coding scheme into your microwave, just by the nature of the path that requires it to be digitized.

"You might have a Musicam-delivered piece of music that is stored in apt-X and transmitted out to the transmitter, and then another coding at that stage. Anything that keeps the CD unbit-rate-reduced—16-bit—coming to the station is going to have a positive effect on the sound. Personally, I was thrilled that Sony MiniDisc didn't take off.

"If I could put on my editorial hat, it is to make people aware that this is happening. This is a third entity in the mix that affects the quality of music on the air. This isn't the broadcaster or the music producer. We should insist on a minimum of 256 kilobits—256 kilobits is more rugged-sounding (than linear 16-bit sound), and while that could be more acceptable on a more short-term basis of a few days, I would think that it would be a real loss to the music industry to not get the CDs out to the stations.

"Let's say we have three country stations in a city, and all three of them get Garth Brooks at the exact same time through the digital distribution service. They will all sound equally bad. Who loses in the long run? It's Garth Brooks who loses, and the broadcaster who continues to use that bit-rate-reduced version also."

CHARLES ADAMS

Charles Adams has worked at Circuit Research Labs, one of the leading names in the field of signal processing design and manufacture, for the past 20 years and is currently the company's engineering manager.

"The issue of the 75-microsecond pre-emphasis curve is one that the FM

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—Charles Adams

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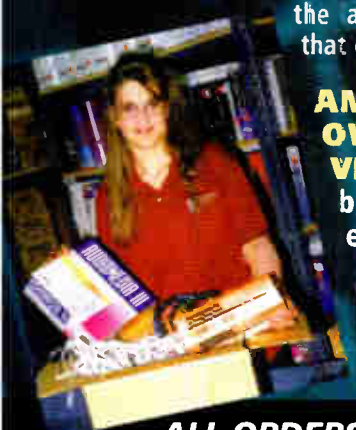

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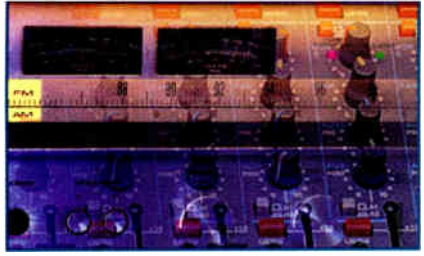

broadcaster has to deal with," Adams says. "If you have modern, synthesized-sounding music coming from the recording studio that has already been EQ'd and hyped-sounding on the CD, and then you put another boost of high frequencies on it, which is required by the FCC for transmission, then all of a sudden you find yourself exceeding your modulation limits in a big way. The 75-microsecond pre-emphasis curve can easily add 17 dB of boost at 15 kHz. The job of the station's processing is to try to push that curve back down again, without sounding like it is doing it, and without the station sounding like it is overmodulating.

"Let's say that someone really cranked up 8 kHz. The processor has to pull that back down again to keep the station from overmodulating. Sometimes that is what you may hear. It is a kind of a pull-back or ducking effect. If somebody has used the limiter at the studio to really increase the energy level in the high frequencies, it is just going to aggravate the situation at the radio station even more.

"There are other things that studios and producers pay no attention to whatsoever. They are not in a mind-set to think about what the processing is trying to do. The signal processing is trying to build up the average RMS energy level to the greatest extent that it can. One of the things that can really bother an audio processor is having the signal coming into it as asymmetrical. For instance, there are some CDs that I play quite often, where the singing voice is way asymmetrical. If there is some way that I could get to the voice without worrying about the music—if I could just get to the voice, premix and make it more symmetrical, then there would be less destruction to the overall music later on in the audio processor.

"I am talking about the symmetry of the voltage of the signal. Look at the signal on an oscilloscope and watch how far up positive and how far down negative the voltage goes. In some recordings, it may go up two volts positive and down half a volt negative. When the processor sees this, it ends up working too hard on the positive side. As a result, all of the music suffers, and the voice suffers. When the processor works hard on the voice, it tends to work hard on the music, too. You then end up with more distortion than you would have otherwise.

"What we try to do on the processing end is come up with some way of scrambling up the phase on the audio, so that no matter what you put into it, the voltage is fairly symmetrical. Keep in mind what we are trying to do: We are trying to deviate the FM carrier. We are trying to swing that FM carrier to +100 percent and -100 percent modulation as much as we can and as much of the time as we can to optimize the signal-to-noise ratio of the station. If you give us an asymmetrical signal that may go +100 percent on the positive side, but is only -20 percent on the minus side, the processor goes ahead and tries to push that on out. It does so at the expense of the positive side. It creates more distortion than you would have had, if you...had some way of making the audio more symmetrical to begin with.

"I'm not sure that anybody anywhere pays any real attention to this at all in

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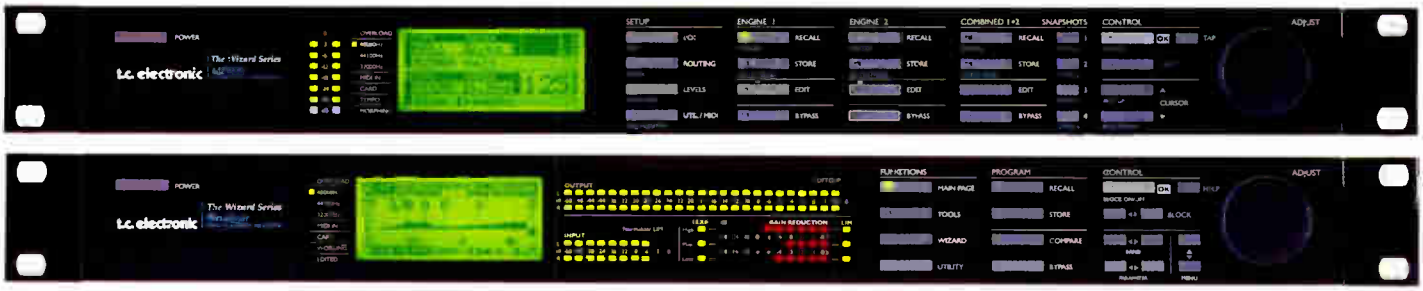

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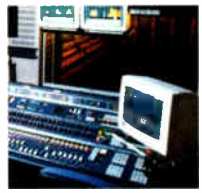

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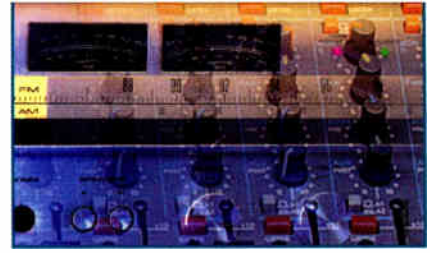

the studio. They probably have no meters or instruments to tell them if something is asymmetrical or not. So it is pretty much left up to the broadcast audio processor guys, later on, to try to figure out how to fix it.

"The only other thing would be to try to make the audio as natural and as dynamic as possible. Don't try to overcompress things in the studio. It is like garbage in and garbage out. With audio processing, if it is garbage in, it is a lot more garbage out.

"Most audio processing is multiband for broadcast stations, so if there are distortions in the low frequencies—lots of rich harmonic distortion—the processing tends to boost that even higher in gain...because the bands get processed separately. They have a different amount of gain in each band, so what can happen is you can increase the amount of perceived distortion in the audio, just from what was in the original source content. I find that the audio that our processor handles the best is the audio that has the least done to it. As dynamic as possible is good, and it will actually come out sounding pretty dynamic later on."

There is a lot of concern that not only will a lot of people employ this bit-rate-reduced digital material, but they will also start mixing it with other digital systems of processing, as well.
—Stan Salek

STAN SALEK

Stan Salek is senior engineer for Hammett & Edison Consulting Engineers, a firm that works in the radio and television broadcast industries. Salek has been at H&E for five years. Previous to that, he was a director of radio engineering for the National Association of Broadcasters and also worked with Charles Adams at CRL.

"Personally, I'm not completely sold that digital broadcasting is going to be a hit, with the bit-rate reduction and the like," he says. "We still have more water to go under the bridge before we make a decision on that. I think that the handwriting is on the wall, and there is a lot of concern that not only will a lot of people employ this bit-rate-reduced digital material, but they will also start mixing it with other digital systems of processing, as well. So it will be bit-reduced using one technique, and then it will be retransmitted to the consumer using yet another technique. The techniques are generally not compatible with each other, and what you will end up with on the listener's end is something that is fairly low-quality.

"I haven't seen a broadcast system yet that proposed to use linear (16- or 20-bit, CD-quality) audio, because of the bandwidth that it would take on the radio channel. This is really a form of data compression, and what that compression really looks for are periods of silence or audio signals that are masked by other audio signals.

"There is a system called Musicam, and part of the operation of that system is that it would look for quiet sounds that were masked by louder sounds. It would remove the quiet ones from the coding process. When you are all done, you end up with what they say is roughly equivalent to what the human ear hears. For people who have done A/B comparisons of linear and audio encoders, I think that some of them are quite convincing, but it really depends on the programming material." ■

Rick Clark, a Nashville-based producer, would like to thank the following individuals, who were extremely generous in sharing information: Chuck Adams, Andy Laird, Stan Salek and Donn Werrbach. Thanks also to Richard Faith, David Hodge and Jack Otterson for further assistance.

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Jacks Belo

And Other Truths About 8-Bus Recording Consoles

Get Back Jack. Get Real.

Have you ever seen a pro-studio recording engineer mess with the cables on a console? Of course not. That's why true recording consoles have their jacks in back. Look at any console in any serious studio. Truth is, once the console is installed there's no need to change the setup. Like the TASCAM M2600MKII — the next-generation 8-bus. Available in 16, 24 and 32 input models, it looks clean, sounds sweet and works the way you want it to.

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With 6 AUXes *(2 are stereo)*, the TASCAM M2600MKII has more AUXes than any other console in its class. But the best part is — you can use all six — all the time. No other console in its price range can make that claim. That means you can use more effects, set up multiple independent stereo headphone mixes and have more flexibility. No limitations. And no repatching.

Get Out! Direct or With The Group.

A true sign of a recording console is direct/group switching. That's what makes recording with the TASCAM M2600MKII so smooth. Think about it. Send any signal direct to tape or disk by pressing one button. Or, send a group of signals direct to tape or disk just as easily — no patching here! You'll never have to crawl around or mess with your cables again. Spend more time recording and less time figuring out how.

The Features Demanded by Pros.

The M2600MKII has everything a great recording console should have — and more. It's an In Line configuration with flip switches. And you get your choice of balanced (+4dBm) and unbalanced tape ins and outs. Phantom power (48V) switchable in banks of 8 channels. And an optional multi-process meter bridge so you can keep your eyes on the board — and not your recorder. Plus, a semi-parametric split EQ on every channel and it's ready for automation using any of a number of third party packages.

Watch it. Do Those Switches and Knobs Wiggle?

Before you buy an 8-bus console check out the quality. Knobs and switches that wiggle are going to be a problem. For example, check out the controls and faders of the M2600MKII. No play, no wiggling. You can feel the quality. Feel those smooth long throw 100mm faders. Clean. And check out the ergonomics. Even the largest fingers will fit between the knobs. Try that on others!

Use A Solid Heavyweight.

TASCAM has built more recording consoles than any other manufacturer in the world. We know how to build a quality product that will last. The M2600MKII is a solid console. You can feel the difference just trying to lift it. Just compare it to the less serious lightweights on the market. Plus it comes with an extra heavy external power supply that delivers more headroom than anything else in its class. Just what you expect from the leader in multitrack recording.

Get Smart. SmartSwitches™

The difference is in the design. This is a serious console. Take a look and you'll notice the design touches that distinguish the M2600MKII as the next-generation 8-bus console. Like TASCAM's exclusive self canceling and two-tone SmartSwitches — for protection from redundant operations and visual confirmation of all button positions at a glance. Quite a hassle on others!

Great Sound. The Next-Generation 8-Bus.

The real truth about a recording console is sound. With Absolute Sound Transparency™, high-end mic pre-amps, ultra low-noise circuitry, and high-output op amps, the M2600MKII is amazingly quiet, absolutely transparent and perhaps the best sounding console under $20,000. And starting at only $3,199, it's truly the sound decision for a next-generation 8-bus recording console. Put it on your shopping list today.

Maximum Headroom

Increased range of mic amp trim control down to 0dB accommodates +4 signals without using the pad–improves signal to noise ratio.

Double Reinforced Dual-Ground System

Wider ground line patterns on the PCB, extremely heavy gauge wiring, and enhanced electronics yields greater headroom and improved sound quality.

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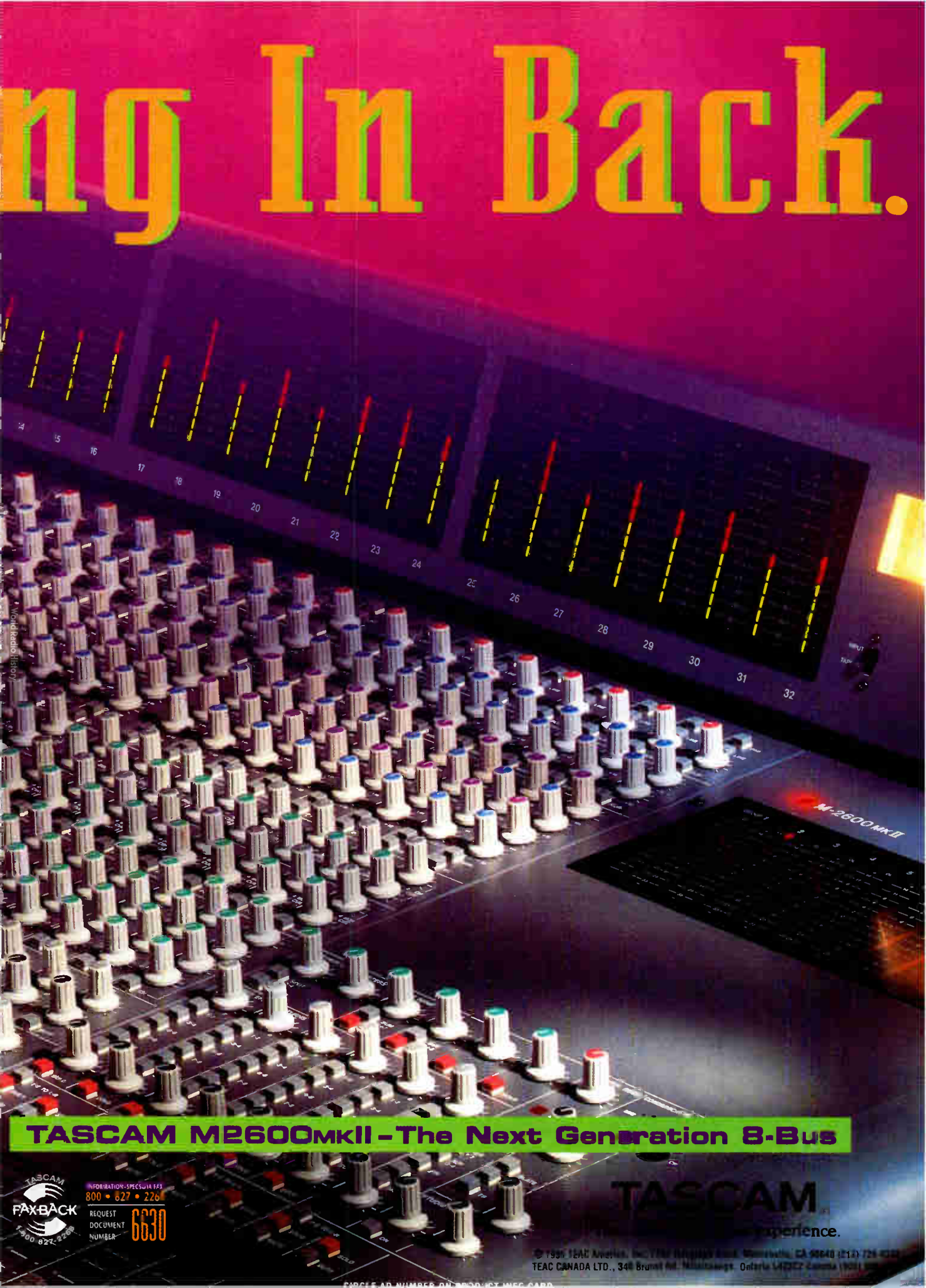
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Mixing Forum

Four Top Professionals Talk Gear and Techniques

by Rick Clark • Mixing is a lot more than merely throwing up tracks and getting a balance. Even though it involves a certain amount of technical expertise, great mixing is truly an art form. The best mixing engineers are the ones who can tap into the creative essence of the moments captured on tape, and then synthesize them into something larger than the individual tracks suggest. Even today with the "help" of automation and the importance of effects, a mixer's intuitive sense of balance is still his or her most valuable tool.

ILLUSTRATION BY SHANNON ABBEY

World Radio History

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Mix interviewed four top mixers, each with his own expertise and vision, for this applications forum on mixing. We'd like to thank Chuck Ainley, Bill Schnee, Tom Tucker and Matt Wallace for being generous with their knowledge and time, and Jack Joseph Puig and Pam Morrison of House of Blues and Scream Recorders for their valuable direction.

BILL SCHNEE

Bill Schnee is one of the recording world's most respected engineer/mixer/producers. Since his start, working on Three Dog Night's classic *Suitable for Framing* under the tutelage of Richie Podolor, Schnee has gone on to enjoy a hugely successful career that has included over 55 Gold records, 33 Platinum projects and 50 Top 20 singles. Schnee has worked with Barbra Streisand, Carly Simon, the Pointer Sisters, Chicago, Whitney Houston, Dire Straits, Amy Grant and Neil Diamond. Artists who have benefited from Schnee's production touch include Boz Scaggs, Huey Lewis & The News and Pablo Cruise. Schnee has been nominated eight times for the Best Engineered Recording Grammy, and has won two, for Steely Dan's *Aja* and *Gaucho*.

"When I get a tape to mix, I usually ask for a rough mix to 'see' where the producer and/or artist thinks the song belongs. Unless they want a completely fresh approach, this helps me save time in getting the mix going.

"People usually hire a 'mixing engineer' for the specific talent he brings to the mix, and therefore I never feel shy in offering my ideas—musical and otherwise. The amount of creative input I personally feel I should give to a mix varies with the type of music being mixed. With a jazz record, I start with the basic assumption that what is on tape is the record they want—not a lot of effects, etc. But with a pop or R&B record, I feel I have a lot more freedom to try different effects, rearrangement ideas or whatever, as long as whatever experimenting that takes place doesn't cause one to lose sight of the overall picture. Too many times, in a complicated mix with a lot of experimentation, the musical 'forest' is lost for a bunch of effect- or idea-driven 'trees!'

"Even though I've always felt engineers should have at least a basic knowledge of electronics, I truly feel mixing is a right-brain function. Like the musician doing a solo where he needs to forget all the technique he's spent years trying to develop so he can give an inspired performance, so should an engineer feel, and not think, his way through a mix.

"I love getting a tape where everything is organized and ready to go. I have never liked the concept of 'fixing it in the mix.' I would just as soon not have to fix things that could or should have been dealt with during the recording process, and save my energy for more creative efforts. Of course there are certain situations that are best left to be dealt with during the mix. My rule of thumb is one, if it ain't broke, don't fix it! Two, if it is broke, try to fix it before you mix it! Of course there are times when the kick or snare should be replaced or augmented, and I'm grateful for the Forat F16 at those times. Then there are times when I'll try running a track through a guitar amp or head to change the sound radically. These kinds of creative efforts are where I would like to spend mixing time instead of fixing problems—or comping vocals for that matter!

"I grew up sonically in the world of hi-fi; tubes and such. As a result, I've always gravitated towards consoles that are more transparent—open, natural top end—and have good, punchy bottom. I suppose in this category you find old Neves, API and Focusrite, although I constantly found myself going for studios with one-off custom-made consoles with minimal electronics in them.

"When I committed to opening my own studio [16½ years ago], I decided a console of this type was a must. I designed the console with Toby Foster and Steve Haselton. It uses discrete amplifiers and tube mic preamps and bus amps. Since every amplifier, even resistor or capacitor, in the audio chain acts like a piece of gauze through which you listen, my philosophy is less gives more. I would rather have to make extra patches or find a more creative way of accomplishing a certain signal flow for events that take place 10 percent of the time in exchange for less electronics that you listen through 100 percent of the time. What does any of this 'sonic purity' have to do with getting great mixes? Very little, to be sure. But since this kind of fidelity is so hard to capture and so easy to lose, I would rather not have to fight the console to get it. Note that in many types of music or various situations you might not want extended fidelity, but it's much easier to 'throw it away' when unwanted than to get it, when desired, if it's not there.

Since every amplifier component in the audio chain acts like a piece of gauze through which you listen, my philosophy is less gives more.
—Bill Schnee

"My console has GML automation, which, for me, is a necessary evil! I say *necessary* because with 48 tracks or more of music and only two hands, there's a need. I say *evil* because I much prefer to do all the mixing myself—in real time. In fact, one of my favorite things to do is live-to-2-track (or direct-to-disc in the old days) where you have to mix or 'perform' on the spot. I don't like having to need to use automation, but in most cases, I'm afraid I do. The good news of automation is how it allows you to perfect subtleties in a mix. The bad news is there aren't as many last minute 'right brain' moves or accidents in a mix—aka spontaneity! As a result, I usually get the mix to a reasonable state before I even turn the automation on [most of the EQ, effects and reverbs set]. Then I fine tune with the computer. When mixing, I love to find or create dynamics in various parts of the song for added impact. The automation definitely lets me do more of this more precisely, but hopefully not at the expense of spontaneity.

"The big monitors in my room are the same ones at The Mastering Lab—a custom system with an EV tweeter, Altec midrange horn, and Utah woofers. However, what I use mostly for mixing are modified [by Steve Haselton and Doug Sax] Tannoy Golds [10-inch]. I use a modified Yamaha 2200 power amp, which Doug Sax found to match up great with the Tannoys. I don't mix at any fixed level. Rather, I vary the level throughout the day, and never very high. I decided years ago to ensure longevity in my career by not blowing my ears out! Besides, if I monitor at reasonable levels,

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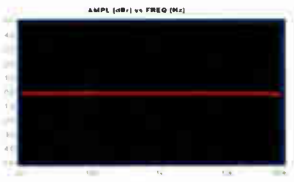

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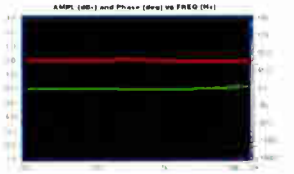

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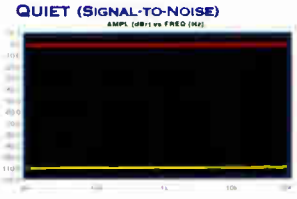

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then there's someplace to go if I want a hyped playback."

MATT WALLACE

In the world of modern or alternative pop and rock, Matt Wallace has scored significant success with artists like School of Fish, Paul Westerberg, Dime Store Hoodlums, Red Five, Satchel, Dog's Eye View and Sun Catcher, as well as The Replacements' *Don't Tell a Soul*, which featured the band's biggest hit "I'll Be You." Wallace's biggest success, however, came with Faith No More, whose 1989 album *The Real Thing* went Platinum.

"For me, when the concept of building a mix is mentioned, my approach tends to be backwards from some of the folks I know who do a lot of mixing. I tend to start from the vocal and the guitar and kind of build down to the drums, instead of starting from the drums and building up. For me, most songs tend to 'live' between the voice and an acoustic or electric guitar, or some kind of keyboard.

The voice is really the reason we listen to most songs. I try to get it to sound really great, and then build around it.
—Matt Wallace

"As I build the voice, guitars and keyboards, or whatever, I will get the balances set, and then I'll mute the lead vocal and listen to the play between the instruments to make sure that the EQs are right, and that sort of thing. To me, it has been easy to get the drums to sound good or big. In the past, if I got things sounding good and massive from the drums up, it might be like, 'Where does the voice fit?' The problem I had building a mix up from the drums was that you'd find yourself EQ'ing the voice to be *heard* in the mix, instead of EQ'ing the voice to sound wonderful. I think that's slightly backwards. The voice is really the reason we listen to most songs. I try and get it to sound really great, and then build around it.

"I've had a lot of success in the past mixing with a lot of compression, but over the years, I've learned to use less and less stereo bus compression. Stereo bus compression can be like an instant shot of heroin. You can push it on, and all of a sudden, it is like 'Wow, this mix sounds like the radio.' The problem with that is that it tends to not force me to focus on what is or is not working in a mix. If you put enough compression on it, you can pretty much make anything kind of stand up and work.

"You can actually start fighting compression in a mix, because you get to a point where you've got to turn up your voice a little louder, and you push the voice up, and suddenly the compression from the kick or the entire mix will start to suck it down. It really opened my eyes when I was mixing. One day while I was mixing, I thought, 'What the hell—I'll turn the compression off.' My mix sounded horrendous. It was like, 'Oh my God! What's going on here?' It was really unbalanced.

"Now, I may mix for six or eight hours, and once I really feel that the mix is in its place, I'll say, 'Okay, now with the addition of minimal compression, it should actually help and give things that extra sheen or gloss that

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kind of glues everything together.' It has certainly made me work a lot harder as a mixer, and try to make things work on a more organic level. At that point, compression is kind of the icing on the cake, instead of the main spice or ingredient.

"Conceptually, the major questions in starting a mix are: What am I going for? Am I going for something that is loose and slightly sloppy, or am I going for something really polished and hi-fi? Or do I want lo-fi? What kind of feeling do I want the listener to have at the end of the day? Should it be very together and tight and well-performed and mixed, or should it be a little more organic-sounding? Should the listener be impressed with the technical prowess of the musicians, or should people be moved to tears by the feeling of the performance? All those things are in the forefront of my mind. You can mix a song any number of ways. You can bring things to the forefront that will draw you in, or things to the forefront that are really aggressive and impressive. It really depends on where you are going with it.

"I also have a theory that a good mix really isn't necessarily the same as a perfectly balanced or EQ'd mix. It's really all about the emotion and feeling. For the most part, I think that perfect mixes can be boring. I like it when things are slightly odd or interesting or flawed. When it gets down to it, with all of the equipment that we have these days—with automated mixes and delays, Harmonizers and putting things in Pro Tools—you can actually create a technically perfect recording and mix pretty much with anyone off the street. But does it actually move someone, and is it something that is a little unique?

"When you listen to some of those Jimi Hendrix mixes, there are phase anomalies, where you can barely hear the drums at all. Everything is swimming in the mix, and occasionally the tom toms will jump out of nowhere. From a rhythmic technical perspective, they are horrible, but from an emotional spiritual place, they are outstanding. You listen to that stuff and go, 'Oh God, I must be on some awesome drug here. What this guy is putting across has got me in his sway.' An emotional mix can enable me to remove myself as a professional and say, 'Maybe for five minutes, I've forgotten about my bills and life and everything.' When I actually get an emotional response, I want to go jump in my car and go buy that record and listen to it a million times. It's just wonderful, and that is what it is all about, whether I am speaking as a fan, or as a professional."

TOM TUCKER

Since 1990, Tom Tucker has engineered and mixed five Prince albums, including *Emancipation*, *The Gold Experience*, and the hit singles "The Most Beautiful Girl In The World" and "Betcha By Golly Wow." Other artist credits include George Benson, Brand New Heavies, Kid Jonny Lang, Mavis Staples, Nona Gaye, Boz Scaggs, Sergio Mendes, Phil Upchurch, Joe Sample, Ricky Peterson, Mayte, Big Head Todd & The Monsters, Trip Shakespeare and The Rainmakers. His tracking and mixing work can also be heard on the 1993 film *Hoop Dreams*.

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yourself, 'Is this magic? Do I have goose bumps, yet?' If I'm not getting goose bumps, then I should ask, 'What is wrong?' I try to keep it exciting, and sometimes that means starting over or regrouping. I guess the biggest lesson I've learned is not to get carried away on any one thing. If the snare drum is driving me nuts, and I find that is all I can think about, then I may blow the whole mix.

"I very much like to put in a long day, like 12 hours, and then leave the mix up and come in with a real fresh head in the morning. I want to make sure that I'm not kidding myself about there being magic there. You can't make a performance be magical if it isn't there in the tracks. That is something that all young engineers should know. I quit trying to do that years ago. You can enhance things in a mix, but I learned that you have to work with quality people, or you may just be kidding yourself.

"Particularly in R&B, the groove itself should be magical. By that, I mean that the groove should be hook-y, before you even hear a single note of the song. I look to put all of that together, so that it is all meshing together very well. Paul Peterson [bassist for the artist formerly known as Prince] plays a five-string that really growls around 40Hz, which is really nice. [AFKAP] became fond of that, so between the Moog basses and the five-string basses being able to get the real deep thing going on, I don't think there is a record that I've done in the last five to six years that doesn't have a lot of 40Hz on it, for example.

"In the old days, we couldn't do that, because they couldn't cut it on vinyl. Now with CDs, we don't have to be afraid of bottom end, and I really like to pound that on. I limit it pretty heavily going in with tube limiters, like the Summit, and then, in the mixing process, I like to use the Neve 33609, which I hit pretty hard. I am also very fond of Avalon EQ. It's very common for me to use Pultec or GML on the program, but the Avalon stuff is just unbelievable. It's 50 volt bipolar and it goes down to 18Hz, and it has the high frequencies up to 25kHz, so you can put a lot of air on the top and really get the bottom to be big, too.

Particularly in R&B, the groove itself should be magical. It should be hook-y before you even hear a single note of the song. —Tom Tucker

"My technique of equalization is normally subtractive. I begin my mixing with subtractive EQ. It is less phasey to do that as well, vs. additive EQ. It's a little more difficult technique, but once you learn it, you can build holes in the musical spectrum, all the way from 1,500Hz, down to 150Hz, opening those areas for the other instruments to speak through. I think it's very typical that the lower midrange is the "mud" area. Oftentimes, keyboards, like Rhodes sounds, are all lower midrange. By opening the window in

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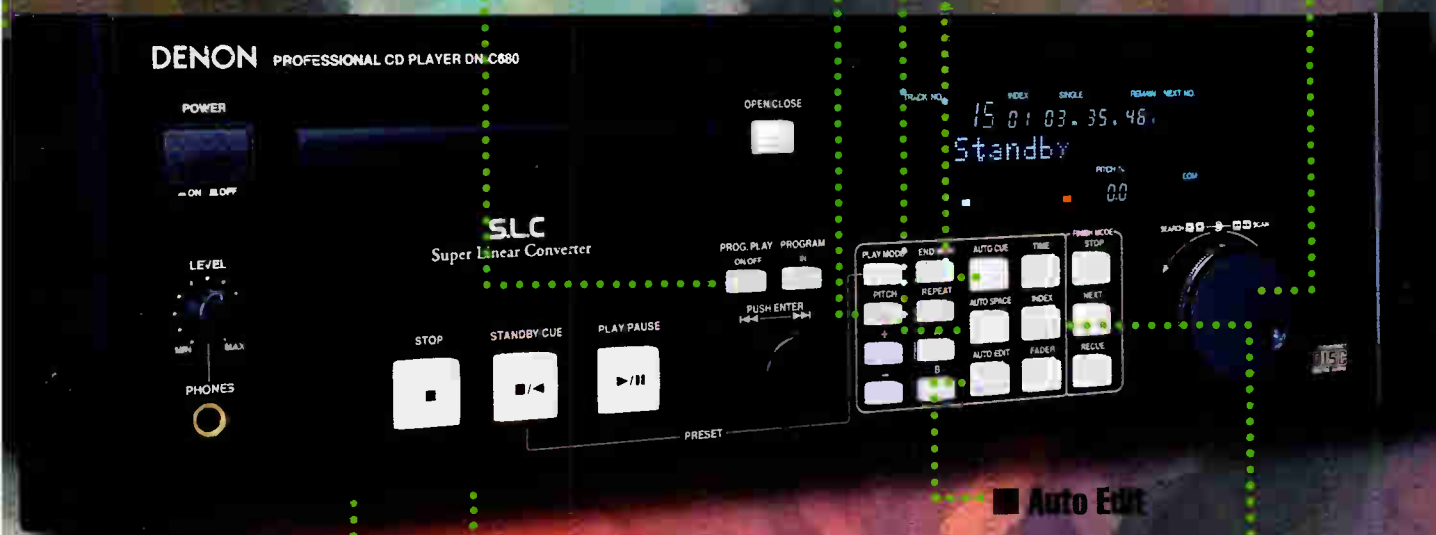

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the other instruments, the vocals can speak through there.

"I love the really great-sounding EQs, like the API, the old Neves and Pultecs. If I use any additive EQs, it is usually that. If I want something to be crunchy, I use SSL EQs, like for drums. However, I use a couple of different EQs for the bottom. I will use the SSL EQ in the 80 to 150Hz range, because it's kind of punchy, and then for the deeper stuff, where I really want the subs to be pure, I will go to an Avalon or Pultec. The API is very clean and pristine. It can get harsh, though. If something is already a little harsh, I might opt to add the Neve for the additive EQ, or a Pultec, which has a very soft top.

"I don't gate anything while I record it. You can really screw things up. It really bothers me when anybody does that if I have to mix something. I pretty much always use Drawmer gates, like on the toms and snare, kick, when I am mixing, because they are frequency-selective. If I am in a studio that doesn't have Drawmers, I will use Kepex, but I will key them off of an EQ, so that they are frequency-selective. That is very critical. Toms will ring and put a rumble through everything. It's like a big low-grade cloud, so the gating process is real important in the mixdown situation.

"If I have any say over the mastering, and I know that it is going to go to radio, I probably will ask that some of the real deep low end get knifed off, just because it isn't going to translate, and so that it won't grab it too hard. I think for radio, if it sounds a little crunchy, it's better. I go for a very even, natural sonic spectrum. The kick drum, the snare and the bass, and the lead vocal are probably all at equal levels. Those particular instruments won't get in the way of a lead vocal either. The lead vocal can feel really loud, and those things will not clobber the vocal, in terms of hearing the lyrics."

You are never going to really find that place where the mix is going to be good by getting into the automation early and riding everything.
—Chuck Ainley

CHUCK AINLEY

George Strait, Vince Gill, Reba McEntire, Tricia Yearwood, Wynonna and the cream of Nashville's biggest Platinum country stars have made use of Chuck Ainley's engineering and mixing skills. Ainley's most notable non-country work includes Dire Straits' 11 million-selling *On Every Street* and Mark Knopfler's moody, dynamic 1996 solo effort, *Golden Heart*.

"I've been an SSL guy for many years, just because I prefer the work surface. For me, it's an easier desk to get around. Generally, if I have a choice, I will jump on the new SSL 9000 desk, which is amazing-sounding. I think SSL has really gotten around their shortcomings sonically, with the 9000. You can make older SSLs sound good, too. I carry an awful lot of outboard equipment, like old vintage Neve

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02R Praise From Recording Pros.

Phil Ramone:

Grammy award-winning producer of Billy Joel, Frank Sinatra, Barbra Streisand and others.

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President of DMP Records: Credits: DMP Big Band "Glenn Miller Project" and "Carved in Stone."

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Roger Nichols:

Grammy award-winning recording engineer, producer of Steely Dan, Rickie Lee Jones, Rosanne Cash, etc.

"With the 02R's total reset of all parameters, I can automate levels, pan, EQ and external effects sends. After I've determined the set-up, I can hit GO and walk away to listen. The automation does it all."

Frank Filipetti:

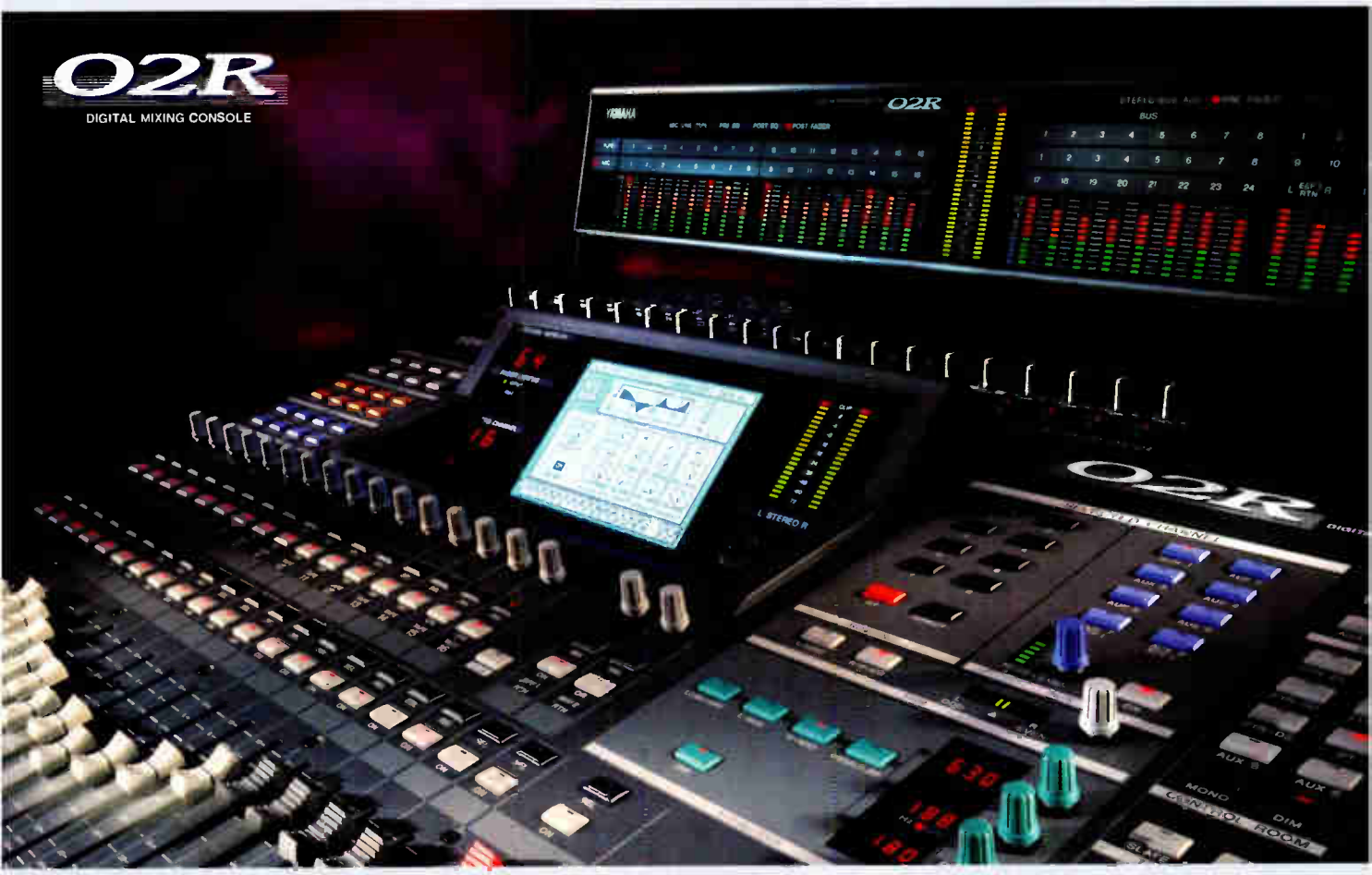
Recording engineer for James Taylor, Carly Simon, Marc Cohn, and others.

"I really like the A/D converters on the 02R. They sound very musical, and not at all harsh. I give very high marks to the EQ; it gave me everything I needed for tracking."

Hans Zimmer/Media Ventures:

Oscar winning film composer; The Lion King and Rain Man and others.

"We've put 02Rs into every room at Media Ventures. It's become the essential piece of audio gear for all of us. There are now no less than 16 02Rs scattered among the facility which are being used on such projects as Chicago Hope (CBS) and The Profiler (NBC)."



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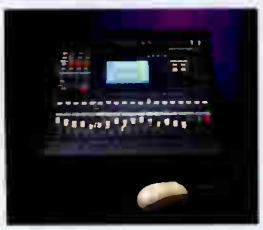

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modules and other tube gear and things that I can patch in, if I want that kind of thing, like on bass drum or bass, and bypass some of the stages of the SSL.

"Regardless, when it gets down to the radio, who is going to tell the difference between desks anyhow? I'm trying to make the best-sounding record possible, but at the same time, if the desk is going to interfere with my creative process in mixing a record, that's going to show up on the mix, more than the sonic differences between the desks at that stage.

"We ultimately have to go to CD, and let's face it, that is a limiting factor until they decide to make CDs sound better. I've actually been mixing a lot to half-inch analog or, if I have to go to digital, I'll mix through this specific Pacific Microsonics HDCD processor at 20-bit. It's pretty amazing-sounding. Also, if you have the decoder, it's really amazing—it sounds like analog coming back. I'll actually just mix through a half-inch machine and go straight out of it, into the Pacific Microsonics, and then into the Sony 9000. Going through the analog machine kind of gives you that analog character, and it will also eat up some of your transients, and you can get a little bit hotter level. You're getting it straight off the re-pro head, right to the digital machine. That is one of the tricks.

"I go to the Sony 9000, that will store 20-bit. There are other media that will store 20-bit, but I tend to believe that the Sony has the least error correction going on. It's a real solid medium; it's going to stay there. I trust it. I never have had any trouble with it. The 9000 is a recorder in itself. You could go straight into the 9000, but I don't really care for its A/D converters. The Pacific Microsonics, besides being an A/D converter, is also a processor that encodes HDCD information. Basically, I am not all that technical about what it's doing, but it's sampling at a very high sampling rate at 20-bit. It's encoding that on the Sony. What happens is you come back out of the Sony through the Pacific Microsonics, and you can convert that 20-bit sampling rate down to 16-bit 44.1. But it has an encoding process to where, if you have the de-coder, you can get back your original 20-bit information, though it is also compatible, so that you can play it on a regular 16-bit machine.

"Basically, a lot of this gets right down to finances, of course. It is expensive to rent all of this gear for a project. A lot of record companies are insisting on it, but some artists don't have that kind of budget.

"I try and stay out of the automation as long as possible, until I know in my mind the rides that I am going to do on the instruments. Maybe I haven't yet practiced them, but I know intuitively that the guitars are going to have to come up there and this and that. I like to have everything sitting in a place where the track really works already, without having to do rides. That's what tells you, 'Do I need to compress things more? Do I need to get some of the compression off of things?' Until you can get everything to work, it's best without riding things. You are never going to really find that place where the mix is going to be good by getting into the automation early and riding everything." ■

Rick Clark is a Nashville-based writer, musician and producer.

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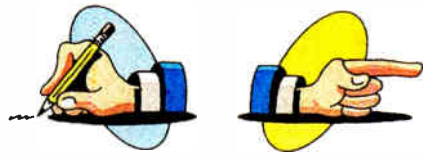
Audio Education, in Brief

SHORT-TERM PROGRAMS TO ENHANCE CAREER OPTIONS



So you want to land a job in that glamorous industry, the recording biz. You're dying to break in, and you're ready to take the important first step—learning the ropes.

Or maybe you're already in the industry and you'd like to advance your career by enhancing your skills or learning some new technology. Maybe you're considering a career change. Or perhaps you're just feeling nostalgic for your old slide rule. At any rate, audio school is on your horizon.

There's only one problem. Okay, two problems: time and money. How do you train for your dream job without giving up your current one? What do you do when you want to go to school but you're not realistically able to move across the country, or invest years of your life—and tens of thousands of dollars—in an audio education?

Well, there are hundreds of programs out there designed just for you. Whether you have an hour, a summer or a semester to spare, short-term audio programs can provide a comprehensive, sometimes intense, hands-on learning experience tailored to your schedule and pocketbook. They offer good ways to expand your knowledge in a particular area or explore a topic without committing a great deal of time and money—a realistic option for many working professionals. There are plenty of classes offered at night or on weekends, and many schools even offer scholarships and financial aid packages. Classes can be found at training centers, colleges and sometimes local studios. Also, many manufacturers sponsor educational events. Read on for a small sampling of the recording programs you can take this weekend, this summer and beyond...

For 25 years, Synergetic Audio Concepts has been sponsoring live sound seminars in various cities nationwide. Topics covered in the Week of Audio Education five-day series include basic concepts of sound reinforcement, system design and ways to maximize an existing sound system. Advanced training places an emphasis on the role of the computer as a design, measurement and operational tool. Other upcoming Syn-Aud-Con events include workshops on loudspeaker design, grounding and shielding issues. For schedules, locations and registration fees, contact Syn-Aud-Con: 8780 Rufing Road, Greenville, IN 47124; 800/796-2831; schedule details and extensive program information can be downloaded from the Syn-Aud-Con Web site at www.synaudcon.com.

CCRMA, Stanford University's Center for Computer Research in Music and Acoustics holds annual summer work-

BY SARAH JONES

ILLUSTRATIONS: PAUL MOCH

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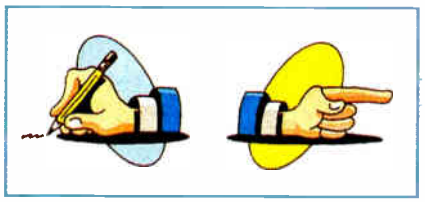
shops in various advanced subjects. This year's workshops, held from June through August, include: Audio & Haptic Components of Virtual Reality Design (June 16-27), Computers in Music Scholarship (June 16-27), Interactive Composition and Performance with Computers (July 7-18), and Digital Signal Processing for Audio: Spectral and Physical Models (August 11-22). CCRMA is also offering a three-part series on algorithmic composition and sound synthesis in Lisp, running through July and August. Workshop fees range from $400 to $1,500. An annual concert of new music by CCRMA composers will take place on July 24. Contact CCRMA, Department of Music, Stanford University, Palo Alto, CA 94305-8180; 415/723-4971. For information about research and composition projects currently under way at CCRMA, visit http://ccrma-www.stanford.edu/overview.

The **Banff Centre for the Arts**, in the heart of the Canadian Rockies, is designed for experienced professionals seeking career development. The centre offers many music and sound programs this year, each approximately two months long. Two work-study programs are offered: The Audio Associates program, June 2 through August 15, October 2 through December 17 and January 5 through March 27 (1998), is an advanced program involving CD production, co-production with theater and media/visual arts, research and experimentation. Recent guest faculty include John Eargle and André White. The Audio Assistants program (dates same as the Associates program) is a residency for those interested in gaining fundamental audio engineering knowledge. Assistants work with Associates while learning equipment and software operations, and eventually engineer their own projects. An Audio Product Development Residency, offered June 9 through August 8, October 6 through December 12 and January 12 through March 20 (1998) are designed to help professional artists develop viable audio products, including master tape production. Program fees are $315 per week, plus room and board. Contact the Banff Centre for the Arts, Office of the Registrar, Box 1020 Station 28, 107 Tunnel Mountain Drive, Banff, Alberta T0L 0C0; 403/762-6180; or visit www.banffcentre.ab.ca/registrar/index.html.

The Edgar Stanton Audio Recording Institute at the **Aspen Music Festival and** School is an intensive four-week, full time seminar taking place June 11 to



July 17. The workshop provides a broad overview of recording fundamentals through class lectures and hands-on sessions in which participants assist in recording daily concerts and rehearsals of the Aspen Music Festival ensembles, including symphonic orchestras, chamber ensembles, opera/choral groups and new music/computer music ensembles. Topics discussed in lectures may include the recording chain, electro-acoustics, psychoacoustics, microphone theory, live mixing techniques, SMPTE and synchronization. For application information or a complete catalog, write Aspen Music School, 2 Music School Road, Aspen, CO 81611; or call 970/925-3254.

Maybe you're ready to attend school, but you're miles from the nearest university, workshop or seminar. You might consider the **University of Colorado at Denver's** online Music Industry Studies Certification Program, the newest addition to the many online course offerings in the university's Extended Studies Program. One of the first programs of its kind, the curriculum consists of seven courses, including Introduction to the Music Business, Fundamentals of Commercial Music and Publishing and Promotion. Here's how

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it works: Once enrolled, students are given a password to log onto the courses, which are taught by industry professionals from all over the country. They then participate in scheduled chat groups and threaded discussions, similar to round table discussions, communicate via e-mail and are given links to sites (ASCAP pages, for example) that will provide additional information. Teachers also provide RealAudio and video lectures for download; and exams and projects are assigned. Classes are offered on a semester basis, and are for university credit. For more information, check out www.cuonline.edu or call Maureen Schlenker, program coordinator, at 303/556-5961 or 888/535-4490.

If you're new to the recording industry, you may be looking for a way to jump in and get some practical experience right away. Jimi Petulla, president of the **The Career Connection**, says his program was designed to solve the age-old problem of "no experience, no job—no job, no experience." In the Recording Connection program (a Radio Connection program is offered for those looking for careers in radio), students who pass an admission interview are enrolled in an on-the-job training program in which a student is assigned one-on-one to a mentor at a recording facility. A percentage of the $4,950 tuition goes to the mentor (usually a chief engineer or studio owner), who is required to take the individual through the Recording Connection's audio course outline and evaluate his/her progress through periodic testing—insurance that the student will recieve audio (not coffee machine) training in the studio. Students can arrange to intern days, nights or weekends, depending on studio scheduling. Instructional text and tapes are included in the tuition, and all Recording Connection graduates receive seven years of job placement assistance. For more information, call 800/800-9581; write Recording Connection, 8033 Sunset Blvd. #4042, Hollywood, CA 90046; or visit www.sna.com/musicbiz.

The Recording Workshop in Chillicothe, Ohio teaches the creative operation of professional recording equipment, through combination of lectures and in-studio experience. A variety of programs are offered, ranging from 40 hour, one-week classes to a 200-hour, five-week course. The core program, Recording Engineering and Music Production (five weeks), is the most comprehensive, starting with the basics and moving through operation of consoles, tape machines, microphones and signal

World Radio History

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The answer is: The blanket will degrade sound quality. The so called ***BOSS*** effect (Blanket Over Sound System) can also be achieved without the blanket, but is nevertheless an *undesirable* effect. Often times, when the blanket isn't present and the PA still sounds bad, the culprit is none other than the system's graphic EQ!

Symetrix is making a couple of new concert sound quality graphics that will blow the blanket off your PA!

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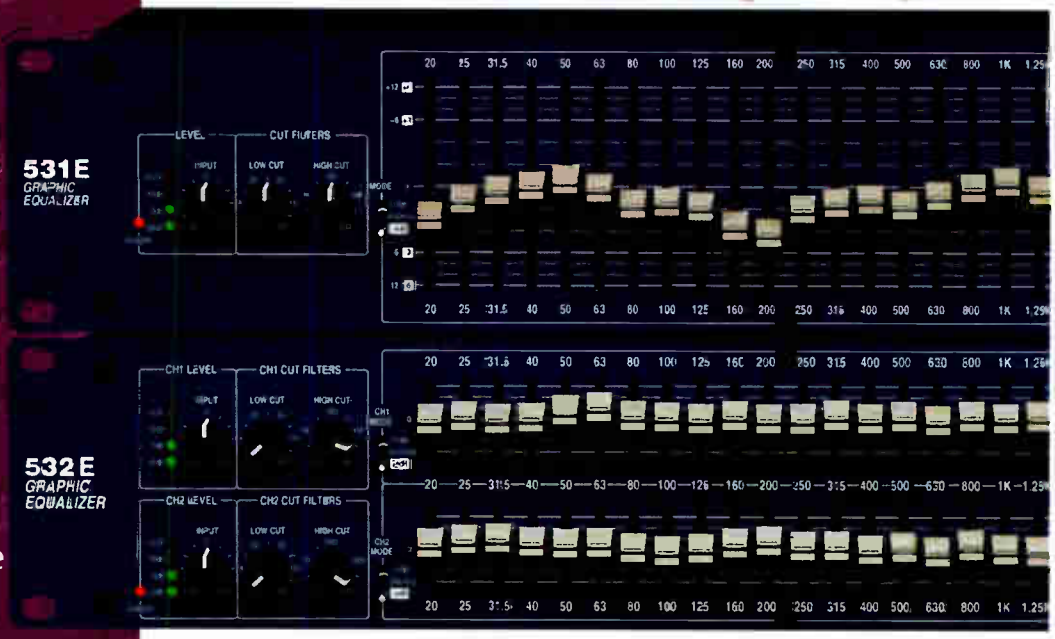
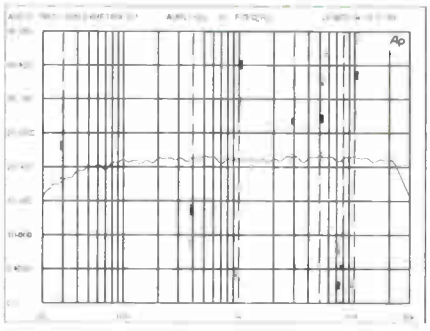
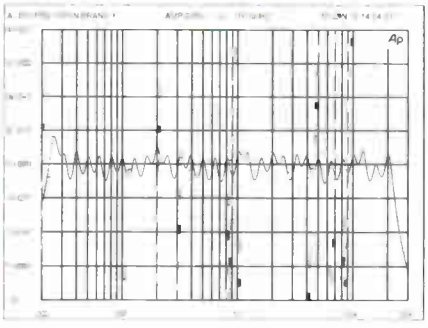




Symetrix 531E ↑ ↓ Brand X EQ



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- The two position **range control** switches the 31 graphic faders between a standard +/-12dB range and a high resolution +/-6dB range.

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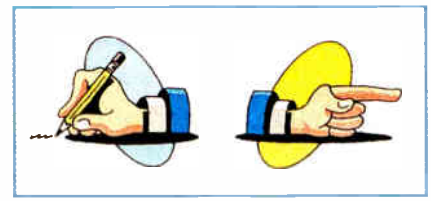
processing equipment. Also included is hands-on work in music recording, mixing and editing. In addition to the main program, The Recording Workshop offers a one-week Studio Maintenance and Troubleshooting program (40 hours), a one-week Advanced Recording Engineering and Music Production option (60 hours), and the five-day NewTech computer-based Audio Production program (36 hours). Tuition ranges from $395 to $1,990; enrollment is ongoing. Internship/job placement assistance is included. To find out more, write 455 Massieville Rd., Chillicothe, OH 45601; phone 800/848-9900; or visit www.bright.net/~workshop.

The **California Recording Institute** in San Francisco offers hands-on recording classes in recording facilities (real and virtual), using The Virtual Mixer, an animated conceptual interface used to demonstrate various styles of mixes that can be created with common studio equipment. The complete recording arts and technology program ($6,800) runs three nights a week (occasional Saturdays) from January through September; a three-month compressed version ($6,800) runs five days a week. Students may also opt for individual introductory



classes (starting at $45), including mixing seminars, live sound classes and Pro Tools workshops. The California Recording Institute is at 1137 Howard Street, San Francisco, CA; call 800/9000-MIX or visit www.hooked.net/users/virtmixr.

Maybe you have more time to invest in coursework. The **Los Angeles Recording Workshop** offers 600-hour Recording Engineer and Audio/Video Production Technician programs ($6,700), each spread over 15, 20 or 30 weeks. The Recording Engineer program is geared toward providing comprehensive hands-on training in all recording procedures, from equipment preparation to setup to mixdown. Also covered are hard disk editing, Pro Tools operation and audio-for-video post. The Audio/Video Production Technician program combines the first 300 hours of the Recording Engineer program with the workshop's 300-hour Video Operator program to provide training for a position as recording engineer or video editor. For more information, contact the registration office, 5278 Lankershim Blvd., North Hollywood, CA 91601; 818/763-7400; www.village.ios.com/~larw.

If you're looking for a music-based education, the **Musicians Institute** offers its newest program, the Recording Institute of Technology. The RIT Journeyman program lasts six months and is split into two 300-hour quarters, in which students work with Los Angeles musicians, engineers and producers in a studio environment. Music development comprises about one-third of the program, with emphasis on instrumental instruction, ensemble playing, music theory and keyboard/synthesizer training. The majority of time is spent learning recording theory and techniques, including electronics, acoustics, lab work and practical recording, including digital editing and live recording. Musicians Institute, 1655 McCadden Place, Hollywood, CA 90028; call 800/255-PLAY or visit www.mi.edu/mw2.

Music Tech, the Musician's Training Center, offers a three-semester program, each unit lasting 13 weeks. Students can choose from two majors, Recording En-

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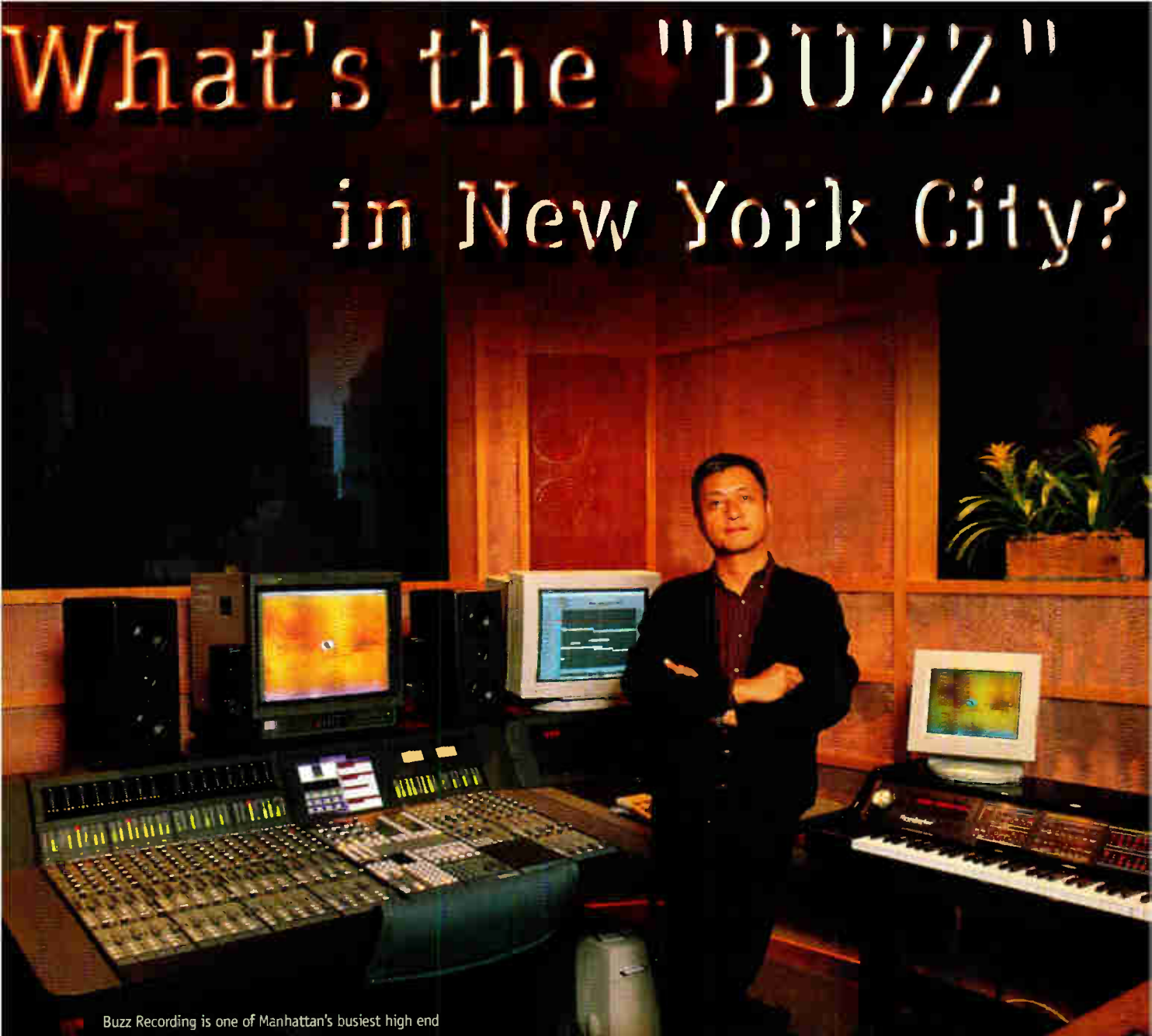

Buzz Recording is one of Manhattan's busiest high end commercial post houses. Their creative approach to audio can be heard in national TV ads from Pepsi, Bud Light and Pizza Hut. In order to keep up with the demand for their work they installed a Euphonix digital-control console in Studio B. For high end audio post, nothing beats Euphonix sound quality, creative signal processing, and blazing speed.

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"The Euphonix is a very musical console. It has a nice, warm sound that is absolutely great," says Mike Marinelli, mixing manager for Buzz. "We love the ease of operation of this console. We needed something that was going to be installed and put to use right away, and with the fast learning curve of the Euphonix, that is exactly what we got." Marinelli continues, "Because Buzz is a sound design atmosphere rather than strictly a mixing room, it is important to have everything online - synthesizers, DAW's, mic inputs, effects processors, etc. Everything is normalled in, which means we can quickly change from the Synclavier to Macintosh sound cards to synth modules in just seconds."

pictured: Jun Mizumachi, sound designer and post specialist, Buzz Inc.

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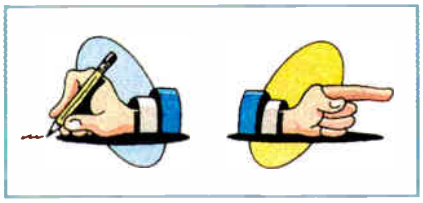
gineer or Production. Both offer MIDI coursework, digital editing, theory and business training. Each student is guaranteed at least 200 hours of lab time in the eight-room recording complex, in addition to time at local studios. Contact Music Tech, 304 Washington Ave. North, Minneapolis, MN 55401; 612/338-0175; www.musictech.com.

The **Institute of Audio Research** in New York City's Greenwich Village offers a 900-hour Recording, Engineering and Production (REP) program. The REP course is designed to provide the combination of technical training and hands-on experience necessary for an entry-level position as an audio engineer. The program consists of about 525 hours of theoretical instruction and 375 in practical instruction, and can be completed in nine months (full time) or 15 months (part time). Classes include work in electronics, acoustics, circuit construction/wiring, music business, recording and mixing techniques, sound reinforcement, and MIDI, synthesis and computers. Intern placement assistance begins before students graduate, and job placement assistance is ongoing. For more information, contact IAR at 64 University Place, New York, NY 10003; 212/777-8550.



Many colleges and universities offer certificate programs in various areas of the industry. If you're the fast-paced type, you might be interested in **Berklee**'s Full Credit Summer Program, where students can complete an entire semester of Berklee's first-year curriculum in just 12 weeks. Classes include music theory, ear training, harmony, arranging, instrumental/vocal labs and private instruction. Students may also attend visiting artist clinics, with access to Berklee's Career Resource Center, library and learning center. For those looking for a more moderate course this summer, the school offers many short seminars including a music production workshop (July 18-20, $375/$325 for Berklee alumni), a weekend of intensive workshops covering many areas of music production technology, such as synthesizer programming, desktop digital audio, multitrack recording techniques, computers in music, and sequencing and MIDI production. Berklee College of Music Special Programs Office: 1140 Boylston Street Box 13; Boston, MA 02215-3693; call 617/747-2245 or visit www.berklee.edu.

San Francisco State University's 24-unit Music/Recording Industry Academic Certificate program is designed for those wanting to break into the recording industry, or for industry professionals looking for a career change or upgrade. "Our premise," says program director Mary Pieratt, "is that no matter what role you intend to play in popular music, you need to understand how the whole business works." The program offers an education in all aspects of the music industry, from recording techniques to artist management to legal issues. Classes are taught by working industry professionals, mostly at night; costs run around $120 per unit. For information, contact the San Francisco State University College of Extended Learning, 425 Market Street, San Francisco, CA 94105; phone 800/987-7700 or visit www.cel.sfsu.edu. ■

Sarah Jones is an assistant editor at Mix.

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RED 7 is similar, but features dynamic control instead of EQ. The mic-pre is followed by a compressor, (identical to the TEC Award winning RED 3) and a de-esser /exciter stage. This is the best vocal front end in the business (in our humble opinion!). $2.995*

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The Van Cliburn

Van Cliburn, age 23, in a New York City ticker-tape parade celebrating his triumphant return from Moscow in 1958 as the winner of the first Tchaikovsky Competition.

PHOTO: BLACKSTAR/ST. LOUIS POST DISPATCH

The evolution of recording technology over the past 30 years has made it almost the norm in popular music for artists to be comfortable and competent on "both sides of the glass." But in the world of classical music, it is far less common to find an active performer who is also a producer, editor and engineer. For concert pianist José Feghali, however, the technical and creative are a natural combination, the synthesis of two long-

World Radio History

Competition on Disc

BY PHILIP DE LANCIE

José Feghali Assembles 30 Years of Classical Piano

time interests into one career. It is particularly fitting, then, that Feghali's current project is producing a nine-CD retrospective series of live performances from the Van Cliburn International Piano Competition, an event in which he was the top medalist in 1985.

Since winning the Cliburn competition, Feghali has appeared in more than 400 performances, including concerts with orchestras such as the Berlin Philharmonic, the London Symphony, and, in the United States, with the symphony orchestras of Saint Louis, Pittsburgh, Detroit, Houston, Dallas, Minneapolis, Indianapolis, Atlanta, Baltimore and the National Symphony. Feghali has appeared in recitals at Carnegie Hall and the Kennedy Center, as well as in major concert halls in Europe, Canada, Hong Kong and Latin America. He also regularly collaborates in chamber music performances, including recent and upcoming recitals with flutist James Galway.

Feghali's first recording, an album of music inspired by dance, was released by Koss Classics in the fall of 1993; the production of that project marked the begin-

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ning of his interest in digital editing. He currently has two additional albums scheduled for release on Virgin Classics: a performance of the Tchaikovsky Piano Concerto No.1 in B-flat minor with the Philharmonia Orchestra of London and an all-Chopin solo recital album.

Born in Brazil, Feghali now lives in Fort Worth, Texas, where he is artist-in-residence at Texas Christian University, host of the Van Cliburn Foundation archives. Feghali's project involves screening material from the archives, transferring the material onto his SADiE hard-disk editing system, enhancing and assembling the program, and preparing the Exabyte masters to send to the replication plant. To find out more about Feghali's experiences with the project, as well as his double-life in classical music, I spoke with him at his Texas home.

How did you first get interested in digital audio editing?

Computers started as a hobby, and then I got more serious about it. I have also always been interested in music technology, hi-fi and the esoteric stuff, and recording techniques. When digital editing came out, I started experimenting with the 56K digital board by Turtle Beach. I did some editing myself, just for my own purposes, and ended up editing one of my own CDs for Virgin, which is not quite out yet. I also did some editing for a CD that I launched for Koss and started getting really into it. I decided to combine my playing and my interest in computers and digital technology, and I started to do my own recording, editing and producing. I hope to have my first fully "in-house" CD released later this year or in early 1998. It will be a recording of solo pieces by Robert Schumann.

And how did you start using the SADiE system?

A year or two ago, Turtle Beach abandoned support of the 56K board. On top of that, I had acquired the Apogee AD-1000 and DA-1000 units and was looking for a way to edit in 20-bit, because I can hear a definite difference between 20-bit and 16-bit material. I have my own Schoeps microphones and a host of other equipment that I bought to do my own recordings, and I wanted to be able to do them in the 20-bit domain.

So, long before this Cliburn project came up, I started inquiring on CompuServe and on the Internet

World Radio History

Sometimes, since these are live performances, there were accidents. But not many, considering that these were young pianists playing under a lot of pressure. —José Feghali

about systems that would do 20-bit editing. And for IBM PC compatibles, the system of choice that was recommended to me by just about everybody was SADiE. So I got in touch with Jeff Boggs of SADiE about the system, and he sent me some brochures. Just then I got busy concertizing and never bought the system.

When this project came up, I decided that trying to do it on the 56K card just wouldn't cut it, and I also wanted to do all the analog-to-digital conversions to 20-bit. So I got in touch with Jeff again, and when I told him about the project, he offered to loan me the system to use for this project, which was extremely nice. The system included an Exabyte drive and a Yamaha CD-R. The Version 3.0 software was under development, so I got a new beta version of the software every couple of weeks. After having used that system to produce the first three CDs, I bought my own, and I'm continuing with that system.

Give me an overview of the Van Cliburn Competition series that you are producing.

This year is going to be the tenth Van Cliburn International Piano Competition. The Van Cliburn Foundation decided to issue on CD a retrospective set of performances that were recorded live during the competition. These performances go back to 1962. They have material from all nine previous competitions: '62, '66, '69, '73, '77, '81, '85, '89 and '93. The CDs will include performances by the gold, silver and bronze medalists from most of these nine competitions.

What is the overall structure of the competition itself?

The competition takes place in several rounds: a preliminary round, a semifinal round and a final round. I think this year they have around 130 entrants. The entrants come to certain cities around the world and perform, either on videotape or in front of a jury. Out of these applicants, roughly 32 are chosen to come and actually participate in the competition. Those 32 pianists from all over the world will then come to

PHOTO BLACKSTAR/ST. LOUIS POST DISPATCH

Van Cliburn, as the winner of the first Tchaikovsky Competition, later helped establish the Van Cliburn International Piano Competition, first held in 1962.

Fort Worth from May 23 through June 8, where they will perform for a different jury.

There are two recitals where they perform for about 25 to 30 minutes each. Around 12 people are chosen to go to the semifinal round. They will each perform a full-length solo recital, 60 to 70 minutes of music, plus a chamber music performance with the Tokyo String Quartet. Six are then chosen to go to the final round, where they will perform two concertos with the Fort Worth Symphony Orchestra. Normally, one is a chamber concerto, like a Beethoven or Mozart or Haydn, and one is a romantic or modern concerto—Brahms, Chopin, Rachmaninoff or Prokofiev or something like that.

So there is a vast amount of material from over the years.

Exactly. Now, for some of the competitions, unfortunately, we did not have all the material, because in the early days, sometimes they would not record everything. And some of the material has disappeared over the years. But we ended up with material from all the medalists from every competition, with the exception of 1966, where we have recordings only of the winner.

Where is all this material stored?

Texas Christian University, which is the venue where the competition takes place, are the keepers of the Cliburn Foundation archives.

What condition did you find the material in when you first went to the archives?

A lot of the tapes were full-track mono, some of them were quarter-track at 7½ ips, some were half-track at 7½ ips, and some were half-track at 15 ips. A lot of the tapes from the '70s and '80s would not play properly and had to be baked. Some were sticking to the heads, squeaking, all those kinds of problems. Most of them had been baked already, because the archives had previously had them transcribed, but the early mono tapes had not been transferred properly. They could not find a full-track mono machine, so they transcribed them on a 2-track, and the quality is not as good as on the masters. Also, I wanted to do as much as possible in the 20-bit domain, which was one of the advantages of using SADiE, and then master it down to 16-bit with the Apogee UV22 process. So I retranscribed all those mono tapes, and when I came to the 1970s and '80s, some of the tapes would not play.

It took me about two-and-a-half months to devise other ways of playing some of those tapes. There was one reel that was only half used, and I spliced up the unused part. I baked it at 110 degrees, 120 and 132, and it still

World Radio History

did not want to play back properly on the machines I had access to. Using an old Tascam tape deck I found in a pawn shop, I started experimenting with lubricants, which is something that most people very much caution against. I tried everything I could think of—Teflon powder, graphite, chalk, whatever—and, of course, most of this stuff would just gum up the tape. Then I came up with the idea of using silicone. Most of the silicone products out there seem to have a lot of petroleum propellants in them that could possibly damage the tape, but I found an electrical grade silicone spray that is extremely fine and appears to use butane and propane as propellants, which evaporate extremely quickly.

Before treating the tape, I recorded something on it and then recorded that tape onto SADiE. I then treated the tape, and played it back 30 times or so, comparing the output levels to the original untreated take stored on SADiE. SADiE has a resolution down to one-hundredth of a dB, so I hoped to tell if the silicone was getting between the tape and the head and causing any degradation of the sound. It ended up that in some places I got 1.5 to 2 dB more output after the treatment than before, probably because the buildup of material shedding from the untreated tape onto the heads had been pushing the tape away from them.

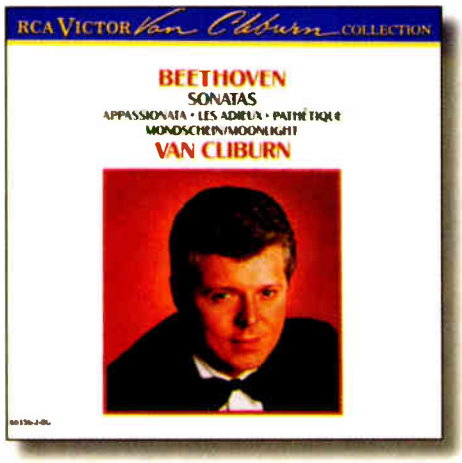
This showed me that the silicone process could work, so I went ahead and treated the five tapes that had not played back properly before, and all of them worked fine after the treatment, with no squeaking and negligible shedding. There was no silicone buildup on the heads or rollers, either. This was about six months ago. I periodically go back and check the tapes, and they haven't disintegrated yet.

Were there any other problems with the archived material?

The problem I am having right now is with my year, 1985. Those were recorded to U-matic and Beta tapes in the F1 format. A lot of those tapes have already developed dropouts. I am making multiple passes and hoping that the dropouts are in different places each time. I have four different Beta machines that I am trying; two are consumer and two are the Sony industrial-type decks.

I am using the F1 right now, which has only analog out, to listen to the material. For the transfer, I am going to use one of the converters that has a digital output. SADiE has a feature for correcting the split-second offset between channels that some of those EIAJ format processors have. Then I can edit the pieces into place.

From 1989 and 1993, all the performances are on DAT. Those are playing back fine so far. A couple of the 1989 tapes have dropouts, but I have four DAT machines, so if a tape does not play on one it will hopefully play back on another.



Beethoven Sonatas performed by Van Cliburn, one of many recordings Cliburn made during his career of yearly world tours and rigorous performance sessions.

How many hours of material did you listen to in order to pick the program for the CDs?

I did about 96 hours of listening. That was only the medalists—first, second and third place. Sometimes I would listen to the digital archive tapes and there were problems, so I would have to go listen to the originals. For instance, since the mono tapes were transcribed in dual-track, sometimes there was "panning" going from the right to left channel and back again, and listening in mono could create phasing problems. So, if I couldn't tell from these copies whether the technical quality was good enough, I would go to the mono originals, which sounded totally different and generally much better than the transfers.

What was your setup for doing the transfers?

We had an Ampex ART-700 deck at KTCU, the radio station at the university. I used it for the 7½ ips full-track mono tapes. For 7½ and 15 ips, I used an Otari MX-5050, because it is switchable between half-track and quarter-track. From the decks, I went into the Apogee AD-1000 at 20-bit, and then into SADiE at 20-bit. That is basically the chain, except that sometimes I had to use noise reduction. Some of the 2-track tapes were Dolby B and some were Dolby A, but most of them were dbx.

What was the setup for the SADiE itself?

I was using a Pentium 90, and the SADiE X-Act card and the XS card. I was using mostly the digital card, because for A-to-D and D-to-A I was using the Apogee units.

What was your process of working with the SADiE system?

There was little editing to do within selections because we wanted to keep the performances live. Basically, I just had to put the material together. Aside from playing the tapes, the most difficult part was the denoising and level adjustments. SADiE 3.0 has available a new CEDAR De-Noise plug-in, which was a godsend because there was a lot of noise in some of the old tapes. There used to be a fairly loud intermittent bass rumble in the hall that came from the air-conditioning system. I was using my B&W 802s for monitoring, and with those speakers you could hear this rumble very clearly whenever the air conditioning was on.

With the CEDAR De-Noise, you can sample the noise and then run the program through, and you can manually change the curve if you want to and listen to the results in real time. And even though at that time I was using a Beta version, it worked extremely well. I was able to get both the tape hiss on the program that was not dbx-encoded and the hall noises by sampling in between pieces where you hear only the noise itself. I was able to get the noises at least 80 percent obliterated, so I was very impressed. If I had not used the De-Noise software, the quality of the project would not be anywhere near as good.

How do you prep the material for final delivery?

I put it onto an Exabyte PQ master and on CD-R to send to the record company. SADiE does the PQ coding virtually automatically. Once you have put on the playlist where you want the piece to begin and where you want it to end, it automatically creates a PQ sequence. You can set it up in five minutes, it's so easy to do. And you can also send it to a CD-R, and it will use the PQ coding as track coding. I got a Yamaha CD burner, the 4x external one, and the recording process is controlled directly by SADiE. You

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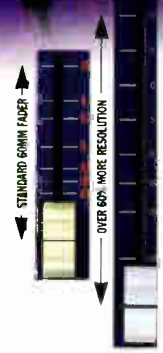

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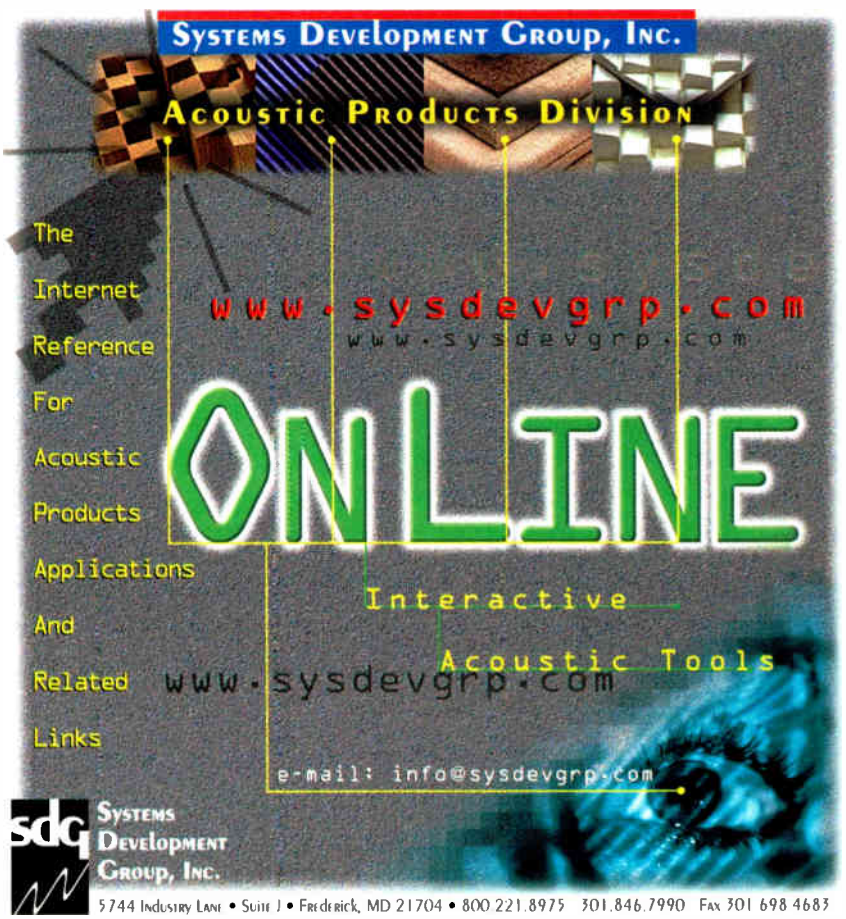

don't need any additional software. SADiE has its own SCSI bus, and that controls the CD recorder.

Who decided which of the performances to use on the CD, and what criteria were used?

I did, in consultation with the Cliburn Foundation and the record company—VAI (Video Artists International)—and also in consultation with many of the performers. I wanted as many people as possible to be happy. That sounds like an impossible task, but we actually managed to get most people quite happy with the selections.

The criterion was first and foremost an artistic one: how good the performance was. Sometimes, since these are live performances, there were accidents. But it was amazing to me, considering that these were young pianists playing under a lot of pressure in a major competition, how few of those there were. I ended up with much more material than needed to create the CDs. As a matter of fact, I realized as soon as I started that the original plan of producing three CDs just wouldn't do it. Most of the pieces are quite long, and we wouldn't be able to include all the available medalists from the nine competitions. So I went back to VAI and Richard Rodzinski, the executive director of the Cliburn Foundation, and said, "This is not going to work out, we need more CDs." They decided to expand the project to nine CDs in a series that will be released over time. We are starting the series with an entire CD of Steven De Groote, the gold medalist of the 1977 competition, who died in 1989. That CD and the 1969 and 1977 CDs are done, and I am now working on the other years.

It sounds like you've been through quite an array of challenges in order to bring this whole project together.

It has been such a wonderful project to do, because we are talking about a major competition and some performers who are major artists today, people like Radu Lupu, Christina Ortiz, Alexander Toradze and Vladimir Viardo. You are talking about people who are out there, and these are performances from their youth, from many years ago. And Landreth Auditorium, where the competition takes place, is a fantastic hall for piano, absolutely marvelous. So both from a historical perspective and from the excitement of working with these live performances, it has been an extremely exciting project for me. ■

Phil De Lancie is a mastering engineer at Fantasy Studios, Berkeley, Calif.

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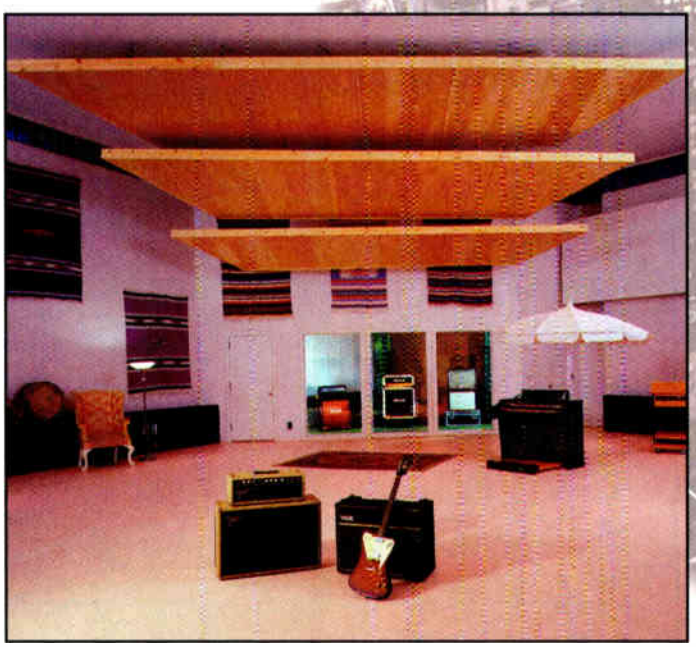
There are countless thousands of people who spend their entire lives in Manhattan without once leaving the island, including, no doubt, one or two musicians and recording professionals. But if they were willing to travel a bit, they would find that the regions around the city—Upstate New York, Fairfield County in Connecticut, Long Island and Jersey (unless you want to be taken for rube, always say "Jersey," never "New Jersey")—are teeming with studios.

These facilities are far enough away from the center of Manhattan to be considered separate from New York's recording community, yet close enough to be affected by the fortunes of Manhattan's studio network. A tour offers a glimpse into the diversity of facilities and personalities that surround the Big Apple.

by Dan Daley

Water Music Studios



MANHATTAN SKYLINE PHOTO MARVIN E NEWMAN/IMAGE BANK

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Above: Carriage House Studios main room with live room and large control room. Right (L to R): Hector Rodriguez, Johnny Montagnese, owner; Narada Michael Walden; Diana Ross and David Frazier

Bearsville Studios

PHOTO STEPHEN GREEN ARMYTAGE

Cheap Trick at Pie Studios in New York (L to R): owner Perry Margouleff, Tom Petersson, Rick Nielson, producer Steve Albini, Bun E. Carlos, Robin Zander and George Fullan, assistant engineer.

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Joel Bluestein, owner of Dreamland Recording

UPSTATE NEW YORK STATE OF MIND

The eastern side of the Hudson is peppered with the homes—and home studios—of many of New York's leading producers, engineers, label chiefs and artists, including Phil Ramone, Mick Guzauski, Tommy Mottola and Mariah Carey. But it's the west shore that's home to the Upstate region's classic studios: Bearsville, Beartracks and Dreamland.

Bearsville, in Woodstock, is the pioneer studio in the Upstate region and was one of the first residential recording facilities in the U.S. Founded in 1969 by the late Albert Grossman, Bearsville is now owned by his widow, Sally. Bearsville has three studios equipped with a Neve 8088 (originally from Ramport, The Who's first studio), an SSL 6056 E/G and an API Legacy with Flying Faders automation. A fourth facility is a large rehearsal space.

Studio manager Mark McKenna reports a mix of international and national business, with what he calls a historical emphasis on alternative music; recent clients include Butthole Surfers, Sugar Cubes, 10,000 Maniacs and Blues Traveler. "The self-contained setting is attractive to self-contained acts," he says, "as well as to new artists. Managers and A&R people feel they can keep a new artist better focused in a setting like this, but still have them close enough to New York to recharge their batteries." Accommodations for up to eight people are included in the day rates, which range from $2,500 for Studio A to $1,850 for The Barn. Those rates have gone up "marginally," says McKenna. "It doesn't matter how far or close you are to New York City, the economics of the studio business affect you everywhere." However, he adds, the two-hour drive is a perfect balance of distance and proximity. "We can get anything you need up here in two hours," he says. "But you're still in a very different place from the streets of New York."

Beartracks, founded in 1984, has one of only nine Focusrite consoles on the planet—and the only one in the States equipped with Flying Faders automation—in one of its two rooms; the second room houses a Trident 80B and is used primarily for overdubs. Like most large studios in the region, Beartracks now offers accommodations as part of its $1,750-per-day rate. Studio manager Chris Bubacz says that Beartracks has changed its marketing tack from attempting to lure city-based clients to focusing more on the growing number of producers in the area, like Barry Eastman (Anita Baker, Brandy, Jeffrey Osborne) and Frank Filipetti, who split their time between Upstate and the city.

"Playing the market of trying to bring the city up here didn't prove terribly successful," says Bubacz, saying that it might have something to do with New York's increasing urban base of music. "The R&B and pop A&R people don't want to leave their offices to listen to mixes; the rock guys—their bands are here for six to eight weeks at a time—seem more inclined to hang out," he observes. One remedy is the pending installation of ISDN lines, which the regional NYNEX office tells Bubacz they can do—but not quite yet. "It's very frustrating wait-

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ing for them to get their act together," he says. "You'd think we were on the moon."

Still, he says, Beartracks has been able to inch its rates up over the years in the wake of studio upgrades and the increasing affluence of the region's producers and engineers. "There's three reasons people come up here," he notes. "The equipment—some people just love the Focusrite; the location, since not everyone who comes to the East Coast wants to work in Manhattan; and third, that everything works here. Our chief of maintenance, Doug Oberkirker, used to be the maintenance tech at Hit Factory, and now he lives next door to us."

At Dreamland, where the former church-turned-tracking room turned 100 years old last year, owner Joel Bluestein says the single-room studio has been a favorite of many alternative acts and their producers, including The Lemonheads, Juliana Hatfield and locally based producer Wally Gagel. "There's been a big Boston connection through here in recent years," Bluestein says. "It's been very producer-driven in terms of who chooses the studio to do the record in."

Dreamland, which moved to its present location in 1986, has a vintage 48-input API discrete board with Studer A820 and Otari MTR-90 analog multitracks, and rents for around $1,500 per day. The growth of regional, independent recordings has made the question of whether Upstate studios are alternatives to Manhattan studios less of an issue—"if it ever was one," amplifies Bluestein. "They come here because of what's here. We have the old API and things like a Mellotron. In New York, all those things are rentals, when you can find them."

Bluestein states that business has been tighter in recent months—something that his regional colleagues also acknowledge—due mainly to an off year in the music business in general, which has led to a tightening of the record labels' practices regarding things like purchase orders and booking deposits. "We're all seeing the backlash from a bad [sales] year, with a tightening of both budgets and attitudes," he says. "When a label calls to book a project, they're reluctant to issue a P.O. or give a deposit or even pay until more than 30 days after completion. They're asking us to be their bank. That may work in the big city, but it puts an incredible strain on our cash flow. And it's been happening more so in the last six months. Twice a year, we end up holding the bag on a project, which is a major deal for a single-room facility."

AS THEY SAY IT, "LON GUYLAND"

Long Island is a narrow strip of land that is home to two New York boroughs—Queens and Brooklyn. But once you cross the line into Nassau, a third of the way down the L.I. Expressway, you've entered another zone of life, where the teased hair competes with the tresses seen along the Jersey Shore, and a place—adjacent Suffolk County—with the nation's highest-paid police force. The studios tend to cluster near the city line, from the affluent North Shore near Glen Cove to the picket-fenced tracts of Hempstead.

Pie Studios owner Perry Margouleff has had a lifelong sideline of ferreting out, collecting and reselling vintage guitars and amps to celebrities and well-heeled just-plain-Joes. Nearly four years ago, when Margouleff built his vision of the classic late-'60s British studio in Glen Cove, he included an all-discrete, personally modified Neve 8078 with 32 API EQs and 72 inputs of GML automation. The vintage appeal of the studio, which rents for a card rate of $1,750 per day, has found a niche among artists and producers, vintage and otherwise, including Joan Osborne (who recorded parts of her Grammy-nominated debut record there with producer Rich Chertoff) and comeback kids Cheap Trick.

"Long Island is a good compromise location," says Margouleff, a Glen Cove native who had tried studio ownership several years earlier with less success. "I might have a wider range of clients if I was in the city, but I wouldn't be able to pursue the same level of equipment because so much money would be going into Manhattan overhead. I feel connected to the city's music scene, but the clients here come from all over. The vibe here is based on equipment and attitude; it's not location-dependent."

It can be argued that the closer a studio gets to Manhattan, the less relevant Manhattan seems to be. Tiki Recording, one of the island's studios with the longest history (it was started in 1979) has a "very diverse" client base, according to studio manager Inge Jannen. The three rooms—two Trident TSM consoles and a MIDI pre-production room—host the area's own multicultural mix of urban, rock and regional commercial production. "There's a lot of independent bands that don't want to go into

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Tiki Control Room A with Tiny Tim, Joe Ism, Fred Guarino (studio owner) and Inge Jannen (studio manager) in 1995

the city," says Jannen. "And sometimes we get people who are playing at [large live music venue] Westbury who want a fast overdub as they're passing through the area."

The studio, built into a house and currently at the tail end of a two-year renovation, shares the densely packed North Shore area with Pie Studios and Cove City Sound, but Jannen says each studio seems to have attracted its own set of clients based on each facility's personality. "This is the real homey place that's family-run," she says. "It all depends on the kind of studio personality you're looking for." To bolster the studio's $75-an-hour rates, Tiki added mastering in 1996, run by longtime New York mastering engineer (and Tiki owner) Fred Guarino, which Jannen says has been a good source of ancillary profit at $55 to $75 per hour. "But the studio runs mainly on an hourly basis," she adds. "We do as many as four and five sessions a day. It's not like the Upstate studios. We get a lot of spillover from the city, but it's also a lot of local engineers and producers bringing work in."

Music Palace, in West Hempstead, was founded in the early 1980s and is now a two-room SSL G and MIDI-suite facility. What was once a preponderance of urban clients has given way to a more diverse base, which has included Salt-N-Pepa and Peter Gabriel, says manager Joe Jack. The Tom Hidley-designed room has little interface with the city, he says: "It's more like [owner] Mike Bona's hobby. He's been doing it for 20 years, and he's developed a lot of personal relationships with artists and producers. So in a very real way, our fortunes are not tied to those of the studios in the city. People come here for Mike as an engineer, or for the Hidley room, or for the SSL. It's 40 minutes from the city. But it's really its own place."

CHRISTMAS—AND EVERY OTHER TIME—IN CONNECTICUT

The Carriage House was founded by Johnny Montagnese 17 years ago after a diverse career that included stints as a musician, child psychologist and juvenile probation officer. "The perfect background to be a studio owner," Montagnese quips. The studio, built into the carriage house on a former dairy farm in Stamford, has one SSL E/G-equipped room that tends to be locked out for extended projects—a month or more. Jazz performers like Bill Evans and Randy Brecker call it their favorite room, and the client list is peppered with alternative artists like The Lemonheads and the Violent Femmes, and pop acts such as Diana Ross. Rates are set at $1,350 for the day, although Montagnese concedes that he often has to negotiate, like his counterparts in the city.

Success on the fringes of New York depends on service, he says, "And I service the hell out of clients. You need a ride, you need cognac—no problem. I learned about service from the panic that comes with owning your own business." It also helped that for years Montagnese had a close relationship with Skyline Studios in Manhattan. The two studios had a reciprocal relationship for

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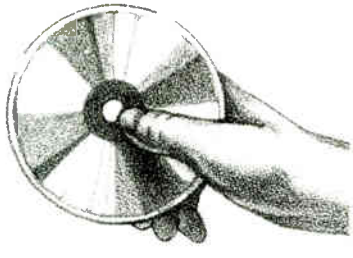

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L to R: Presence Studios owner John Russell, assistant Dennis Hrbek, producer/engineer Elliot Scheiner

their overflow until Skyline closed its doors in 1994, and the Carriage House was able to build up a substantial return business clientele. However, says Montagnese, the rise of home studios has hurt to a degree. "We'll lose a project for ten days when the client goes home to do overdubs between tracking and mixing here," he explains. "But the attraction is that this place is like the cottage you rented for years on Martha's Vineyard—you can stay at the Hilton, but you really want to come back to a place that's more like yours."

Presence Studios moved to affluent Westport four years ago after 14 years in New Haven. Owner John Russell based his new business plan for the Russ Berger-designed, two-room, Neve VR-and-Fairlight facility on the premise that technology had become less important than location. "The gear is important, but once you reach a certain level, it's the quality of life that draws clients," says Russell, referring to producers like Phil Ramone, Elliot Scheiner and Danny Kortchmar, who have each used Presence in recent years.

The region is an alternative to working in the city, says Russell: "We'll challenge any room in New York technologically," he says. "The thing is, it takes less time to get here from 54th Street than it does to get from 54th Street to the Battery," he adds. Rates for the studio are $2,000 per day for 48-track digit-

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al, $1,400 for 24-track analog. Russell says he is also moving aggressively toward getting more post-production work into the Fairlight MFX-3-equipped room, and finds encouragement in the fact that National Video recently opened a full post facility in Westport. "We're not talking about network programs; more along the lines of cable work," he says. "But more of that work is starting to filter up here since a lot of the talent and producers live in the area."

JERSEY? WHAT EXIT?

Despite being the butt of more jokes than President Clinton, New Jersey has long been New York's secret weapon—it offers the opportunity for acts and producers to develop in a low-pressure environment but still be close to the action in town. Clubs like Hoboken's Maxwell's have rivaled CBGB's and Don Hill's as the place to catch new talent on the way up, or current alternative hits on their way through.

Water Music Recorders is the only residential facility in the metro area, says owner Rob Grenoble of the 15,000-square-foot, two-room facility he owns in Hoboken, just across the Hudson from the Lincoln Tunnel. Founded in 1978, the studio has a 48-input Neve 8088 and an API 1604 with an AMR monitor sidecar. As one might expect, the client list is heavy with alternative acts from all over the U.S., including Pavement, Girls vs. Boys, Jawbox and Chopper One. The rate is between $1,400 and $1,500 per day, including accommodations, and it's the residential aspect that sets Water Music apart from the city, says Grenoble. "That and the large [52x40] recording room, which is something that's hard to find in Manhattan at these kinds of rates," he says. "The room pulls some business from the city, but the accommodations are what pull people in from all over. That and the closeness to New York—it's a buck on the PATH train."

Still, it's Jersey, and Grenoble says that the region never really developed a studio community as did Manhattan. "It's a bedroom suburb of the city here," he says. And despite strong rate growth in the last two years, Grenoble concedes that he knows he can't keep that kind of growth up forever. "You're always subject to the buzz—when that wears off, you're in the same boat as everyone else," he acknowledges. "Once you hit the same rate levels as New York, you're in competition with [those studios]. And that's a whole other thing. And also, alternative acts are not the big-ticket budgets. So you're then competing to get another level of act in, acts which are more familiar with the Manhattan studios."

At HWII (It Is What It Is), former Record Plant New York owner Roy Cicala is partners with John Hanti in a converted Weehawken warehouse that Hanti ran as a rehearsal studio until Cicala backed the former Record Plant Remote truck up to a loading dock and

—CONTINUED ON PAGE 229

PHOTO: MEREDITH MCKEOWN

At Showplace Studios: engineer Michael Wooding (left), studio manager Jess Mulvaney (rear) and owner/engineer Ben Elliott

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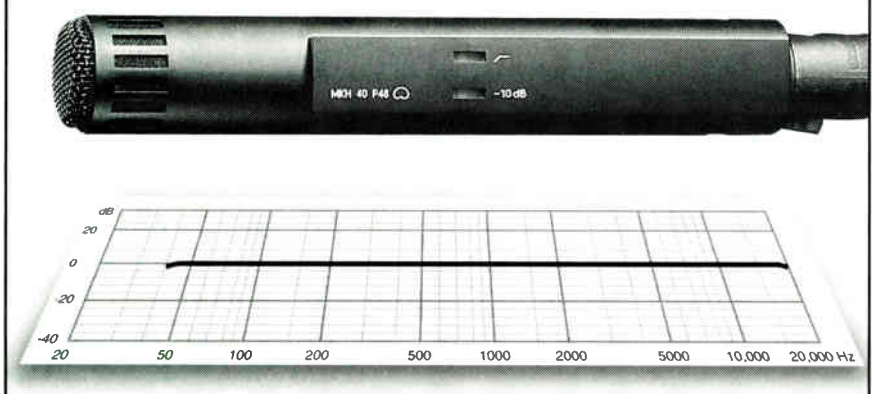

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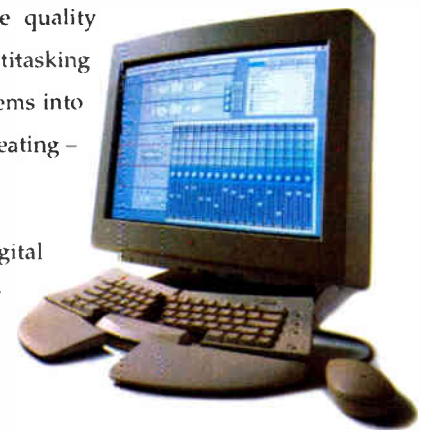

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"The English Patient" edited at Saul Zaentz Film Center.

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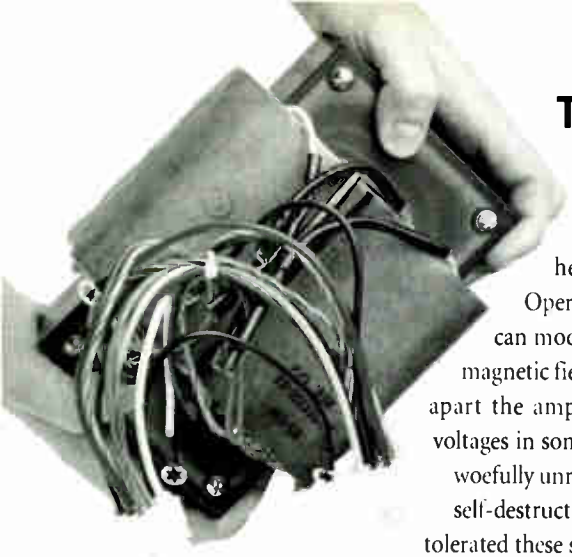

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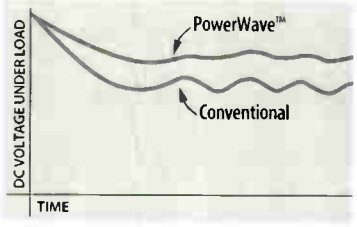

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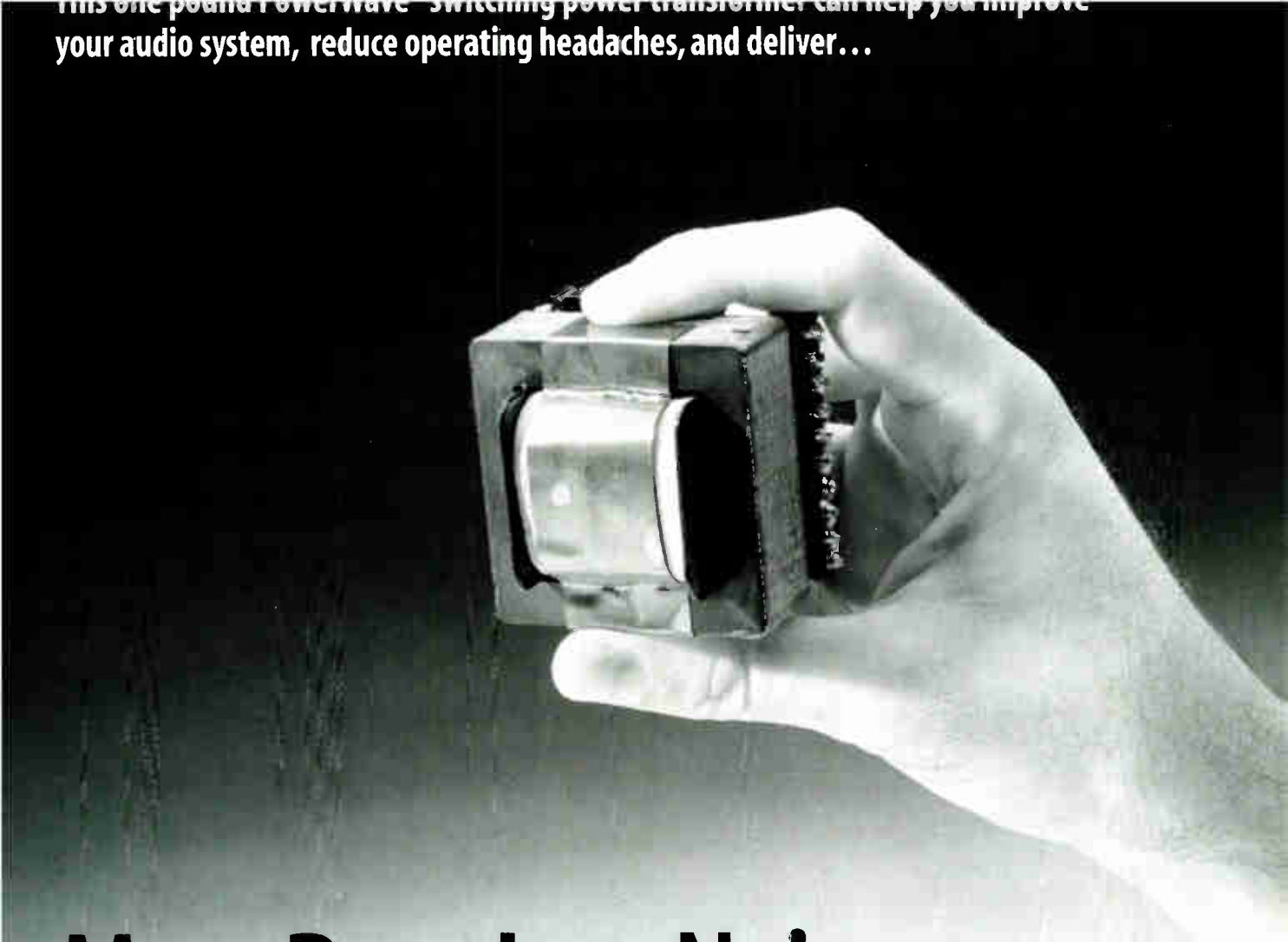

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LARRY FAST

SYNTHESIST'S HOME STUDIO

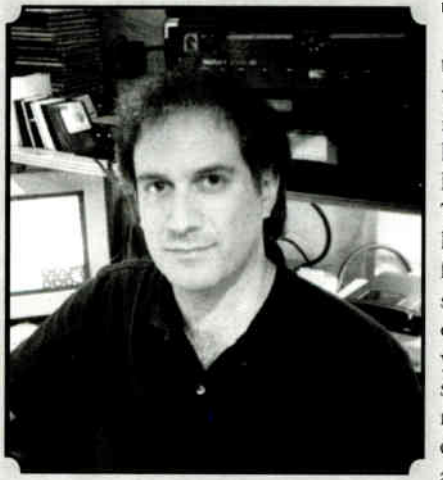
His home studio is nestled in a tiny New Jersey community that has a population only slightly larger than a big league ball club's spring training camp roster, and the neighbors know him as the helpful guy who's active in local efforts to maintain the fragile ecological balance of the area. Outside his home town, however, Larry Fast is known for other things, and his standing as one of the seminal synth figures in progressive rock seems secure.

Fast's a great guy. He's one of those super-smart people who seem slightly embarrassed by how much they know. Questions about physics, computer chip structure or how to get to West Orange are always treated with patience and interest.

Fast's early love of music melded with an equal passion for electronics. When he heard the revolutionary work of Wendy Carlos, Fast knew that he had found his milieu. He invented a fictitious group called Synergy, and released the first of seven albums under that name in 1975. The inventiveness of this work led to high-powered synth programming gigs with the likes of Hall and Oates, Foreigner and producer Jim Steinman. This work also brought him into contact with Peter Gabriel. Fast programmed and played on all of Gabriel's solo albums through *So*. "At that time Peter's music was taking a turn toward the indigenous, and my chair ceased to exist in his orchestra, so to speak."

When *Mix* dropped in, Fast was practicing Bach, in preparation for a live performance of Carlos' "Switched On Bach 2000" at the Beacon Theatre in Manhattan. "We've got six to eight synthesists coming in from around the East Coast to perform various Bach works on a bunch of Kurzweil K2000s that the company has loaned Wendy for the performance. Wendy's very much into historical accuracy with respect to Bach, whose earlier work was written with just intonation tunings. The great thing about the current batch of synthesizers is that you can call up tuning tables for each piece without having to agonize over retuning all the time."

It's been nearly a decade since Fast released *Metropolitan Suite*, his last Synergy project, but he's been feeling the itch to get back to composing lately. "I've been involved in a lot of other projects, including scoring a number of films with David Bryan, the keyboard player with Bon Jovi, producing projects with Jim Steinman, and developing an infrared device for the hearing impaired. However, I've been using my Web site [www.Eclipse.Net/~Synergy] to communicate with fans, and I've remastered my old titles. The interest in new work from me is stronger than I would have expected, which is exciting and gratifying."



Fast's home studio centers around a Mac IIci from the Paleolithic Era. "I'll be replacing it very soon, but it still does what I want it to do, and I rely on some software—particularly the Waves Sound Designer plug-ins that at this point are only available on NuBus systems." Fast remastered and CD-prepped all of the Synergy albums in his home studio. "I went back to the original analog mixes, before the LP EQ was put on. The originals have more low end than the LP versions do. I used Waves modules and Digidesign's DINR during the remastering process.

"The tapes of mixes going all the way back to the '70s I found to be in excellent condition. They had dbx on them, so they weren't noisy. However, some of the aesthetic decisions made at the time with respect to the overall EQ, dynamics, compression and so forth I see differently now. The Waves Q10 module is incredible. I used it to very finely tune the upper, lower and mid frequency ranges. I also used their C1 module in the mode where you can uncompress data in order to get the level up toward the 16-bit maximum—you want the dynamic peaks to be fully employed, without blasting to zero, obviously. I also redithered tracks using the Waves L1 module."

Although he looks forward to the day when analog processing will be even less of a presence than it is today, with computers that look like consoles (e.g., the Yamaha 02R), Fast still mixes on an old Tascam M50 board, which he has hot-rodded to lower the noise floor. To the question of whether synthesists are dinosaurs in the age of perfect samples, Fast answers, "If your only intent was to look at standing waveforms and try to mimic a violin, then yes, samples do a much better job at that task, although most people feel that replacing the sound of a player caressing an infinite number of nuances out of an instrument as he or she plays is something that we'll be hard pressed to do with any technology. If, however, you take the position that synthesis can help create a world of sounds that do not exist in the real world, then you remain excited about the possibilities for shaping new sounds all the time." ■

BY GARY ESKOW

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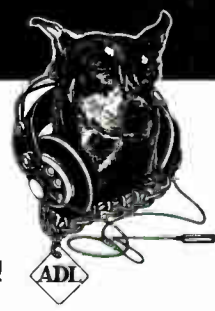

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MICHAEL BEINHORN

HITS FROM THE EDGE

Michael Beinhorn stretched his legs, leaned back on the couch in the hallway lounge of Studio Instrument Rentals' rehearsal studios on 52nd Street in Manhattan, and blew out a cloud of smoke from the small cigar he was smoking. He seemed to relish the quiet moments before our interview was scheduled to begin. As one of the most successful and in-demand producers on the contemporary music scene, Beinhorn doesn't often get such pure moments of relaxation.

On that day, Beinhorn was working with Social Distortion, the legendary punk band, on the album that would eventually become *White Light, White Heat, White Trash*. Although the band had long had a significant cult following, major commercial success had eluded them. That's where Beinhorn came in. Now a staff producer for Epic (though still able to work independently), Beinhorn is becoming known for his Midas Touch in the studio—nearly everything he has produced since Soul Asylum's 1992 breakthrough LP, *Grave Dancer's Union*, has gone Platinum, including Soundgarden's *Superunknown*, new contributions to Aerosmith's Geffen Records hits collection and the most recent Ozzy Osbourne album, *Ozmosis*.

Epic/550's hunch that Beinhorn's production skills would help take Social Distortion over the top paid off: In its first week of release, the album's single "I Was Wrong" was the most added record on modern rock radio and an MTV buzz clip. In a matter of weeks, *White Light, White Heat, White Trash* outsold all the band's previous releases and ensured the group a lengthy world tour.

But according to Beinhorn, the Social Distortion record was a hit because it features great songs by a great group—nothing more, nothing less. And though he has enjoyed more commercial success in the past four years than many producers see in a lifetime, Beinhorn remains unfazed. He claims no special gift for turning out hits, no magical formula that he can produce at will. He simply tries to bring out the best possible music from the musicians he has chosen to work with. The key, he says, is to be tuned in to as much of the creative process as possible.

One reason Beinhorn relates so well to musicians is that he is a player himself. He spent many years working his way up the ladder as a keyboard player in New York City's trendy underground club scene, eventually joining Bill Laswell's adventurous studio project called Material. Beinhorn and Laswell (and the other members of Material) formed a partnership that lasted five years, from 1979 through 1984. In addition to Material's own recorded successes (which included albums for Celluloid, Island and Elektra Records), the team also recorded popular albums for Shango and Nona Hendryx. In 1983, they co-wrote and produced the Grammy Award-winning album *Future Shock* for jazz keyboardist Herbie Hancock. That album's Top 10 instrumental single, "Rock It," gave Beinhorn his first big commercial success, and it opened the door for him to work with a number of other acts ranging from drummer Lenny White to reggae superstar Yellowman to avant-garde minimalist Brian Eno.

But when asked about his years working with Material, and with Bill Laswell in particular, Beinhorn becomes somewhat apprehensive. He admits that their parting was not particularly amicable, saying, "It was one of those things. I would be happier to be not sharing the same oxygen on planet earth with the guy, but I have to, so what the hell. When you look at the total body of work we created, both as musicians and as co-producers, it was good for the time we were in. Some good things came out of it, although it was a painful process. In the end, I look at it as something that got me from point A to point B."

Between 1986 and 1992, Beinhorn produced a wide variety of acts, including the Violent Femmes, Liquid Jesus, the Buck Pets and Raw Youth. But it was his work in 1987 and 1989 with the then relatively unknown Red Hot Chili Peppers that established Beinhorn's credentials in the alternative music world—he produced *Uplift Mofo Party Plan* and *Mother's Milk* for the group. "I'm not going to take credit for any leaps and bounds that band might have made," Beinhorn says, "but I know when we worked together there was more emphasis on trying to focus. They seemed relatively unfocused on the first two records before me. There's a certain irony in my work with the Red Hot Chili Peppers. I can't say I would take anything that was offered, but when I started working with the Chili Peppers, I was at the bottom of the barrel. EMI sent me a tape of this band that they didn't know what to do with at all. They had no idea where to go with this project."

With Beinhorn's encouragement, the group made its first serious attempts to fuse its ongoing love for funk with a cutting-edge pop sensibility. And although *Uplift Mofo Party Plan* wasn't a huge success, it showed the promise of the union of the Chili Peppers and Beinhorn. Then, however, fate struck a blow when the band's guitarist, Hillel Slovak, died of a heroin overdose. "Unfortunately that happened right before we were about

BY BRUCE PILATO

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to start *Mother's Milk*, and that way-laid us a bit," says Beinhorn. "Around that time, Hilly was in a very bad state. He seemed to have kind of lost any desire to continue living." Still, Beinhorn was able to rally the rest of the band and help them create *Mother's Milk*, the band's commercial breakthrough. "From the time that I met those guys, I really liked them as people," says Beinhorn, in retrospect. "I had a great affection for them, and it seemed to me that we worked real well as a team."

In 1992, Beinhorn was working on an album called *Far Gone* for the Sub Pop act Love Battery, when he got the call to handle production for Soul Asylum, who had signed with CBS Records after a few commercially unsuccessful attempts for A&M. Although he didn't realize it at the time he took on the record, Beinhorn's work with the band on its *Grave Dancer's Union*, with its MTV/pop smash "Runaway Train," would propel the producer into the league of big-budget album projects. The multi-Platinum success of the Soul Asylum project led to Beinhorn's selection as producer for Soundgarden's hit CD *Superunknown*. Five million albums later, Soundgarden were superstars, and Beinhorn was being asked to produce acts like Aerosmith, Living Colour and Ozzy Osbourne.

On both Osbourne's *Ozmosis* and the Social Distortion LP, Beinhorn refined a concept he's favored for some time now—bringing in cases of his own recording gear no matter where he works. Commonly, he arrives with his custom Studer tape machine and several road cases loaded with his hand-picked selection of outboard gear and equalizers. Working closely with a New Jersey-based engineer named John French, who has a lot of experience with equipment development and modification, Beinhorn was able to put a custom 8-track head stack on a Studer 800 recorder, which allowed him to work at a slower tape speed to optimize the low end.

"When we made the Ozzy LP, I decided I wanted to go crazy and run at 7½ ips, which my Studer machine runs at," Beinhorn says. "You can compensate for that with a higher level. There is more noise, but a lot of my favorite records have a lot of noise. Do you want noise or do you want mediocre sound? If that's the question, I know where I am going to be. I have no idea what the phenomenon of a lower tape speed has to do with a heightened low end, but I do know a lot of people like working at 15 ips over 30 because of that. I've taken it a step further by going down to 7½. When I recorded at 15 ips the sound was clear as a bell and wonderful, but when I chose 7½ ips, the enhanced low end was absolutely staggering, like nothing else I had ever heard before." Another special modification to the Studer allows for stripping in timecode. "It's my idea," Beinhorn says, "but I give a lot of credit to John French, because he designed this thing."

The other major component of Beinhorn's portable studio is his extensive collection of Neve equalizers. "I have so many Neve EQs that I don't need a Neve console to work on," he says. "My stuff racked-out sounds better than most of the consoles I've worked on, so I don't even bother anymore trying to get the perfect console every time. There's a particular class of Neve equalizers I came across in Atlanta before I started Soundgarden—the Neve 1057. They have huge transformers. They are enormous, and the sound is amazing. They

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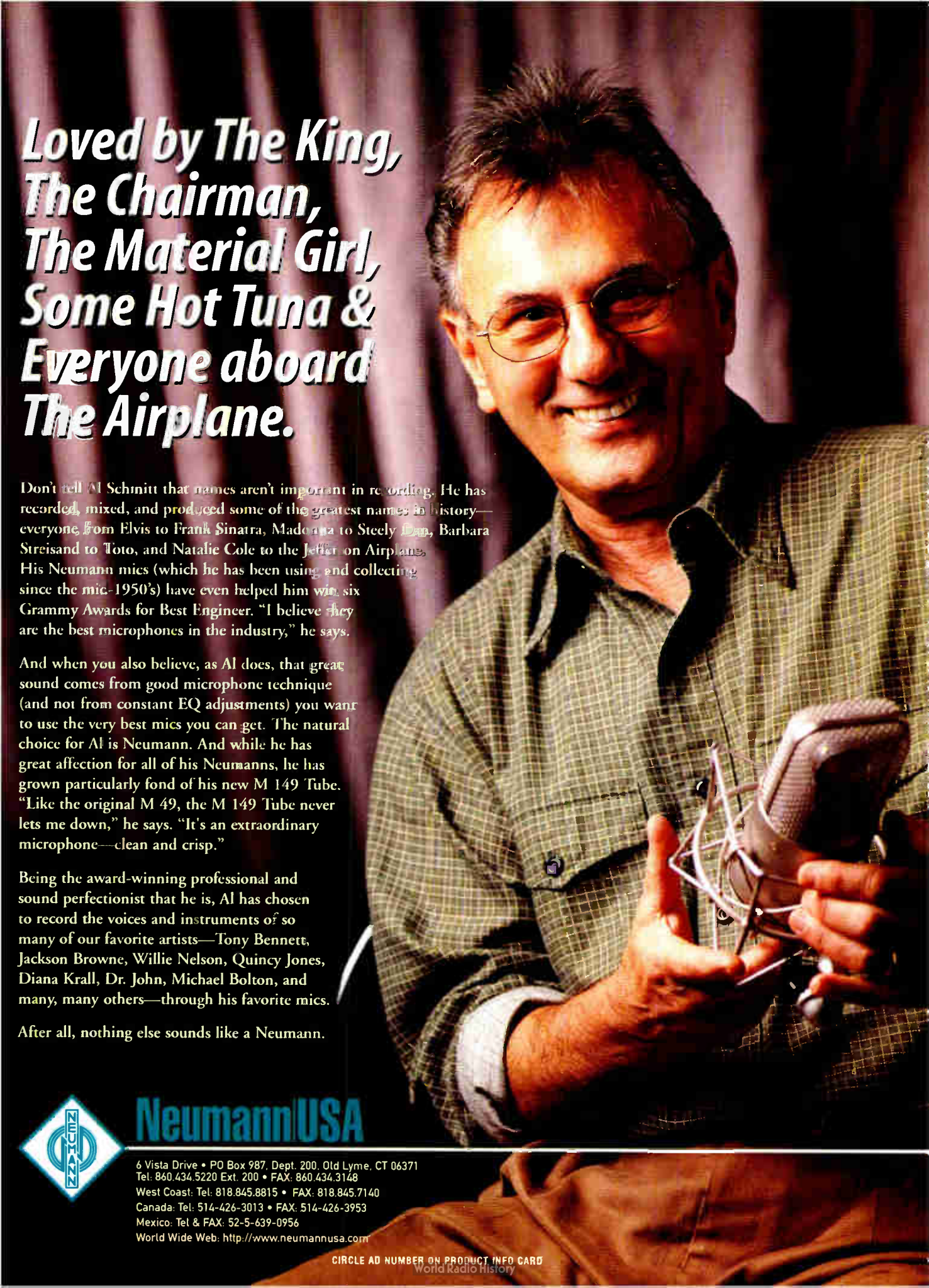

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were in consoles around 1964 or 1965. I have 23 of them, and I don't think there are too many more of them than that. I found six after trying really hard, and then shortly after that I got another 17. Those 17 came out of the first two or three consoles that Neve ever brought over to the United States. Checking out the history of them is fun. Another class of EQs is the 1058. They're standard Neve-size, like the 1073s. They have a black face, a high shelf and a low shelf and five switchable frequencies, and that's it. They're very, very fat-sounding—a great guitar equalizer and microphone preamp."

Beinhorn says he also uses "the obligatory 1073—I love those on vocals—and Neumann V76s, which are really nice. Originally, I thought I would use these more than I do, but I kept going back to the 1073s. There's a harshness to those EQs that I love. It's all about what goes to tape. Hopefully, the outboard gear in the end can make the final sound better."

Beyond technical considerations, however, Beinhorn believes that "what matters is the quality of the songwriting and the intensity and conviction of the performance. The songs dictate how I produce something. It's all down to the material. The kind of stuff I am attracted to, or favor, has to do with a level of emotional intensity. That makes me decide whether or not I want to work with someone." And he's willing to push the artists he works with to come up with material that fits that criterion: In the middle of recording the Social Distortion album, Beinhorn put the sessions on hold at one point and asked band leader Mike Ness to go back and write more material, songs that went deeper into his soul. "He wasn't afraid," says Ness of Beinhorn. "He wasn't trying to change anything, and he was also crazy. It was then I realized that we were going to get along just fine."

With his impressive track record from the past few years, Beinhorn is now in the enviable position of being able to pick and choose which acts he wants to work with for the label, and as he points out, "I've been offered more than I can actually do, so I obviously have to say no sometimes. It's usually a pretty instantaneous decision. If I don't get a strong feeling about a project instantly, chances are probably I won't do it." ■

Bruce Pilato is a freelance writer living in Upstate New York.

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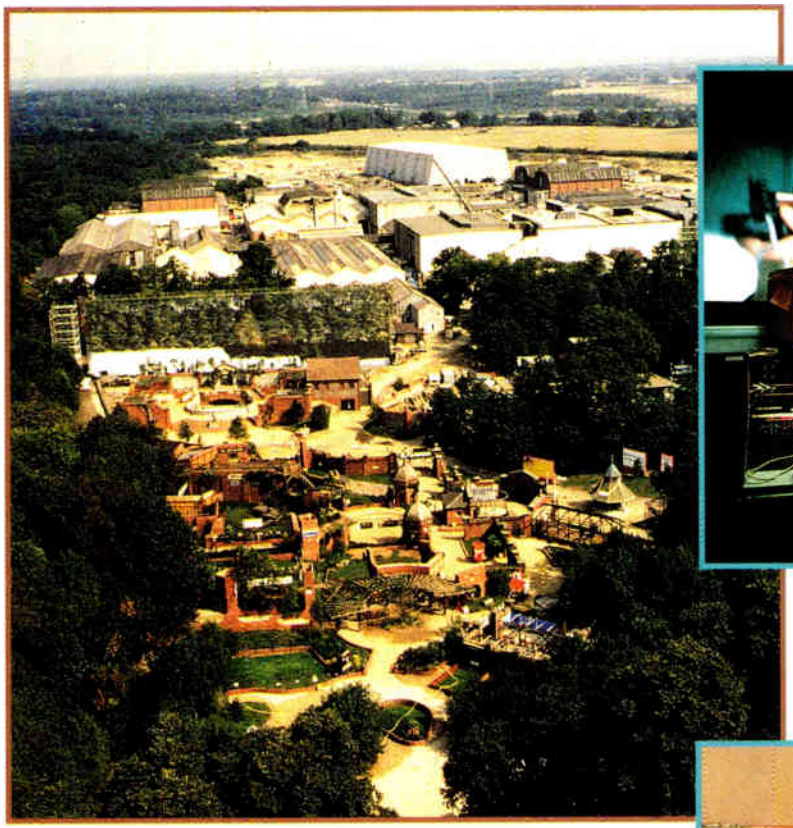

Above: Graham Hartstone, head of post-production, at the SSL console in Pinewood Theatre 1. Onscreen is Pierce Brosnan in GoldenEye. Left: An aerial view of the Pinewood estate.

Demonstrating Foley recording in Theatre 5 are boom operator Sandy Buchanon and the sound transfer department's Nic Pocock. Onscreen: Timothy Dalton as Bond.

The artisans at Pinewood Studios, nestled in heart of rural England some 20 miles west of London, describe their facility as a full-service production community. Graham Hartstone, Pinewood's head of post-production, is more succinct in his view of what Pinewood offers: "Our 60-plus years of active involvement with the international film and video community means that we can satisfy the demand of any size production. We like to create a soundtrack that in every way enhances the moviegoing experience.

"In fact," he continues, "we prefer to work with directors who *know* what they want and are very sound-conscious—that way we get to enjoy ourselves!" Hartstone cites several directors as being particularly aware of the story-telling capabilities of audio post-production, including Stanley Kubrick (work on *Full Metal Jacket* was completed at Pinewood), David Lean (*Oliver Twist* and *A Passage to India*), Ridley Scott (*Blade Runner, Thelma and Louise* and *1492: The Conquest of Paradise*), and James Cameron. "At the moment, we have director Philip Noyce here, dubbing his new film, *The Saint*, starring Val Kilmer, which is a particularly 'sound-heavy' action film." In addition, Pinewood has handled shooting and post-production for a wide range of successful British and international films, including *Batman, Interview With the Vampire, First Knight, Mission Impossible,* plus a majority of the Superman and James Bond movies, culminating in the most recent, *GoldenEye.*

BY MEL LAMBERT

Last year, Pinewood Studios celebrated its 60th anniversary. The facility was established in 1936 by entrepreneur Charles Boot and J. Arthur Rank, and the name apparently has its origins in the fact that the estate, including the impressive Heatherden Hall, which houses the main administrative offices, is ringed by pine trees. (Many pundits

—CONTINUED ON PAGE 94

World Radio History

"THE BEST OF MARTA SEBESTYEN"

Music From "The English Patient" and Beyond

What most people will remember of the score for the film *The English Patient* (covered in Dec. '96 *Mix*) is the voice of Marta Sebestyen, though they may not know her name. Sebestyen sings the song "Lullabye for Katharine" that is used as a recurring theme during the North African scenes. In the context of the film, and given the foreign sound of her voice to most English-speaking listeners, many may assume that Sebestyen is Middle Eastern; not so. She is a Hungarian singer/composer with an unusual voice that is at once powerful and small.

Stemming from the public's great affection for *The English Patient*, Rykodisc has released *The Best of Marta Sebestyen*, a collection that includes "Lullabye for Katharine," which was recorded in Berkeley, Calif., expressly for the film, plus selections from the albums Sebestyen has made for the label over the past several years. Included are some more traditional Balkan folk recordings that she made with the band Musikas, and selections from her later solo albums, which fuse traditional and electronic instruments into the type of layered, haunting sounds that moviegoers will associate with the cruel and sad funereal scenes of Katharine lying in the dark cave, hoping for her lover's return and preparing for death.

PHOTO: RAY BURMISTON

Marta Sebestyen

Many of those later recordings come from the album *Kismet*, a collaboration of Sebestyen and her former husband/producer Nikola Parov. Parov and Sebestyen began working together because of their shared interest in traditional Balkan music and instruments. Parov is a multi-instrumentalist and plays most of the Balkan stringed and woodwind instruments on *Kismet*, which was recorded to ADAT at Tom Tom Studios in Budapest.

Parov says that, for most of the songs he worked on, Sebestyen would just sing into a little tape recorder, on her own, and bring a cassette into the studio. Then he would consider the song and come up with some preliminary arrangements, which they would review and refine before he came up with final arrangements. "It's difficult to make arrangements with her, though," Parov explains, "because very loud and fat arrangements don't work with Marta because her vocal range is quite limited and needs a soft background. Sometimes, when I would hear the voice with the arrangements, I'd think, 'Something doesn't work here. It sounds like a washing machine behind this woman.' So I would make new arrangements, muting out the things that made her voice disappear, and find instruments that would make the album softer."

At the suggestion of Rykodisc's Joe Boyd, executive producer on the album, Parov brought *Kismet* to London's Livingston Studios to be mixed by the studio's manager, engineer Jerry Boys. First, Boys transferred the ADAT recordings to 2-inch analog to be mixed in the facility's Studio 1 on the SSL 4056 E console. "But it was obvious to me when I was doing the mixes that the vocal sound was not brilliant," recalls Boys. "It had been recorded on ADAT and as far as I could figure out, in a fairly dead studio with not necessarily the best-quality microphones. So Joe and I decided to get Marta to come in, and we re-voiced most of the album."

To re-record Sebestyen's singing, Boys used a Neumann M49 mic and Massenburg preamp, to an Otari MTR90II tape machine. "She's got that hard sort of thinish voice," he says, "so I used a valve mic to try and bring a bit of warmth and

BY BARBARA SCHULTZ

World Radio History

air into it. We redid the vocals in only one day. She's quite a remarkable singer."

Otherwise, Boys and Parov kept the Hungarian recordings, though Boys says they reworked some of the arrangements during the mix and added just a touch of reverb to everything. "Everything that had been recorded in Hungary had a sort of air-

PHOTO TITUS G PANDI

Producer/musician Nikola Parov

less sound to it, partly because it had been done in small, dead rooms and partly because of the ADATs; for acoustic music, they have their limitations. So we added a bit of subtle, very bright reverb to give the feeling like you're in a space, but not to sound like there's reverb on it."

More recently, Boys has mixed *Kilim*, Parov's first solo album, for Rykodisc. This new release blends even more electronic sounds with traditional ones, and also seems to have absorbed a good deal of Irish folk influence from Parov's current job as one of the founding bandmembers in the touring production of *Riverdance*.

"For *Riverdance*, I use my typical instruments, but I need to play in that semi-Irish, semi-international style that's unique to Riverdance," Parov says. "In my work, I play so many instruments that I don't have the opportunity to be a perfect performer on one instrument, like a piano player or guitar player who is so good because he is spending all his time on that instrument. Without having any illusions about myself, I know that I am a talented person who can handle different instruments very well. But I also know my borders—how far I can go and how much energy I have, because in the meantime, I have to do other work, like producing albums, having a life..." ■

—FROM PAGE 92, PINEWOOD STUDIOS

have offered that the name was selected more for its similarity to "Hollywood" than anything else.) The first film completed at Pinewood Studios was *London Melody*, produced by Herbert Wilcox. At the opening, one industry insider reportedly observed that "it's as if a millionaire has decided to make pictures in his garden."

Today, Pinewood is still owned by The Rank Group PLC and boasts the world's largest silent stage—the 45,000-square-foot Albert R. Broccoli 007 Stage—and Europe's biggest exterior tank. In addition, during the late '60s, four new stages were built to accommodate expanding requirements for film and video production—bringing the total to 18—to accompany new viewing theaters, cutting rooms and stage lighting. Pinewood also handles a large number of television commercials.

For sound, Pinewood boasts an impressive collection of editorial, ADR and dubbing suites. Theater 5 is intended for ADR and Foley recording, while Dubbing Theater 1 features an automated 60-input Solid State Logic SL-5000M console, and Dubbing Theater 2 an automated Theatre Projects board. The recently completed Theater 3 handles commercials, episodic television and drama productions; the centerpiece of this room is a 16-fader/four-layer AMS Neve Logic 2 digital console with an integral 16-output AudioFile Spectra hard disk recorder/editor. Theatre 7 is a 115-seat viewing room, complete with 70/35mm projection and surround sound playback in all formats.

Also, within the sprawling Pinewood complex are a number of independent production and post-production centers, including Reel Sound, which contains five sound editorial/design rooms equipped with Avid AudioVision systems. Two additional rooms, owned and operated by freelance editor Nick Adams, offer Pro Tools systems. Reel Sound recently handled sound for *Love in Paris*, *Roseanna's Grave*, *Sarajevo* and *Fierce Creatures*, the recent comedy from the team behind *A Fish Called Wanda* and *Love in Paris*.

FILM DUBBING STAGES

Installed during 1991, Theatre 1's 60-channel Solid State Logic 5000 console features 32 output buses, arranged in four banks of eight, to provide enhanced flexibility during predubs and stem recordings, or to finals. VCA-based automation is featured on channel faders and mutes. According to lead mixer John Hayward, "Normally we premix to 6-track ADR and Foley, plus main effects; we might have as many as three 6-track effects premixes, as well. We do not normally premix the music but play it live into the final mixes." Typically, tracks are prelaid to the room's Avid AudioVision hard disk systems—or accessed via removable hard drives—while the final mixes are made to 35mm 6-track mag. Theatre 1 was the venue for the re-recording of *Thelma and Louise*, *1492: The Conquest of Paradise* and *Bugsy Malone*.

Theatre 2 features a vintage 60-input/32-bus Theatre Projects console, which replaced a Neve board back in 1980. The first film to be mixed on the Theatre Projects was *Victor/Victoria*. It was also used to dub *Blade Runner*, Alan Parker's *The Wall*, *Superman*, *A Passage to India*, *Aliens* and most of the James Bond movies. The console features Penny & Giles VCA automation, plus VCA-based automated panning. An unusual feature in the room is a long bank of bus-output meters that are flown above the console and visi-

Nic Le Messurier at the Logic 2 in Theatre 3

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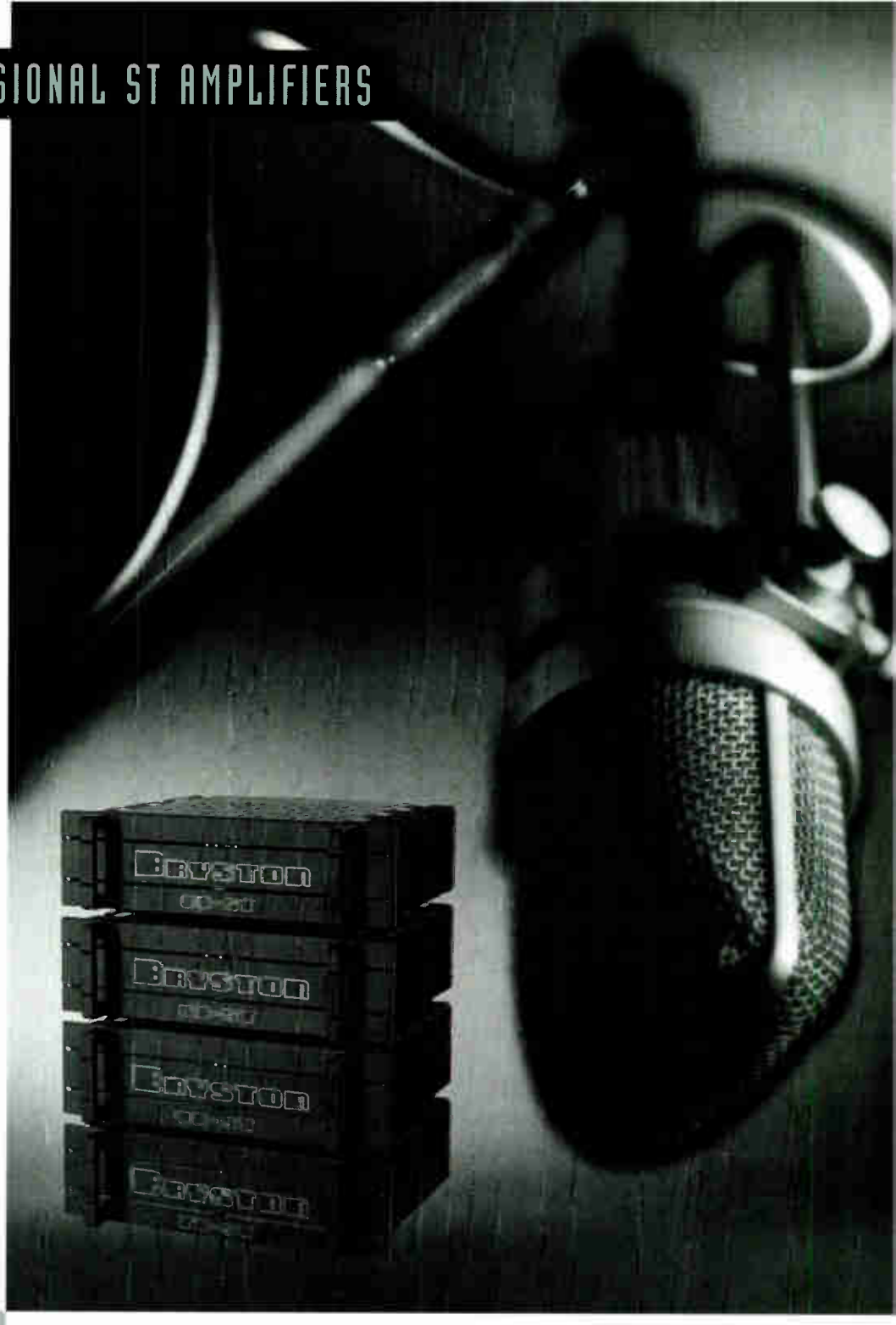

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ble within the top edge of the mixer's field of view.

Unlike the conventional practice in Hollywood, Theatre 2 normally runs with a two—rather than a three—person crew, with the gaffer handling both music and dialog, while an assistant looks after sound effects. "However, on a busy mix," Hartstone says, "we might use a second assistant to look after the extra effects tracks." Hartstone and his crew are the proud recipients of three Oscar nominations—for the re-recording of *Superman* (1977), *A Passage to India* (1984) and *Aliens* (1985)—plus several BAFTA Awards.

Theater 5 handles ADR and Foley recording and features a small Alice console, with tracking to Avid AudioVision hard disk or 35mm mag. The central machine rooms for all of the dubbing theaters house a number of Filmax HS5000 6-track dubbers, equipped with PC-based motion controllers and frame-offset systems, plus Quad Eight/Westrex recorders. Pinewood's sound department also offers optical recording to all film formats, including DTS, SDDS and Dolby Digital.

PHOTO MEL LAMBERT

At the Avid AudioVision inside Reel Sound Editorial, Nick Adams works on Fierce Creatures.

TV/FILM DUBBING STAGE

Theatre 3 was completed in late 1994 as something of an experiment. "We needed to look to the future of our industry," recalls Hartstone, "which lies firmly in the all-digital domain. The Logic 2 was well-established at both Yorkshire Television and the BBC, with whom we regularly trade material. So, to move [audio files] seamlessly from their studios to ours, we needed to investigate file formats and the logistics of transferring sound elements." Pinewood also needed to be able to rapidly transfer audio materials from its AudioVision editing systems directly to the AudioFile.

The first production to demonstrate the viability of OMF-based file exchange was *The Wanderer*, a 12-part drama series produced by Yorkshire Television for Sky1, the UK's leading satellite network. Files were transferred from YTV's Logic 2/AudioFile system to removable magneto-optical disks, then loaded directly into Theater 3's integral 16-output AudioFile Spectra system.

Intended primarily for commercials and long-form TV drama mixing in a film-style environment, Theatre 3 features a conventional surround-sound monitoring rig comprising JBL Model 4410s for left, center and right, with a pair of JBL Control 5s for the left and right surround channels. Room design was by Harris Grant, which, coincidentally, has offices within the Pinewood complex.

According to Theatre 3 lead mixer Nic Le Messurier, who has been with Pinewood since 1968, the majority of sound elements are presented as hard disk virtual tracks; for long-format episodic TV and drama productions, tracks also arrive on Tascam DA-88. "A conventional format involves DA-88 for edited original dialog, ADR and synchronized effects, with another DA-88 holding additional effect tracks and Foley," Le Messurier explains. "Although we might be mixing from up to four DA-88s, normally we try and keep this number to between two and three." Other elements might be delivered on eight or 16 tracks of AudioVision hard drive, plus Pro Tools music tracks. Picture source is normally half-inch Beta SP or ¾-inch U-matic. Alternatively, if the project was edited at Pinewood on an Avid Media Composer or Film Composer, picture playback will be from hard drive.

As Le Messurier recalls, during mixing of "On Dangerous Ground," a recent production for the UK's Sky1 satellite service starring Rob Lowe, "We had picture playback from Avid-format hard drive, plus eight tracks of dialog premixed to DA-88; eight tracks of effects premixed on DA-88; premixed Foley on a third DA-88; and music relayed from Avid AudioVision. Once we have shown a trial mix to the producers in our viewing room, we can go back and touch up the automation by recalling a mix on the Logic 2. That ability saves us a lot of time." The various premixes for "On Dangerous Ground" took close to three days, with

In Theatre 6, late '60s: re-recording mixer Otto Snel (seated) and ADR effects mixer Kevin Tayler.

World Radio History

one day for the mix. "Four to five days to mix a 90-minute drama is typical," Le Messurier says. "A one-hour show might require a 'fast' four-day turnaround."

In contrast, sound elements for a series of three one-hour pilot episodes of *Wilderness* from Red Rooster Productions for Carlton Television, directed by Ben Bolt (son of film director Robert Bolt), were cut on Pro Tools and delivered in AudioVision format—premixed dialog and effects—or Pro Tools format (additional effects, music and Foley). "Here we could access the sound files directly from the Logic 2's built-in AudioFile editor," says Le Messurier, using OMF file compatibility via removable magneto-optical drives.

A modified encoder and decoder enables the monitoring of the 4:2:4 Dolby Surround matrix. Nearly 100% of the productions that pass through Theatre 3 are dubbed in stereo and surround sound. "This room is a lot smaller than our other dubbing stages," Le Messurier concedes, "so that we can more closely mimic the dimensions of the home playback environment."

The final 2-track Lt-Rt mixes are

BITS & PIECES

CANADA

LiveWire Remote Recorders (Toronto, Ontario) finished 1996 with a 1,200-mile trip to Halifax to record an Anne Murray special for Nashville's High Five Productions; guest performers included other local heroes Bryan Adams and Jann Arden. The special was recorded onto 32 tracks of Tascam DA-88. Other recent LiveWire projects include a live Bush broadcast for MuchMusic and mixing of the Genie Awards (Canada's Oscars) in Toronto. LiveWire has also acquired some new gear: a pair of Genelec 1031A monitors, two early-'70s Neve 1084 preamp/EQs, a 1979 vintage Teletronix LA-2A tube limiter, a UREI 1176LN blackface compressor and a TC Electronic M2000 Wizard...**At Studio Morin Heights** (Quebec), recent sessions include Tea Party and Ronnie Jordan, both engineered by staffer Simon Pressey; and Paul Northfield recorded Larry Gowan, G//Z/R and Moist...**Turtle Recording Studios** (Richmond, BC) reports that Brian Howes has been in recording a solo project, *Waterwing*, with producer/engineer Kevin Zaruk. Zaruk also recorded some tracks for Alberta band Rake, who were in with producer Chad Kroeger.

EUROPE

Equipment rental company **John Henry Enterprises** (London) acquired four Klark-Teknik DN800 active crossovers for use by BBC engineer Aden Gregory on the "Later With Jools Holland" program. The gear was supplied by distributor Marquee Audio...**Mikam Sound** (Dublin) took delivery of its second Electro-Voice DeltaMax speaker system. The sound company's other system is still touring with the popular *Riverdance* show. PAG Direct are the distributors who supplied the rig...The music department at **Surrey University** purchased a DDA CS3 for use in its Tonmeister music and sound recording course. **Pro TV** in Romania has equipped its new broadcast truck with a 32-channel DDA QII console...**Gemini Audio Production** (London) added a new track-laying suite to its facilities in the basement of Hammer House in SoHo. The new room features a DAR Sabre Plus compact editing system. The facility already had two DAR SoundStation systems in its two main studios, and there are plans to network all three rooms this year...**Sarm West** (London) acquired its second SSL 9000 J Series console, a 56-input board that is part of the redesign of the facility's Studio 3. Sarm's first 9000 J was installed last year and has been used for clients such as Bon Jovi, Depeche Mode, Kylie Minogue and Seal. **Plus XXX Studios'** (Paris) Studio 2 recording room and control room were redesigned, too. This studio acquired a 72-channel 9000 J; the new board will be used for film score mixing, and pop music recording and mixing. ■

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augmented by a 2-track M&E stem printed to a pair of timecode DATs. These tracks, in turn, are laid back as 4-channel sources to the edited Digital Betacam picture masters. "No, we don't print a 4-track LCRS master," Le Messurier says, "simply because we don't need it. We can always reconstruct the mixes, if necessary, from the automation data and source reels.

"The automation is superb, and the [Logic 2] system has proved exceedingly reliable," Le Messurier adds. "There is definitely a need in this application for an all-digital console. Fully automated fader, EQ and panning is essential for today's productions, as are automated aux sends for reverb and special effects. I would prefer a larger-format desk—a 32-fader version with two layers per fader might be more useful than my current 16-fader/four-layer configuration—primarily because I could handle two-person mixes more efficiently. With only 16 faders on this configuration, having two simultaneous mixers at the console is not really practical."

THE FUTURE

"In retrospect, it wasn't such a brave decision" to go with a digital desk, Hartstone says. "[AMS Neve] was the only company I would trust to deliver a system that would keep on delivering high performance for us in a time-conscious environment. Would we update our current film dubbing theaters to this type of technology? Yes, eventually. It's no great secret that we are currently looking at a possible replacement for the Theatre Project console in Theatre 2. The [digitally controlled analog] Harrison MPC looks interesting; we might consider that path.

"In the meantime," Hartstone continues, "we are concentrating our efforts on fully integrating Pinewood's current collection of digital recorders and editors. We have Avid AudioVision playback systems in each of the three theatres; I would estimate that for three out of four of the past films mixed in Theatre 1, the majority of sound elements—as much as 80 percent—were replayed back from AudioVision format, with film and video projection.

"The next stage is the much-awaited 'Dolby Drives,' designed to replace mag dubbers and recorders. We have been very encouraged with the tests we've seen and are looking forward to integrating them here. Since they will be fully plug-and-play-compatible with our AudioVision systems, the new Dolby Drives will become the ideal medium for layback, predubs and final. It should be just what the doctor ordered!" ■

PHOTO: MEL LAMBERT

The entrance to Heatherden Hall is built from an antique fireplace.

Mel Lambert currently heads up Media&Marketing, a consulting service for pro audio firms and facilities.

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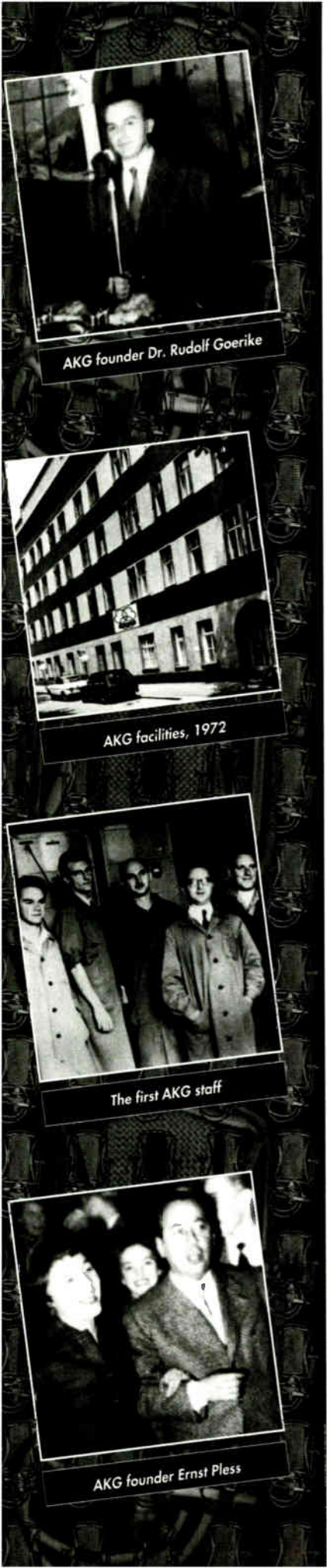

AKG founder Dr. Rudolf Goerike

AKG facilities, 1972

The first AKG staff

AKG founder Ernst Pless

AKG TURNS 50

Austrian Microphone Maker Celebrates Golden Anniversary

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Some AKG microphones from the '40s, '50s and '60s (left to right): C-12A, D-25, D-112 (old version), K-59 headset, D-58, DY-9, DYN-20 and DYN 200-K

In pro audio's digital era, 50 years is both a half-century and an epoch. But it's also a useful vantage point from which to take stock of a very changed industry and the unique position AKG—whose entire diverse product line is analog—occupies. First, though, a bit of history.

In May 1947, surrounded by the rubble that was Vienna in the wake of Allied bombing during World War II, physicist Dr. Rudolf Goerike and businessman Ernst Pless opened Photophon to begin manufacturing of cinema projectors and related equipment. The company was founded on Goerike's particular expertise and on a solid marketing basis—movies were the great escape for many in the bleak landscape of postwar Europe. Goerike and Pless soon changed the company name, for business reasons, to AKG, which stands for Akustische u. Kino-Gerate (Acoustic and Film Equipment). But the acoustic part soon became the center of the fledgling company's focus, based on Goerike's innovative microphone diaphragm designs. The first success—and the world's first single-element cardioid microphone—the AKG D-12, propelled the company's fortunes even as Pless was delivering orders on a bicycle, and at times accepting payment in the form of black market cigarettes and butter. The mic also introduced the AKG logo of three overlapping cardioid patterns. The film equipment business was discontinued in 1965.

by Dan Daley

AKG's product line has been diverse in the past half-century, sometimes oddly so. While its professional microphone line was building, AKG was also making car horns, door intercoms, telephone handsets (telecommunications products continue to be a large seller for the company) and in-pillow speakers—a brief fad from the 1950s—all of which are represented in a compact museum display in the lobby of the company's sprawling 4.2-acre plant in Vienna's southern reaches, where 450 people make a heck of a lot of microphones.

But it was the D-12 that formed the basis of AKG's success in pro audio. Developed in 1953, the dynamic mic offered a tight pattern and extended low-frequency response to an industry on the verge of hi-fi. It quickly

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gained an avid following, which opened the door to subsequent new products, such as the C-12 condenser mic (developed in 1953), also destined to become a classic. Both microphones were produced in several versions, including the C-12A and stereo C-24, the AKG Tube and the C-12VR, the most recent model with the original capsule. Yet another classic of the era is the C-414, which is based on the original capsule design for the C-12 but with smoother upper-frequency characteristics, which made it a favorite for vocal applications.

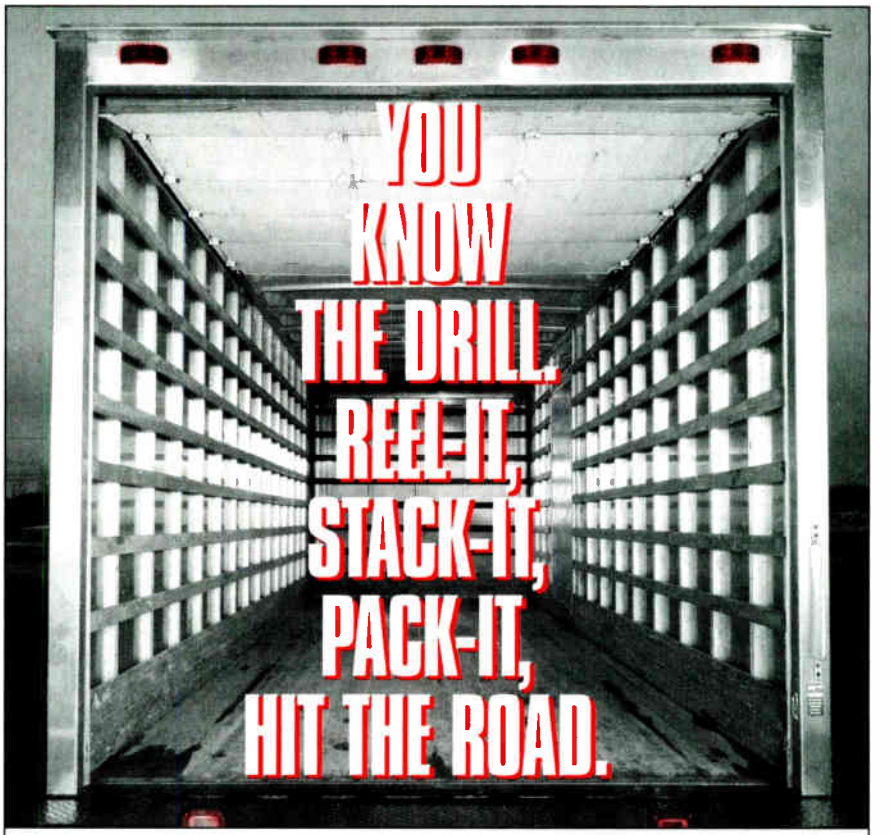
The development of AKG's product line over the years reflects the massive philosophical shift the overall pro audio industry has undergone: from that of an engineering-driven business to one predicated on marketing. The C-12, developed by recently retired AKG engineer Konrad Wolf, was innovative both because of its diaphragm design and its slender tubular housing, which was considerably smaller than Neumann's competing U Series and which also had shock-mounting integral to the design, as opposed to an elastic-web mic suspension. But for all of its early success in broadcast, film and music applications, the C-12 (also marketed by Siemens as the SM 204 and by Telefunken as the M251, part of an OEM strategy to enhance AKG's limited postwar distribution capability) was discontinued around 1963 as solid-state electronics took off and the electronics industries—pro and consumer—looked to FET technology to free them from cumbersome tubes.

"Everyone wanted smaller, FET-type microphones," recalls Norbert Sobol, AKG's affable pro audio products manager. "We had success making smaller tube microphones, like the C-12, replacing the large 6072A tubes with smaller Nuvistor tubes. The same with the C-414, which was using solid-state circuitry but used the same capsule in a smaller housing and which was the first interchangeable microphone assembly. But solid-state was a big buzzword at the time, so everyone was switching to that, including us."

The C-414 was originally intended as the first AKG high-end FET offering (the C-414 comb) in 1971, using the same modified rectangular shape first designed for the C-12A in 1962. By the mid-1970s, though, the C-414 was using tube circuitry with its smoother C-12-based diaphragm. It went through various sub-types: the C-414EB/P48 reflected the fact that by 1977 U.S. consoles had standardized 48-volt phantom power (the "E" phonetically represented "XLR," as opposed to the "CB" version for the German DIN plug standard, and the C-24 stereo version, so designated because it utilized two C-12 capsules).

Early FET designs and pop music never quite meshed, and rock 'n' rollers brought demand for tube sound back with a vengeance in the mid-1970s. "At first, we thought going back to tubes would be a fad," Sobol remembers. "But within a few years, we realized—quite happily—that it was not. I think every engineer has a special place in his heart for the way tubes sound. In 1983, we came out with the first reissue of the C-12 design [same electronics but with a 414 capsule and a smaller housing], The Tube." It was followed 11 years later by the C-12VR, which was virtually the same as the original C-12 design, replacing the C-414's capsule with the edgier characteristics of the original C-12 capsule. That same capsule was also re-created in the 1993 transformerless TL-2 version of the C-414.

Acknowledging that the pro audio market has evolved based on a digital revolution—one that microphone companies could not have been part of—Walter Ruhrig, AKG's music division product manager, says, "This new mar-



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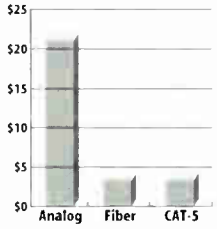

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An AKG specialized microphone, headphones and speaker

ket was not developed by companies like AKG. The new market has very specific requirements as far as accessories are concerned." In response, he says, AKG has developed entirely new lines, including the C-3000—a less expensive large-diaphragm microphone that includes high-end features such as shock-mounting, yet at a cross-market price—and the Emotion and Performers Series, which aim at entry-level studio and live sound niches. In addition, the C-414 has seen its own retail price reduced twice in two years.

"The major change that has been seen is that marketing now leads engineering, the reverse from the way it used to be," Ruhrig says. "We saw it was time to enter what has become the mass market of pro audio, which we did with the Emotion Series, available at very low cost. The Performer Series is positioned in the gray zone between consumer and musicians. Even the packaging has become more consumer-oriented."

As if to underscore that point, an interview with AKG wireless products manager Roland Scholz focuses as much on the packaging for the WMS-51 VHF budget-priced wireless unit as on the product itself. The package includes:

- A brightly colored box with application icons on the cover—along with an endorsement photo of Simply Red lead singer Mick Hucknall—and graphically illustrated product information on the back; Scholz believes this can take the place of the sales personnel, who are increasingly less available on a one-to-one level as pro audio moves into the Wal-Mart age.
- A color-coded frequency chart, which, Scholz points out, makes things easier for both salespeople and consumers.
- And a cross-marketing advertisement for AKG's Micro-Mic line of instrument microphones. (Doug McCallum, AKG's sales and marketing VP in the U.S., commented that, while the pro audio market is becoming more global, the U.S. and European markets still have differences, and that AKG's U.S. operation is focusing on the WMS-300 UHF wireless system aimed at a mid-market price point.)

But while the industry is moving toward a mass market, no one at AKG believes that should have a deleterious effect on quality. AKG benefits from a unique manufacturing capability that evolved over the years, centered on production lines that dovetail automation developments from other industries such as plastics—the incoming plastic for what will become transducers looks like bags of breakfast cereal—along with highly specialized manual assembly and the company's ability to make many of its own tools.

Diaphragm manufacture is at the heart of the plant's activity, framed by casing manufacture and electronics assembly. AKG has long used what they call "Tiefzieh Varimotion Technology" (Tiefzieh is an Austrian word that translates as "deep drawing"), essentially a transducer shaping methodology that both widens the frequency range of microphones by permitting more than one thickness in a single transducer and which also helps maintain consistency from one microphone to the next. "Manufacturing provides part of the character of a microphone's sound," explains Norbert Sobol. "And you keep the character consistent by keeping manufacturing with as little variation as possible. That's difficult to do because every part of the microphone plays a part in its sound—the housing, the grille, everything. Once you've developed each part to where you want it, you have to freeze it in the manufacturing process and repeat it over and over every time without variation. That, we've learned how to do."

That experience will be put to the test as AKG enters its second half-century. With its most recent reorganization behind it—ownership has changed several times since 1975, before the company became part of the largest single entity in pro audio, Harman International, in 1994—AKG will seek to remain at the top of the high-end microphone market, move deeper into

An AKG D-12 microphone in a TV studio

the project/personal studio markets and the wireless and live sound markets, and introduce new products, such as the EMS-1 in-ear monitoring system, which was introduced at NAB and is scheduled to become available in late summer.

It has become routine in the pro audio business to ask whether a company can cover all the bases of the new mass-market paradigm. And the response tends to be an equally routine "of course," laced with a whistling-in-the-dark bravado needed to tackle much broader horizons. But as AKG's international sales manager Heinrich Zant puts it, "As long as we keep basing the future on what we've learned in the past, keep the quality at the same level that built the company in the first place, and keep our focus on the things we do well, like transducers, then we can do it." ■

An AKG DYN-40 hand-made vocal mic, 1947-'48

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TUBE PROCESSORS

The Outboard Renaissance

Saying that vacuum tube circuits are enjoying a renaissance in studio electronics is an understatement. The tube's lineage goes back far enough to qualify for social security benefits, yet there's no question of retirement in sight: This glowing bubble of glass and metal is showing up in new products at a dizzying clip.

Why are new products using decades-old technology? Many people claim the audio tube's pleasing distortion characteristics breathe new life into audio signals. A general prejudice against IC-based designs and digital recorders is that they add a cold, hard edge to sounds. Tubes add no such harshness and can actually compensate for some of the damage done by solid-state electronics, or so say their boosters.

Though some may scoff at the supposed sonic superiority of the tube, there's one fact no one can dispute: Sales of tube audio processors are hotter than ever. New manufacturers are getting into the tube game, and prices are falling to make tube gear affordable on even the smallest budgets. In the next few pages, we'll take a look at tube outboard gear currently available from nearly 20 manufacturers. These signal processors run the gamut from a $150 palm-sized compressor to units costing thousands of dollars. Because we spotlighted new mic preamps in the March '97 *Mix*, this article focuses on tube processors that don't have a mic preamp stage.

BY LOREN ALLDRIN

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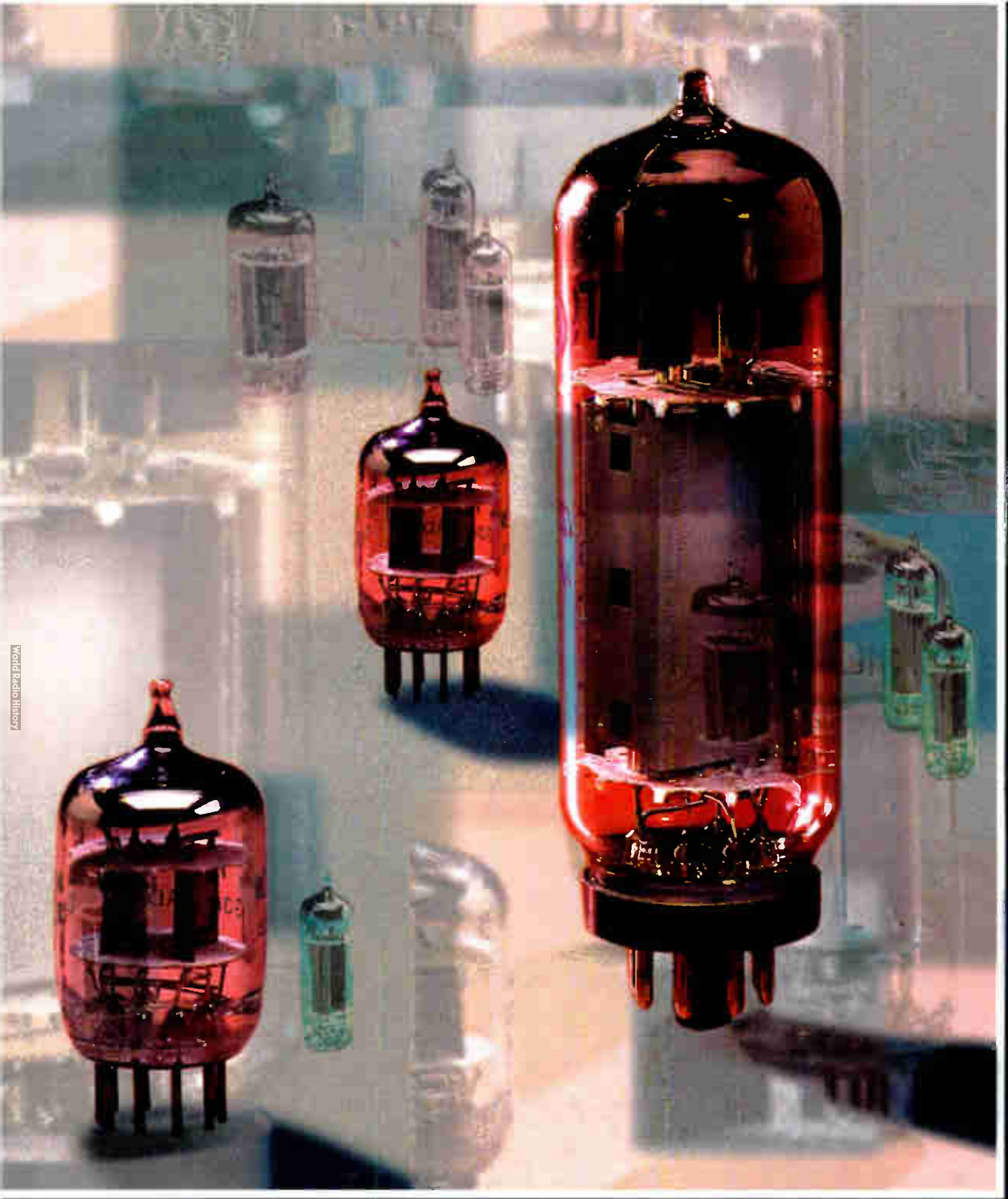

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THE PROCESSORS

The ADL 1000 and ADL 1500 compressors from **Anthony DeMaria Labs** (New Paltz, N.Y.) are all-tube compressor/limiters, which use optical attenuators for smooth, "invisible" compression. Both offer gain and peak reduction controls, switchable output level or gain reduction VU metering, program-dependent attack and release times and balanced XLR inputs and outputs. The ADL 1000 ($1,695) is a mono unit; the stereo ADL 1550 ($2,995) offers identical controls plus a stereo link switch.

ART Levelar

Aphex Systems (Sun Valley, Calif.) has applied its patented Tubessence technology to a pair of outboard processors, the Model 109 4-band EQ and the Model 661 Expressor compressor/limiter. The Model 109 EQ ($449) will work in stereo 2-band or mono 4-band modes; each band offers fully parametric control with up to 15dB boost/cut in peak or shelf mode. The Model 661 mono compressor/limiter ($749) has manual attack and release controls, Easyrider automatic setting, soft knee switch, sidechain high-pass control, high-frequency expander, dual-bar graph LED metering and "spectral phase enhancer" circuit.

Aphex 661

Applied Research and Technology (ART) of Rochester, N.Y., has three compressors in its processor lineup, all using Vactrol® electro-optical compression and 12AX7A tubes. The Levelar ($159) is a compact mono unit with threshold and output level controls, LED gain reduction metering and ¼-inch inputs and outputs. Switches select bypass or active modes, limiting or compression ratios and auto or fast attack/release times. The stereo Dual Levelar ($329) offers the same controls as the mono unit, adding a link button and balanced XLR I/O. The stereo Pro VLA ($599) offers all the functions of the Levelar plus variable ratio controls, separate switches for attack and release time, mechanical VU meters and LED gain reduction meters.

Bellari (Salt Lake City, Utah) has three units in its processor line: the RP282 and RP583 stereo compressor/limiters and the RP562 stereo sonic exciter. The RP282 and RP583 compressors ($650 and $700 respectively) offer an optical gain reduction circuit, sidechain insert on each channel, stereo link mode and switchable VU-style metering. Manual controls include threshold, ratio, attack time, release time and output gain. The RP562 stereo exciter ($400) uses all-tube circuitry to correct phase changes and "harmonic structure" differences, offers LF/HF enhancement controls, adjustable subwoofer output, XLR and ¼-inch I/O and LED metering.

Demeter (Santa Monica, Calif.) offers the all-tube VTCL-2A stereo compressor/limiter with a list price of $1,995. The VTCL-2A boasts variable attack and release time controls, stereo or dual-mono operating modes and output gain controls. Switchable VU-style meters monitor input level, output level or gain reduction. Inputs and outputs are balanced XLR, balanced TT or unbalanced ¼-inch jacks.

Demeter's new II Series processors use a hybrid design with tube amplification and solid-state driver stages. The EQ-1 ($1,300) functions as a stereo 3-band or mono 6-band fully

Demeter VTCL-2A

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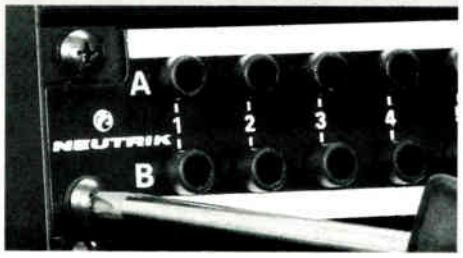

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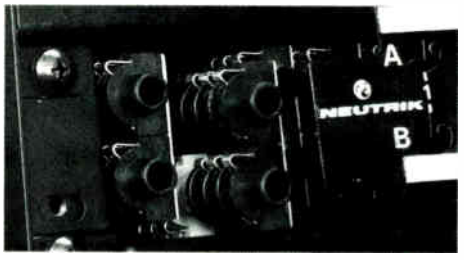

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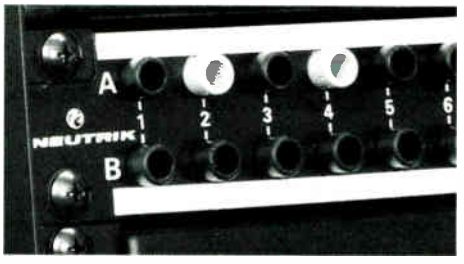

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DigiTech VCS-1

parametric equalizer. Each band offers up to 12dB boost or cut. The HC-1 ($1,050) is a mono tube compressor that uses the "H" tube gain stage and classic photocell compressor section. Each channel of the HC-1 offers variable attack and release time controls, input sensitivity switch, overload LED, sidechain output, link input and low-frequency sensitivity switch.

As its name implies, the VCS-1 Dual Vacuum-Tube Dynamics Processor from **DigiTech** (Sandy, UT) is a 2-channel unit combining compression, de-essing, noise gating and peak limiting. Its hybrid design combines new-generation VCAs with dual 12AX7 tubes. This 2-rackspace, stereo-linkable device features balanced XLR or TRS I/O, illuminated VU meters and a sidechain audio path. Compressor controls include threshold, attack, ratio, release, hard/soft knee and auto or manual operation; gating has adjustable threshold and attenuation; and separate thresholds are provided for both the de-esser and limiter sections. Retail is $999.95.

The model 1961 tube EQ from **Drawmer** (distributed by QMI of Holliston, Mass.) offers four fully parametric bands with bandwidth from 0.3 to 3 octaves and up to 18 dB of boost or cut. Each channel has individual band bypass, six stepped frequencies per band, sidechain insert, variable high-pass and lowpass filters, switchable input/output level and balanced XLR inputs and outputs. The 1961 ($2,349) has two additional tube output stages with LED indicators for overload and "soft-clip" distortion.

Dunmore Vintage Audio (North Hollywood, Calif.) recently released the DR 2A S stereo compressor. The DR 2A S ($2,459) uses seven tubes, matched photocells and fast attack/slow release constants designed to re-create the sound of the vintage Teletronix LA-2A. Each channel offers a sidechain EQ loop, input level control, compression control and switchable output level/gain reduction VU meters. The unit will work in dual-mono or linked-stereo modes, offering up to 40 dB of gain and 30 dB of gain reduction.

The Model 2 TLA Mastering Amp from **Giltronics** (Kapaa, Hawaii) offers a minimalist approach to achieving a

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tube sound for recording, mixing or mastering. The Model 2 TLA ($1,995) provides two channels of transformer-balanced tube gain, with a range from -6 dB to +12 dB. Level controls include seven-position coarse-adjust gain rotary switches and fine-adjust potentiometers.

The **Groove Tubes** (Sylmar, Calif.) EQ1 is a semi-parametric equalizer with passive filtering and a vacuum tube makeup gain stage. The EQ1 offers five interacting boost/cut bands and four crossover switches; these controls allows users to dial in up to 20 dB or more of attenuation and roughly 5dB maximum gain. The half-rack EQ1 ($695 plus PS2a power supply, $350) offers XLR and ¼-inch I/O and a 3-stage LED signal indicator.

Groove Tubes CL1S

Also from Groove Tubes is the CL1S compressor/limiter ($2,495). The CL1S is a stereo tube unit with variable attack and release time controls, four selectable compression ratios, sidechain access for each channel, compression bypass, mono or linked stereo operating modes, up to 20 dB of makeup gain and switchable input sensitivity. An optical compression system helps the CL1S achieve a classic "'50s" sound.

The **Inward** (West Hills, Calif.) VAC RAC mainframe system ($1,980) allows up to four all-tube processors to be fitted into a two-rackspace package. In addition to a tube mic preamp, the VAC RAC system offers the TLM-1 limiter, the TEQ-1 stepped equalizer and the TII-1 instrument interface. The TLM-1 limiter ($995) has "gain" and "reduction" controls, bypass, switchable VU meter and stereo link switch. TEQ-1 step equalizer ($1,295) offers 15 frequency points on three different bands, each with ±12dB adjustment. The TEQ-1's high and low bands offer peak or shelf mode; high-pass and lowpass filters can be enabled independently of EQ. A tube instrument interface (TII-1, $895) offers front-panel ¼-inch inputs and outputs, input and output level controls, "amp" out jack with three-way buffer switch, transformer-balanced mic-level output and bass and treble EQ controls. Discount package prices for the VAC RAC system (mainframe, power supply and two modules) run from $3,185 to $3,985.

Offering more than 20 tube products, **Manley** (Chino, Calif.) has the broadest line of tube gear available today. Some of the company's more popular units include its mono all-tube Variable-Mu compressor/limiter ($2,350), offering input and output level controls, variable attack time, variable threshold, five recovery settings, limit/compress modes and gain reduction metering. The Stereo Variable-Mu compressor/limiter ($4,000) offers the same controls as the mono unit, with the addition of a separate/link switch and ganged dual input level control. The LA-2A-style Stereo Electro-Optical Limiter ($2,500) has gain and reduction controls for each channel, switchable output level or gain reduction metering, stereo link mode and unique stereo balance control.

Anyone looking for that Pultec™ sound should check out Manley's Pultec line: The Enhanced Pultec Monoblock Equalizer ($2,150) offers passive EQ licensed by Western Electric for low-frequency boost and cut, high-frequency peak boost and high-frequency shelf

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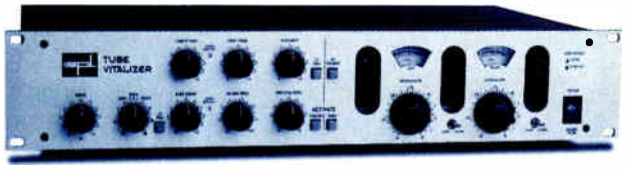
cut. The Enhanced Pultec Mid-Frequency Monoblock Equalizer ($1,750) offers controls similar to those of the Enhanced Pultec Monoblock Equalizer, with frequencies and tighter bandwidths optimized for midrange instruments.

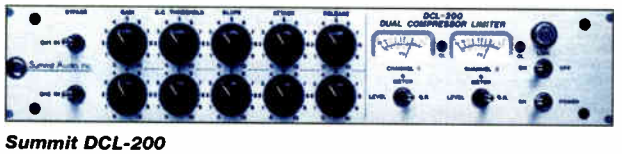
Known for its high-performance guitar amps, **Matchless** (Santa Fe Springs, Calif.) enters the pro audio market with a line of rack-mount signal processors, including a $599 two-space tube mixer. The Matchless RV-1R ($899 unbalanced, $1,099 balanced) is a 3U spring reverb unit with tube-based electronics and tone control. The CB-R Cool Box ($459) is a multi-use, two-space unit offering a number of functions: line driver/buffer, tone control, level matching and tube "warming." The two-rackspace EB-R Echo Box ($999) updates everybody's favorite retro '60s tape-based echo unit with tube electronics and controls for tone, wet/dry mix, regeneration and delay time (0 to 750 ms). The tape format uses audio cassettes, rather than difficult-to-find tape cartridges. The VB-R Vibro Box ($599) is a tube-based tremolo effect, with controls for tone, depth, low/high speed, finite speed, gain and level—all in a two-space chassis.

SPL (distributed by beyerdynamic, Farmingdale, N.Y.) offers the Tube Vitalizer stereo enhancer/processor ($3,399) and the 8-channel Charisma tube processor ($1,199). The Vitalizer process includes LF and HF soft-knee compression, LC or RC filtering and adjustable mid- and low-frequency damping; tube stage offers attenuation and limiting functions. Charisma has eight channels of tube processing, allowing digital 8-track recorders to simulate analog tape compression. Controls include tube drive, "charisma" (saturation quality) and output level.



SPL Tube Vitalizer

Summit (Soquel, Calif.) has four processors that use a hybrid of tube and solid-state electronics: the DCL-200 stereo compressor/limiter, the TLA-100A leveling amplifier, the EQF-100 mono equalizer and the EQP-200A dual program equalizer. The DCL-200 ($2,950) offers variable attack and release times, soft-knee compression, stereo link switch, switchable meters and sidechain insert. The TLA-100A ($1,700) is a mono compressor with gain and gain reduction controls, switchable fast/slow attack and release times, soft-knee compression, sidechain insert and stereo coupling capability. The DCL-200 mono EQ ($2,950) offers four passive filters (seven frequencies each), a tube makeup gain stage, highpass and lowpass filters and individual band bypass. The EQP-200A stereo EQ ($2,500) offers passive filters with switch-selectable frequencies for high peak boost, high shelf cut, low shelf boost and low shelf cut.



Summit DCL-200

The Indigo Series from **TL Audio** (Oakville, Ontario, Canada) boasts several tube processors, including the EQ2011 stereo 4-band EQ ($1,295), the EQ2012 stereo parametric EQ ($1,395), the C2021 stereo compressor ($1,395) and the O2031 stereo overdrive unit ($1,295). The EQ2011 offers shelving high and low filters, two peak mid bands, input gain control and aux instrument input. The EQ2012 fully parametric EQ functions in stereo 2-band mode or mono 4-band mode, with ±15dB gain and variable Q from 0.5 to 5. The C2021 stereo compressor offers variable input, threshold, ratio and output gain controls; attack and release times are switch-selectable between fast and slow presets. The C2021 also offers front panel ¼-inch instrument inputs and sidechain inserts. The O2031 stereo overdrive unit has 3-band EQ (common to both channels), variable lowpass filter, aux instrument input, rear-panel "boost" mode footswitch and variable input and output gain.

Tube-Tech's (Westlake Village, Calif.) line of tube processors includes the CL 1B mono compressor, the LCA 2B stereo compressor, the EQ 1A equalizer, the ME 1B midrange equalizer and the PE 1C program equalizer. The CL 1B mono compressor ($2,195) offers continuously variable or preset attack and release times, selectable VU meter, input and output transformers and two interconnect buses for linking multiple units. The LCA 2B ($3,495) stereo compressor has a separate compressor and limiter on each channel, manual attack and release time controls, six preset attack and release time settings, LED gain reduction display and input/output transformers. The EQ 1A full-range equalizer ($4,395) offers 36 overlapping frequencies on three bands, high and low shelving filters at six frequencies each, variable highpass and lowpass filters and individual bypass switches. The EQ 1AM ($5,695) adds rotary switches for precise repeatability of settings. The ME 1B mono midrange EQ ($1,819) offers passive filters for low-frequency peak, mid-frequency dip and high-frequency peak. The PE 1C mono program equalizer ($1,850) uses passive filters for low-frequency shelf boost or cut, bell-shape high-frequency boost and high-frequency shelf cut.


TL Audio EQ2

New from **Voce** (Ridgefield Park, N.J.) is the EVC-1 mono tube compressor. A half-rackspace unit, the EVC-1 ($799) has all-tube circuitry, transformer-balanced inputs and outputs and photocell compressor circuit. Controls include threshold, attack, release, ratio and output level; the EVC-1 also offers switchable metering, bypass switch and key listen function. The soft-knee compression curve delivers smooth, subtle compression with a "vintage" sound. The external power supply (EVPS, $299) will power one or two EVC-1 compressors. ■

Voce EVC-1

Loren Alldrin is a Nashville-based producer and writer.

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PREVIEW

OPCODE VISION 3.5

Vision 3.5, a major upgrade to Opcode's (Palo Alto, CA) integrated MIDI sequencer and digital audio recording program, features native Power Mac code for faster processing, Adobe Premiere plug-in support, integrated Apple QuickTime support and a lower price of $395. A new DSP Menu offers normalize, sample rate convert, invert phase, reverse, mix, EQ and fade in/out features. Enhanced Sound Manager support allows for double the number of available tracks (up to 32), and Vision now reads and writes all major audio file types, including WAV, .au, AIFF and SD II formats.

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DAR OPEN MEDIA RECORDER

The OMR*8* Open Media Recorder from Digital Audio Research (Chessington, England) offers record capability to two media—removable magneto-optical and hard disk. The three-rackspace OMR*8* can store up to three hours of 8-track recording (12 hours for two tracks) on its internal 8GB hard drive, or 30 minutes per side on a 2.6GB optical disk (2 hrs/side for 2-track). DACs are 18-bit; internal processing is 24-bit. Features include cut-and-paste editing, record undo, automatic gating to maximize disk space, scrub, varispeed and VTR emulation. I/Os are AES/EBU, and the unit is compatible with all other DAR workstations and the D-*net* Open Media networking system.

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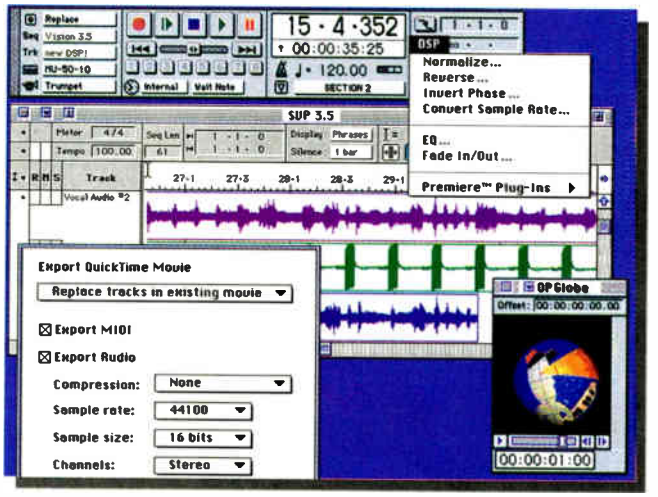

DAKING COMP/LIMITER

The 91579 compressor/limiter from Geoffrey Daking (Wilmington, DE) features switches and detented pots for all functions and parameters for repeatable settings. Front panel controls select compression ratios ranging from 1.5:1 to 20:1; threshold adjustable over 20 dB in 2dB steps; nine attack times, seven release times; and 11 dB of makeup gain in 1dB steps. The unit also offers bypass, stereo link switching and a 3-function VU meter (I/O/gain reduction). Connections are balanced XLR, TRS and a sidechain insert.

Circle 329 on Product Info Card

WAVES PLUG-IN BUNDLES

Waves (Knoxville, TN) has created two new bundles for its DSP plug-in software, adding both DSP card and DSP farm processing bundles to its non-DSP Native Power Pack bundle. The TDM Bundle includes the Q10™ Paragraphic Equalizer, L1™ Ultramaximizer, S1-Stereo Imager, C1™ Compressor/Gate, TrueVerb™ room emulator/reverb, PAZ-PsychoAcoustic Analyzer, WaveConvert™ (a multimedia audio batch file utility) and TrackPro™ (a lossless SD II audio file compression program). Price is $2,300. The MultiRack DSP/SDII Bundle includes the MultiRack application, which manages DSP resources on multiple cards, and Q10, L1, C1, S1, TrueVerb (native version), PAZ, WaveConvert and TrackPack Lite (a lossless SD II audio file compression program). Price is $1,200.

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MUTATOR ANALOG FILTER/ENVELOPE FOLLOWER

Mutronics Ltd. (distributed by Analog & Digital Systems Research, Glendale, CA) offers the Mutator stereo analog filter and envelope follower. A two-rackspace unit, the Mutator has two independent voltage-controlled filters similar to those found in analog synthesizers. Filters can be controlled by internal LFOs and/or an envelope follower section, which enable the envelope of one sound to be applied to the filtering contour of another. Each LFO has four different waveforms; panning effects can be produced via a stereo link. Connections include unbalanced ¼-inch audio I/O, control voltage inputs and MIDI in/thru. Price is $1,295.

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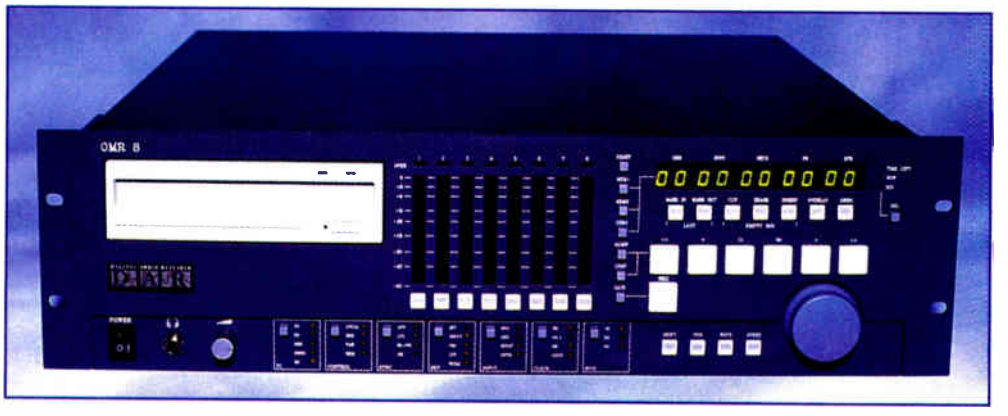

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PREVIEW

DENON PRO CD

The DN-680 pro CD player from Denon (Parsippany, NJ) features a large jog dial and shuttle wheel for fast search and cue operations. Cue and preview functions include Auto Space and Auto Edit, which aid in sequencing and timing CD-to-tape transfers. Cueing and search operations may be operated in single- or ten-frame increments, and pitch is variable in 0.1% steps up to ±9.9%. Output connectors include AES/EBU and balanced analog XLRs and both analog and digital RCA. Price is $900.

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FAIRLIGHT 24-BIT UPGRADE

Fairlight (Culver City, CA) has announced its intention to deliver 24-bit capability on the Fairlight FAME and MFX3^{plus} platforms. Both Fairlight systems already incorporate 40-bit floating point internal processing, so the upgrade to 24-bit digital I/O can be implemented without affecting the systems' processing power. The A/D and D/A converters in the FAME and MFX3^{plus} systems will remain at 18-bit resolution.

Circle 333 on Product Info Card

PHILIPS SOUND ENHANCER

Philips Key Modules (distributed by Mackenzie Labs, Glendora, CA) announces a new version of the Professional Sound Enhancer. The IS 5022/F3D Advanced Professional Sound Enhancer includes two Philips DAC7 stereo 20-bit converters, and S/N, THD and dynamic range specs have been upgraded. The IS 5022/F3D features a range of DSP functions, including declicking, noise reduction, stereo enhancement, EQ, jitter removal and sample rate conversion. I/Os include both analog and AES/EBU and S/PDIF digital. Retail: $3,450.

Circle 334 on Product Info Card

ASC CUBE TRAP

The Cube Trap from Acoustic Sciences Corporation (Eugene, OR) is a 15x15x40-inch rectangular bass trap designed for corner loading. Resembling a hi-fi speaker cabinet, the Cube Trap is covered in black grille cloth, has black lacquer end caps and can function as a monitor stand. Available singly, or $739 a pair.

Circle 335 on Product Info Card

GML DIGITAL FILTER

George Massenburg Labs (Van Nuys, CA) introduces the GML 9550 8-band digital noise filter. Jointly developed with the Walt Disney Company, the GML 9550 removes low- to medium-level noise artifacts from archival sources, and has many "clean up" applications in music and post recording. The unit has a rackmount processor and desktop controller with eight sliders, each controlling a digital filter. I/Os are digital AES/EBU, S/PDIF (co-ax and TosLink optical), plus external word clock. Price is $4,500.

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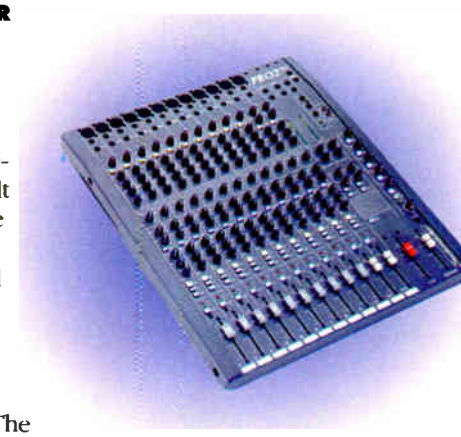
STUDIOMASTER PRO 2

Studiomaster's (Anaheim, CA) PRO 2 mixer is offered as a rackmount 12-channel model 163 ($849) and a desktop 16-channel model 203 ($1,049). Features include balanced mic and line inputs, 3-band EQ with mid sweep, 100Hz highpass filter, channel mute, five aux sends, and 60mm faders on each channel. Two stereo input channels can accept both mic and stereo line inputs simultaneously and two additional stereo line inputs with limited EQ. Channels are assigned to an L/R and/or a mono output. Additional features include 48V phantom power and comprehensive solo/AFL and cueing features.



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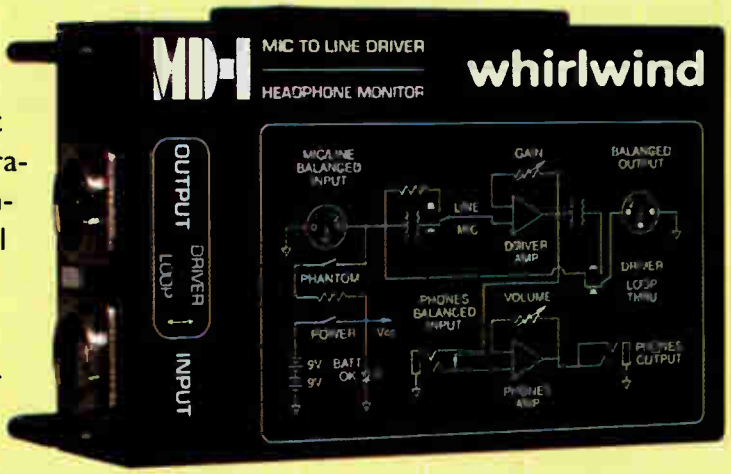
A Portable Mic-to-Line Driver with Phantom Power and a Built-In Headphone Amp.



The Whirlwind MD-1 combines a high quality mic/line input stage with a transformer-isolated line driver and independent headphone amplifier. It's ideal for boom, parabolic and interview mics, and provides phantom power, local monitoring and a line-level balanced output for noise immunity over long cable runs.

The MD-1 is housed in a rugged steel chassis designed to easily withstand the wear of daily professional use. It comes with a belt clip and is powered by two standard 9V alkaline batteries that are accessed through press-latch trays in the side of the unit (changing batteries does not require opening the case).

The MD-1's input stage features a level control with a 40dB range and a MIC/LINE input level switch, plus switchable 18V phantom power for condenser mics. Its output can be switch selected between the isolated gain stage and a straight loop-through.

The headphone Volume control provides a 60dB range of adjustment to the post-transformer input signal or to signals inserted at the headphone Line In jack. Because of its flexibility, the MD-1 is an ideal general purpose audio signal tester and amplifier for the production toolbox. It's another great audio problem solver from Whirlwind.

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PREVIEW

MIC PREAMP CORRECTION

The following section was inadvertantly left out of the Mic Preamp article in the March *Mix*:

The system 9098 Remote Contolled Microphone Amplifier (RCMA) from Amek (U.S. offices are in North Hollywood, CA) is a 4-channel mic pre with analog and optional digital outputs. Each RCMA mic channel has a gain range of 66 dB, adjustable in 6dB steps (with digital output option fitted, gain is 71 dB in 1dB steps) and features phase reverse, phantom power, ground lift, mute and monitor functions. The input section is identical to that on the Rupert Neve-designed Amek 9098 console. Selection, naming, grouping and gain-setting for each channel are effected via an LCD screen, cursor keys and a multifunction rotary control. Up to 16 setup configurations may be stored and recalled. The optional digital output replaces the distribution circuitry and provides 20-bit, 64x oversampled AES/EBU output; both analog and digital outputs are available simultaneously. Retail is $5,705, and up to 16 RCMA units can be remotely controlled at one time.

Amek's System 9098 Twin Microphone amplifier is a one-rackspace device with two separate channels, each with microphone amplifier and direct inject input. Maximum gain range is 72 dB with switched and fine gain controls. High-pass filter, mute switch, 7-segment LED meters, phase switch and phantom power are standard. Stereo operation is possible, and A-B and M/S (main and side) decoding circuits with width control are included. U.S. list price is $1,710.

Designed for ENG or field recording applications, the MP1 from **Beyerdynamic** (Farmingdale, NY) is a battery-powered mic preamp in a compact, rugged case. Retailing at $799, the MP1 supplies 48VDC for phantom powering of condenser microphones, and the unit is powered via two standard 9VDC batteries or any external 12VDC source.

Beyer also distributes SPL (Sound Performance Lab) products. SPL's MikeMan ($699) is a 2-channel studio preamp based on the acclaimed SSM 2017, which provides an EIN spec of -128 dB. Features include line and mic inputs, 48V DC phantom power, phase reverse switches, 10-segment LED peak meters, and balanced and unbalanced outputs, which can feed two different sources simultaneously. Transformer inputs and outputs are optional. Priced at $1,399, ProMike is the professional version of MikeMan, adding servo-drive technology, double-ground shielding, variable high- and lowpass filters, 7-pin XLR input for stereo mics, 20-segment LED peak metering and three outputs per channel.

HOT OFF THE SHELF

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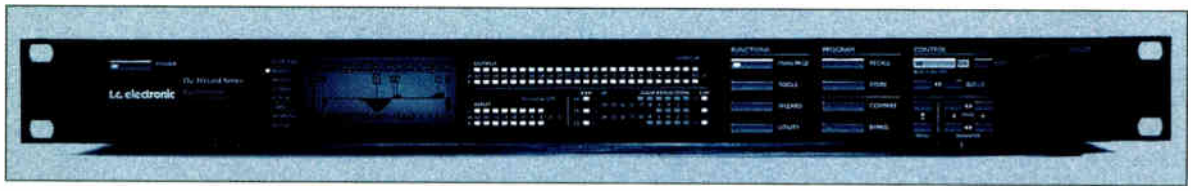
TC ELECTRONIC FINALIZER

STEREO DIGITAL PROCESSOR



A great mix usually comes together in the final moments of the mixdown process. Often, it's the final tweaks to the stereo bus (and not individual channels) that make all the tracks gel. To this end, mixdown (and remastering) engineers often enlist an assortment of favorite outboard boxes (converters, compressors, tube processors, etc.) to strap across the stereo bus output of their console. Wouldn't it be more convenient if all that processing power was under one hood? Preferably a digital hood, so you could store your settings for future recall and editing? That's exactly the idea behind the TC Electronic Finalizer.

The Finalizer is a single-rack-space, stereo digital processor containing a slew of processing options strung together in series: EQ, analog emulation, stereo width adjustment, de-essing, normalization, expansion, compression and limiting. You can use most, but not all, of these processors simultaneously, or individually bypass any you don't want to use. The order in which the processors are chained together is preset and can't be changed. The Finalizer offers a variety of ways to get in and out of its digital domain. These are all on the unit's rear panel.

The Finalizer can be placed between your mixer's stereo bus output and your mixdown deck, or—in a remastering context—between, say, two DATs or before or after a signal entering/exiting a workstation. Separate left and right analog inputs and outputs are provided on four XLR balanced connectors. These are linked to 20-bit (4-bit, 64x oversampling) A/D converters and 20-bit (1 bit, 128x oversampling) D/As, respectively, and can also be wired to accommodate unbalanced gear. Digital I/O is provided in both S/PDIF and AES/EBU formats via coaxial and XLR connectors, respectively. The maximum wordlength is 24-bit for AES/EBU but is limited to 20-bit for S/PDIF. The omission of word clock I/O ports limit the unit's usefulness in complex digital multitracking setups, but the Finalizer is first and foremost a mixing/remastering device. The unit can lock to any incoming sample rate between 30 and 56 kHz. Rounding out the unit's rear panel are MIDI in/out/thru ports (for effecting remote program changes), power switch and connector for the detachable AC cord, and a momentary-type footswitch input. The latter can be used to bypass processing, or for foot-controlled activation of a digital fade in/out.

The Finalizer's front panel has a plethora of meters, status LEDs and page/menu/parameter access buttons (plus the ubiquitous adjust knob for editing parameter values and scrolling through stored programs). All the usual facilities are there: edit, name, store, recall, compare...It takes a few hours to really familiarize oneself with the entire territory, but once you do, the user interface is quite fast. A fairly large LCD screen provides a wealth of information, including graphical displays of status and operational parameters. Of special note are Finalizer's dual, 26-segment, high-res LED output meters; sample rate indicators (LEDs indicating lock to 32, 44.1 or 48kHz rate); and LEDs that indicate digital overload and when a preset has been edited. Conveniently, there's a power switch on the unit's front panel. A PC card slot provides additional RAM for storing custom programs—you provide the 64KB memory cards it uses. The Finalizer ships with 25 ROM presets and 128 user RAM slots.

BY MICHAEL COOPER

AROUND THE BLOCK

The Finalizer uses the same software as its venerable (and much more expensive) cousin, the M5000. The processing path is arranged in separate blocks laid out in a serial chain, starting with the input section. In the input section, you can independently adjust the input levels for left and right channels, choose between analog and digital inputs, select 44.1/48kHz sampling, and/or tweak the front end's 2 to 200Hz low-cut filter. Dual 10-segment LED ladders on the unit's front panel offer adequate, though not high-resolution, input metering. Maximum input level is +21.8 dBu, which should be sufficient for interfacing with most gear. However, my Yamaha 02R Digital Console's +4dB analog outputs would clip the Finalizer's A/Ds whenever I ran the console's mix bus above -6 dBFS, curbing the maximum resolution of the console's 20-bit D/As. The solution was either to stay in the digital domain (precluding analog processing options), use external attenuators before the Finalizer's analog front end or, as a last resort, use the 02R's unbalanced -10dBV analog outputs to feed the Finalizer.

One of my first tests of the Finalizer was an A/B test of its A/Ds in comparison to those provided on the Panasonic SV-3700. The Finaliz-

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er's 20-bit converters (dithered to 16 bits) sounded a tad warmer, fuller and smoother (i.e., less "glassy") than the SV-3700's converters. But the difference was subtle.

After the input section comes the Finalizer's EQ block, which offers five bands of very flexible and musical stereo EQ. All five bands give excellent control over corner frequency, boost/cut (±12 dB) and slope. The high and low bands are overlapping shelving filters. The three middle bands are fully parametric (bell curve); each equalizer covers a 20 to 20k Hz range and is capable of both notch filtering and broad tonal shaping. Additionally, the EQ block has its own master output gain control (±12 dB).

Next in line is an "insert" block. Here you can choose between one of three algorithms: "digital radiance," stereo adjust or de-essing. You can only use one of these algorithms at a time, but the one you choose can be used simultaneously with any or all of the Finalizer's other processing blocks.

The "digital radiance" algorithm adds second harmonic distortion to your program material, adding thickness and beef to a mix and raising its perceived level. The effect sounds similar to tube processing and can be dramatic when pushed hard. On the downside, however, it also tends to fill in all the air in a mix and scatter the soundstage localization a bit. Use with caution—a little goes a long way.

The "stereo adjust" algorithm is a remastering tool useful for correcting mixes having too much or too little effect, or a lop-sided stereo image. Set to 100% stereo, it eliminates all center-panned, dry elements of the mix, leaving only effects. At the other extreme (100% mono), hard-panned elements—including reverbs—are greatly attenuated but not completely eliminated, thus giving a boost to center info (e.g., dry vocal, kick, snare, bass). The Left/Right adjustment control does not just heap everything to one side of the mix but also attenuates what's on the side you're panning away from. That is, at 100% right setting, elements that are hard-panned left are eliminated and the entire mix comes out of just one (right) speaker. Obviously, you'll be using much more moderate settings than these in practical situations.

The third "insert" algorithm is a de-esser. This processor worked surprisingly well on some wretched, old stereo program material I dragged out of my haunted past—it tamed excessive sibilance without creating any dynamic dips in the mix. There's no metering for gain reduction here. However, you know when you're above threshold when a status LED (labeled "working") lights on the unit's front panel.

After the insert block comes a normalizer that's capable of adding up to 18 dB of gain. It optimizes your program level to eke out every last scintilla of headroom. A built-in clipper can be set for soft or hard action; a front panel LED lights whenever it kicks in.

The next three blocks are an expander, compressor and limiter, in that order. These all offer frequency-dependent, multiband operation. You get dynamics control over three frequency bands, defined by adjustable crossover points common to all three processing blocks. The crossovers affect the audio path (as in a "dynamic equalizer"), offering a lot more power and flexibility than mere sidechain filtering. Threshold, attack and release controls are independently adjustable for each band and each dynamics processor (ratio controls are added for the expander and compressor). The audio signal can be slightly delayed so that the processors can "look ahead" for more accurate triggering. Make-up gain is automatically applied to the compressor's three bands, but you can adjust post-compression

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gain independently for each band. You can even set the compressor's detection scheme to peak, RMS or somewhere in between. Separate 10-segment LED meters on the Finalizer's front panel show gain reduction for each of the compressor's three bands. Additional status LEDs show when limiting or expansion is occurring in any of the three bands.

The expander only offers a 40dB range of attenuation and is mostly useful for gating out noise at the start of a mix. I could not gate out a drumstick count-off to a song without gating the wanted program material.

The Finalizer's compressor and limiter sound quite good. With the proper settings, you can get more level and punch out of your mix without any pumping. However, a pair of stereo-linked Aphex Expressors provided a creamier fatness to the same mixes that I just couldn't get with the Finalizer, no matter how I fiddled with it. The Expressors produced a noticeably bigger bottom, fuller low mids and silkier highs. In fact, I've yet to hear any digital compressor deliver the impact and thickness that a good VCA lends to a mix. And this is coming from a self-professed digital cheerleader.

Finally, we come to the Finalizer's output block. Here you can select your digital wordlength from 8 to 24 bits (anything below 24 bits is redithered appropriately), the analog L/R output level (all outputs, including digital, are hot at all times) and the parameters for an outstanding digital auto-fade function. The auto-fade can be activated by the adjust knob or foot pedal to fade a mix up or down in .05 to 60 seconds. The fade curve can be either linear or exponential; either way, it's very smooth.

EXTRAS

Neophytes will appreciate the Finalizer's Wizard function, which automatically chooses appropriate parameter settings based on your answers to four basic questions regarding the program material you wish to process. Several highly useful software tools are also provided. A level flow meter shows you the level in each processing block, making it easy to track down overloads at a glance. An infinite peak hold LCD output meter holds the peak reading even if you switch to another page/function, which is important. The phase correlation meter is helpful on more than just mixes; while tracking solo classical harp, it proved to be useful in monitoring the phase relationship of the two mics I had up. A 1kHz calibration tone is also available.

CONCLUSIONS

The Finalizer offers a lot for $2,495. It also offers enough rope to hang the immoderate user. That's a good thing. I don't like boxes that decide for me when enough is enough. But, brute force engineering aside, the Finalizer also gives the experienced user the ability to tweak a mix subtly.

My search for a digital compressor that sounds as good as analog models is unfortunately not over. But the Finalizer sounds considerably better than other digital compressors I've heard. And the unit offers a number of highly useful algorithms other than compression. The EQ, normalizer/limiter and auto-fade functions are particularly good. If you're looking for a grab bag of mastering tools at an affordable price, the TC Electronic Finalizer is worth a listen.

TC Electronic, 705A Lakefield Road, Westlake Village, CA 91361; 805/373-1828, Fax 805/379-2648; email: tcus@tcelectronic.com; Web site: www.tcelectronic.com. ■

Michael Cooper is a producer, engineer and owner of Michael Cooper Recording in Eugene, Oregon.

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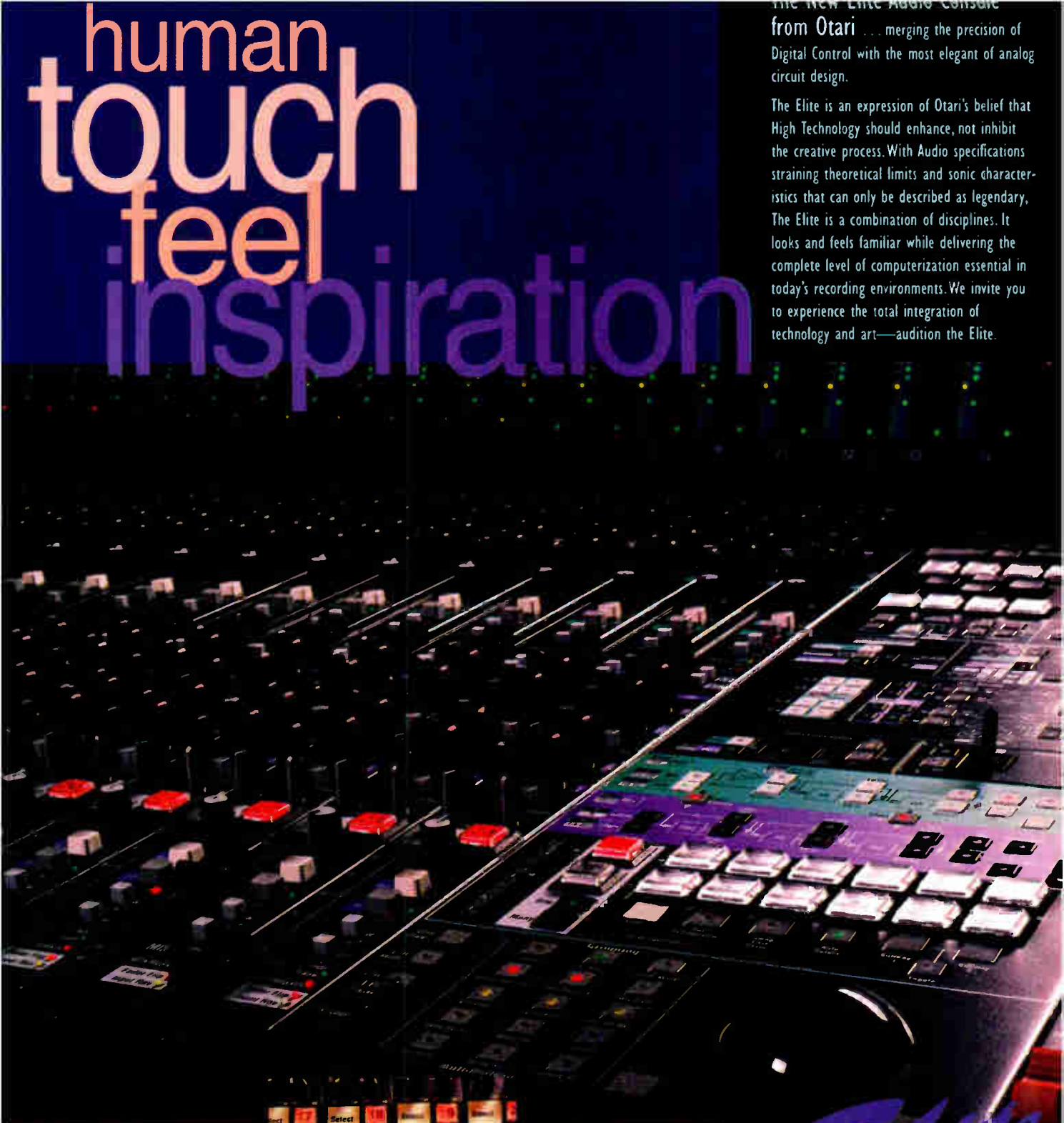

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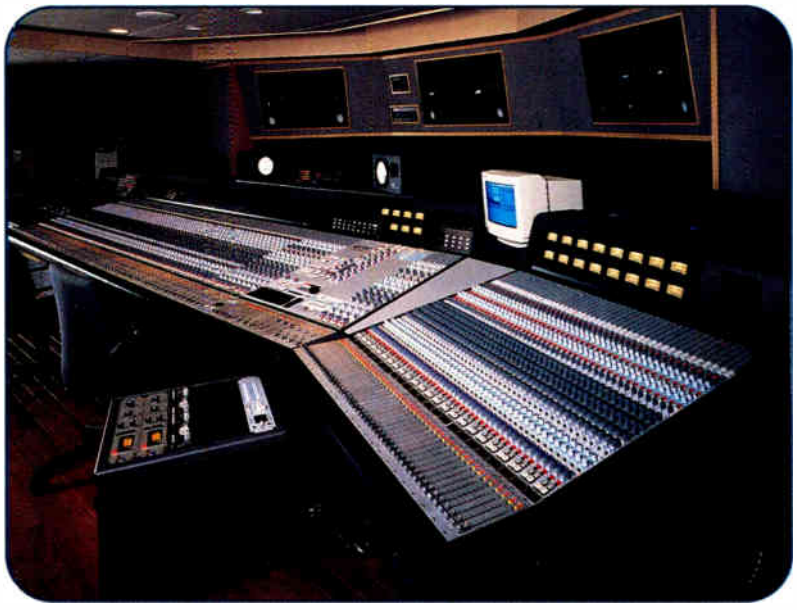
AMEK 9098

ANALOG RECORDING AND PRODUCTION CONSOLE



The Amek/Rupert Neve-designed 9098 Analog Recording and Production Console epitomizes a number of outstanding superlatives. It is a piece of technology that literally dominates a control room in a way that a lesser brand does not: It sounds magnificent (due in no small part to an attention to sonic detail that escapes many console designers), and its user interface is as intuitive as anything I have come across in many years. And why shouldn't this be the case? Amek has been building highly regarded mixing systems for close to 23 years now, and in 1990 the firm hired Rupert Neve to design an ultimate analog console: the 9098. Rumor has it that he was given *carte blanche* to not only include many of his well-known design elements, but also to extend the analog envelope. (The console's numeric designation, incidentally, appears to point to a continuing tradition from Mr. Neve's former manufacturing involvement; a chronology that also hints of possible things to come!)

Close to four years in gestation, the result—to my ears—is one of the sweetest-sounding consoles I have heard. The EQ section alone is simply superb—no great surprise to anybody familiar with Rupert's previous handiwork. All in all, the Amek 9098 is the kind of board that, sadly, too few of us will get to experience. Its one downside, of course, is that such a board doesn't come cheap—but it's one that leaves you with the distinct feeling that *all* consoles should be built this way.

There are no "standard" configurations: All 9098 consoles are priced on an individual basis. Typical prices range from $600,000 for a 24-input/24-monitor system with Amek's SuperMove moving-fader automation and Recall, to $740,000 for a larger-format, 48-input/48-monitor configuration (similar to the system I used during my evaluation session at CBC, Vancouver). In addition to fader automation, SuperMove also includes real-time automation of up to 198 switch functions per module, offline editing of mix data, Virtual Dynamics and SuperLoc machine control.

OVERVIEW: ERGONOMIC PLUS SONIC PRECISION

In every respect, the 9098 commands your attention. The module width, for example, is larger than anything you are likely to see on a current-generation console: 45 mm, instead of Amek's usual 35 mm. The front panel also lacks any dual-concentric knobs or controls that serve several functions. Instead, there's an uncluttered user interface that is easy to understand at a glance, and one that lets you reach the targeted control in an instant. All buttons and switches are large and well-labeled, and most controls are color-coded for easy line-of-sight scanning down the width of the board. And what knobs! Their retro look is very reminiscent of designs from the '70s, with a great feel and easy-to-park center detents. The possible bad news, of course, is that such a console is now far from petite; expect to be moving around a lot on a 9098, as you reach for controls located either side of the central sweet spot.

Configurations can be built from 32- or 24-position buckets, married to double- or single-width jack bays, in a typical split-configuration layout, with separate mono/stereo input modules, and dual-input monitor strips. As an example, consider a typical "serving suggestion" quoted by Amek for a larger music-recording facility: a frame that accommodates a total of 88 module positions, made up of two 32-position chassis plus a single 24-position bucket, enabling a 48/48 configuration to be built up from 48 of Amek's Model 9098A mono input modules and 24 Model 9098K dual-input monitor modules, with space for up to eight Model 9098L stereo input modules to be added at a later date.

All master, monitor and control functions are handled from a multi-module center section. The console's normal presentation is in a straight line; curved, L-shaped or winged configurations are also

BY MEL LAMBERT

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available at extra cost. Unless custom jackfields are specified, the 9098 normally includes a sufficient number of patch points to cover the installed modules and monitor section, plus 96 spare holes for external sources and other devices.

The console's standard metering system uses traditional VUs: 48 meters read bus/tape signals; six master VUs read LCRS and stereo signals. Plasma meters can also be supplied, in addition to PPMs and ancillary Phase Correlation indicators.

By offering three basic input modules as building blocks, Amek has hedged its bets, as the user can mix-and-match inputs and outputs to suit the specific application. For added flexibility, the 9098A mono input module accepts mic, line, tape and/or bus sources, with dedicated panning modes for a variety of mixing and post situations, including multichannel film and TV. Signal-flow configurations on the console are set up from a bank of Master Status switches in the center section but can be reversed on any channel with a local switch. Six Master States are available: Direct, Broadcast, Record, Mix, Film and User.

At power-up, the 9098 console defaults to Mix status, with the 9098A tape input being routed to the main stereo bus via the fader, multitrack routing being assigned to cue A, 9098K monitor inputs to off-tape, and all outputs to the left and right mix bus. (Master Direct mode assigns the channel path in the 9098A modules to the corresponding direct output, with the 9098K monitor modules selected to tape input.)

In Broadcast mode, the 9098A module's mic/line is selected to the stereo bus via the fader, and the multitrack busing is derived from cue A. Record mode selects the 9098A's mic/line input to the multitrack assignment, disconnects the output to the stereo bus, selects all the 9098K monitor inputs to off-tape and routes all monitor channel outputs to the stereo bus. Film mode is currently configured to select cue A to the 48-track bus and engage LCRS panning, while providing Solo and Mono to the center speaker only. Film mode also provides for stereo surround monitoring, enabling 5- or 6-channel monitoring in conjunction with the main control room monitors. Finally, User mode currently clears all settings on the console; as with the Film mode,

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this setup may eventually be configured via Amek's SuperMove automation system.

As will be appreciated, these master modes enable a number of important system configurations to be set up at the press of a button. In addition, a series of Secondary Function Status switches on each module select tape or Group/Bus input to the corresponding 9098A or 9098K module.

A Channel mix-minus/direct output is also available from each 9098A module as required, to provide a pre- or post-fader feed from the module to the patchbay insert send. (Usefully, when this mode is selected, the direct level control is automatically inserted into the signal path.) In addition, simultaneous access is provided to multitrack routing and mix buses from the main pan control.

In addition to a record input on each 9098A module, which provides access to the mic/line switch, a Subgroup setting selects the relevant bus signal, allowing that channel to be used as an audio subgroup. (Mix bus amplifiers are located on either 9098A or 9098K modules.) Tape feeds the output of the same-numbered track on the tape machine to the channel, allowing tracks to be replayed through the console in mixdown mode.

Inputs may be routed to a total of 48 buses in two banks of 24, the default source being the channel fader, post panpot; alternatively, the routing can be sourced from either cue A or cue B. The 9098 has four stereo buses—(A, B, C and D)—plus a main Quad mix bus, denoted LCRS. A powerful multimode pan in the 9098A Mono Input module can be used in a variety of film/TV applications. In stereo mode, the Main panpot operates between any pair of odd/even numbered buses, including the stereo buses; if the LCRS switch is pressed, it also sends to the L and R Quad Master bus. In Quad mode, the Main pan feeds selected consecutive pairs of left and right multitrack buses, while the Surround pan accesses the next selected consecutive pair of buses. In LCRS mode, four consecutive buses are selected, with Main pan outputting left, center and right signals to the first three buses, while Surround pan feeds the fourth bus. In Stereo Surround mode, cue A is fed from the surround signal and assigned to a stereo bus to provide 5-channel panning.

Mic and line inputs feature Rupert Neve's TLA (Transformer-Like Amplifier), which accepts high input levels (in excess of +20 dBu) and is described as simulating the performance of a transformer. Up to 72 dB of mic gain is available, with ±6dB trim, and +48V phantom power; line, tape and Sub gain is set by a -18/+6dB trim. Two insertion points are provided in the signal path, each with an automated In/Out switch; Insert #1 can be selected post-EQ or post-fader, and Insert #2 selected either pre-EQ or to the Dynamics side chain.

THE EQUALIZATION

The 9098A's EQ section is a jewel. In addition to individual highpass (22-300 Hz) and lowpass (4.3-25 kHz) filters with 18dB/octave roll-offs, four parametric bands are standard: HF with switched center frequencies at 2.5/3.8/5.7/9/13/20 kHz (a rotary control provides continuous transition from peak to shelf response); LF with center frequencies at 30/48/66/100/160/270 Hz (default curve setting is shelf, although a peak-response curve can also be selected); HMF (High-Mid Frequency) with a frequency range of 500 to 5k Hz (a x5 switch shifts the range to 2.5k to 25k Hz); and LMF (Low-Mid Frequency) with a frequency range of 20 to 200 Hz (x5 for 100 to 1k Hz).

Each band offers ±18dB cut/boost. A Notch facility on each midrange section creates a steep notch of 25-30 dB. Three

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in/out switches enable all EQ sections, just the two midrange, or the HF and LF sections to be selected and automated via SuperMove. A remarkable Sheen control fitted to the HF section substitutes a gentle slope in place of the normal steep response curves, and enables a softer EQ profile to be added to a signal. A similar-function, Glow, in the LF section substitutes a gentle slope in place of the standard Bell/Shelf, for a more rounded EQ response—a useful tool when subtlety is needed, rather than brute adjustment.

The 9098 features 16 aux sends. On the 9098A mono channel, these are grouped as two stereo cue sends—A and B—plus one stereo aux send and eight mono sends. For enhanced flexibility, cues A and B can be selected to alternative sets of buses. Each send features a Mute switch that can be automated via SuperMove. Each pair of sends boasts a Pre/Post switch. Cue sends A and B can access the 48 multitrack buses, while cue A can also access the stereo buses. A mono switch on each cue converts the panpot to a second level control feeding the even-numbered buses. (As if that wasn't enough, cue A can also be selected to any of the four stereo buses.)

Several Solo modes are available, controlled from the Master section and automated via SuperMove. The mute switch is also automated by SuperMove. A 104mm moving fader is augmented by a 4-segment PFL meter showing overload, zero level, -15 and -40 dB. (Overload Threshold is set from the center section.) A useful multi-segment gain-reduction meter operates in conjunction with Virtual Dynamics. Automation comprises a familiar array of Read, Write, Touch Write and Update buttons. Automated switches on the 9098A module include mono/stereo aux and cue mutes; EQ, Dynamics, Insert 1 and 2 in/out; mute; Solo; and Solo Safe.

Designed primarily for returning external signals, the 9098L module incorporates a stereo input channel and stereo effects (FX) return path. Both MS or A/B stereo signals can be processed, with image-width control and dual-channel EQ. Full 48-track routing is also provided, in addition to simple assignment and panning to the main stereo buses.

The FX return path features four dual-mono aux send level controls that can be routed to the 16 available buses in various combinations, with pre/post switching. The stereo channel enables either stereo line or dual group (multitrack routing bus) inputs to be selected. Again, all 16 aux buses can be accessed in various combinations, with automated Mute switches. A four-band stereo parametric and highpass filter is available within the stereo input signal path, and features controls identical to those fitted to the Monitor module. Two channels of Virtual dynamics are also provided for the stereo input. Automated switches provided on the 9098L comprise aux/cue mutes on FX return and stereo line inputs, plus EQ, dynamics and inserts in/out. The module's 100mm motorized stereo fader features similar status switches and level indicators to the mono unit.

DUAL-CHANNEL MONITOR MODULE

The 9098K dual monitor module has two identical input channels. In Split mode, the module provides two tape-return monitor channels, while for an all-input configuration it might be used for line-level sources during recording or remix. As with the 9098 mono/stereo input modules, access is provided to 48 buses, plus the four stereo (A/B/C/D) buses. Inputs comprise line, sub (input from the bus output) and tape. The module can also access all 16 aux buses, via a limited number of controls. Two pairs of assignable level controls and panners can be toggled to access

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buses 5 through 14, while a pair of dedicated controls access cue buses 1 and 2 or 3 and 4. Mutes and pre-fader switches are also featured.

The module's EQ section comprises a highpass filter (20-300 Hz, 18 dB/octave) and a four-band equalizer almost identical in performance to that of the 9098A: two switched frequencies of 10 kHz or 4.8 kHz on the HF shelving band; sweep range of 1.2 to 18 kHz on the peak/dip HMF band; sweep range of 160 Hz to 2.4 kHz on the peak/dip LMF band; and switched frequencies of 46 Hz or 100 Hz on the LF shelving band. Both channels are also fitted with Virtual Dynamics. The Pan control provides standard L/R operation in 2-channel stereo mode to the 48 output buses, or any combination of the four stereo buses and the main quad bus.

THE CENTER SECTION

Occupying eight module spaces, the 9098's center section houses monitor source, control and master status functions, plus faders for the stereo buses and main mix outputs. A stereo bus matrix features four sections that enable any of the four stereo buses to be mixed into any of the other three and/or the main Quad mix bus. The master section normally boasts six VU-response meters: four for the LCRS sources and two to stereo sources, with individual input selection. In addition, a useful control enables thresholds for peak indicators used throughout the 9098 console—channel threshold, track meters threshold and main meters threshold—to be set between +8 and +22 dB.

A bank of ten master switches controls the stereo Solo system, and selects PFL, AFL and Solo-In-Place modes. Channel and Monitor Solo Safe are also available. Master Pan modes can be selected from four modes, labeled Stereo, LCRS, Quad and Stereo Surround; Master Pan forces all 9098A mono input modules into the selected format, with corresponding monitor reconfiguration. A total of 28 sources—18 internal and ten external—can be selected to the control room monitors, which in turn can be toggled between main speaker 1 (a Quad speaker system); main speaker 2 (a second four-speaker array); stereo near-fields 1/2. (LCRS sources are sucked down to Left and Right for the stereo meters and near-fields). Talkback can be routed to aux 1+2, aux 3+4, cue 1, cue 2, aux Group A, aux Group B, Comm A, Comm B, Slate, Mix and a studio output.

DYNAMIC AUTOMATION WITH RECALL

Amek's powerful SuperMove Moving-Fader and switch automation is similar to the firm's SuperTrue VCA-based software used on other consoles. Running on an IBM-compatible Pentium PC, user control is via a 2-button trackball and a QWERTY keyboard with dedicated function keys for standard modes. Fader resolution is 12-bit (4,096 steps) and 256 steps/full travel for rotary controls.

Cue list allows various console and external MIDI events to be triggered against timecode, while Mix Processor provides offline editing of mix data. All conventional operational modes, including Read, Update-VCA, Update-Servo, Write, Touch-Write and Isolate are provided, either globally or on a channel-by-channel basis. Any channel can be a slave or a master, and a master can itself be a slave for Grandmaster/Master/Slave operation.

A subprogram within SuperMove automation, Virtual Dynamics allows a VCA within each signal path to be controlled from an onscreen icon, and set up for compression, limiting, expansion, gate etc. Settings can be saved and loaded with the Title data (such as Cue Sheet, Channel List, etc.). A single VCA is provided in each channel for the Virtual Dynamics and to provide a VCA-style update/grouping mode, but it can be bypassed to provide a VCA-free signal path.

SuperMove's Recall system enables up to ten different console-surface snapshots to be stored within each Title. Aside from certain controls in the monitor section, all pots and non-automated switches are provided with Recall. Onscreen graphics allow recorded values to be matched quickly and easily with their current settings by matching physical with the indicated positions. A Recall Mask function enables only certain functions to be recalled. Voice Recall can be used, which sets up the PC to tell the operator which settings should be reset. An auto-scan function can also be selected to locate only those controls that vary from the positions held in memory. Very neat.

Amek's SuperLoc timecode transport controller operates within SuperMove, and provides various remote and autolocate functions. Function keys provide single-key operation of such tasks as GoTo Cue, Cycle, GoTo & Play, plus more basic functions. A Jog/Shuttle wheel is also provided. Currently, two tape machines can be controlled via an Adams-Smith Zeta 3 synchronizer, or a Motionworker for five-machine setups; the software is being enhanced to provide control of other brands and models, and to provide MIDI Machine Control.

THE AMEK 9098: FINAL THOUGHTS

I have rarely enjoyed the experience of exploring a new console so thoroughly, nor have I been more delighted at the outstanding quality of the console's construction and general user interface. Time spent on this console is a rare treat. Sure, it's a large real estate in today's space-hindered control rooms. But once you map out the front panel functions, determine where everything is, come to terms with the central mode switching, and load an automation file with some respectable source material, the console flies!

Reach for outrageous amounts of EQ without the board protesting; dial in creative dynamics sections to keep you out of trouble, and then build the mix as you go. Everything feels solid and behaves as it should. All mix data handles securely and reliably, with transparent access to different modes. The Amek 9098 doesn't come cheap. But for studios looking for a no-compromise signal path, allied with bullet-proof computer control of all essential functions, the Amek 9098 sets new benchmarks of creative power, intuitive response and sonic performance. An exhilarating experience!

My sincere thanks to Don Pennington, Manager of Resources, Radio; and Peter Schell, Manager of Radio Technical Services, at Canadian Broadcasting Corporation, Vancouver, for providing me with access to the organization's large-format 9098 in Studio 1. Designed and constructed in 1973 as a joint venture between CBC Engineering Headquarters' Reginald Penton and the acoustical consulting firm of Barron, Strachan's, David Brown, Studio 1 is used for a number of orchestral sessions, and serves as the "home studio" of the CBC Symphony Orchestra.

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Mel Lambert currently heads up Media&Marketing, a consulting service for pro audio firms and facilities.

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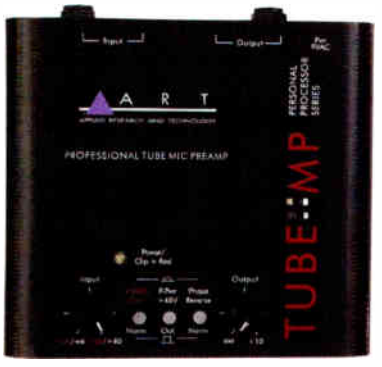

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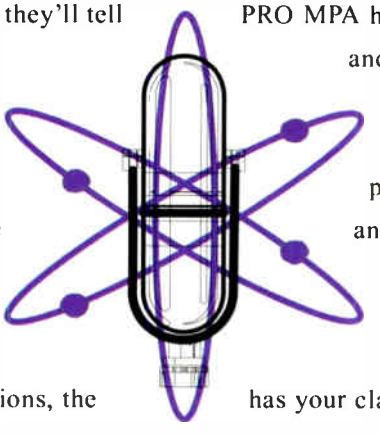

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YAMAHA REV500

DIGITAL REVERB

Yamaha's REV500 is a straightforward, low-cost reverb effects device with a few added twists. It uses third-generation DSP chips, with 20-bit oversampling converters. By scaling down its ProR3 processor, Yamaha has introduced a 'verb that will become an instant hit with budget-minded engineers.

At a retail of $499, there are a few compromises to this unit, but you'll be hard-pressed to find a better-quality reverb at this price point. The REV500 is destined to become standard equipment in small studios as well as dual-effect, single-console club systems, which will give it a wide user base.

The REV500 succeeds as a product that can be used *sans* instruction manual, and its user-friendly display and soft-knob user interface are encouraging. Its memory is organized into four banks of 25, by type of effect: Hall, Room, Plate and Special. Under each of the four program types, there are 25 presets and 25 user memories, for a total of 100 each. Changes are stored into user memories that are initially identical to the factory presets. The REV500 asks for confirmation of store commands with a second press of the store button. Modified presets are limited to being stored into one of the 25 user locations within the effect-type bank.

Instant access to the four main parameters is offered by rotary encoder "soft knobs," dedicated to Pre-delay, Reverb Time, Hi-ratio and Early Reflections (ER) level. A large, backlit soft-green LC display switches from the digital readouts of the four parameters to show changes as they're made. Adjusting one brings up a graphic representation of the effect's envelope, showing how the change moves the shape of the effect. A moment after adjustment, the display returns to the numeric readouts of the four main parameters. Pre-delay can be adjusted up to 200 milliseconds, reverb time from 0.3 up to 99 seconds, the Hi-ratio rolls off the reverb's high frequencies from 1.0 down to 0.1, and the early reflection level is adjustable from 0 to 100. Push the Effect Level key and the ER knob also controls the effect's level, adjustable from 0 to 100. Each of these five parameters responds to MIDI Control Change messages in real time from controller numbers 12 through 16. Using my Lexicon MRC controller with a generic setup, I had LARC-like control of the four main parameters; or changes can be automated via a MIDI sequencer.

The utility menu's first page, called INT. PARAMETER, allows control of up to eight additional parameters for each preset, with the first soft-knob scrolling and the second adjusting. Four additional parameters are common to all reverb algorithms. These are Lo-ratio, Diffusion, Highpass filter and Lowpass filter. Three more parameters, Density, ER Liveness and ER Delay, are unique to the "reverb-only" effects.

Though it offers nine types of compound reverb effects, the REV500 is pretty much a dedicated reverb. There are two to four additional parameters for controlling the extra functions. Seven of these compound effects follow the reverb in series with a gate, resonator, dynamic filter, chorus, flanger, symphonic or tremolo effect. An echo-reverb preset uses pre-delay feedback to create an echo effect, which is then mixed through the reverb block. Finally, a reverb-plus-chorus effect places a chorus in parallel. Although low reverb times and low levels of diffusion can be used to reduce the balance of reverb in these compound effects, there will always be some level of reverb. Other than

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shortening the 'verb time to 0.3 seconds, it's not possible to run effects without reverb. For example, it's not possible to merely use the early reflections as a delay or multidelay effect. It's best to think of the REV500 not as a multi-effects box, but as a dedicated, parameter-adjustable reverb with enhancements.

Rear panel connections are pairs of XLR and ¼-inch jacks for inputs and outputs with a +4/-10 switch for each, a footswitch jack and two MIDI connectors. Other utility menu items include title edit, input-, output- and footswitch-mode select, MIDI settings and editing of the start-up message that appears for a few seconds when the unit is first turned on.

Though this is a stereo machine, the REV500 is by no means able to split control of parameters between channels. The input can be stereo, or fed mono from the left input only, and the output can be either effect-only or combined with the source with the effect level parameter affecting the wet/dry balance; these are indicated on the LC display, as is the balance, when adjusted. A footswitch can be used either to mute or advance the program according to the MIDI change map. A unique feature of the REV500 is its built-in sound demonstration source, either a snare drum or cross-stick sample, providing a clever way to audition presets without an external input.

The REV500 isn't a one-box solution to everyone's multi-effects needs, but it does fill the "great little 'verb" market niche nicely. Those on a budget who need a dedicated reverb will find it an outstanding value in a parameter-adjustable effect. Access to the four main parameters makes it a snap to get a sound quickly, and another half-dozen parameters, while not as accessible, are available for further tweaking. Possible applications include monitor rigs that suddenly need a little extra processing for in-ear monitors, clubs that need parameter-adjustable effects, groups on their first interstate tour that need a dependable pop snare drum sound, or as a second or third device in a studio or road rack. Many effects racks will find a REV500 just the addition that will please operators without breaking the owner. The bottom line: Here's a clean, quiet reverb with nice definition that is comparable to big-ticket reverbs.

Yamaha Professional Audio, 6600 Orangethorpe Avenue, Buena Park, CA 90620; 714/522-9011; fax 714/739-2680. ■

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LEXICON MPX 1

PROFESSIONAL MULTI-EFFECTS PROCESSOR

Over the past few years, Lexicon has introduced a variety of new effects processors aimed at budget-conscious consumers. Units such as Vortex, Alex and JamMan were good values that did one or two things fairly well, but simply weren't in the same league as the more expensive professional processors that Lexicon is known for. Mid-priced units like the LXP-1, LXP-5, and LXP-15 had a wider range of effects, and a great sound for the money, but weren't particularly easy to program and operate. With a vast array of exceptional effects, nearly unlimited programming options, and an extremely friendly user interface, Lexicon's new MPX 1 is light years beyond any of those devices.

The MPX 1 has so many features that I could not possibly describe them all here. Instead, I will focus on the most significant ones, and allude to many of the others. Having used the MPX 1 extensively for several months now, I'm continually discovering more well-thought-out features or programming possibilities. Yet the MPX 1 is not difficult to operate. Its user interface is well-designed, and anyone can master its operations in no time. If you need more information about a particular function, the manual is clear and concise.

OVERVIEW

The MPX 1 retails at $1,299 and is a single-rackspace unit, nine inches deep and weighing a little over six pounds. The front panel controls and the rear I/O connectors are arranged in an intelligent, ergonomic manner. Inside, the MPX 1 offers 16- to 32-bit processing (depending on which effects are active), and 18-bit A/D and 20-bit D/A conversion. Its 60 individual effects types are arranged into six Effects Blocks, each of which has all of the features of a dedicated processor, including its own Mix, Level and Bypass controls.

The audio path through each Block is stereo, and the ordering and routing of the six Blocks is independent in each program (or group of Effects Blocks). The MPX 1 has a minimum dynamic range of 90 dB at 20kHz bandwidth, and a signal-to-noise ratio of around 95 dB.

Perhaps the single most important feature of the MPX 1 is its Multiple DSP Architecture. It takes a lot of processing power to create complex reverbs, and since most multi-effects processors rely on a single DSP for everything, the more effects you use, the less power there is for any individual effect. If you want pitch shifting, chorus and delay with your reverb, you may have to settle for a far less complex reverb, or you may not even be able to have that combination of effects at all. The MPX 1 gets around this problem by using a dedicated "Lexichip" (the same one found in the company's more expensive processors) to handle reverb, while a second DSP handles all other effects. So, you can have up to five effects active without compromising the reverb quality.

Three knobs and 19 buttons on the front panel provide access to, and control over, the MPX 1. Nine small backlit buttons select the six Effects Blocks and access the Mix, Patch, and Bypass functions. A lit Effects Block button indicates the Block that is active in the current program. Pushing it once bypasses the Effects Block, while pushing and holding it activates the Help function, and the name of the effect is shown on the display. Two slightly larger buttons allow tapping in delay times (Tap), and activating the Glide continuous controller (A/B). A large knob and two buttons labeled No and Yes select and/or modify various functions and parameters. Other buttons select operational modes (Program, Edit, Store, System) or modify the functions of other controls (Options, Value).

There's a large three-part digital display on the front panel. One part indicates headroom via two columns of six LEDs, another displays program or patch number, and a third has a two-row, 16-character display for names of programs/effects/parameters and help messages. Dialog boxes appear here for most editing functions. LEDs indicate status of digital in, clock, MIDI, tempo and A/B functions. The headroom display can indicate not only input levels, but also output levels, effect input and/or output levels, and LFO, ADR, envelope and foot pedal levels.

The MPX 1 has the usual TRS phone jacks and XLR connectors for analog I/O (switchable from +4 to -10 dB), and RCA S/PDIF digital I/O ports at 44.1 kHz. A Soft Sat analog limiter can be inserted before the A/D converters to reduce overload distortion. Analog I/O levels are set using two front panel knobs; digital levels are set internally.The A/D and D/A converters can be used independently of the DSP, which is a nice touch. There are also footswitch and footpedal jacks, and MIDI In/Out/Thru ports.

BY BARRY CLEVELAND

World Radio History

GO CONFIGURE

As I mentioned, the MPX 1's effects are arranged in six Blocks: Pitch, Chorus, EQ, Modulation, Delay and Reverb. Within the Chorus Block you will find chorus, mono flanger, stereo flanger, phaser, rotary speaker, aerosol, orbits, centrifuge 1, centrifuge 2, comb 1 and comb 2. Similarly, the Modulation Block contains panner, auto panner, mono tremolo, stereo tremolo, overdrive, and mono, stereo and dual volume controls. The EQ Block contains not only various 1/2/3/4-band equalizers, but also a frequency splitter, crossover, sweep filter and wah-wah.

Effects within the same Block cannot be combined, but the six Blocks can be configured in an almost limitless number of ways. Each Block can be assigned to one of two signal paths ("upper" and "lower") in any order, and every possible type of connection can be made between them. For example, you can split a stereo input signal into two stereo pairs, sending one pair to stereo chorus on the upper path, and the other pair to a stereo pitch-shifter on the lower path, then merge both sets of stereo outputs into the inputs of a stereo delay, then split the delay's outputs into two mono signals, running one into an auto-panner, and the other into a stereo reverb, and finally merging both sets of stereo outputs at the end of the chain.

A particular configuration of effects constitutes a program. Programs may be created from "scratch," or assembled by copying individual effects from other programs. If you like the flanger in the 480 Prime Flange program, but you'd like to combine it with the reverb in the "PCM 60 Room" program, there's no problem; you simply go into Edit mode, select Copy Effects, dial in the program that you want to copy the effect from, push that Effect Block's button, and there it is. The parameters for any effect can be adjusted in Edit mode, or up to eight of the most important parameters can be assigned to a Soft Row, in any order, and accessed directly from the program screen, without having to exit to the Edit mode at all. That makes a huge difference in live sound situations, or when making real-time adjustments on-the-fly. Parameters can also be adjusted by using the Patch function and "patching" controllers of various types to them, such as a foot pedal, LFO, the A/B Glide switch, a MIDI controller, etc.

Finally, all system parameters (including audio parameters), modes, MIDI parameters, and database settings can be stored as a Setup, and there can be up to five Setups.

The MPX 1 supports Dynamic MIDI and MIDI automation control messages, and it has a variable Control Smooth feature that filters sparse incoming MIDI data to allow for smoother parameter changes. Of course, the MPX 1 also sends and receives Program Change messages, performs MIDI dumps, creates MIDI maps and Program Chains, and sends and receives MIDI Clock messages. It even has a built-in arpeggiator!

SOUNDS

The MPX 1 comes loaded with 200 useful factory preset programs, with space for 50 user programs. The presets range from general usage programs like Small Hall, Big Chamber and Dual Tap Delays, to interesting combinations like FazerTremolo (where a crossover EQ routes the low frequencies to a phase shifter and an ambience effect, and the high frequencies are routed to a stereo tremolo), Rev Wahtouch (where a bright reverse reverb is routed through

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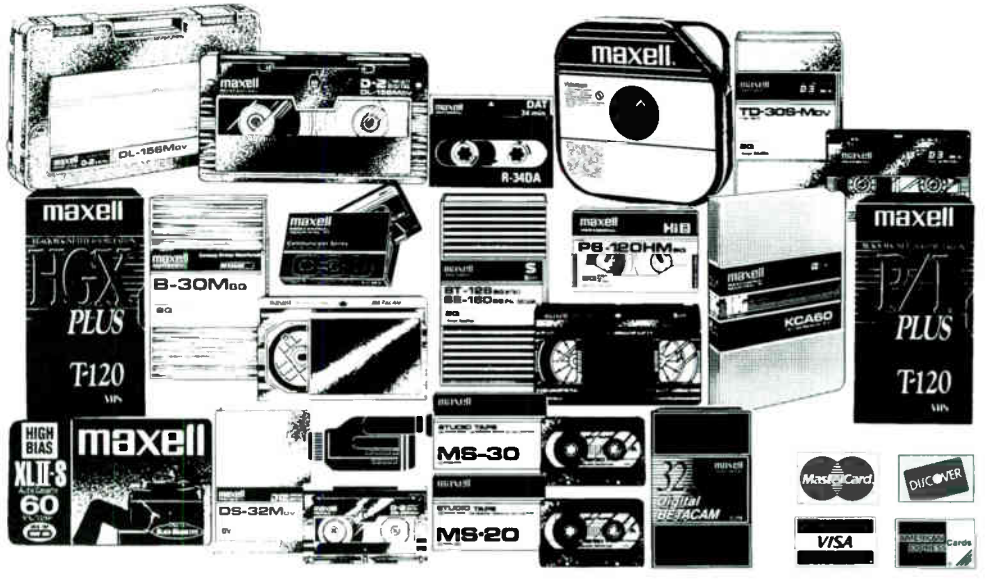

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a wah controlled by input level), to novelty programs such as '50s Sci-Fi (which plays a cascade of descending pitches through a delay and reverb), TV in Room, and Call Waiting (you guessed it). There are also dual mono programs with, say, echo on one side and reverb on the other, and even a Tuning Note. Besides sounding great, the programs use the majority of the MPX 1's extensive routing and patching options, making them excellent teaching examples while learning its ins and outs. In fact, the MPX Blue program uses six simultaneous Effects Blocks, split path routing, and five patches to internal controllers, making it a particularly rewarding study.

As for the individual effects, I could not find even one that was less than excellent. The delays were clean and crisp, the choruses rich and thick, the flangers full of shimmering overtones, and the reverbs full, complex and clear. Even the harmony processor, which would often glitch in my LXP 5, tracked every subtle nuance in both high and low registers.

There is also a database search and sort function, allowing users to organize programs by number, name, source type (Acoustic, Drums, Guitar, Keyboard, Live PA, Tempo, Sound FX and Vocal), effect type (Pitch, Chorus, EQ, Modulation, Delay, Reverb: Plate, Hall, Inverse, Gate and Dual), source & effect type (any combination of source and effect types), members of MIDI maps, members of Program Chains (e.g., numbers 1-10), or the last ten programs loaded. Each program can be tagged to appear under one or more of the sort categories.

As I said at the beginning, I could not hope to cover all of the MPX 1's features in this review. Nonetheless, if what I have managed to cover has piqued your interest, I highly recommend that you get your hands on one of these units and check it out for yourself. Even if it doesn't change your musical life in the way that it did mine, I'm sure you'll agree that the MPX 1 is simply stunning. It offers outstanding effects and a brilliant user interface at a reasonable price of $1,299.

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Barry Cleveland is a San Francisco-based composer, recording artist, producer and engineer. He also plays guitar with the improvisational quartet Cloud Chamber.

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WESTLAKE AUDIO LC 6.75

COMPACT STUDIO MONITORS

BY ALEX ARTAUD

Westlake Audio is a company long regarded for excellence in designing monitoring systems. Its BBSM series continues to receive raves for clarity and accuracy. With the Lc 6.75 ($999/pair), Westlake owner/chief engineer Glenn Phoenix and his team have focused on providing affordable close-field reference monitors tailored for small control rooms, editing suites and broadcast production facilities.

The Lc 6.75s are a two-way, ported system with a ¾-inch soft dome tweeter and 6.5-inch polypropylene woofer. The cabinets are available in a black utility finish and measure a compact 16x8x10.4-inches, each weighing slightly more than 20 pounds. Inputs are dual banana, five-way. Frequency response is listed as 60 Hz to 18 kHz (± 3dB), which is fairly impressive for their size. Power handling is rated at 80 watts continuous and 120 watts peak with operating impedance nominal at 7 ohms, minimum 5 ohms. Sensitivity is fairly low, at 87 dB SPL 1W/1m.

As for internal components, the 6.75s use performance-matched Solen capacitors and Ohmite ceramic resistors. Coils are hand-wound, made onsite to Westlake specs. By the way, the Lc part of the product name stands for Large inductor, small capacitor. I asked Glenn Phoenix to explain the 6.75's design philosophy.

"The BBSM series was designed to achieve a multi-amp sound using a high-level, low-impedance [passive] network, comprised of a low inductance coil in series with the drivers and a high capacitor value. This creates a low impedance load that can be problematic with many amplifiers. In designing the Lc series, we liked the sound of low impedance crossovers and wanted to keep costs down. Essentially, we increased the operating impedance slightly, using a series inductance value that is higher and a lower capacitor value. This makes the 6.75s a little less sensitive than the BBSMs."

I used the 6.75s with two different amplifiers: a Hafler trans•nova P-1500 and an Australian Monitor proPHILE K7. The P-1500 is a fairly low-power amp (75 or 85 watts/channel into 8 or 4 ohms, respectively), which sounds great with most near-field speakers when played at reasonable levels. Although the 6.75s have a power handling rating of 80 watts, they need a much larger amp to sound right. Using the 75-watt amp, my mixes and audition material sounded boxy and lacked midrange definition compared to the (powered) Meyer HD-1s. A/B testing the two speakers with a variety of reference material, I perceived a general lack of complex harmonic overtones in the Lc 6.75s. There was a brittleness in peak transients, a lack of roundness and no depth to the tone.

I switched to the much-higher-power K7 (400 W/ch at 4 ohms or 255 w/ch at 8 ohms), and the difference was immediately apparent. The brittleness was gone, highs were clear and the bass frequencies had surprising authority. Word to the wise: These monitors require a power amp with plenty of headroom.

Westlake recommends setting the monitors with the listener at ear level to the monitor's acoustic center (approximately 1-inch above the mechanical center of the monitor). I also experimented with the 6.75s on their sides but preferred the stereo imaging in the recommended upright configuration at the proper height. The 6.75s are particularly sensitive monitors and do respond to minute adjustments.

Okay, but how do they sound? Gorgeous. I first listened to old mixes of material I was familiar with and then remixed some songs with them. In both cases, the 6.75s were consistent and very true to the material. I couldn't detect any adverse coloration. In fact, I was pleased to find how consistent the mixes sounded everywhere from my car stereo to my HD-1s. Next, I selected a variety

—CONTINUED ON PAGE 229

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SOUND FOR FILM

THE TWINS OF POST-SYNCHING

ADR AND FOLEY

by Larry Blake

It hasn't always been like this in film sound.

The past two columns have documented the "track growth" of the film industry, from a time when all projects were mixed in mono with no more than 20 tracks, to today's stereo mixes, in which each of the elements of the dialog, ADR, group walla, Foley and background effects premixes frequently reaches that number. Hard-sync effects are in a league of their own, going from fewer than eight tracks on simple films to 500-plus on the "mine is louder than yours" action spectacles of the late '90s.

ILLUSTRATION: TIM GLEASON

This yesterday vs. today comparison shows that not only are more tracks used now, but some of the food groups weren't even around back then. Foley was not Foley; it was merely part of the sound effects that were done on an as-needed basis by each editor for reels that they were cutting. At Fox, it was called "make in sync" (or was it "make and sync" at Paramount?), at MGM it was "Sync A," for the stage where it was recorded (and still is on the Sony lot), and if you were at Universal you said "send it to Foley," as in Jack Foley, who ran that department. Calling post-synched sound effects "Foley" began industrywide as sound editors left Universal and began working elsewhere in the mid-'60s, or so I understand from talking with sound editors who were around then. Thus we see that the popular myth that the process was invented by Mr. Foley is simply not true; in fact, as far as I know, the very first sound movie back in 1926, *Don Juan*, had Foley'd sword fights.

At any rate, today's *modus operandi* of Foley being "walked" and cut by special-ists did not begin until the early '70s. Since then, a whole industry of Foley artists (a term preferable, I think, to "Foley walkers"), mixers and supervising editors has appeared. In fact, I believe that the Foley for virtually all big-budget U.S. films is done by a core group of Foley artists numbering no more than 20.

As much as I appreciate what Foley can do for films—and in the hands (not to mention feet!) of talented Foley artists, it can be substantial—Foley is my least favorite sound to sit down and cut because I believe that the real creativity is in the performance, presumably with assistance from intelligent spotting of the cues. But when Foley gets to the edit stage, the "sync" part of its nature ("post sync," "make in sync," remember?) rears its head, and you become not so much a creative editor as a sync droid.

I have found that on most of my films I can get by with fewer than 12 Foley tracks, and even at that amount, I don't feel constrained to cover the show completely. I am, of course, including completely covering for the music and effects that are needed to create foreign-language versions. I think the importance of M&Es is a good third of the justification of extensive Foley today, the other two being awareness of Foley's creative potential and the fact that production tracks aren't what they used to be, with just far too many scenes shot MOS.

Yet even with my measly 12 tracks, it bugs me to waste anything, and it pisses me off when I specifically don't cue background footsteps yet the tracks come back from the stage with everybody covered. After a certain point, you just don't care about people walking back and forth 20 feet away. As the old saying goes, if the audience is noticing those footsteps, we have a lot of other, bigger problems.

A few years ago, I wrote a series of columns titled "I'm Still Here," which detailed the unnecessary work that all those who work in film sound—in production, sound editing and re-recording—do

—CONTINUED ON PAGE 143

World Radio History

FACILITY SPOTLIGHT

NEW FACES IN NEW YORK

by Gary Eskow

In the middle of a late-'80s/early-'90s slump, which for a variety of reasons saw production in New York City drop dramatically, it seemed many audio post facilities were being supported by HBO and MTV, along with the regular stream of commercial work and feature films. But film and television companies seem to have returned, and they're bringing along work for many of the audio post facilities.

Meanwhile, more and more facilities have been positioning themselves as both audio and video post houses, in an effort to keep creative work in-house from start to finish. One such example is GLC Productions, located in the Village. Dan Kramer and Christopher Hyun started GLC as a 32-track recording studio back in 1988. In 1990, they bought Donald Fagen's Harrison MR4 console—the one he recorded *Nightfly* on—and they continue to serve recording industry clients such as producer Daddy-O, who recently produced an album for MCA artists New Child at GLC. Lenny Kravitz and comedian Chris Rock have also worked at GLC.

Kramer and Hyun saw the future early, however, and got involved with audio for video. One of the first Digidesign-equipped post houses, GLC sees computer-generated animation as a principal source of future work. "Incorporating state-of-the-art Silicon Graphics 3-D animation services in the past year has strengthened our ability to deliver refined broadcast products. 3-D animation is one of the most technically demanding endeavors in the production industry. We now have the capability of delivering film-resolution three-dimensional graphics including character animation, motion capture and optical effects. This complements our existing full production services (recording, sound design, off-line/online video editing and production), for which we've garnered numerous awards, including the '96 Clio Award

—CONTINUED ON PAGE 144

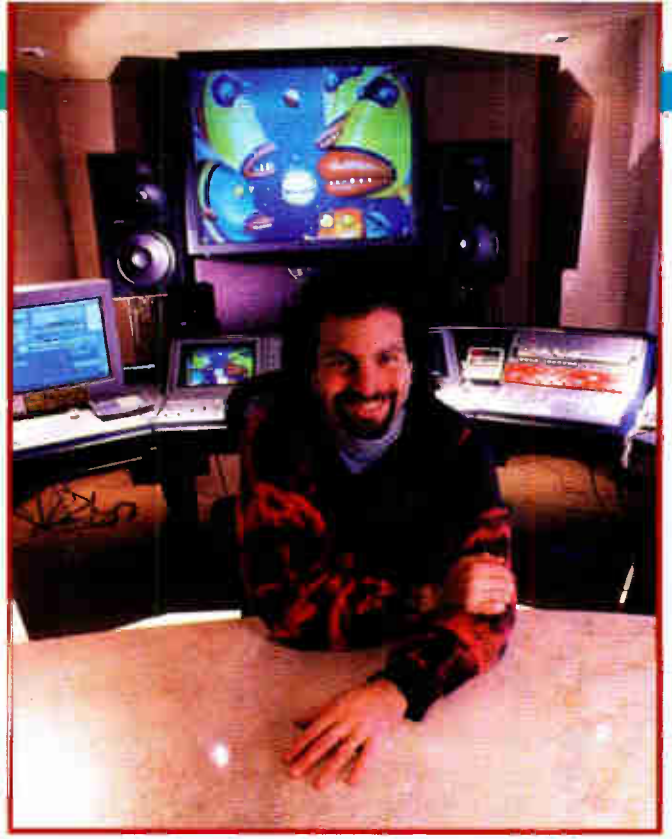
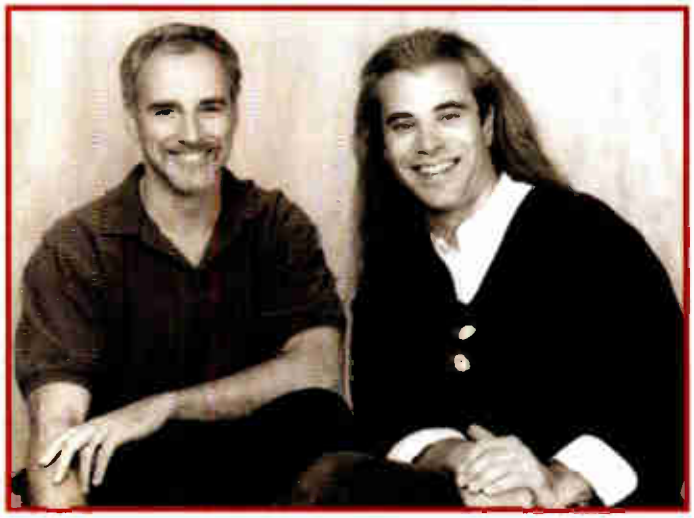


PHOTO: LORI KLEIN

Mixer/sound designer Rich Cutler in Aural Fixation

GLC Productions creatives from top to bottom: Steve Lamorte, Sonny Calderon and Robert Muntrone

Mess Hall Music principals, composer Doug Hall (left) and executive producer Andy Messenger



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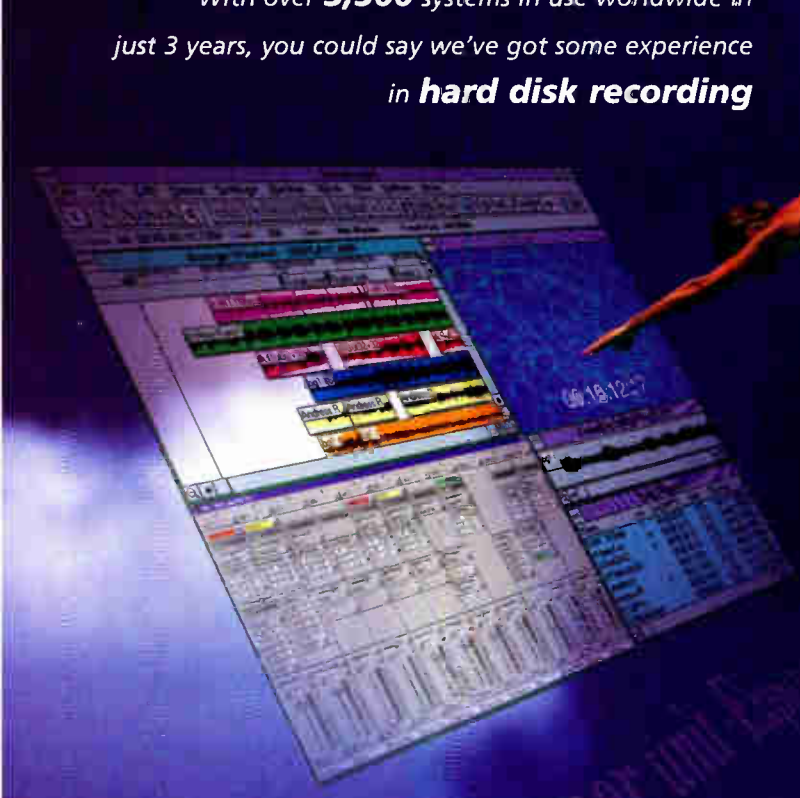

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—FROM PAGE 140, SOUND FOR FILM

in a sometimes-futile effort to let the director know that we're "still here." Foley is frequently a very guilty part of this equation, and it's easy to see why: If you have the time and money it takes to spend weeks on the Foley stage and to transfer and cut the resulting tracks, you can cover every moment in a film, including moments like explosions that you might not think of as Foley.

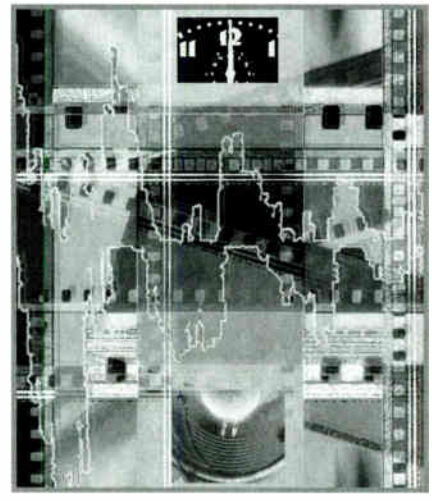
Of course you can, but the point here is that I think spending hundreds of thousands of dollars on Foley is simply taking a producer to the cleaners. When I hear of films shooting 70-plus Foley tracks, I don't think: "Great, a lot of my colleagues got a lot of work from this film." Instead, I wonder why didn't they stop at 40 tracks, spending the rest of the money on more sound design time, more field effects recording, more sound effects editors, more mix time?

I don't think it's jealousy on my part that I've never supervised a film with a "blank check" sound budget that allows such activities. Beyond a certain point, dozens of Foley tracks are simply not going to read, especially when you consider that any scene that busy probably has a lot of other effects going on, not to mention the music score.

On the far other end of the scale are TV shows and low-budget features for which eight tracks would be a lot. It is common in these situations to "hang" the original stage multitrack tape and not cut the tracks. "Our walkers are in sync" or "it's good enough for TV" are the mantras that I hear. Regardless of how talented the Foley artists are, I think it's respectful, and not insulting, of their work, to copy it into a workstation for sync tweaking. Aside from the obvious fact that you will save a certain amount of stage time/dollars by not having to get everything dead-on, editing the Foley in a workstation allows you to match sync of the production track exactly. This is one-half of the dual-headed sync god that Foley must worship, the other one being how it feels in your gut.

For this reason, I have always felt that the drawbacks of working to linear videotape (as opposed to a Moviola, where one can rock picture and track at crawl speeds) have been overstated, in view of the other considerable advantages of cutting on a workstation. Back to the double-headed sync god, you can match sync to production visually (using waveforms) on a workstation much more easily than you can on film, and gut sync will always be a function of how it feels at play speed. Literally matching the frames where the heel and toe meet the ground is of no use if the cut track feels wrong. Of course, this debate is going to disappear completely as more and more editors use disk-based video for picture reference.

The other half of the world of post synchronization, ADR, has firmly established itself as an adjunct to dialog editing, much as Foley has to sound effects in general. The only difference is that I hope to avoid ADR as much as possible, whereas I look forward to the creative abilities of Foley.



Make no mistake about it, there are times when you have to use ADR and it really helps the final product. Outside of the obvious examples, such as putting new words in actors' mouths to help explain plot points (what I call the See-Threepio Effect), the right ADR can really make a scene come alive. It's for this reason that I like to have a session with the principal actors after the director's cut but before the first preview. Post-production supervisors get all squirrely about this, saying, "What if we find out we will need them again. I'd rather wait." To which I reply that we know we'll probably need them again (although half the time it ends up that we don't), but that it's important to make preview audiences' perception of the film be as clear as possible.

Also, every film goes into post-production with certain lines or scenes that have to be looped; shooting ADR early in post gives you the chances at a second, final try later on when you do what would otherwise have been your only session with that actor. That first session also gives you a feel for how you need to get the best out of actors in terms of number of takes and what type of cooperation you can expect from them. Having actors duplicate their on-screen body position is essential in matching production, and most of them will work with you in this regard.

Another cottage industry that has grown in post-production sound is group walla. This involves hiring a group of actors to come in and sweeten scenes. Their work can range from general crowd walla to putting specific words in the mouth of nonspeaking extras to P.A. voices. As is sometimes the case with Foley, watching a movie with just the group walla can be a painful experience, although when you add it to the whole soup, it makes sense. I have found that in crowd scenes, group walla works best when it adds close-up detail to effects recordings and on-set wild tracks.

One of the more unfortunate parts of the ADR machinery is the addition of lines for the TV/airline version. Having done what you can editorially (by eliminating the god from goddamn, for example), you still have to sheepishly ask your actors to say such out-of-place words as "melonfarmer." (The network TV version of *Scarface* is notable in its proliferation of accusations of harvesting fruits of members of the family *cucurbitaceae*.) This process always pisses off directors, as is indicated by the fact that they rarely get complete TV coverage during shooting. (Not that we can blame them.)

There really is something bizarre about creative filmmaker types being beholden to the whims of the people at airlines who have to sign off on your film's suitability for in-flight viewing. I'm serious about this; you have to barter with them: "I'll trade you two goddamns for one crucial shit."

On a film I worked on last year, we had to do last-minute ADR to replace curse words for the theatrical version. How can this be so, you might ask. Well, they had shot the film with the usual plethora of f-words until it occurred to someone at the studio that we would get an R rating, thus restricting the ability of our leading man's fans to get in, which wouldn't be a problem with a PG-13 rating.

So we looped all but one f-word, because that's what you're allowed according to the letter of the PG-13 law, although we submitted it to the MPAA with two of them in the hopes of flying under their radar. We got shot down.

A little historical note: ADR stands for Automated Dialog Replacement (not Automatic) and replaced the original "looping" process in the '60s. Before a loop-

World Radio History

ing session, the picture and guide track were cut into identical-length loops with beeps leading to the line. In the days of optical, the recordings were extracted from a roll after it was processed and printed; the procedure changed with the advent of mag by cutting a piece of equal-length blank stock for the recorder, thus the term "virgin looping."

"Looping" had a very clear set of good and bad points. The much-lauded good point was that by hearing lines over and over again in succession, actors have an easier time of matching the meter and pitch of their original performance, if indeed that's what you're looking for. However, since the recordings only existed as little islands, there was no way to play back a whole scene, much less to easily try parts of different takes.

The ability to play back entire scenes precisely was one of the selling points of ADR because the picture and sound were both in whole reels, the beeps before lines added electronically. Multitrack recording allows directors to hear both sides of a conversation, even if the other actor's lines were done earlier. ADR also gives needed flexibility in choosing the length of the line—sometimes actors find it easier to nail them in smaller or larger sections.

As you might have guessed, ADR to film or multitrack, even with the fastest system, by definition involves rewind time that throws actors out of the rhythm they had in the days of looping. Of course, there is great potential with having picture and sound in ADR sessions coming from hard disk, not to mention Foley and ADR editing.

Send your ADR and Foley stories to PO Box 24609, New Orleans, LA 70184, fax (504) 488-5139, or via the Internet: swelltone@aol.com. ■

Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although the amount of rain would have to be one of them.

—FROM PAGE 141, NEW FACES IN NEW YORK
for our 'Skids' campaign in the television/cinema recreational item category [production, editing, score and sound design, in addition to posting video]."

GLC has five Macintosh 9500s running Pro Tools 4.0, working in conjunction with Mackie 8-bus consoles. To warm up the sound, the facility has a handful of Summit tube compressors and EQs, as well as eight custom tube mic preamps built by Nat Priest. Kramer says that in addition to the tried-and-true Lexicon PCM 70s and Yamaha SPX-1000s that dot the studio, his staff is very high on the new Focusrite TDM plug-ins. "The user interface and algorithms on their D2 EQ plug-ins are great, as are the TC Tools reverb and chorus—they're the first that sound as warm as their stand-alone pieces.

"The bottom line for us is servicing the client," Kramer says. "By offering all aspects of posting to our clients, we are able to take a lot of the guess work out of a project. There's no more putting touches on a final cut and wondering how the music is turning out. That tight interaction of disciplines lets our clients realize their creative vision to the fullest extent possible."

We could jump on the express and deplane a block from Planet 10 Post, but we'll blow the roll and cab it instead to West 44th Street. Midtown has definitely changed. If you're looking to peep for a quarter you may be disappointed. Times Square has gone Disney, and who says that's such a bad thing?

Steve Borne, sound designer and president of Planet 10 Post, has been working in the city for the past five years, the age of Planet 10 Post itself. Two years after launching his facility, Borne merged with Eliza Paley (film projects include *The Last Temptation of Christ*, *The Hudsucker Proxy* and *Get Shorty*) and Paul P. Soucek (credits include work on *Honeymoon in Vegas*, *Sleepless in Seattle* and *What's Eating Gilbert Grape*). The original 300 square feet have been replaced by a new 6,000-square-foot space.

Borne says that Planet 10 Post has established itself as a boutique shop specializing in independent films. "People who come to us understand the sound process," he says. "We're interested in creating an interesting sound for a project, not pushing a job through so that we can get to the next one. All three of us are extremely dedicated to exploring the possibilities of sound. Formulaic work is not what our clients get."

Editing bays are outfitted with 12 Pro Tools systems, a Synclavier 9600, Behringer Eurodesk MX 8000 8-bus mixing consoles, an Avid AudioVision workstation and Genelec monitors. Borne says that Digidesign's Pro Tools 4.0 software is a clear step up. "4.0 is amazing. I've been beta testing for Digidesign for some time, and 4.0 just feels a lot more solid than any other version. The video playback is greatly improved—the screen redraws are much quicker than in previous software versions.

"The automation is also light years ahead of where they've been," he adds. "You can effortlessly sort through the audio bin by file size, creation date or alphabetically. That's really useful. A lot of times we've recorded several sessions of ADR for a project on different dates. When a client asks, 'Where's the session we did?' You've got to get to it as quickly as possible, and the new software helps in that regard. 4.0 also keeps stereo files together, which wasn't the case earlier on."

Hard-wired consoles may never go the way of the dodo bird, but mixers like Borne are gravitating toward the features that workstations offer. "You can now tweak EQ parameters in real time without any fear of zipper noise," he says. "Audio Suite now does real-time destruction on files; it makes a new file that's a reverse on the older file—you used to have to go over to Sound Designer to get this functionality.

"We use Post View as a Quick Time-style movie that we bring up on a separate monitor," he explains. "As Digidesign has migrated over to the PCI platform, they've found that there's a lot more inexpensive video boards that can capture picture and play back at extremely reasonable prices. We use the Miro DC 20 cards, for example, which costs less than $700 and gives a picture that's equivalent to an S-VHS tape. That's really quite amazing when you think about it. Using this card doesn't slow down the Pro Tools user interface either. You can click your mouse for all functions while the system's playing and shift a frame in real time, rather than having to stop and execute the shift. I love this!"

Borne continued to rave enthusiastically about PT 4.0 while we put down the phone and checked out the Davis Cup semifinals on ESPN. When we returned..."There's much better grouping on 4.0, as well. You have relative grouping and an unlimited amount of groups." Still, Borne likes the feel of faders, and grabs his Peavey PC 1600 for control.

You want some absolutely primo commercial music and sound design? We gotta drive out to Montclair, N.J., a few skips in my Benz (read, Isuzu

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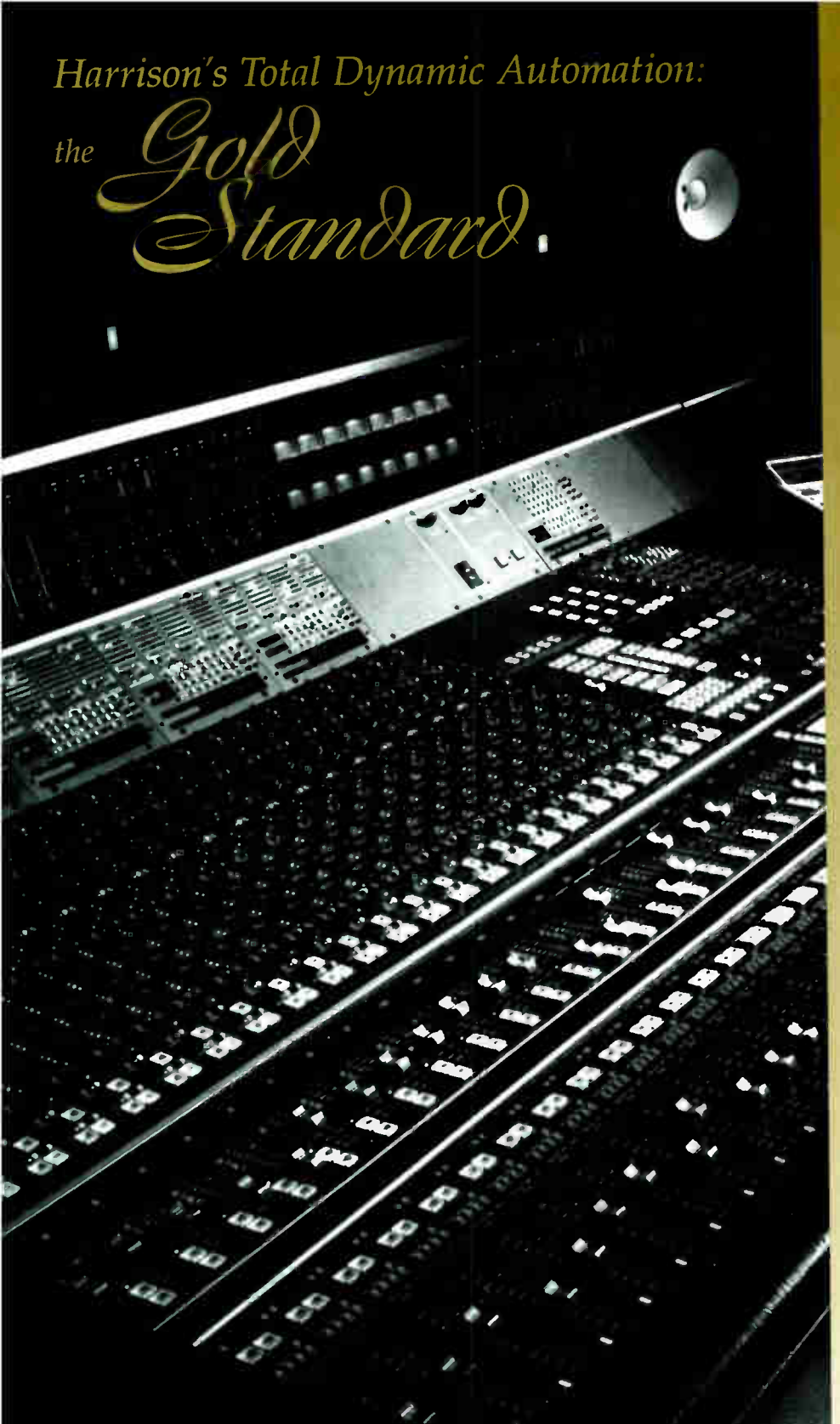

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Rodeo), but the reward is worth the ride. First of all there's the New Jersey town itself: Book it as one of the most attractive places in the metro area, with leafy streets, a ton of musicians and artists, and a progressive mentality.

There's also Mess Hall Music. Creative director Doug Hall and executive producer Andy Messenger spent a decade at fabled underscore shop Elias Associates, and the bond they formed is evident. Hall came to the jingle biz by way of playing the "thruway circuit" with his rock band, touring Holiday Inns throughout northern New York state. Eventually, the band came to Manhattan, cut some demos and fell apart. Hall stayed.

"I was actually one of the first composers that the Elias brothers hired after they started to have success," Hall recalls. "The experience of working day after day on great-looking commercials was invaluable. There has to be a balanced relationship between picture, voice-over and music. The end goal is to further a client's positioning message, but battering the viewer over the head with that message can actually be counterproductive. People will turn off a cheap attempt at selling. You can use humor, visual beauty, the attractive power of music, any number of things in combination to call an audience to your spot. Fitting in with the other elements of a production is skill number one, for me as a composer, and for the select number of other writers that we use."

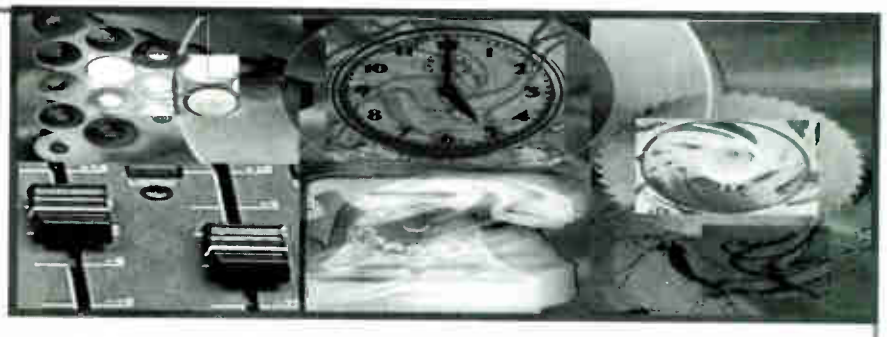
FOLEY RECORDING

by Tim Moshansky

In an age where much of what we see in movies and on television has been shot on either a soundstage or in a noisy location, then combined with computer-generated images, Foley recording has become increasingly important as a way to give audiences a sense that what they are seeing is realistic and believable. Great pains are taken to ensure that every nuance, every gesture is re-created and recorded on a Foley stage.

Sometimes it's not enough just to add door slams, footsteps and a walla session. Modern filming, computer graphics and editing techniques have created a need for more than the usual "see a dog, hear a dog" approach. Morphing is a good example of a (albeit passe) film technique that required a parallel advance in sound design and recording. How do you create the sound of a car morphing into a horse? With all of the creative approaches to getting good sounds, a Foley stage can be the sight of grown men doing seemingly weird things, like sucking and licking their wrists (Foley for the Playboy Channel) or walking in size 12 pumps with their Speedos on (footsteps for a woman in a mini-skirt).

The Foley stage is probably the single most effective design tool available today, according to supervising sound editor Wylie Stateman of Soundelux, Hollywood. "It's much faster to do a track in real time to picture of a man handling a doorknob or opening and closing a door or dresser or cabinet than it is to search for the appropriate sound effect in a library and brute-force editing it into sync with the picture," he says.



"There are often little nuances that the actor brought to the way they did something that may not have been captured in a library recording of that same sound," adds Mike Ruschak, a Foley recordist and mixer at Sync Sound in New York. "There are some sounds that you can't find in a library. Somebody pouring a bowl of Cornflakes—you may not have that, specif-

—CONTINUED ON PAGE 151

ELECTRONIC FOLEY

Tom Orsi, an engineer and mixer at the Beverly Hills Video Group, has been bucking the trend of conventional Foley with what he calls "electronic Foley" since at least 1991. A classically trained percussionist and composer, Orsi has refined his method to the point where he has done complete mixes for TV and film projects using only his computer and a large database of sounds. For the new Pamela Anderson movie *Naked Souls* (HBO/Showtime) and the *World of Wonder* series for Discovery, Orsi completed all aspects of the sound, including ambience, Foley, music editing, sound design, dialog editing, ADR and final mix—all from one computer.

"I have templates that map four different footsteps into one keyboard, so when I see four people walking, I see it as a quartet," explains Orsi. "I can loop it one time and then perform it as a quartet on the keyboard, and lo and behold I've done four people's Foley in about 45 seconds." Orsi licensed many films, from *The Winds of War* to *The Ten Commandments*, and transferred the sounds from the original mags to DAT. His core library now consists of 12 gigs of data representing 1.2 million sound effects. These sounds are mapped with Sample Cell and recorded into Pro Tools or Studiovision Pro, directly to picture.

Orsi is aware that many people in the film sound community may scoff at his approach. "There is such hack work for digital Foley being done," he admits. "It's kind of like what you do before you know what the real deal is. But I've done 'real' Foley for many years. If I had my druthers, I'd have a crew of 100 people. I love the camaraderie. I don't enjoy the isolation that computers have created, but the reality is that electronic Foley is transparent, fast and economical. ■

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Messenger has an authority that most music producers lack—he's an accomplished trumpet player. "I had a soul band in New York for many years, and by virtue of the fact that most of the other players had no interest in business, I ended up handling our affairs for the functions that we played," he says. "As I got into setting rates for corporate parties and other functions, I realized that I enjoyed the marketing aspect of the business. One thing led to another, and I ended up as a music producer at Elias, which is where I met Doug.

"Doug's great skill is that he blends superb taste with an ability to suspend his own artistic inclination until he's had the opportunity to feel out everyone involved, in terms of direction and the effect that people are going for. Only when he's sure that he's in line with a client's thought process does he start to write. His success ratio is extremely high for that reason."

Hall's home studio is relatively low-tech. ISDN lines connect him to the rest of the world, he records and edits on a 16-track Pro Tools system, and a Mackie 8-bus console is his main board. "I could certainly put more gear into this room, and probably will over time, but recording and mixing finals in pristine studio environments is critical for me," Hall says. Like many other New York commercial composers, Hall and Messenger record at Back Pocket with great regularity. "Joe Arlotta ["Lumpy" to his close friends] is a superb engineer, and their A room is a great place to track."

Messenger says ISDN lines are great, but he's looking forward to the next step. "We're waiting for the day when clients can download picture to us directly, as a Quick Time movie. FedEx will seem like snail mail."

We end where we began, with an Aural Fixation. This brand-spanking-new audio post facility has offices at First Edition, a leading New York editorial firm. Located on East 47th, Aural Fixation occupies a 2,000-square-foot space, where company co-founders Bobby Smalheiser and Randy Howite

TWO MORE FROM NEW YORK

A couple of names that have been fixtures in the New York scene for the past 15 to 20 years recently upgraded facilities and/or picked up new accounts. SLP&CO. added composing and music-producing credits

to the new Michael J. Fox sitcom *Spin City*, which is said to be the first three-camera shoot in New York since *Sgt. Bilko*. Owner/composer Shelton Leigh Palmer also created the theme song for *Live With Regis & Kathie Lee*, the network ID package for MSNBC, the on-air promotional spots for *The Ricki Lake Show*, as well as countless commercial music spots. Chief engineer is Jason Baker. Compositional tool of choice is a Synclavier 9600.

Meanwhile, Bob Pomann of Pomann Sound put in an SSL OmniMix as the centerpiece of his longtime ScreenSound facility. It was immediately put to use on the animated series *Brand Spanking New Doug*, an ABC Saturday morning offshoot of the popular Nickelodeon series *Doug*, which Pomann has provided sound design for from its inception four years ago. ■

Left: Pictured with Bob Pomann (at the OmniMix) are, left to right, engineers Lou Esposito, Juan Dieguez, Marc Bozerman and Joe Gauci. Below: Michael J. Fox taking a break from Spin City with SLP&CO. owner/composer Shelton Leigh Palmer

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have set up two mixing suites, designed by John Storyk and Beth Walters.

Mixer/sound designer Rich Cutler is pleased with the SSL OmniMix and Avid AudioVision combination, and the 12 Avid Media Composers that Aural Fixation own. "The output and flexibility of the OmniMix console are very impressive," Cutler says. "It has the input/output capability to handle our 100 percent digital format and a sophisticated control system that makes things happen quickly.

"The convenience to our clients of having audio services where they're cutting picture is great, but then they see the rooms and hear the environment that we work in, and that makes my job easier," he adds. "We can handle any video format, and we have surround sound, as well. Clients working on tight schedules really like having us in-house."

Mixing in many rooms is like doing hard time, with no way to tell if the clock says two in the morning or afternoon. Aural Fixation is different. "One of the sides of the room has double-paned windows built into the walls. It's a wonderful thing to be in a mixing room and have daylight. It creates an open, light, airy, comfortable environment without sacrificing any sonic accuracy."

Cutler says that cutting digital picture gives First Edition, and by extension Aural Fixation, a shot at extra work. "One of our editors was doing some Army spots the other day, a package of two :15s. The footage was so good that he went ahead and cut some :60s and :30s, as well, which we designed sound for. As a result of the work we did, the clients bought these other spots. Working digitally made that kind of spec work possible.

"Most sound designers think that if a workstation doesn't have a keyboard attached to it, there's something wrong, but I like cutting sound on the AudioVision. We have a large array of CD libraries, and I have lots of my own sound files to draw upon. I love the power of the AudioVision as a sound design tool."

According to Cutler, the trend toward computer-generated visuals is upping the creative ante for sound designers. "In the past, we were doing sound design for mostly real-world applications—here's a dog barking, a train pulling into a station. As we move into less literal realms, there is no right or wrong; it's up to the sound designer to create a world of his or her own. For example, we recently posted a Revlon spot that featured Claudia Schiffer. Our editors used the Flame program to create a pastiche of bottles moving all around her. At the point the Revlon logo breaks up like a pane of glass and turns into a tornado and finally turns into Claudia, there was a lot of room for sound design. What should that effect sound like? I used ten or 12 layers of sound to create an effect to match that picture. That's challenging work." ■

Gary Eskow is a producer, musician and freelance writer based in New Jersey.

—FROM PAGE 146, FOLEY RECORDING

ically. We used to do a show called *Monsters*, and we needed the sound of a mummy ripping the heart from a living person. That's something you don't normally have in your library. So we'd go out and get a watermelon and cut it open and take a piece of calf heart or something and pull it in and out a few times, and then pitch it up or down."

Sometimes a low Foley budget can call for drastic measures. Ruschak recalls working on *Bellevue Emergency*, a reality-based trauma program for TV. The producer wanted lots of off-camera sounds to convey the sense that it was

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TECHNOLOGY SPOTLIGHT

THE 20-BIT ADATS

A FIRST LOOK AT PHASE TWO MDMS

At the recent AES Europe show in Munich, Alesis and Swiss high-end pro audio manufacturer Studer announced an alliance for the development of ADAT Type II, a new 20-bit recording system based on the S-VHS ADAT format. Slated for late-summer/fall release, the first two Type II recorders will be the Alesis Meridian and the Studer V-Eight.

The Type II format provides 20-bit linear recording (up to 67 minutes on a T-180 tape at 44.1 kHz), as well as a mode that switches the new machines to 16-bit operation. The latter mode provides Type II decks with full backward compatibility for the recording and/or playback of tapes made on the 100,000 (or so) machines using the original 16-bit ADAT format. The 20-bit tapes will not be playable on the Alesis, Fostex and Panasonic Type I ADAT decks. However, up to 16 ADAT decks (of any vintage) can be interlocked for as many as 128 tracks, in sample-accurate sync, merely by connecting the standard Alesis 9-pin sync cables between transports.

One look at the new ADATs and you can be sure something's different. Housed in a die-cast, four-rackspace chassis, the Meridian and V-Eight have the look and feel of pro video editing decks, with a large jog/shuttle knob, illuminated transport buttons and a keypad for entering SMPTE addresses or the 100 locator points. Under the hood, both machines feature the Matsushita "IQ" transport used in Panasonic's high-end video editing systems and operate twice as fast as the Alesis XT. A 40-minute (T-120) tape rewinds in 30 seconds—wind speed is 80-times play speed, and shuttle is 10-times play speed. Variable-speed forward/reverse "reel rocking" is also possible, and, if desired, audio from the aux track can automatically be routed to any track output in Jog mode.

The transport offers more than mere speed. Dual direct-drive motors under servo control move the tape efficiently, and this design eliminates the idler wheel, so tape handling is gentler. With no brake adjustments needed, no idler to clean/replace and an automatic head cleaning wand, maintenance needs should be greatly reduced. An offline mode allows formatting on one deck while recording on others—without repatching sync lines. After formatting, a "tape certify" function can check the tape and provide a count of tape errors.

A major difference between Type I and Type II is that the new format includes a dedicated timecode track (timecode can also be derived from the machine's absolute-time counter), as well as an analog auxiliary track for cueing or other purposes. The decks also offer onboard SMPTE/EBU timecode chase lock sync (all frame rates are supported), MIDI Machine Control, video reference I/O (with 75-ohm termination switching) and word clock in/out. Post-production pros will appreciate the "pull-up/pull-down" feature, which adjusts the sample rate by ±0.1% to compensate for film shot intentionally for video release at 30 fps (or 24 fps film transferred to video at 30 fps) and the standard NTSC frame rate of 29.97 fps. This makes a 0.1% change in the speed of the tape, while leaving the timecode format/frame rate unchanged.

All analog interfacing is via balanced XLRs (including timecode and aux tracks) or the 56-pin EDAC (Elco-compatible) connector used on all previous Alesis ADATs. ADAT lightpipe digital in/out ports are standard; an expansion slot is provided for an optional 8-channel AES digital I/O interface. Other features include up to 170 ms of delay on each track, auto-punch with Rehearse mode, digital routing from/to any track on a machine

BY GEORGE PETERSEN

—CONTINUED ON PAGE 247

World Radio History

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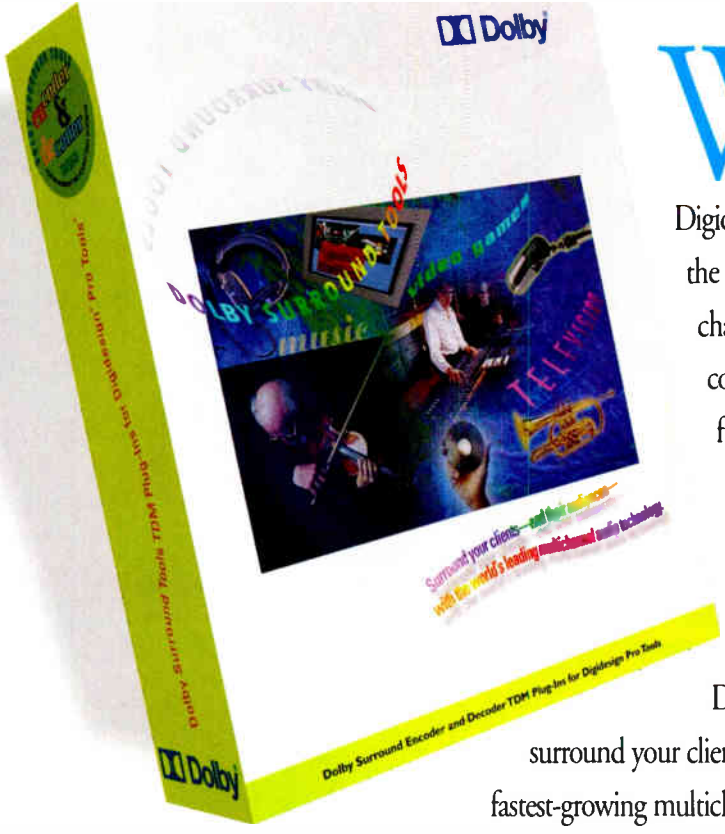

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ARENA SOUND

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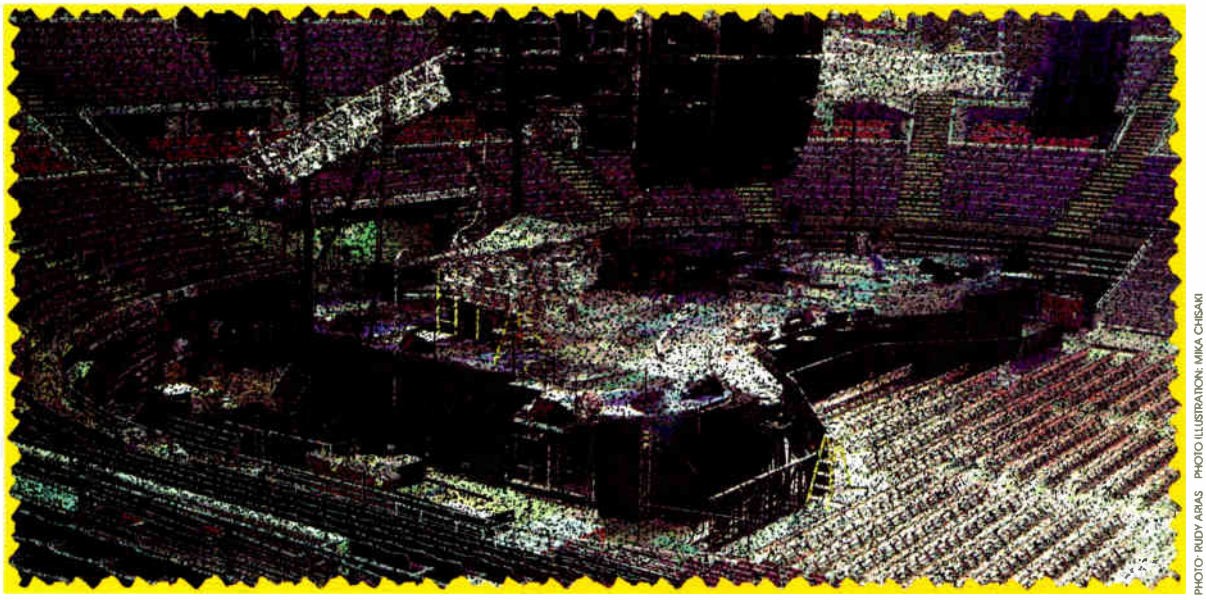


PHOTO: RUDY ARIAS PHOTO ILLUSTRATION: MIKA CHISARI

As you read this, U2 begins a year-long stadium tour with more than 50 trucks and 15 buses, ultimately carrying a 1,000-ton production and its crew of 200 to more than 5 million fans in dozens of countries. The 30 tons of P.A. is just one part of a production that includes the world's largest video screen and three sets of steel. What equipment will be on this summer's stadium and arena shows to improve the basic quality of sound going out to the worst seats?

Arena shows have the best consoles and processing money can buy (or rent). I've heard many show tapes and listened to mixes on headphones, and while the engineer's skill often outweighs the advantage of one stadium speaker system over the next, most large venues put both at a disadvantage. I consider myself fortunate to have assisted "Funk" Ponzeck with Clapton at the old Ritz in NYC, mixed Tony Bennett at the White House, watched Sting tape *MTV Unplugged*, and sat beside the monitor board while Metheny made my eyes water, but in 20 years I've never heard an arena show that couldn't be topped by dozens of smaller shows, and it's not the gear or the engineers.

After all, arena acoustics are often designed with extra reverberation to make sporting events more exciting. Of course, the speakers are better than ever: sophisticated arrays of modular enclosures are now commonly available from regional companies. But battling the acoustic environment and the laws of physics (and the budget) to deliver high fidelity to all seats remains a fundamental challenge for arena concert sound companies. All too often, the venue's acoustics overcome the speaker system and the FOH engineers' mix, and someone makes an executive decision to make the whole mess louder in the hope that "impact" will make up for shortcomings in intelligibility.

There are solutions. Increasingly higher-Q speaker products and distributed designs allow concert-goers at the largest outdoor shows to hear music in the next ZIP code, but time and money prohibit this approach for all but special events and purpose-built venues. Right now, many concert-goers would bring FM Walkmans to arena shows, if only there were something to listen to. Wouldn't you?

Ten years ago Stevie Wonder played on the Boston Common as part of a now-defunct open-air series. Green fences kept outsiders from looking in but couldn't keep the music from entertaining those without ducats. Over at stage-left was an early in-ear monitor system, essentially a low-power live-broadcast (pirate) FM radio station. Walking back from my apartment on Marlboro Street after lunch, I noticed people outside the fenced-off venue spreading blankets in anticipation of a show they would not be able to see but could hear for free. These were the early days of personal sound systems, and many in the park that afternoon had boom-boxes and Walkmans to enjoy their own preshow warm-up music. Little did these bystanders know that by tuning to a normally unoccupied portion of the FM band, they could have listened to a mix of the show intended only for Wonder's ears.

Today, provisions for hearing impaired (HI) patrons are required by the ADA law at public assembly venues with more than 50 seats. Anyone who requests these re-

—CONTINUED ON PAGE 168

BY MARK FRINK

World Radio History

METALLICA

Staring Into the Lion's Mouth

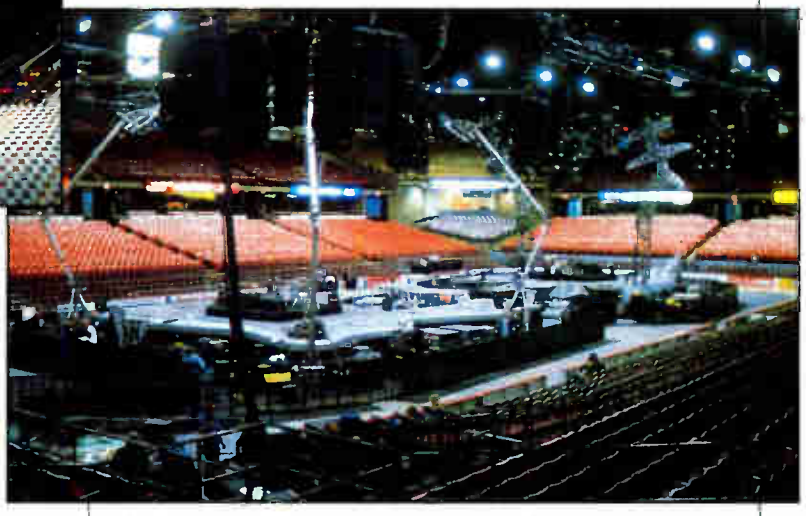
"You put out a record every five years, then there's bound to be some drastic changes," Metallica's James Hetfield says of *Load*, the band's latest release. "People have to take that with a block of salt. People have to understand what's been happening in our lives. What we've been doing, where we've been, where our minds are at."

Formed in 1981 by drummer Lars Ulrich and guitarist/vocalist James Hetfield, Metallica burned a fast, furious and raging trail across the '80s musical horizon. Shunned by commercial radio, they nonetheless went Gold in 1984 with *Ride the Lightning*, their second LP. *Master of Puppets* followed in 1986, posting Platinum sales in the U.S. The band's fourth LP, *...And Justice for All*, spawned two singles and a U.S. arena tour in 1988. Their fifth eponymously titled LP (known as The Black Album by fans), was produced by Bob Rock in 1991. The band played 300 dates around the globe between August 1991 and July 1993, then took a year off. Session work resumed in 1995, this time yielding the tracks for *Load*, with Bob Rock producing once again. Representing a distinct creative departure from their past studio efforts, *Load* maxes out CD content limitations with a 79-minute soundscape of 14 songs.

PHOTOS: PAUL NATKIN

Singer/guitarist James Hetfield

Paul Owen (left) and "Big Mick" Hughes at the FOH mix position



Metallica's rig at the Rosemont Horizon, Rosemont, Ill.

In support of *Load*, Metallica found themselves occupying the headlining slot at Lollapalooza in 1996. With audio supplied by Des Plaines, Ill.-based dB Sound, the act stormed the U.S. and Canada throughout the summer. Then, following three weeks of production rehearsals at the National Exhibition Center in Birmingham, England, the band took the wraps off a new dual-platform aluminum stage constructed in the U.S. by Pennsylvania-based Tait Towers and struck out across Europe in the Fall of '96. Returning to the U.S. in late '96, the band is scheduled to tour stateside through Spring '97.

Standing five feet tall and designed expressly for use in arena-sized venues and beyond,

BY GREGORY A. DETOGNE

—CONTINUED ON PAGE 172

World Radio History

MERLE HAGGARD

Classic Country

PHOTOS: STEVE JENNINGS

There's this great country singer/songwriter out of Texas named Dale Watson, who's currently making his third album for HighTone Records. Watson's first album, *Cheatin' Heart Attack* includes the song "Nashville Rash," which, as you might guess, is a send-up of "new country" music. The chorus begins with the line, "Help me, Merle, I'm breaking out in a Nashville rash..." He means Merle Haggard, of course—the soul of real, hard-edged, classic country.

Haggard's out on the road right now, as he is most of the time, reminding his audience what country music is supposed to sound like. Out with him is a great band of players, The Strangers, including lead guitarist Joe Manuel, Abe Manuel (Joe's brother) on fiddle, rhythm guitarist Randy Mason, bassist Eddie Curtis, drummer Biff Adam, Norm Hamlet on pedal steel guitar, Alan Markham on sax and Bonnie Owens singing backup (as do Haggard's rowdy fans a good part of the time). Haggard's front-of-house engineer, for three years and counting, is Greg McGill, whose 20 years of experience was mainly with regional California acts before joining this tour.

FOH engineer Greg McGill

Mix saw the show at San Francisco's Maritime Hall, a sailors' union hall that was transformed into a dance hall last year (see Club Spotlight in Jan. '96 *Mix*). It's a big, boomy wooden-floored space with a high-curving ceiling and a small balcony full of wooden seats—not the easiest room to mix (and to mix from the balcony), but the venue has invested in a high-quality Meyer Sound system, and the Hall's crew are impressively helpful. Jack Shaw, chief engineer for the Maritime Hall, has prepared a bound, comprehensive booklet for visiting engineers that not only lists installed and otherwise available equipment, but includes complete load-in instructions, clear wiring and patching diagrams, manufacturers' product instructions and specs, names and phone numbers of staff and freelance engineers, and guidelines for using the system and packing up.

The installed Meyer system is centered around a 40x8x4 Meyer/ATL (Acoustic Technical Laboratories) M4084 console. The P.A. includes three self-powered MSL4 speakers per side on the floor, and two per side flown, for the balcony. There are also two Crest-powered MSL2s for downfill and one Crest-powered UPA2c for center downfill.

The monitor board, which is situated at stage left, is a Meyer/ATL M3208 32x12. Haggard's monitor engineer, Bob McGill (Greg's brother) is carrying a monitor rig on the tour (a Soundtracs board and MacPherson wedges powered by AB International amps), but he didn't need it in S.F.; he made use of the Hall's Meyer UM1C, MTS-2 and UPA1 wedges. And both Greg and Bob McGill stuck with the venue's available outboard gear, which includes five Meyer CP-10 parametric EQs, one Meyer VX-1 EQ, an Ashley GZXS 31-band ⅓-octave EQ, plus a Yamaha SPX900II multieffects unit.

"I carry a few reverb effects and gates," Greg McGill says, "but nothing spectacular. We normally go into venues that have the equipment that's needed, so there's really no reason to bring equipment in when it's already there. Usually, their system's already fuzz-free, and adding something to a system can cause more problems than it solves. And with the way we tour, we have to drive overnight to get there and do a show that day, so there's not enough time to deal with big problems."

The Merle Haggard tour is Shure-endorsed, however, so McGill uses his own Shure mics, the same setup every night: SM57s on Haggard's Fender Bassman guitar amps and on accordion, an SM58 on sax, an SM81 on trumpet. On drums, McGill places

BY BARBARA SCHULTZ

—CONTINUED ON PAGE 230

World Radio History

Balanced Power is ideal for the most critical, ultra-low-noise installations.

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

The IT-1220's heart is a specially wound and shielded toroidal isolation transformer with a center-tapped secondary, allowing the AC power to be balanced at its source. The current-carrying wires are no longer "hot" and "neutral" (0V), but two 60V lines of opposite polarity (referenced to the safety ground connected to the center tap), whose difference is 120V.

The IT-1220 provides 14 balanced outlets (two front and 12 rear) and includes an accurate, self-checking "smart" AC voltmeter, an Extreme Voltage Shutdown circuit, and a "Soft Start" circuit to prevent large inrush surge currents.

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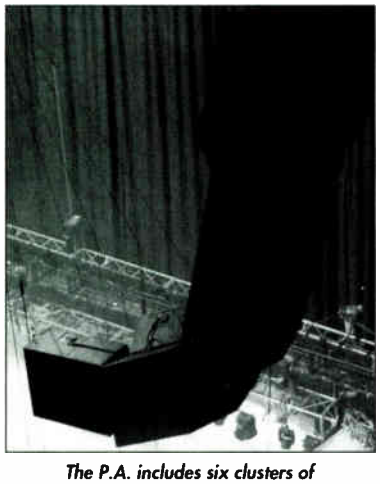
World Radio History

SOUNDCHECK

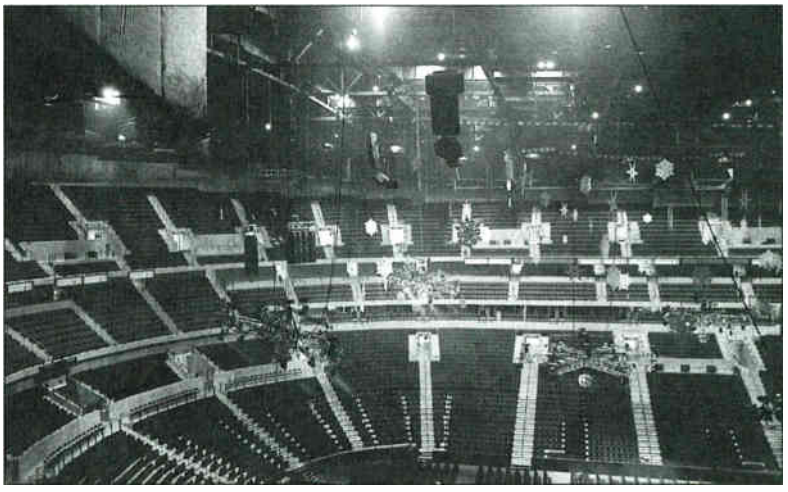
NASHVILLE ARENA

The December 18, 1996, opening of the 18,000-seat Nashville Arena was an event to remember for local residents. Dubbed the Tennessee Christmas concert and featuring Amy Grant, Vince Gill, the Nashville Symphony and Nashville Choir (among others), the event was by all accounts a great experience. Concert-goers were treated to what could become the arena concert venue by which all others are measured. "This arena actually allows you to hear the musical details," was one of many positive comments heard following the concert. Until now, the city has lacked an indoor venue that was large enough for most major acts. The new arena, along with its dedicated rehearsal hall, may now be viewed as the ideal venue in which hometown artists can kick off their national tours.



The P.A. includes six clusters of Renkus-Heinz Co-entrant speakers

When the city leaders of Nashville decided to build a new arena, they held a design competition. Included with the normal specifications for a modern sports facility was the unique requirement for an arena that would feature acoustical characteristics to service Nashville's world-famous music industry and become a venue for fans and performers alike. The city's emphasis on acoustics and performance was signified by the participation of Vince Gill on the architectural selection committee.



The new Nashville Arena, system designed by Wrightson, Johnson, Haddon & Williams of Dallas

The winner in the design competition was the architectural team of HOK Sport of Kansas City, and Hart, Freeland, Roberts of Nashville. Wrightson, Johnson, Haddon & Williams of Dallas were the team's acoustical, sound and audio-visual systems designers. Though the arena design brief was for a multipurpose space, the acoustical design directive was quite different. According to Jack Wrightson, "The primary acoustical design goal for most professional sports arenas is for crowd noise first, concerts second. The sports franchises that occupy these facilities want the place to be really loud when the crowd gets going. In Nashville, the goal was to design a venue with controlled acoustics that would help, not hurt, the arena-class touring sound system.

"The biggest problem in the design of acoustical treatments is the ability to achieve low-frequency absorption," Wrightson adds. "Most roof and wall treatments work fairly well down to 500 or 250 Hz. But at frequencies below that, there is generally a problem with excessive reverberation. It is not unusual to see a modern arena with reverberation times of five to six seconds at 125 Hz and 2.5 seconds at 2 kHz. This imbalance can result in a 'boomy' sound quality."

BY VANCE BRESHEARS

TRAPEZOIDAL BAFFLES

The low-frequency problem was addressed by using large, free-hanging acoustical banners designed to reduce reflections off the acoustical metal deck ceiling. In addition, a large series of trapezoidal "fin" baffles ring the rear of the arena, overhanging the upper-level seating. These 4-inch-thick baffles are filled with high-density Fiberglas and stand approximately 10 to 15 feet high and 30 feet long, with the long axis extending out into the arena. High-frequency absorption treatments are more conventional.

One of the more unique treatment methods is the use of an additional space in the upper part of the building that is acoustically coupled to the main volume through Fiberglas insulation. The result is dramatically improved low-frequency absorption. Just as the low-frequency performance of wall-mounted absorption panels is improved by mounting them with an air gap behind each panel, having no backing with a large volume behind can produce even better low-frequency absorption.

"The result is a very controlled acoustical environment," Wrightson notes. "We were able to eliminate excessive reverberation, particularly at lower frequencies, and attenuate

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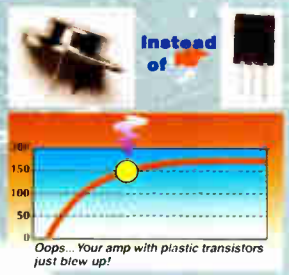
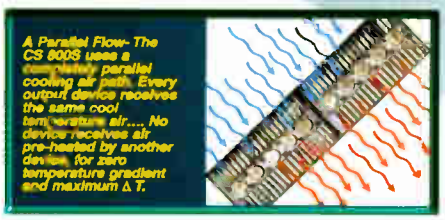
What to Keep

The new CS 800S uses metal (TO-3) power transistors, because plastic devices just don't deliver equivalent thermal performance. While metal devices can be used right up to silicon junction failure, plastic devices degrade 50°C (90°F) sooner. This margin of "thermal headroom" can be the difference between a really loud finale and something more final.



Oops... Your amp with plastic transistors just blew up!



Books have been written about thermal management, but it all boils down to three things: air flow, heat sink area, and Δ T (the difference between the heat radiator and ambient air). The CS 800S uses a unique "parallel flow" heat sink alignment so every transistor receives the same cool temperature air for optimum Δ T.

With two variable-speed 32 CFM fans cooling hundreds of square inches of heat sink area, and metal (TO-3) power devices (in the air stream), the CS 800S will play very loud for very long (years - not minutes or seconds).

The audio amplifier section uses proven Class A/B ultra-linear complementary topology with several improvements that further reduce the distortion/noise floor even lower than the already "audiophile quality" CS® 800X (40 v/μsec, <0.03 % thd, etc.)

Our exclusive output circuit design (patents pending) completely compensates for amplifier output impedance. We conservatively spec damping factor at 1000 but it is only limited by component tolerance.

Modular inputs and outputs provide flexibility in configuring the CS 800S for your application. Binding post, or Speakon® outputs, it's your call. A clever input circuit accepts anything from XLR balanced line level signals to single-ended speaker level signals. Caution: don't try this with a non-CS amplifier; speaker level input signals will fry most amps on the market today!

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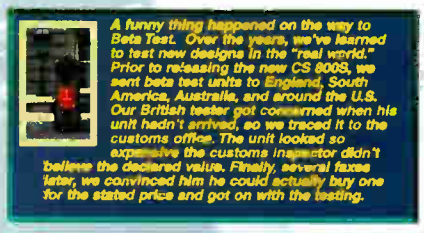
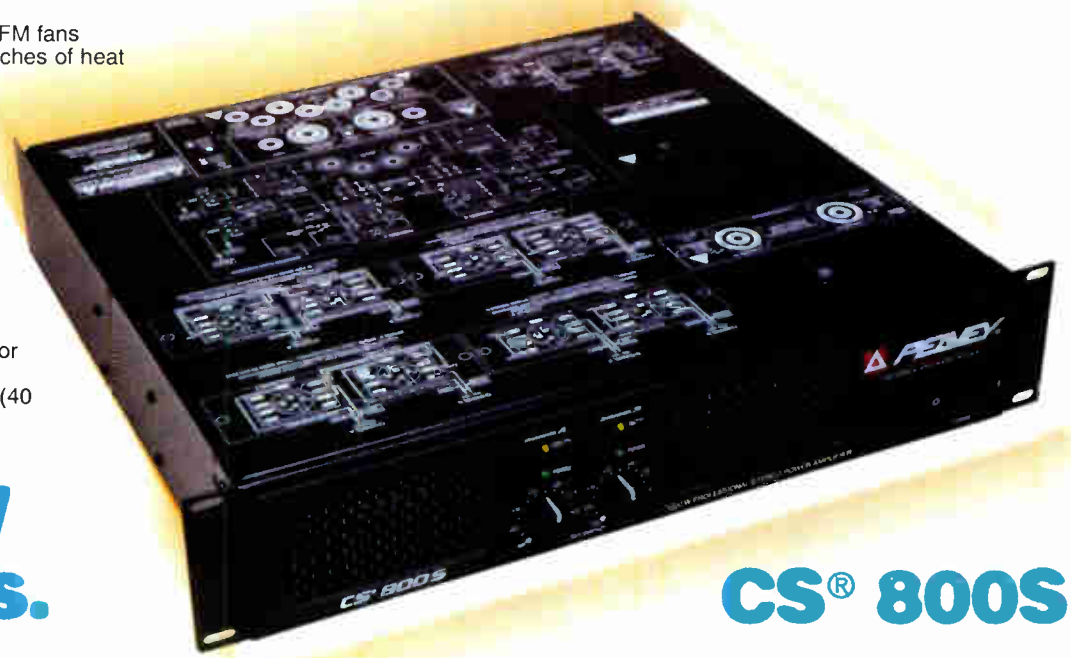


What to Change

The new CS 800S is two rack spaces high and weighs only 23.5 lbs! The CS800S wasn't lightened by using a smaller power transformer and fewer output devices on a "trick" heat sink. We used our years of digital and "switchmode" experience to develop an advanced high frequency power supply. More than just a replacement for the old heavy iron transformer, intelligent load and thermal sensing dynamically interact to provide more power, longer, and more reliably than previous approaches.

This, combined with our more than 30 years of experience building the most reliable solid-state amplifiers in the world, allowed us to redesign the whole amplifier from input to output, merging the best of the old with the best of the new to deliver 1,200 watts of superior performance without breaking your back or your pocketbook. The CS800 just keeps getting better!



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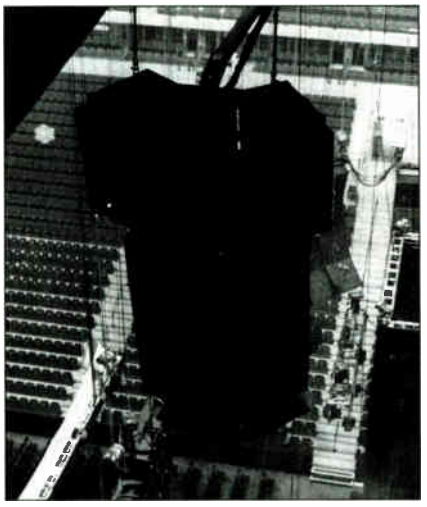
most of the late-arriving sound reflections that are generally detrimental to clarity and intelligibility. But since the seating bowl is similar to most others with hard surfaces, there is still enough early reflected sound energy to make the room feel right. The original design called for angled and contoured faces at the front of the club and upper-level seating to reduce echoes without further absorption. However, this feature was eliminated during the cost-cutting phase of the project."

For the grand opening concert, as will surely be the case for most concert events, a touring system was brought in. However, for other functions, including arena football and boxing, the house system will be relied upon for high-quality speech and music sound reinforcement. Eventually, the city hopes to bring in an NHL or NBA team to make the venue its home.



"They wanted a high-impact sound reinforcement system that could take advantage of the controlled acoustics in the room," says WJHW's Brad Ricks, sound system designer for the arena. "Because of their acoustic and sound reinforcement requirements, we decided to utilize a four-way, high-power-density speaker system that included subwoofers. In most rooms of this size, you don't stand a chance with subs because of the acoustics. Sound below 100 Hz becomes very problematic."

DISTRIBUTED CLUSTER DESIGN

The main seating bowl system is based on a distributed design of six clusters roughly following the hockey dasherboard outline. Clusters of Renkus-Heinz Co-entrant speaker components are spaced with two on either side covering the main side seating areas, and two clusters at either end covering the end sections. Speaker components include Renkus-Heinz CEMH64-3 mid/high cabinets for long throw, each containing six 1-inch high-frequency compression drivers and six 6.5-inch midrange cone drivers. "These long-throw cabinets provide a tremendous amount of punch and impact in a relatively small package," observes Ricks. "They have good directivity control throughout the mid and high bands, and generally are great-sounding boxes."

Medium- and short-throw speakers are the Renkus-Heinz CE-3 64 and CE-3 94, respectively. Also used in the main clusters are the CE-3 low and C-3 subs for the low and sub-bass frequencies. Additional sound system coverage for some of the upper seating areas is provided by CEFR95-1 speakers on signal delays.

"The system design criteria included high-impact, full-range music reinforcement, even sound coverage and high intelligibility," says Ricks. "We chose the Renkus-Heinz speakers for their combination of high output, directivity control and sonic quality.

"Probably the main compromise in the system is a slight loss of sound level coverage in the very upper rows of seats," Ricks continues. "We felt it was worth a few dB rolloff in the upper seats in order to keep sound energy off

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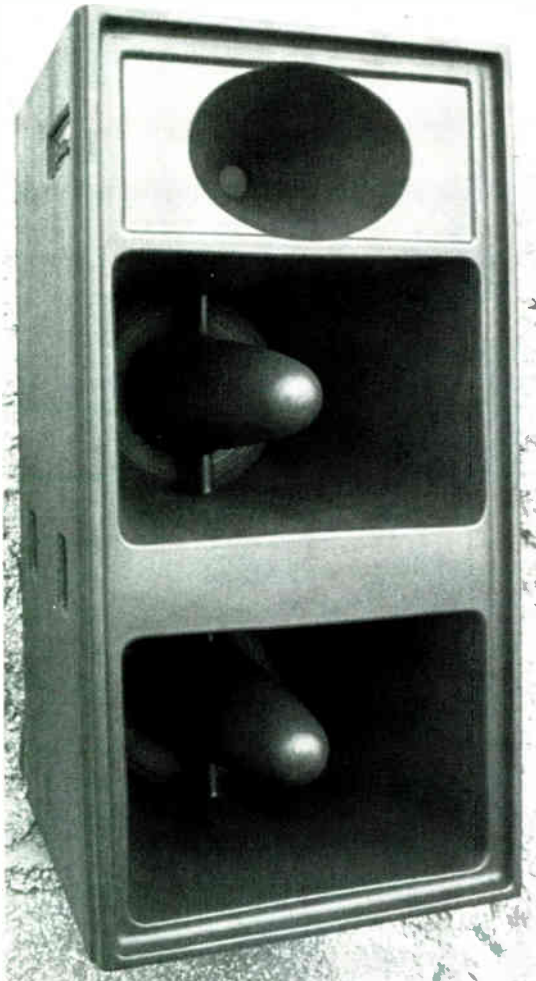
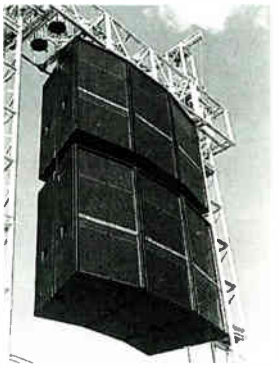


Most loudspeaker systems cost a lot more than the price of their individual components. Only Viking Audio offers an extensive line of high quality enclosures *without drivers*. Save thousands of dollars by installing the drivers yourself - a simple task taking less than one hour per cabinet.



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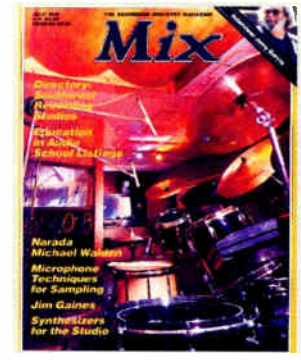

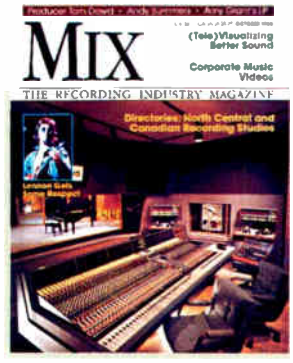

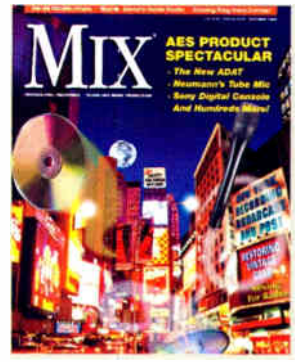

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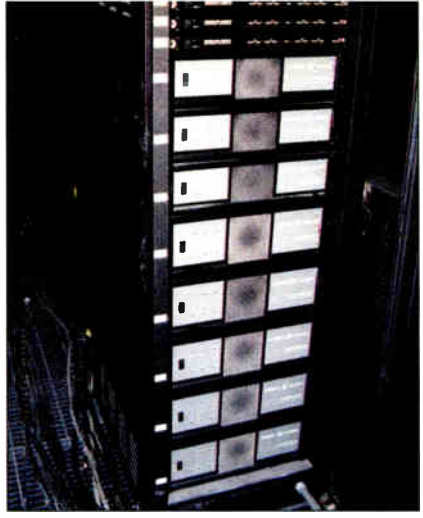
World Radio History

the upper walls and minimize reflections. We decided to aim the long-throw speakers down just a bit to provide the best balance of seating coverage while minimizing reflections. Even with the extensive amount of absorption, there will be some reflected sound energy off the metal deck wall materials."

COMPUTER-CONTROLLED AMPLIFIERS

Powering the Renkus-Heinz speaker system are NexSys computer-controlled Crest CKS and CKV amplifiers. The Crest computer-controlled amplifier system allows each of the six main clusters to have a dedicated amplifier rack located directly above for short speaker cable runs. Also distributed in the main cluster racks are White DSP-5024 signal processors connected through a serial control system.



The P.A. is powered by a computer-controlled Crest amplifier system

The NexSys computer-control system eliminates the requirement for all amplifiers to be located in a central equipment room. Distributed amplifier racks can be monitored and adjusted via computer control from the control room. Through a combination of signal routing and NexSys amplifier control, a touring act can tap into the house system and provide coverage to some of the upper seating areas. "NexSys presets allow us to set up the system for various configurations of amplifier level changes and muting control to accommodate a variety of scenarios," explains Ricks. "We also can set up similar configurations with the White DSPs. Once the final setup is complete, there will most likely be a concert mode and a normal mode for both the NexSys system and the Whites."

Signal processing for the system in-

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- *"...quite detailed, allowing you to pick specific elements out of dense mix."*
- *"...I would encourage all nearfield buyers, regardless of price point, to listen to these monitors."*

Pro Audio Review
Lorin Alldrin, Sept/96

- *"It was a pleasure mixing on the YSM-1s, and the resultant mixes translated exceptionally well to other playback systems...ear fatigue was nonexistent."*
- *"...The YSM-1 reproduces timbres with near pinpoint accuracy."*
- *"The YSM-1 is a full-bodied, sonically neutral monitor that, to my ears wins the prize for delivering the most realistic picture of the aural spectrum."*
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Electronic Musician
Brian Knave, July/96

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NEWSFLASHES

Grammy-winner **Celine Dion** is on the road this year with gear provided by Montreal-based **Solotech**. The tour employs two Soundcraft consoles for front of house: a 48-input Europa and a 32-channel sidecar. The Europa is also being used as a recording console; all of the shows are recorded to Sony PCM-800 8-track digital. The monitor board is a Soundcraft SM-24. Dion and her six-piece band are also using Garwood in-ear monitors...Soundcraft consoles were also used for the recent **BRAT Awards** held at the **London Astoria** theater and sponsored by NME. Equipment for the event, which was provided by **Marquee Audio** and **Britannia Row Productions**, included a Europa for front of house and an SM24 monitor console. The monitor system at the Astoria included four Turbosound TFS 780 Flashlights and four TFS 760 Floodlights for sidefills, plus 16 TFM 115 wedges, two TFM 250s and two TFL 118s for drum fills, all powered by a combination of BSS EPC-780 and EPC-760 amplifiers...Level Control Systems reports that two of its LD-88 digital mixers were installed

—CONTINUED ON PAGE 166

World Radio History

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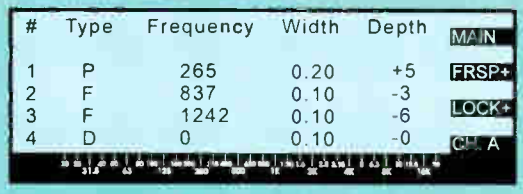
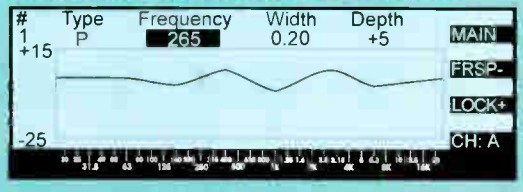
1. FBX/Parametric EQ — List View

Tabular editing of 12 digital filters, switchable to parametric, fixed FBX, or dynamic FBX. Patented, adaptive FBX filters find & eliminate feedback, providing more gain, improved clarity, and more wireless mic mobility. Adjustable FBX sensitivity and tracking.



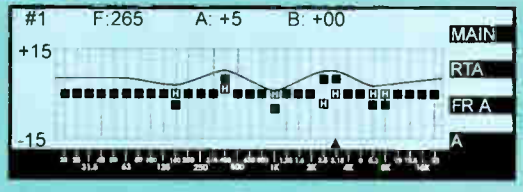
2. FBX/Parametric EQ — Graphic Edit View

Click & Drag graphic editing of parametric filters; grab-a-filter or select any point on curve to edit using cursor keys & datawheel. Shows response curve as you sweep filter center frequency, width, or depth. Filter ranges: 20 to 20kHz, +12 to -80 dB, 1/100 to one octave.



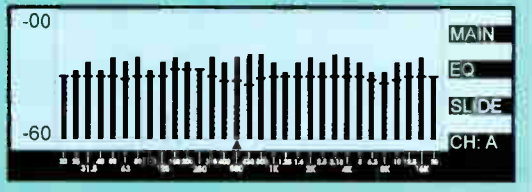
3. Graphic EQ

Edit 31 bands per channel simultaneously on same screen. View actual frequency response curve as you adjust filters. Edit channels individually or LINK them together. Edit one channel and COPY it to the other. View POWER-Q curves or room curves.



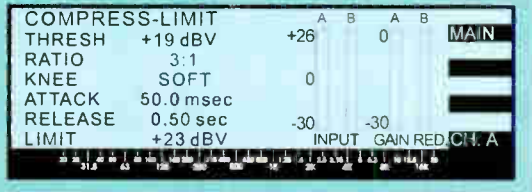
4. Real-Time Analyzer

31-band, digital, filter-based, 1/3 octave ISO. Choose A, B, or C weighting, absolute/normalized display, slow/fast response, pink or white noise generator. Superimpose graphic EQ on RTA display** for precise viewing and editing of frequency response.



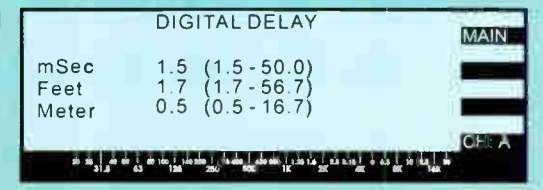
5/6. Compressor-Limiter/Gate

Control compressor threshold, limiter threshold, compression ratio, attack & release time, gain and peak limit for each channel. View input and output levels, and gain reduction. Adjust gate threshold, attack, release.



7. Digital Delay

Two 1x1 digital delays with 20 microsecond resolution. Input in feet, meters or seconds.



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cludes Renkus-Heinz controllers and White DSP-5024 digital signal processors. System installation was by SESCO (Hingham, Mass.), with Joe Patten working as the project manager and Tom Boulaine as the project engineer. Additional control is accomplished by a Crestron touchscreen control panel for the announcer, tuner, TV audio, and auxiliary signal routing to upper concourse, club concourse, main concourse, restrooms and ticket booths.

"It has been fun to work on an arena with different acoustic and sound system requirements," Wrightson says. "It will be interesting to see how people feel about this room after it has been used for some time." ■

Vance Breshears is a sound system design consultant based in Alpine, Calif.

—FROM PAGE 164, NEWSFLASHES

at the **Lance Burton Theater** at the Monte Carlo Casino and Resort in Las Vegas. The theater sound system was designed by **Specialized Audio-Visual Inc.** of Clifton Park, NY...An EAW speaker system was installed in **Club Colosseum**, a London nightclub overlooking the Thames. The system was designed and installed by **CVA Ltd. of London**...**Feld Entertainment**, which produces Ringling Bros. Barnum & Bailey Circus, Walt Disney's World on Ice and The Wizard of Oz on Ice, is using 350 channels of CyberLogic amplification for its touring events...The new production of Bizet's *Carmen*, which opened in February at London's **Albert Hall** employs a sound system designed by **Autograph Sound Recording** (London). The system includes two clusters of eight Meyer Sound MSL-4 loudspeakers, plus four clusters of four Meyer UPA-1s...System designers **Acoustic Dimensions** hired Brian Elwell as part of an effort to expand its Dallas office. In addition, the company's New York office has relocated to 2 East Ave., Larchmont, NY 10538; 914/833-1300...The **Welk Champagne Theater** in Branson, MO, took delivery of 240 of System Development Group's (Frederick, MD) Art Diffusors and Sonora Panel wall treatments. This theater was voted Best Sounding Theater in Branson by the Branson Music Awards in 1995. ■

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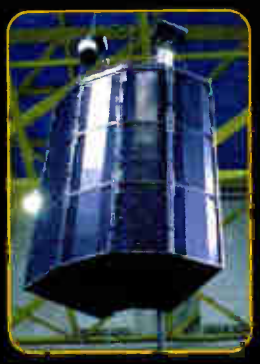

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—FROM PAGE 156, ARENA SOUND

ceivers can use them, often at some nominal rental fee, and you may find it interesting to check out the house HI system next time you buy a concert ticket. In a world with increasingly louder environments and music, it's a sure bet that HI patrons will make up a larger segment of the listening population as time goes by.

However, the quality of low-bid arena HI systems is often poor. The transmission can be noisy, suffer from limited bandwidth and, like the listening conditions in the back row of the balcony, is often neglected and unmonitored. Another reason for poor quality is deliberate decisions by the artist's engineer. A common source of bootleg recordings is an unauthorized split from the feed to a venue's HI system. It's often impossible to verify the security of a connection that begins with an XLR on the arena floor and routes through a house patchbay to feed a remote transmitter. Some engineers therefore defend their artist's material by providing a voice-only or partial mix to HI systems, ensuring that any tapes made will be incomplete. Although it's conceivable that a production could maintain complete control by carrying its own transmitter and receivers, the law requires provisions for 4% of the audience, a daunting inventory for arenas that hold tens of thousands.

Despite the legislative support of HI, any act that plans to transmit quality audio to show patrons via the FM band faces legal hurdles. Several years ago, the Yes tour provided a live FM broadcast of the show for patrons with Walkman receivers. When asked for details, an inside source had no comment and said there were "lots of reasons not to talk about it." As one might expect, FCC law protects traditional broadcasters at the expense of smaller interests. Various sections of the airwaves have specific guidelines for how they are to be used.

Two exceptions to FM regulations are of interest. Under Part 15, low-power broadcast on frequencies from 88 to 108 MHz is permitted without license as long as measured field strength is less than 50 microvolts per square meter at 50 feet, allowing an effective range of 50 feet at best. A typical application is in health clubs that offer multiple televisions, allowing patrons to listen to the audio program of their choice while exercising. Other applications include multilanguage presenta-

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tions and hearing-impaired systems in very small theaters. Larger venues use higher-powered FM systems operating outside the commercial band with proprietary receivers. (Infrared broadcasting for HI systems in theatrical venues avoids FCC restrictions, but infrared can't cover large venues because of its line-of-sight nature.)

The noteworthy loophole in broadcast law is Part 74, which permits theatrical productions to use frequencies in TV channels 5 and 6, between 76 and 88 MHz, at up to 50 milliwatts measured at the transmitter, and there is no field-strength limit. Stage, movie and TV productions make use of these frequencies for remote IFB, one-way cueing channels and director's confidence monitoring. This includes transmitting on 87.5 to 87.8 MHz, at the low end of the dial. Walkmans can tune in those frequencies, and there's not much down there if there's no local TV-6. Stereo broadcasting is not legal because the subcarrier requires more bandwidth, but with an efficient antenna, it's possible to cover an entire stadium. Though the devices are not designed for this purpose, it's clear that patrons who bring their own Walkmans could listen in on these frequencies, as could the production personnel for whom the transmission is intended and legal. Suddenly, the lips on the video screen are in sync with the words! With noise-canceling headphones or in-ear transducers, any delay offset from the P.A. would be reduced or eliminated.

The outdoor Boston Common concert series was ultimately canceled because of the complaints of residential neighbors. But it's not hard to conceive of concerts in the future that are drowned out by street traffic and other ambient noise, while both patrons and performers listen to in-ear transducers. With the arrival of digital radio broadcast this year and recent developments in cellular technology, it's easy to imagine multichannel local area transmissions for a variety of applications, including theatrical entertainment. Walkman concerts are not going to replace arrays of trapezoidal enclosures, but it's interesting that one evolution in entertainment audio may make use of the consumers' own equipment, rather than mountains of speakers from a half-dozen 18-wheelers. ■

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

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LIVE SOUND

—FROM PAGE 157, METALLICA

the new stage is capable of bringing in-the-round performances to legions. The double-ended, dual-platform setup is highly angular and incorporates various pitches and planes. Each end incorporates a drum kit that can be raised and lowered hydraulically. With Ulrich alternating between the two drum kits, plus ten vocal mic positions outfitted with hard-wired Shure Beta 58As, the band is free to address any section of the crowd at will. Lighting rises above the 360-degree performing area on alien-like mechanized arms that fold up and down with the aid of visible tendons made of steel cable.

Sound reinforcement this time out was supplied by SSE Hire Ltd. of Birmingham, England. Based around six stereo hangs made up of more than 140 pieces—including Electro-Voice MTH4 and MTH2 mid/hi cabinets, and MTL4 and MTL2 bass bins—the system is fueled by a rolling army of Crest 8001 and 7001 power amplifiers. House control is supplied by a Midas XL4 console with flying faders, while signals are divided within the digital realm according to a three-way scheme by BSS Omnidrive units.

Central among the monitor system components are CPM wedges and BML cabinets from SSE, complemented by E-V FS212 and FS115 wedges. Buried beneath the stage, most monitors point straight up through the grillwork of the dual-ended platform. Monitor mixes come from a Midas XL4 via Crest 7001/8001 amplification, DX 34 and XEQ3 crossovers from E-V, and Klark-Teknik DN 360 graphic EQs. Microphones are mainly Shure models and include a pair of U24D/Beta 58 UHF wireless systems.

Metallica's front-of-house engineer is Michael "Big Mick" Hughes. His partner, below deck at the monitor desk, is Paul Owen. At 39 years of age, both Englishmen (Hughes is from West Bromwich, and Owen is from Kingswinford) have been with Metallica since 1982 and 1986, respectively.

Mix spoke with both men this past February at Chicagoland's Rosemont Horizon, where Metallica played to sell-out crowds on three consecutive nights. Our interview began in a backstage tuning room littered with amplifiers and road cases. At one point, Metallica's Kirk Hammett burst in with a small silver pendant dangling from a hole pierced below his lower lip. Waving the

World Radio History

"These puppies keep on barking"

Dear Audix,

"After years as a session bassist and music teacher, I finally decided it was time to start making my own albums at home. In this digital age, choosing recording equipment isn't very difficult until it comes to studio monitors. A friend loaned me some "well known" speakers but they really lacked bottom end and lower-mids. (A major problem if you're a bass player!) A local music store recommended I try some Audix PowerHouse speakers and I got the self-powered PH15-vs. Man, I just love the little brutes!! I not only tracked my last two CDs on them.... I mixed on them as well. On my new record I came up with some super-fat, clean, low end kick and bass grooves that make me crazy! I see no reason to upgrade because these puppies just keep on barking." Kudos to you and your design team!

Keep up the great work,

Dann Glenn

Bassist—Recording Artist, Nightvision Records

Thanks for the letter Dann!

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PH15-vs are constructed with a 5 1/4" polypropylene long throw woofer and a 3/4" ferrofluid tweeter. Every woofer and tweeter are matched with a custom crossover and front ported cabinet for the most balanced sound possible.

Like Dann, you'll be amazed at the definition and punch these compact speakers deliver. Best of all, suggested retail for the PH15-vs is only $479 per pair.

PH15-vs

SPECIFICATIONS

frequency range	*50Hz-20kHz*
power capacity	*45 watts RMS per ch.*
nominal impedance	*4 ohms*
sensitivity	*88 (1w@1m)*
crossover frequency	*2.6kHz*

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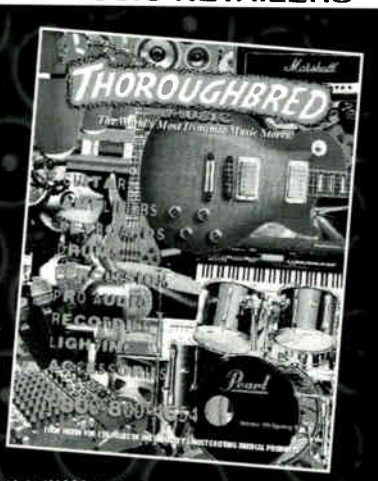

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stub of a cigar for emphasis, he declared that he always keeps *Mix* in the studio "for effect if nothing else."

Sometimes it's hard to imagine that only four people are responsible for the overpowering musical assault Metallica launches onstage: four people, four instruments, minimal effects and gimmicks. It's a simple formula. What is the essence of their sound?

Hughes: It's the energy I'm trying to capture. For instance, the kick drum has to rattle your teeth, you know what I mean? If it doesn't, then it's not working. That's what the fans come to hear. They come to have a rage at a Metallica show.

What are the average SPLs onstage?

Hughes: They are probably in the range of 110 to 112 dBA.

Loud. And you have ten Beta 58As ringing the stage, the back line, plus two drum kits. How do you effectively deal with the all-too-great risk of ambient mayhem and feedback, given the volume and all the microphones out there?

Hughes: We take a common-sense approach. First of all, there is no back line. Not in a traditional sense at least. All of the back line gear is enclosed in isolation chambers. The guitar amps are housed in boxes at stage left and stage right. Audio-Technica ATM 4050s are used inside. Bass is DI.

Owen: What we've done is isolate the back line completely using what are essentially recording studio techniques. It provides me with the ultimate amount of control, as well as the ultimate amount of blame, because if it doesn't sound right, the finger doesn't get pointed at the guys who would normally be responsible for the back line. It points straight at me, because everything is coming through the monitors. But when it comes to control...I actually do sustain for the guys in different places—on leads and things—and I'd never be able to do that with open mics on the back line. This way I can take it as it is and do what I want with it—to the band's liking of course.

Hughes: Paul generates an incredible amount of volume with the monitors. He probably has 80 kilowatts of wedges pointed straight up at the roof from under the grille. Not only does that screw with the ambience of the vocal mics, but it splatters energy off the roof like paint, so I have to come in and try to fit the P.A. in around that plot. But

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what can you expect when you have 80 wedges going with one guitar playing as loud as possible? It's going to be everywhere, y'know?

Given your environment, do you gate the Beta 58A vocal mics?

Hughes: I use a Behringer MDX2000 Composer on each of the vocals. At the end of the Composer there's an expander gate. It's just one knob. So yes, I actually gate the vocal mics, which is something I don't normally do, because I hate the hip-hep-hup-hup choppy sound of a gated vocal mic. But the Composer works—they sing into it and it never misses a beat. The only time I have to switch it off is when they're simply talking to the crowd, and that's easy enough to do from the desk. Otherwise, they are all gated all of the time.

Does the Composer have an impact upon your use of effects?

Hughes: Definitely. I do a lot of delay effects, and some flanging, chorus and reverb. When you have ten vocal mics in-the-round, it's impossible to chase the performer around from mic to mic and add the appropriate effect when required. That would be a full-time job in itself. And if all the vocal mics were sitting there open with all these effects on them, the whole thing would just take off and you'd have every mic going waah-waah-WAAAAH. With the Composer I can apply the same effects to all the mics, and there's no problem.

Stage vibration has to be a problem too...

Owen: This is an aluminum stage, so of course vibrations can really travel right up our mic stands into the mix. Especially in the front line. These people wear big boots too, that doesn't exactly make them the most graceful things in the world. So the potential for vibration noise is a constant threat.

How do you combat that threat?

Hughes: The improved design of the Beta 58A—which includes a new shock mount—has been a big help. I've always been a stalwart when it comes to the original Beta 58, but one day Paul came to me and said, "Mick, ya gotta try this." So we gave the 58A a knock, and he was right. I really enjoyed it; it rejects a lot of the rubbish that's around. And trust me, we have enough ambient sound out there for every metal band on the planet. If you sit at the drum kit and Paul chops the guitar up for you, I guarantee you'll never have heard anything like that. The pressure is incredi-

—CONTINUED ON PAGE 230

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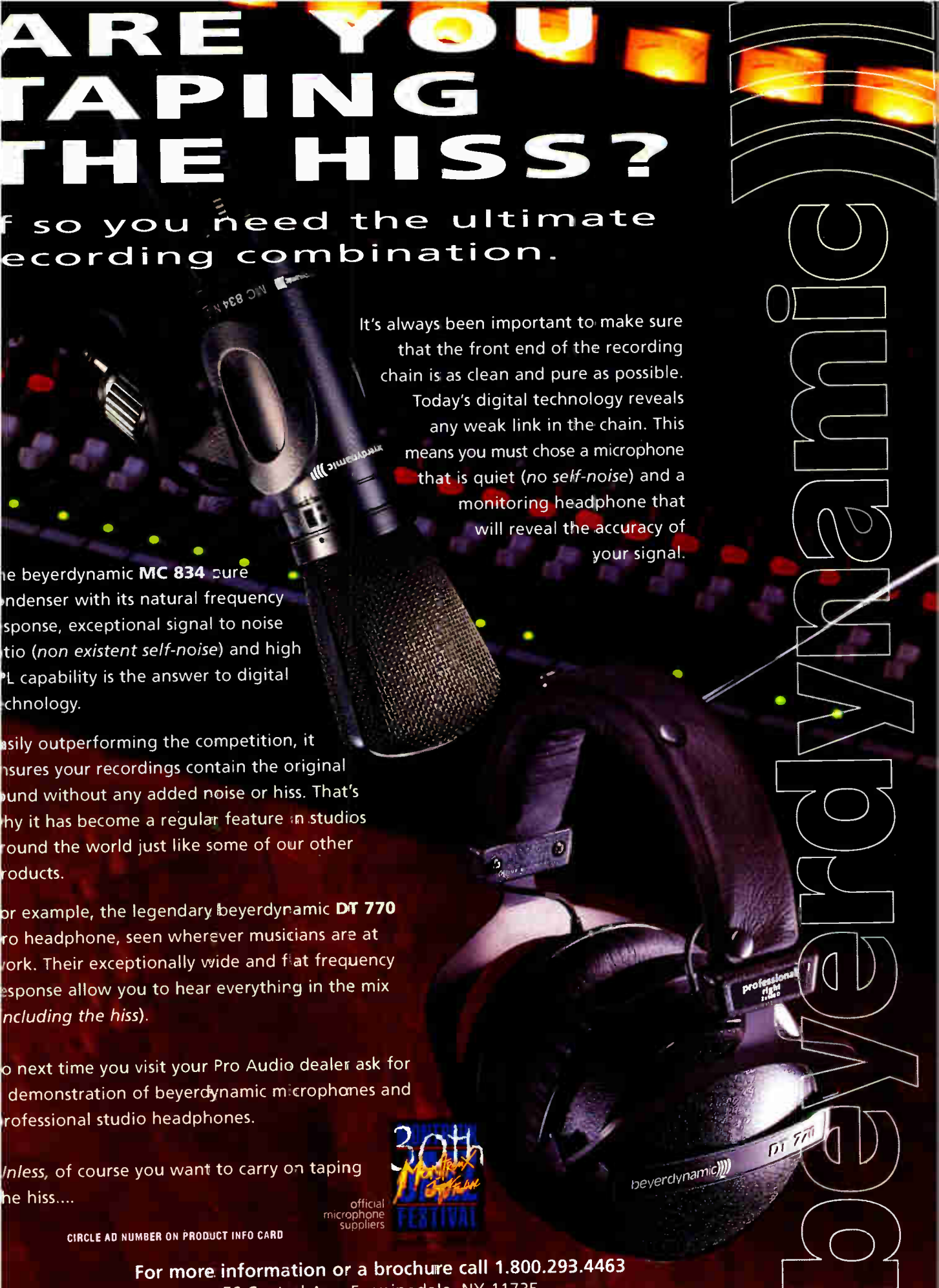

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New Sound Reinforcement Products

EAW LA212

EAW (Whitinsville, MA) has added the LA212 two-way, full-range loudspeaker to its Linear Activation Series. Including a 12-inch woofer and 2-inch exit compression driver on a proprietary waveguide, the LA212 features an asymmetrical vented enclosure and may be stand-mounted for P.A. applications or used as a floor wedge. Long-term SPLs of 120 dB are claimed. Price is $1,645.

Circle 314 on Product Info Card

E-V RE500

The RE500 handheld condenser mic from Electro-Voice (Buchanan, MI) features a large-diameter, true condenser element, which—according to EV—offers improved signal-to-noise and temperature variation resistance. The phantom-powered RE500 features a cardioid pickup pattern, Warm-Grip™ body shell and AcoustiDYM™ shock-mount system for reduced handling noise. Frequency response is 80-18k Hz; dynamic range is 128 dB; maximum input SPL is 148 dB. Price is $450 list.

Circle 315 on Product Info Card

dbx 20 SERIES GRAPHIC EQUALIZERS

The first three models in the 20 Series of graphic EQs from dbx (Sandy, UT) are the 2231 2-channel ⅓-octave EQ ($749.95); the 2031 single-channel ⅓-octave EQ and the 2215 2-channel ⅔-octave EQ (both $499.95). All 20 Series units feature dbx's Type III noise-reduction circuitry to reduce noise due to radical EQ settings; they also include PeakPlus (patent pending) limiting for overall gain control. Front panel controls include input and limiter thresholds, 45mm sliders, NR and EQ bypass, range selection (±6 or 15 dB) and low-cut filter insert. I/O connections are XLR, ¼-inch and barrier strip.

Circle 316 on Product Info Card

AUDIO-TECHNICA ATM89R

Audio-Technica (Stow, OH) offers the ATM89R handheld condenser microphone in its Artist Series. Featuring a 2-micron, gold-vaporized diaphragm (the mic permanently charges the back plate, rather than the moving element), the ATM89R is supplied as a hypercardioid; an interchangeable element design allows cardioid, subcardioid and omni elements to be substituted. Frequency response is 70-20k Hz, internal shock-mounting minimizes handling and impact noise, and the mic handles 138dB SPL signals. Price is $325.

Circle 317 on Product Info Card

CADAC MONITOR CONSOLE

Cadac (Luton, England) announces its first monitor console, the M-Type. Sharing a common frame design with the Cadac F-Type, the M-Type can be custom-configured with a variety of layouts, multipin connectors and output transformers. Features include up to 112 input channels with 28 independent mix buses (each channel offers 14 stereo sends); a combination of direct and matrix outputs can provide 52 separate outputs. Assignable VCA masters and alphanumeric displays aid in complex setups, and a typical signal path offers four dedicated monitoring points, assignable to two separate cue systems.

Circle 318 on Product Info Card

SABINE FBX-SOLO 620

Sabine (Alachua, FL) offers the FBX-SOLO 620 Series automated feedback control unit in ¼-inch SL-620 ($324.95) and XLR SM-620 ($349.95) connector versions. Both units automatically sense feedback and place up to six ⅙-octave adaptive digital filters on offending frequencies for automatic feedback control and improved gain-before-feedback. Each FBX-SOLO unit has a programmable noise gate and filter-locking feature to capture and store filter setups. Filters may be switched from ⅙- to ⅓-octave.

Circle 319 on Product Info Card

ALLEN & HEATH DIGITAL PROCESSOR

The DR12:8 digital audio processor from Allen & Heath (Sandy, UT) allows contractors and others to replace multiple rack-mounted processors with a single 2U system. Offering 12 ins and 8 outs, the DR12:8 can act as a crosspoint matrix with comprehensive ducking features, or can be configured to combine gating, compression, equalization, mix and gain-control functions for a variety of signal paths. Up to 16 internal memories allow storing multiple setups, such as eight separate 31-band graphic EQs for monitor mix applications or multichannel surround sound panning patches. Controls include 12 user-definable soft keys and an LED screen, and the unit may be expanded internally to provide up to three times more processing power, delays and remote control. Preliminary price is $2,995.

Circle 320 on Product Info Card

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"An indispensable tool for digital recording..."

—Joe Hardy

When Memphis producer and engineer Joe Hardy (ZZ Top, The Jeff Healey Band, The Radiators, etc.) is working to capture an artist's unique sound, he relies on the Peavey PVM™ T9000 condenser tube microphone. With its self-polarized condenser capsule and vacuum tube preamp, the PVM T9000 mic gives him the mellow warmth that can only come from a tube.

The uniform cardioid polar pattern makes it perfect for studio vocals, and because it easily handles SPLs up to 137 dB, Joe can count on it when high SPL instrument applications are required.

The PVM T9000 also includes a 10 dB attenuator and 80 Hz low-cut filter switches to control the variables that could hex an otherwise good session.

To complete the package, the system comes with shockmount/heat-sink, special cable and power supply.

The PVM T9000 tube microphone from Peavey Audio Media Research. Trusted by the best!

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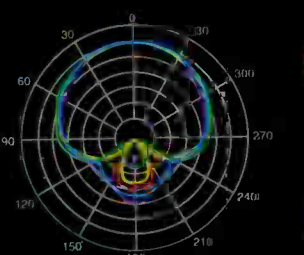

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Q: What's the difference between a PCI soundcard and the

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A: Oh, about a gazillion things.

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These days it seems like everyone and their brother is making PCI audio interface cards for the PC and Mac. To say the marketplace is a bit confused is like saying Times Square on New Year's Eve is kinda crowded. So how do you separate the good from the bad and the ugly? Easy. Look hard at the features, determine what's important to you, then balance that against what's going on in your pocketbook.

We'll help. Study these pages carefully. We think you'll soon see that Layla delivers the features and performance you want—at a price that's remarkably easy on your budget.

Okay. Got the picture? Obviously Layla isn't just another card, but a complete system. A system designed to help you make great-sounding music. Designed to grow as your needs grow. Designed to change the way you think about hard disk recording.

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LAY IT Forget about having to premix output tracks—rever. Layla features ten independent balanced analog tputs, each one boasting a superior quality DAC, for true 0-bit audio performance. And our exclusive OmniBus™ udio assignment architecture lets you easily configure the tputs as aux sends, monitor mixes, discrete track outs—u decide. Plus you can play back on all ten output hannels while you're recording on all eight input channels , that's not just full duplex—that's octadecaplex!

EXPAND IT Now for the really big news: You can synchronize multiple Layla systems—expansion is as simple as plugging in another card and connecting the word clock output of the master unit into the word clock input of the slave. (Daisy-chain as many Layla units as you have PCI slots in your computer.) When you build a larger system you not only get more hardware ins and outs (how does 24 inputs x 30 outputs grab ya?), you get more (lots more!) DSP horsepower.

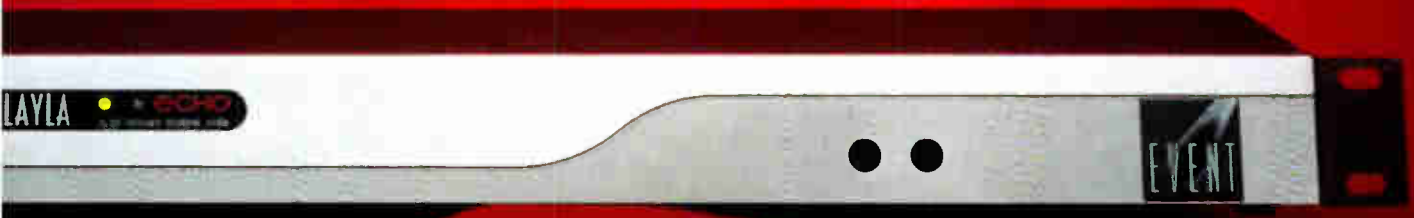
MIDI IT(!) All right. We admit that MIDI in/out/thru probably isn't the most earth-shattering feature you've ever seen (even if it is opto-isolated). But we know you'll appreciate the convenience of being able to create a simple, yet powerful audio/MIDI multitrack recording system without having to hook up a ton of additional gear (or worrying about your MIDI interface card conflicting with the IRQ on your digital I/O card, which conflicts with your SCSI card, which conflicts—you get the picture). Did we mention that Layla is a true Plug and Play™ system? That's right, no jumpers to set, no IRQs to configure (in fact, only one IRQ is used for both audio and MIDI functions and no DMA channels at all are used). Setup is as simple as plugging in the card and connecting the included multipin cable from the card to the audio I/O unit.

SYNC IT Layla offers synchronization capabilities that make it perfectly at home in a variety of professional environments. Synchronize to picture via SMPTE/MTC. Lock to external word clock. Generate sample-accurate sync from the master clock out. (Our word clock provides continuous single-sample resolution from 5kHz to 50kHz.)

DIG IT Create a 24-bit stereo master mix to send to the digital output. (Yes, Virginia, there's stereo 24-bit digital input as well.) Or maybe an all-digital effects loop is more to your liking? Whatever the application, your precious audio tracks are handled with 24-bit precision throughout Layla's internal audio path.

EDIT IT Work with total freedom. Edit your music with the precision and flexibility that only random-access disk-based recording can provide. Layla is compatible with any audio recording/editing application that uses standard Microsoft Windows 95 calls—which means Layla works with virtually all of today's most popular programs, including Cakewalk's Cakewalk Pro Audio™, Steinberg's Cubase Audio™, and Sonic Foundry's Sound Forge™ (to name just a few). You also get support for software plug-ins from respected manufacturers like Waves and Arboretum Systems. Don't yet own recording software? Not to worry: Layla comes complete with a custom version of Syntrillium Software's Cool Edit Pro™—a powerful multitrack audio recording and editing environment—so you can enjoy a no-hassle musical experience right out of the box. (Our Macintosh software package, which provides compatibility with a host of professional audio and MIDI sequencing applications, is scheduled for release in Summer '97.)

PROCESS IT That big black square sitting in the middle of the Layla PCI interface is Motorola's latest generation DSP—the 56301, a 24-bit chip running at an astounding 80 million instructions per second. In addition to being a giant chunk of raw processing power, it's the PCI bus-master, meaning that it handles all the routing of data in and around your system. That leaves your computer's CPU free to do things like drawing screens really fast. The 301 also handles audio timing information so you get dead-on synchronization accuracy and—here's one for the engineers out there—zero-latency sample-positioning (in other words, it always knows what audio is supposed to play when and where).



ECHO IT Why does it say ECHO on the card? Simple. Our strategic partners, ECHO Corporation, are the engineering team behind Layla. ECHO has been providing audio ASICs and DSP system software and drivers to the computer industry for the last 17 years, and their designs have been sold and licensed to such industry leaders as Analog Devices™, Motorola™, Rockwell™, Sony™, S3™, and VLSI™. Why should you care? Because it's your way of knowing that the Layla hardware and software driver (the key to making Layla compatible with so many of the great Windows 95 audio applications) were designed by people who really—we mean really—know computer-based digital audio.

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BY BLAIR JACKSON

PHOTO: CLAY MCBRIDE

Front: Ed Roland. Rear (L to R): Dean Roland, Ross Childress, Shane Evans, Will Turpin

COLLECTIVE SOUL'S CABIN FEVER

by David John Farinella

With a laugh, Collective Soul's Ed Roland explains how it felt to record the bulk of the band's latest release, *Disciplined Breakdown*, in a small log cabin: "It was like the old days, where you set up in your bedroom. Basically we were in one small room. We put Shane [Evans, the drummer] in a corner, put Will [Turpin, the bassist] next to him, and we all circled around." You'd figure that a band that has sold close to 7 million albums, had a half dozen Top 10 hits (including four Number Ones) and played with such acts as Van Halen and Aerosmith, would lock out Giant Studio X for six months while they recorded their next album. Not this band. A friend of theirs found the cabin while they were on the road, they scaled their gear back and simply started playing together. "It wasn't because that's what we wanted to do," Roland continues. "It was basically out of necessity. We had no other way to do it."

The sessions came at a time when the band had just spent the better part of two years on the road, and they were going through a legal battle with their former manager. "We knew that things would take some time," Roland says. "So, we just wanted to go in and do some preproduction and learn the songs—see what songs were coming out, which ones worked and which ones didn't. We put down 30 songs, actually," Roland, the band and engineer Greg

—CONTINUED ON PAGE 190

World Radio History

BEN VAUGHN RECORDS IN HIS "RAMBLER '65"

by Jeff Forlenza

Songwriter, multi-instrumentalist and producer Ben Vaughn has only driven Rambler vehicles, made by American Motors Corporation. Vaughn owns two—a '64 and a '65. Turns out that the '65 sounds better. Really, he played acoustic guitar, sang and recorded in each of them and found out that the '65 sounded better. That's why Vaughn's latest album's title is also its tracking facility: *Rambler '65* on Rhino Records (he mixed the record in his house).

PHOTOS: GREG ALLEN

"It was perfect," the energetic Vaughn says of the acoustics inside his vintage vehicle. "The headliner, which is the cardboard material on the inside of the roof, was water-damaged and drooping. And that absorbed a lot of what would have been a problem. The floor was pretty much open metal, so there was a combination of dampening on the ceiling and a live metal floor. It was an happy accident. I got a sound that I was looking for and didn't know how

—CONTINUED ON PAGE 193

A HIP HOP SAMPLE

HOW IT'S DONE AT D&D

by Dan Daley

Hip hop is more than music; it's the cultural umbrella that embraces rap, its variants and other Urban genres. Don't confuse it with Dance, though. That would be uncool.

"[Radio station] Hot 97 dropped dance a few years ago and went to hip hop, and that changed everything," says Doug Grama, co-owner (with partner Dave Lotwin) of D&D Studios on West 37th Street, probably Manhattan's leading down-and-dirty hip hop house. It's not much to look at, technologically speaking, Grama concedes, but that's been its charm as far as the hip hop camps and crews are concerned. MCI 636 consoles, JH-24 multitrack machines and older UREI monitors get pushed to the limit by acts such as Group Home, Jeru the Damager and Lost Boyz.

Studio A at D&D

"You would not believe how hard the EQs get pushed here," says Grama. "It's not state-of-the-art, but I don't think state of the art could take it quite as well and give you that rawness. The equipment is valued for the sound and its rawness—the Akai MPC 60 and the E-mu 1200 are still the big things, as are Technics turntables. So is the Akai 950; you bring in a 1000 and it's not received well because it doesn't have the gritty sound. They want the low-res, 8- and 12-bit stuff. That's where the sound is. The thing is, the hip hop people want to filter all the highs out of a sound. If a rock engineer were to come in the middle of a session and listen to a track, he'd say it sounds like shit. But when you listen to

—CONTINUED ON PAGE 231

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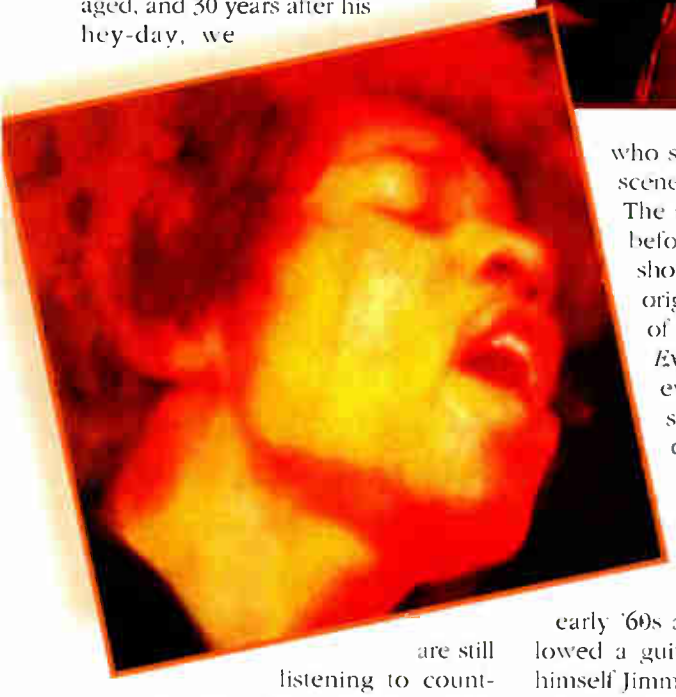
JIMI HENDRIX'S "ALL ALONG THE WATCHTOWER"

by Blair Jackson

The first time I heard Jimi Hendrix's debut album, *Are You Experienced?*, in the summer of 1967, I was 14 and living a comfortable existence in a cushy suburb of New York City. I was already in love with the electric guitar from listening to The Beatles, Stones, Jefferson Airplane and legions of now-forgotten local bands who played at the community dances in my town. But from the first distorted notes of "Purple Haze," it was clear that Jimi Hendrix was in a league of his own, and that in his huge hands the electric guitar was becoming a new instrument. Like the great piano genius Art Tatum, Hendrix was so good at what he did that he made other guitarists—even Eric Clapton—feel inadequate. In my town, if you could play Hendrix decently, you could play guitar. Fortunately, he inspired more musicians than he discouraged, and 30 years after his hey-day, we

PHOTO JOEL AXELRAD/MICHAEL OCHS ARCHIVES



are still listening to countless other great players who were so overwhelmed by Hendrix that they had to see how far *they* could take the electric guitar. Now, that's a proud legacy.

Hendrix was that rare performer who seemed to burst onto the scene as a fully formed talent. The music he made in bands before going out on his own shows little of the vision and originality that exploded out of the grooves of *Are You Experienced?* It's as if whatever he was holding in reserve when he played in other people's bands was unleashed the minute he began work on that first Jimi Hendrix Experience album. Of course, a lot happened between the early '60s and the mid-'60s that allowed a guitarist who briefly called himself Jimmy James to turn into Jimi Hendrix, voodoo child prophet of the Aquarian Age. Like a lot of guitarists in the mid-'60s, Hendrix discovered that playing *loud* expanded the sonic possibilities of his instrument. Psychedelic drugs unquestionably influenced Hendrix's world view and aesthetics, and affected the kind of sounds he wanted to hear from his guitar. And when Bob Dylan started making electric music, he proved that rock 'n' roll could be as intelligent as folk music, and be sung by someone with an idiosyncratic vocal style; Hendrix and many others took comfort in the fact that Dylan was not a "singer" in the traditional pop sense. And if you've ever seen or heard Hendrix's incendiary version of "Like a Rolling Stone" from his history-making performance at the Monterey Pop Festival in June '67, it's obvious that Hendrix felt a special bond with Dylan's music.

It's only generalizing a little to say that *Are You Experienced?* was primarily a showcase for Hendrix's startling guitar pyrotechnics, and that the Experience's second album, *Axis: Bold As Love*, completed in late '67, was oriented more toward Hendrix's gifts as a songwriter. In fact, the rap on *Axis* at the time was that there wasn't enough flashy guitar on

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it—I hate to sound boorish, but I agreed with that criticism, then and now.

Both of those albums were recorded on 4-track at Olympic Studios in London with a young engineer named Eddie Kramer at the board, and Hendrix's manager Chas Chandler producing, with lots of input from Jimi. Actually Hendrix had recorded the basic tracks for a couple of singles ("Hey Joe"/"Stone Free," "Purple Haze"/"51st Anniversary") at several different London Studios—CBS, Pye, Regent Sound, DeLane Lea—before moving to Olympic and hooking up with Kramer. "They came over to Olympic," Kramer says, "because Chas and Jimi were unhappy with the sound they were getting and Olympic was the hot new studio, and I was like the new kid in town—'Let's give it to Kramer because he does all the weird shit.' That's an absolute quote. I'd done a lot of experimental jazz recordings and avant-garde stuff. Not that we were doing anything really different in terms of recording. We didn't have a lot of tools to work with—compression, EQ, reverb and tape delay were about it.

"When you hear what we did at Olympic on *Are You Experienced?* it's amazing it sounded as good as it did because we were struggling to get great sounds, and we had so few tracks to work with. The drums were in mono and we went 4 [-track] to 4 [-track] of course—there's three generations of that sometimes: 4 to 4 to 4. I ended up finishing it, overdubbing on songs that were done prior, cutting new tracks and then mixing the whole thing, experimenting with the panning and all that kind of stuff, which was really the first time I'd had a chance to let fly on that. Of course, Jimi enjoyed all of the little things I did on there. He loved to experiment with sounds and panning and all. So, by the time we hit the second record we were ready to experiment some more.

"*Axis* sounded a lot fuller and more expanded in the high end," Kramer continues. "The drums were now in stereo, so there was a natural growth there. Giving him the broader palette of stereo drums, the bass on one track and Jimi's guitar on one track; that's four tracks. Then we'd take that four and mix that down to two tracks of another four, put some more guitars on and then take that to two again, and each time you're doing it in stereo as opposed to doing it in mono, and it made a big difference to the sound. By that point we'd also introduced phasing, and that drove Jimi completely crazy—he loved that; he had to have phasing on *everything*," Kramer notes with a laugh. This was also the era when Hendrix was working closely with a guitar effects designer named Roger Mayer, experimenting with Mayer's octave divider and various hot-rodded wah-wah pedals and distortion boxes.

Work on Hendrix's third album, *Electric Ladyland*, began at Olympic in the winter of '67-'68. It was late in January '68 that Hendrix first heard Dylan's new *John Wesley Harding* album, which represented a return to a folkier, acoustic-based style for Dylan. Jimi apparently flipped over the song "All Along the Watchtower" and decided on the spot that he wanted to record the song. "Anyone who doesn't appreciate Dylan should read the words of his songs," Hendrix said. "They're poetry, full of the joys and tragedies of life. I'm like Bob Dylan—neither of us sings in the accepted sense. We just be ourselves. Sometimes I do a Dylan song and it seems to fit me so right that I figure maybe I wrote it. I felt like 'Watchtower' was something I'd written but could never get together."

So on January 21, Hendrix and his bandmates—bassist Noel Redding and drummer Mitch Mitchell—went into Olympic to record the song. Once in the studio, Hendrix recruited Dave Mason, who was recording an album with Traffic at Olympic, to play 12-string acoustic guitar on the track. After just a few takes, however, Redding, who had been quarreling with Hendrix a lot, stormed out of the session and Mason took over the bass duties as well.

"There were 27 takes of it," Kramer says. "'Round about take 21, you hear this piano on there and you go, 'What the hell is this?' It's all the wrong chords and notes—it's like some drunk has stumbled into the studio and started hammering on the piano. Well, it's Brian Jones [of the Rolling Stones]! He's on there for two takes, and then he left. It's funny—Jimi's going 'No, no, *no*, man!' On other takes, Jimi's yelling at Mitch and at Dave Mason, 'Hey man, play it *this* way.' Jimi always had a very clear idea of how he wanted his music to sound, and he was not shy about telling other people."

In the wake of the disappointing failure of the *Axis* song "Up from the Skies" to connect with record buyers, there was some talk about rush-releasing "All Along the Watchtower" as a single that spring, but Hendrix decided that he wasn't finished with the track.

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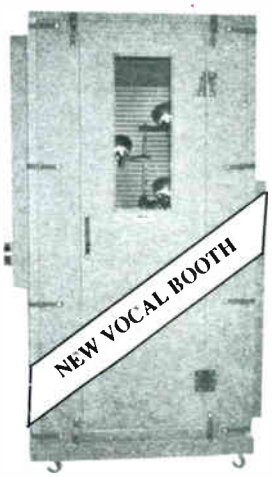

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"Then there was a big jump across the pond to America," Kramer says. "We had cut maybe three or four tracks at Olympic prior to coming over and going to work at the Record Plant in New York." Gary Kellgren, one of the principals in the new studio venture, had previously worked at Mayfair Studios in London, so Hendrix and company were comfortable working with him. "There was a couple of months I couldn't get over because of a visa situation," Kramer recalls, "so Gary cut some tracks. Then I arrived in April '68 and picked it up and finished the record there."

The Record Plant offered greater intimacy than the cavernous main room at Olympic, and there was a technological advantage to recording at the studio, too: It was equipped with a Scully 12-track recorder. "We took the tapes we had and went from 4-track to 12-track, because there were no 8-track machines," Kramer says. The console at the Record Plant was a custom Datamix board: "We ended up getting the same console for Electric Lady [the studio Hendrix built after the recording of *Electric Ladyland*]. It wasn't a great console—it was a bit noisy—but it worked for our purposes, and the Record Plant room itself sounded good." Later that spring, the Record Plant acquired one of the first Ampex MM1000 16-track recorders, so the 12-track tapes were then dumped to the 16-track, giving Hendrix and Kramer even more room to play.

At the Record Plant, Hendrix elimi-

THE MASTER IS REMASTERED AGAIN

Lucky me—I just got my *fourth* copy of *Electric Ladyland* on CD. In the early days of compact discs, the double-album came out as a two-CD set on Reprise Records. Then, the storage capacity of the medium improved, so it was put out as a single CD. Years later, MCA acquired the rights to the entire Hendrix catalog, and they released new versions of the CDs, complete with extensive liner notes (yea!) and new artwork (sacrilege!). Last year, after years of legal wrangling, the Hendrix family regained control of Jimi's recorded legacy, and now MCA, assisted by Eddie Kramer, is releasing the four original Hendrix albums again. This time, everyone *swears*, mastering engineer George Marino of Sterling Sound had the best master tapes available. So what were the others, chopped liver? Well yes, sort of...


PHOTO: CHUCK PULIN

Mastering engineer George Marino and Eddie Kramer at Electric Lady Studios.

"When Warners was still in the picture, prior to MCA, what they were actually using to make their CDs was EQ tape copies," Kramer says. "Even the subsequent MCA releases weren't much better. The basic problem here is that the original flat masters were not used—either they couldn't be found or they were ignored; we're not quite sure which. Second-, third- and sometimes even fourth-generation tape copies were used to make these CDs."

An arduous search began for the true flat masters, and ultimately Kramer says about 85% of the masters for the songs on the four major studio albums were found and, subsequently, transferred to both digital 3348 and analog multitrack with SR. "It was great," Kramer says, "for

—CONTINUED ON PAGE 188

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nated Mason's bass line and overdubbed his own. "Jimi was a fine bass player," Mitch Mitchell says, "one of the best, very Motown-style. He was a very busy bass player. 'All Along the Watchtower' is a classic example of Hendrix's bass playing; he just had that touch."

Hendrix was never one to leave well enough alone, and during that spring, too, he replaced most of his guitar parts on the song, as his vision of the track continued to evolve. Kramer's approach to recording Hendrix's guitar was fairly straightforward—an Electro-Voice M160 mic on the amp (Kramer also used the 160 for Hendrix's vocals), another mic, such as a Neumann U67, placed more distantly in the room, and a 15 ips delayed EMT plate. The wonder of a track like "All Along the Watchtower" doesn't derive from any special recording techniques, but rather from the extraordinary textures Hendrix elicits from his axe by using different effects and playing techniques—in this case, including wah-wah and that famous slinky but ethereal slide during the instrumental break.

"A lot of people think that Jimi would come in and just fool around in the studio until he came up with something he liked, but the fact is he was always very prepared," Kramer says. "He really knew his way around the guitar, and he also knew his way around his own head and what music was in there. He'd say, 'This is what I'm trying to get, this is what I'm looking for—paint me a green sound, man,' and I'd know what he meant. It was usually a quality of reverb or something. But we worked together so much it got to be sort of instinctual."

When it came time to mix "Watchtower," transferring it from the Ampex 16-track to a Scully 2-track running at 15 ips, a problem arose: The first mix was mysteriously lost, and Hendrix and Kramer ended up doing 15 mixes for the song, each a little different from the previous one, since their mixing style was to experiment with panning and such on-the-fly. Evidently, they ended up choosing the correct mix for the album—when the song was released as a single in early September (b/w "Burning of the Midnight Lamp"), it became Hendrix's biggest hit single ever in America, reaching Number 20. In England, Jimi's adopted home, it peaked at Number 5.

"I liked Jimi Hendrix's record of ['Watchtower']," Bob Dylan said, "and ever since he died, I've been doing it the same way [he did]. The meaning of the song didn't change like when some artists do other artist's songs. Strange, though, how when I sing it I always feel like it's a tribute to him in some kind of way."

Hendrix's version of "All Along the Watchtower" is only one reason *Electric Ladyland* is widely regarded as one of

—FROM PAGE 186, THE MASTER

Electric Ladyland we found the original flat masters with Jimi's handwriting on them and all."

For all the albums, "it was a slow, meticulous job working through the tapes song by song, making sure each track had the azimuth adjusted correctly," Kramer says. "The tapes were in perfect shape; there was no baking." The tapes from Olympic were mainly on BASF LR56 ("Those held up the best," Kramer notes) and some Agfa. The Record Plant and Electric Lady tapes were on mostly Ampex 406 and 407.

"We used an Ampex ATR to play them," Kramer says, "and then it went into either Pultecs or the Sontec—we kept it all analog up until the last possible second. Then we put it through the George Massenburg A-to-D converters and into the Sonic Solutions to assemble it.

"We treated it with a tremendous amount of respect. You couldn't add too much EQ, so I tried to keep it as natural-sounding as possible. The best thing was when we A-B'd it with the original Warners CDs, and even the MCA ones, it was like lifting a veil from the front of the speakers because the bottom and the top end that came out was extraordinary! Having the opportunity and privilege to listen to the work I'd done consecutively, there's a wonderful feeling of the way both the sound and the music grows and expands. There's a wonderful ascending line of completion. The sound gets bigger, fatter; his playing gets more and more full. When you hear them all back to back it's a terrific journey." —*Blair Jackson*

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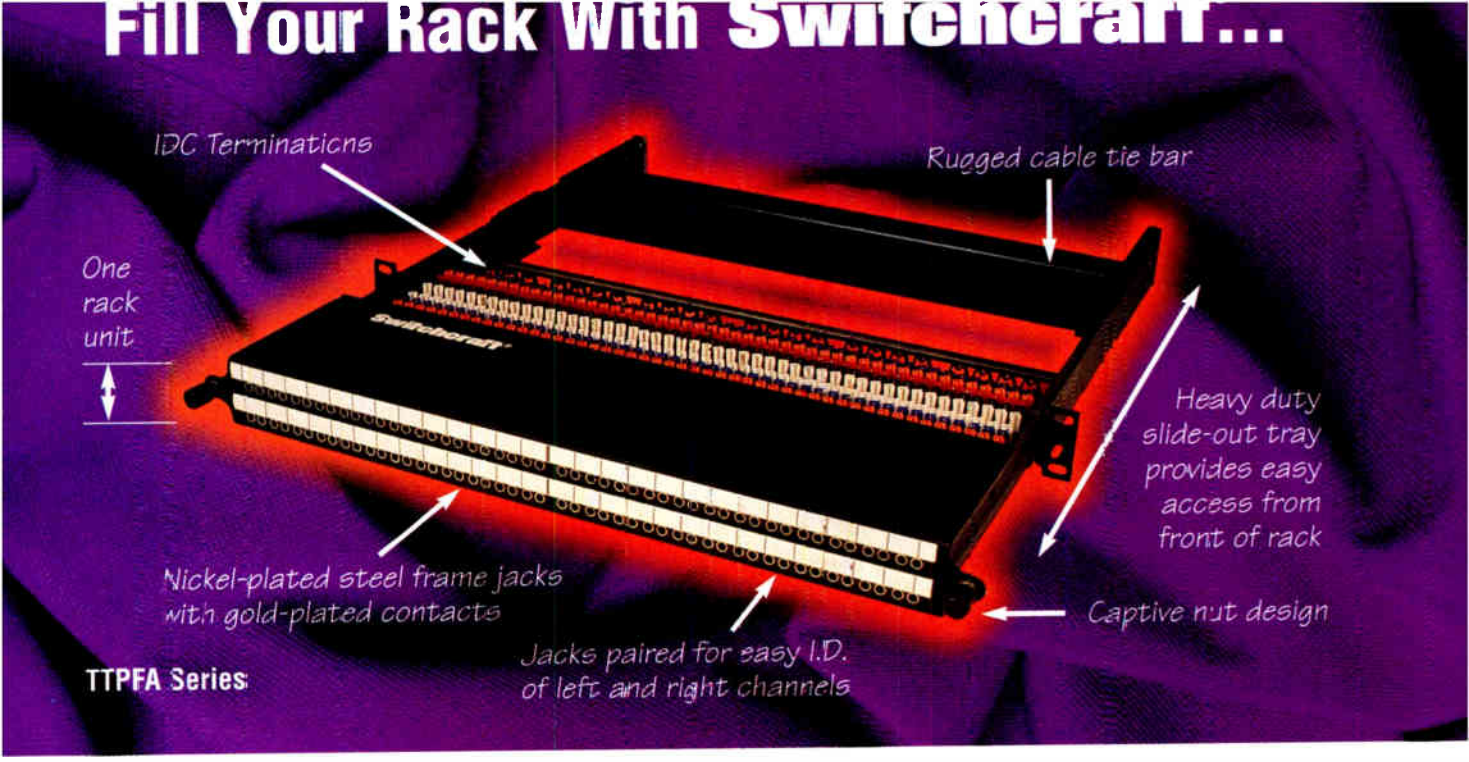

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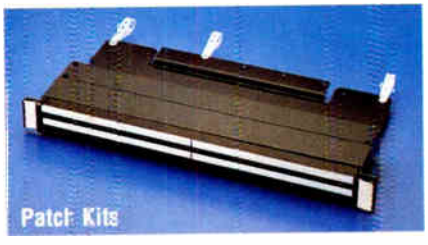

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Hendrix called the album "expression music. That whole LP means so much; it wasn't just slopped together. Every little thing that you hear on there means something. It's not a little game that we're playing, trying to blow the public's mind and so forth. It's a thing that we really mean; it's another part of us."

In another interview later, Hendrix noted, "The *Electric Ladyland* album was good for the time we did it, but we really got about half of what we want to say in it. It would've taken about two more LPs. Now we're onto other things. Our next LP is going to be exactly the way we want it, or else."

Of course we know the tragic ending of the story. Hendrix died September 18, 1970, before he completed that next LP. *Cry of Love* was released posthumously in March '71, and it contains many fine tunes and exciting hints of new directions Jimi's music was heading. (The remastered *Cry of Love* has been expanded to include several songs that Kramer says were meant to be on the album, and has also been renamed *First Rays of the Rising Sun.*) But for me, *Electric Ladyland* remains the definitive statement of this singular talent, and I still regard it as perhaps the electric guitar's finest hour—or more accurately, its finest 75 minutes and 30 seconds.

By the way, keep an eye out for an hour-long documentary on the making of *Electric Ladyland*, made by Isis Films in England, the same folks who put together the amazing film on the making of *Sgt. Pepper*, and one on the Grateful Dead's *Anthem of the Sun* and *American Beauty* LPs. Kramer says the film is filled with fascinating footage of Jimi and his cohorts at work in the studio. ■

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—FROM PAGE 182, COLLECTIVE SOUL

Archilla realized fairly quickly, however, that good things were happening in the cabin. "It was pretty clear to me, but I was more concerned about the quality of the mixes," Roland says. "I didn't want this to be another *Hints, Allegations and Things Left Unsaid*, an album recorded in a basement. I didn't want to be known as the band that puts demos out. Not that there's anything wrong with that, but I enjoy studios. I want to be in a studio. But it worked out fine, the quality was there, the vibe was there, so we just went with it."

Located just outside of the group's hometown of Stockbridge, Georgia, the rented three-story cabin became "home" to Archilla and Mike Childers, who manned the computers during the sessions. The band, who all still live around the town, stayed at home and came to the cabin originally to jam together, and then later to overdub their parts. In an upstairs bedroom, they set up a control room, complete with a Soundcraft Spirit, a pair of Genelec monitors Archilla bought for the project, a couple of Tascam DA-88s and a system to run Pro Tools. The main floor—basically the dining room and kitchen area—is where the band set up to play, and the bottom floor was for storage. Archilla and Roland used a variety of Focusrite, Summit, Manley, API and Lucas tube compressors and limiters to warm up the signal. They also used traditionally "warm" microphones like AKG C-12s and a wide variety of Neumanns, as well as the more standard Shure 57s.

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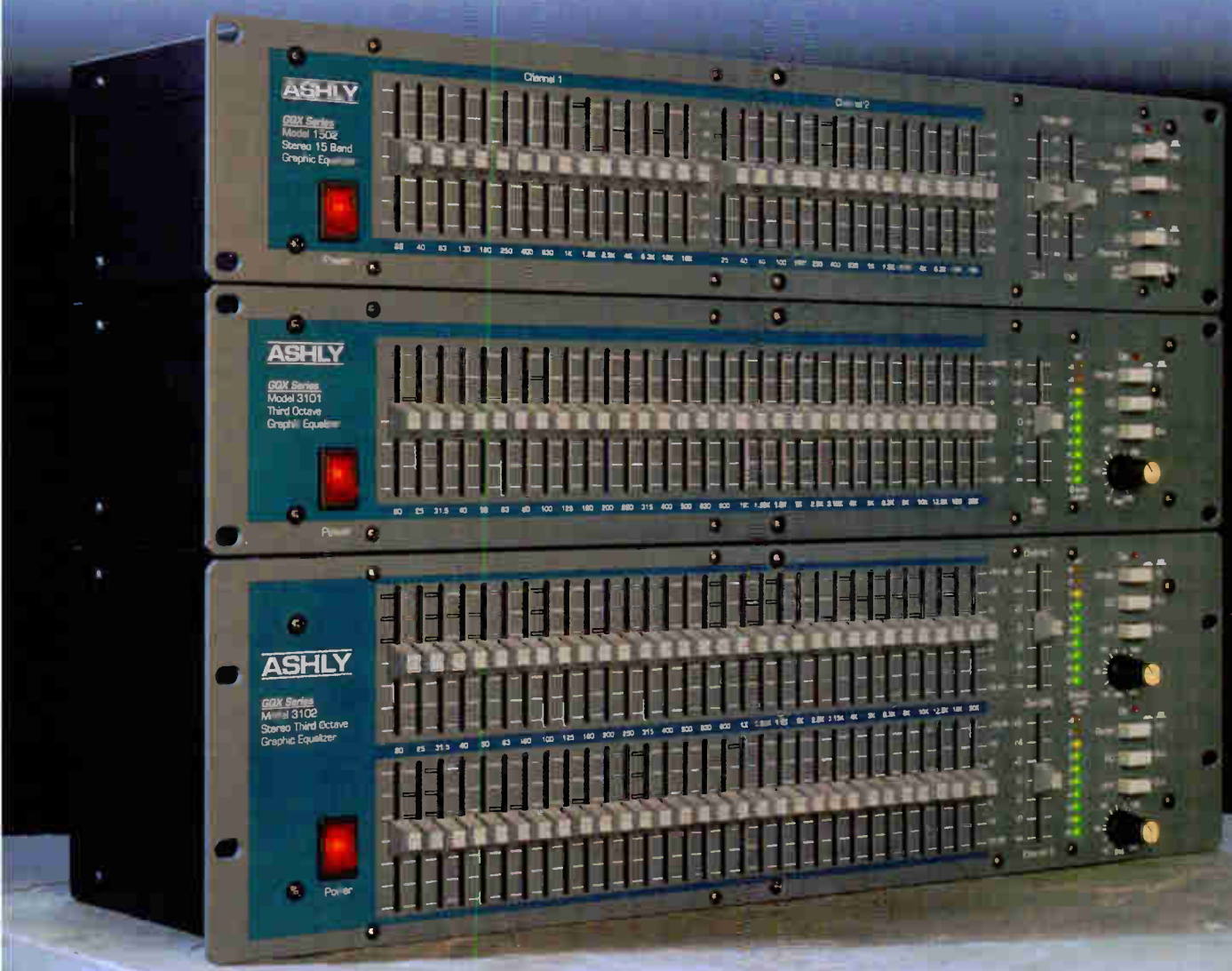

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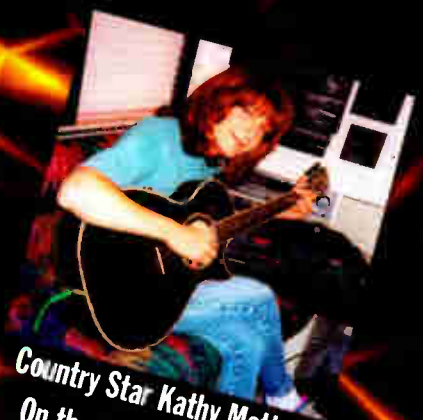

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Roland also purchased an 8-channel strip of Neve 1066 preamps for the sessions, but he believes it was the three Focusrite Red compressors that had the most impact. "We had a pretty small budget, and I was just trying to give us many choices," he says. "We didn't know what would work best. The Focusrites win the most valuable player award for making this record."

While all of the recording was done in the digital domain, the rest of the project was decidedly low-tech. In fact, during the first couple of sessions, they didn't have a talk-back system worked out, so Archilla would stomp his feet on the floor when he wanted the band to stop. After they tired of that, they set up an amp in the middle of the main room so Archilla could talk to the band that way.

To further their minimalist efforts, Shane Evans stripped his drum kit down to its vital parts, which enabled Archilla to use only five microphones while tracking the drums. "I didn't mike the tom-toms, because it was so loud in that little space," he says. "I used a couple of tube mics in front of the drum kit and mics on the kick and snare, and an overhead mic. It was a very simple setup. We worked on getting the drums to sound good in the space that they were in instead of trying to mike every drum and get every little thing on tape," he says. In fact, he adds, at times they removed the toms altogether and Evans played just the hi-hat, kick and snare drum. "It got down to just using what you needed to use. It kind of simplified the engineering process for me, because you didn't have to go do the extra things. You made it sound good in the room, you put a mic in there and that was it. You didn't have all the other gizmos to go through, so you didn't have to worry about it."

Even the vocals and guitar tracks were recorded with relative simplicity. When it came time to record Roland's vocals, the team removed Evans' drum kit and put Roland in the same corner. The only problem was that the ceiling was slanted (and wood), so Archilla hung a sheet above the singer's head to muffle the ceiling reflection, and then enclosed him in two quilts to deaden the area. "That was my soundproof room," Roland recalls. "It was really hot, there was no ventilation, and I was in down quilts. I couldn't breathe." To isolate the sounds coming from the guitar amps, Archilla used an unused amp as a baffle. "If I needed to block off a space I would just roll over the Marshall stack instead of having a big professional wooden baffle," he explains.

Bassist Will Turpin says that the low-key vibe of the sessions helped the band. "We didn't worry about soundproofing, we didn't worry about making it a 'studio.' We put a mic here and there, then we went upstairs to listen to the sound. We took our time and went for the feel."

In the end, all but four of the tracks ("Precious Declaration," "Full Circle," "Maybe" and "Giving") on *Disciplined Breakdown* were recorded at the cabin. Those four were cut at the House of Blues in Memphis. "We wanted to get the band in a different vibe," says Archilla. "It was getting a little claustrophobic in the cabin, and everybody was staying at home. We wanted to get 'em away from home and let 'em feel like they were really doing a record." Even in the larger studio, Archilla says, "We set everybody up in a really tight spot in the room so there was still the closeness that everybody was kind of used to. I tried not to change the overall sound too drastically; it was just the vibe of letting everybody play together and turning the amps on."

To keep the sound consistent with the cabin sessions, Archilla and Childers continued to use Pro Tools and DA-88s to record at the House of Blues. From Roland's perspective, however, the change in venue was quite dramatic: "We went from running up and down the stairs all the time to pressing buttons."

After nearly a year of on-and-off recording sessions (Archilla estimates the actual tracking time was somewhere around five to six months), Archilla, Roland and Childers headed west to mix the record at Larrabee North. Archilla dumped various DATs to two half-inch 24-track machines, and they got to work. "We lived in the digital domain for a long time and then we moved into the rock world," Archilla says with a laugh. As they toiled over the SSL 9000 J, Roland was in another studio cutting additional vocal tracks. Still, Archilla says he was pleasantly surprised when he put the DATs up at Larrabee: "Tone-wise, I was really happy. It wasn't a major thing to go over and mix it. We were limited on a few things, so we were locked in the corner a couple times, but it wasn't anything a turn of a knob here or there couldn't take care of." ■

—FROM PAGE 183, BEN VAUGHN

to get. It's exciting, there's punch to it, and there's an edge to the uptempo stuff.

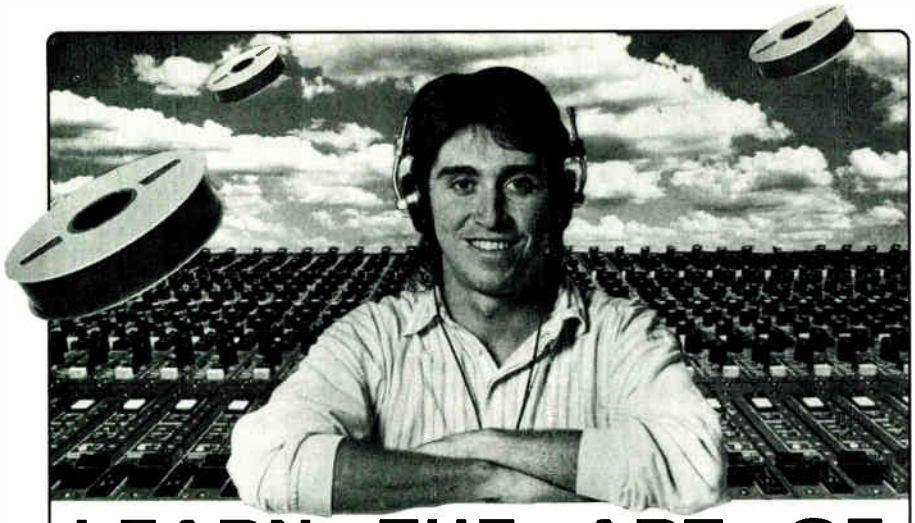
"I got a really great acoustic guitar sound," he adds. "I think it's the best I've ever gotten. For me, when acoustic guitars sound too pretty it ruins everything. You listen to Bob Dylan's first record—now that's an acoustic guitar sound. I like the way folk records used to sound more than rock records—they had a lot of midrange. And for some reason, recording acoustic guitar [Takamine EF-36] in that car with a Shure SM57, pretty much miked on the 12th fret, got that sound."

Vaughn and his Rambler vehicles have shared plenty of quality time, driving to and from various gigs, listening to rock 'n' roll via AM radio. Raised in the South Jersey town of Camden, Vaughn would travel to Philadelphia so he could hang around the famed songwriting team of Kenny Gamble and Leon Huff at Sigma Sound. Later, as a musician, Vaughn would drive up the New Jersey Turnpike to perform and record around New York City. After establishing a following, the Ben Vaughn Combo enjoyed frequent Rambler mileage around the country as well. And Vaughn has frequently made the pilgrimage to Nashville's Music Row to sharpen his songwriting skills, co-writing with the likes of Patty Loveless, Rodney Crowell and Bill Lloyd.

As a frontman, he has released eight albums on a variety of independent and alternative labels including Restless, Enigma, Bar/None and, now, Rhino. As a producer, Vaughn has worked with surf music mavens Los Straitjackets, soul legend Arthur Alexander, rockabilly master Charlie Feathers and alterna-rockers Ween. But it is as the prolific singer/songwriter that Vaughn turns into the DIY engineer. Vaughn has recorded ideas into answering machines, a Walkman and even his 7-track tape deck, which lost track 2 when lightning struck his house. Lately, Vaughn has been writing and recording music for NBC's extraterrestrial sitcom *Third Rock From the Sun*. (Vaughn says he hasn't watched television in 20 years and that NBC producers appreciated his "alien approach.")

Vaughn's *Rambler '65* project started out as an artistic challenge brought on by the love of a car: "I've never owned anything but a Rambler," Vaughn explains. "It's a lifestyle, a commitment, when you decide you like something

World Radio History



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*1996 Mix Audio Production Facilities Report

like a Rambler. It's about beauty of design and engineering. To record in a Rambler was an artistic commitment I felt I had to make to myself at that point in my career and in my life. It might be hard to pull off, but I was gonna get it done whether it sucked or it was great."

So with a never-say-die mentality and a fresh batch of songs, Vaughn set out to record his album in his Rambler. Equipment included two mics—the SM57 and an SM58—the Fostex M-80 half-inch "7-track" tape machine and a Tascam M-208 8-channel mixing board propped on the front seat by a milk crate and a quart of Quaker State motor oil. "The car was in my driveway, and I ran a big extension cord out the window," Vaughn explains. "I would get up in the morning, make a cup of coffee, throw the extension cord out the window, plug in all the stuff and start recording. Some of the gear I would leave outside overnight, and I would put a tarp over the car. Some things I would bring in every day to my studio in my house."

Vaughn sat in the back seat and sang and played guitar while tape rolled. In fact, Vaughn played every instrument (bass, harmonica, keyboards, maracas) on the album, except when he brought guest musician Mike Vogelmann to the back seat of his Rambler to track sitar for the song "Levitation." Vaughn's vocals and harmonica were miked with the SM58. Acoustic guitar and various live percussion were captured via the SM57. All other instruments were tracked directly.

When it came time for electric guitar-oriented songs with vocals, Vaughn was at an impasse, because he likes to sing and play his electric Fender Telecaster at the same time. The solution? "I put the [Fender Deluxe] amp in the trunk with the SM57 and closed the trunk for separation. Then the main problem was what to do with the guitar cable and the microphone cable. So I unscrewed the tail light and went in through there with the cables. And it worked."

Vaughn used various guitar stomp boxes (including the very rare Mica Fuzz Machine) to process his vocals: "I sang through a compressor on a lot of stuff," he explains. "On one song ['Perpetual Motion Machine'], I went through a flanger foot pedal. It was one of those things that when I got the idea I just did it and moved on and didn't think about it until I went to mix it. Then I was amazed. I also sang through a RAT Distortion box to get that kind of sound

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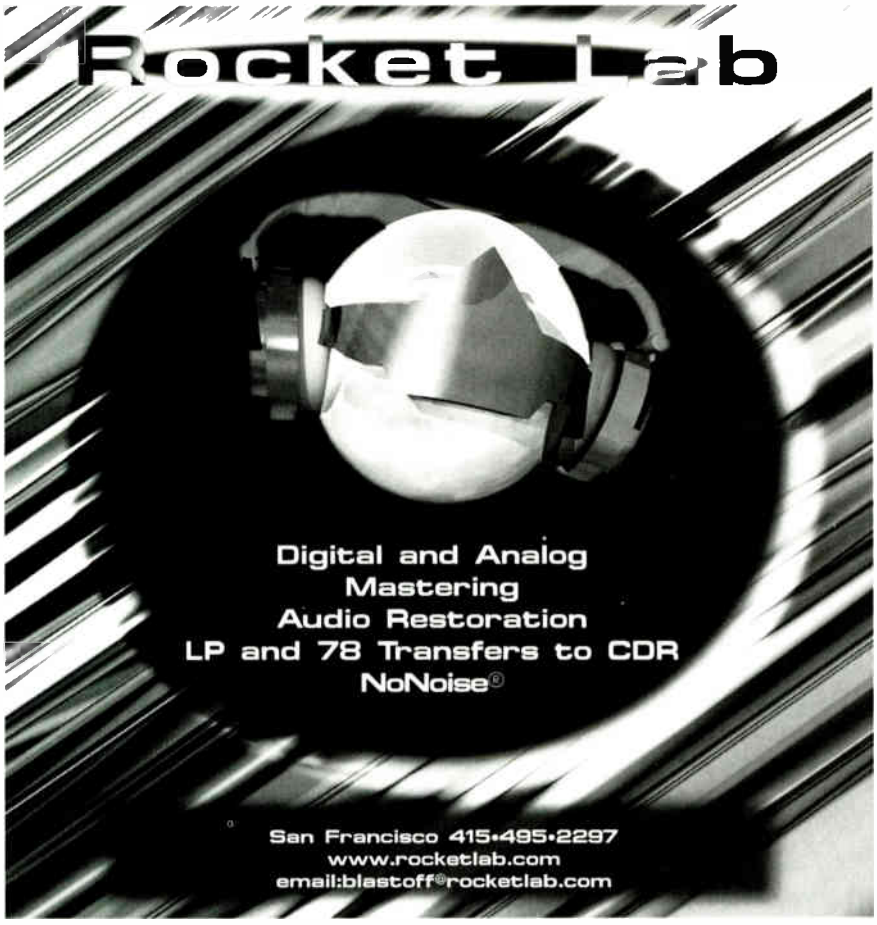

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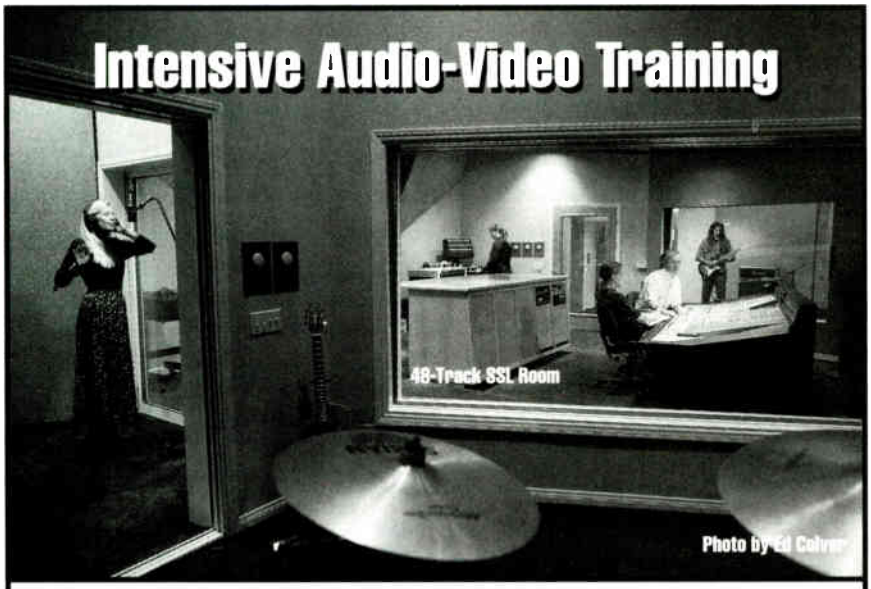


Dave Edmunds got on 'I Hear You Knockin'."

Drums on *Rambler '65* were furnished by an Alesis HR-16 drum machine and Casio keyboard samples, but Vaughn also added live percussion via a Premier 10-inch snare drum, a 10-inch cymbal, maracas and tambourine. And on the song "The Only Way to Fly," Vaughn accompanied his vocals and guitar with the tasty use of brushes on the "kit" of snare and cymbal.

For monitoring Vaughn used a Panasonic 50-501 Receiver/Turntable, "the kind your mom would have, and two little Radio Shack speakers laid on the dashboard," he explains. "When I was playing direct, I would just blast [the playback] in the car and play along. Whenever I had a live mic on, I had to put the headphones on and go under."

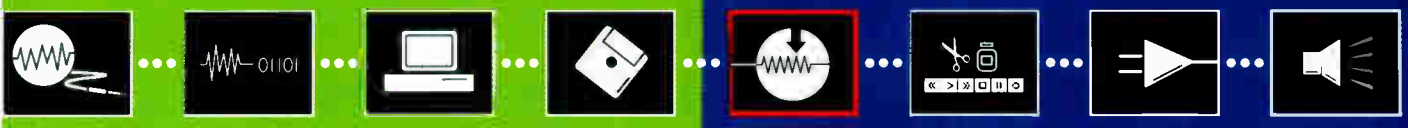
After having recorded an album entirely in mono (*Mono USA* on Bar/None Records, which featured covers of AM radio gems), Vaughn accentuated the stereo sound when he mixed *Rambler '65*: "I did some obvious double-tracking of stuff and stereo panning," he notes. "It's a very stereo album. Extremely stereo, considering the alleged low-tech reputation of it. There's a lot of acoustic guitars that are doubled and panned left and right. I compressed the vocal to be spread across and present. I'd say I mixed in a week. I work real fast."

Not really a certified knob-twister, Vaughn's get-it-done approach to engineering is quite interesting. "I'm not an engineer," he says, "but I'm not clueless. To me it's part of the same thing of playing a gig or playing guitar—engineering is a real tactile, very physical thing. I don't intellectualize about it; it's about making music.

"It took me awhile to stop listening to engineers when they told me, 'No, no, no, that's out-of-tune,' or 'No, no, no, that's distorted.' But that's an engineer's job—they're always ready to protect you from yourself, which I appreciate, but I grew tired of having to state my case for what I do," he says. "I finally started working alone. Making records my way. If a real engineer saw me working—the way I EQ and the way I compress—he would probably vomit. I probably sound like I have no idea what I'm doing until I've put things in the mix. Now, of course, some people may think, 'Oh, that will never get on the radio.' Luckily there's some crazy stuff out there, like Beck and the Dust

—CONTINUED ON PAGE 231

World Radio History



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MEDIA & MASTERING NEWS

1996 YEAR-END STATISTICS
THE RECORDING INDUSTRY ASSOCIATION OF AMERICA

MANUFACTURERS' UNIT SHIPMENTS AND DOLLAR VALUE (IN MILLIONS, NET AFTER RETURNS)

		1987	1988	1989	1990	1991	1992	1993	1994	1995	% CHANGE 1994-1995	1996	% CHANGE 1995-1996
(Units Shipped)	CD	102.1	149.7	207.2	286.5	333.3	407.5	495.4	662.1	722.9	9.2%	778.9	7.7%
(Dollar Value)		1,593.6	2,089.9	2,587.7	3,451.6	4,337.7	5,326.5	6,511.4	8,464.5	9,377.4	10.8%	9,934.7	5.9%
CD SINGLE		NA	1.6	-.1	1.1	5.7	7.3	7.8	9.3	21.5	131.2%	43.2	100.9%
		NA	9.8	-.7	6.0	35.1	45.1	45.8	56.1	110.9	97.7%	184.1	66.0%
CASSETTE		410.0	450.1	446.2	442.2	360.1	366.4	339.5	345.4	272.6	-21.1%	225.3	-17.4%
		2,959.7	3,385.1	3,345.8	3,472.4	3,019.8	3,116.3	2,915.8	2,976.4	2,303.6	-22.6%	1,905.3	-17.3%
CASSETTE SINGLE		5.1**	22.5	76.2	87.4	69.0	84.6	85.6	81.1	70.7	-12.8%	59.9	-15.3%
		14.3**	57.3	194.6	257.9	230.4	298.8	298.5	274.9	236.3	-14.0%	189.3	-19.9%
LP/EP		107.0	72.4	34.6	11.7	4.8	2.3	1.2	1.9	2.2	15.8%	2.9	31.8%
		793.1	532.2	220.3	86.5	29.4	13.5	10.6	17.8	25.1	41.0%	36.8	46.6%
VINYL SINGLE		82.0	65.6	36.6	27.6	22.0	19.8	15.1	11.7	10.2	-12.8%	10.1	-1.0%
		203.3	180.4	116.4	94.4	63.9	66.4	51.2	47.2	46.7	-1.1%	47.5	1.7%
MUSIC VIDEO		NA	NA	6.1	9.2	6.1	7.8	11.0	11.2	12.6	12.5%	16.9	34.1%
		NA	NA	115.4	172.3	118.1	157.4	213.3	231.1	220.3	-4.7%	236.1	7.2%
TOTAL UNITS		706.8*	761.9	806.7	865.7	801.0	895.5	955.6	1,122.7	1,112.7	-0.9%	1,137.2	2.2%
TOTAL VALUE		5,567.5*	6,254.8	6,579.4	7,541.1	7,834.2	9,024.0	10,046.8	12,068.0	12,320.3	2.1%	12,533.8	1.7%

The Recording Industry of Association of America 1330 Connecticut Ave., NW, Ste. 300, Washington, D.C. 20036

* Reflects inclusions of discontinued configurations not itemized in the table.

** Represents six month sales for cassette singles (introduced in the second half of the year).

PRERECORDED MUSIC SALES NEARLY FLAT

The Recording Industry Association of America has released its 1996 figures on shipments of prerecorded music products, confirming a continuing slowdown in market growth that began in 1995 after several years of steady increases. Overall unit shipments (net after returns) for 1996 edged up from 1.11 to 1.14 billion, an increase of 2.2% over 1995. The dollar value of those shipments (calculated at list price) rose just 1.7% to $12.5 billion.

As usual, some configurations fared better than others in the report, which is compiled based on direct data from RIAA member companies (who distribute 90% of the prerecorded music sold in the U.S.), as well as estimates (based on SoundScan retail sales data) of sales by non-members. CD singles, which have had an erratic growth history, posted the biggest gains of any format, continuing 1995's strongly positive pattern. Unit shipments in the format more than doubled to 43 million, while dollar value, reflecting lower prices, rose 66%.

The maturing market for CD albums followed last year's pattern as well, showing growth that, though well below the double-digit jumps of the format's adolescence, was still a respectable 7.7% in units (to 779 million), with an accompanying 5.9% rise in value.

Prerecorded cassettes and cassette singles, on the other hand, continued their fall from favor with the music consumer. Shipments of cassette albums dropped 17% to 225 million, while singles slid 15% to 60 million. That's a big reversal from just four years earlier (1992), when combined album/singles shipments of cassettes exceeded those of CDs by 36 million.

Things are looking up on the vinyl front, meanwhile, with vinyl singles having nearly arrested their decade-long decline. The 10 million units shipped represented an erosion of just 1%. As for the LP/EP category, 2.9 million units may be a drop in the bucket for the overall market, but it translates into a robust 32% increase and makes 1996 the strongest year for LPs since 1991. Music video had a strong year as well, jumping 34% to 17 million units and reaching a dollar value of $236 million, behind only CD albums and cassette albums.

Commenting on the report, RIAA president Hilary Rosen noted that "consumers continue to buy prerecorded music in record numbers. Two-percent growth is positive news." Rosen acknowledged, however, that "as an industry—both the creative side and the retail end—we need to discover what it will take to rekindle consumer interest."

BY PHILIP DE LANCIE

INFOTECH PREDICTS DVD-VIDEO ASCENSION AT MILLENNIUM

Electronic media market research and consulting firm InfoTech sees 2000 as the year when DVD-Video will take off as an important consumer format. In its newly issued DVD Assessment, 2nd Edition, Info Tech asserts that by that time "economies of scale derived from the rapid acceptance of DVD-ROM on the PC desktop will drive down the cost of shared components dra-

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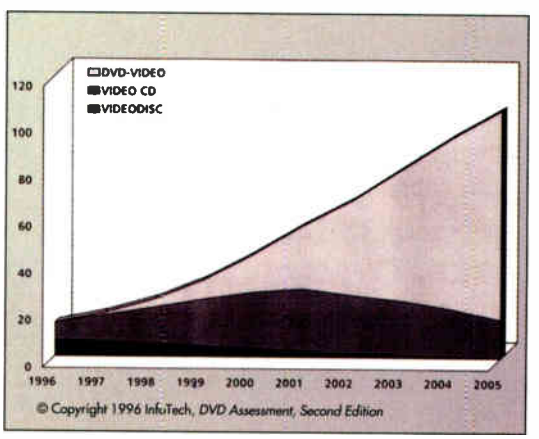

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matically, allowing DVD-Video players to reach mass-market price points in the $250 range," the point at which the units become an easy "upsell" to conventional CD-Audio players.

In the meantime, the company foresees worldwide first-year sales of 820,000 of the players, which are currently being introduced into the U.S. market at prices of $599 and up. More than 600 DVD-Video titles are expected to be available worldwide by the end of 1997, increasing to more than 8,000 by the year 2000. Further information about the report is available from Info Tech at 802/763-2097.

NEW NAME FOR BASF TAPE OPERATIONS

KOHAP, the Korean chemicals group that recently acquired tape manufacturer BASF Magnetics, announced that it has changed the name of the German operation to EMTEC Magnetics (short for European Multimedia Technologies). The change will not affect the brand name on the tape products, which will continue to be marketed under the BASF label for five years. In the U.S., BASF professional audio, video and duplicator tape and related products are marketed and sold by JR Pro Sales of Valencia, Calif.

MASTERING SESSIONS

Digital Domain (Altamonte Springs, FL) announced a slew of 24-bit Sonic Solutions projects, including mastering *Colonial Music of Brazil* for Sony Classical Productions, remastering a bluegrass album by Phil Rosenthal for Sierra Records and mastering the new Rincon Ramblers release on Sage Arts Records...*The Shaming of the True* is the title of a forthcoming posthumous release by deceased Sheryl Crow collaborator Kevin Gilbert, mastered at San Francisco's **Rocket Lab** by Ken Lee and Paul Stubblebine. Rocket also reports work on releases by Machine Head, Jim Campilongo & the Ten Gallon Cats, Big Soul and Korea Girl...At **M Works** in Cambridge, MA, Jonathan Wyner mastered Tonio K for Gadfly Records, as well as projects by Warner Bros. artist Jenifer Trynin and the Seattle Symphony Orchestra...**DBS Digital Mastering Studio** in Hoboken, NJ, reports mastering the re-release of the Raybeats' first album, *Guitar Beat*, for Bar/None Records. Also handled at the facility were albums by Tom Russell, The Wallmen, David Beaudry and Teodoro Reyes.

NEWS BITS

Pacific Microsonics (Berkeley, CA) reports that nine of this year's Grammy-nominated recordings were mastered with the company's HDCD process and that HDCD co-inventor Keith Johnson was nominated for an engineering Grammy for his recording work on the Reference Recordings release *Stravinsky*...**Optical Media International** has spun off its CD Express Services division into a separate corporate entity, **CD Express**, offering CD formatting, recording and production services in Campbell, CA...**Philips Key Modules** (San Jose, CA) is offering a six-page informational brochure about MPEG, describing MPEG1 and MPEG2 and detailing their suitability in various audio and video applications. The brochure is available free by calling 408/453-7373...**Sony Disc Manufacturing** announced that VP Scott Bartlett has been elected to serve as a VP and executive committee member of the ITA. ■

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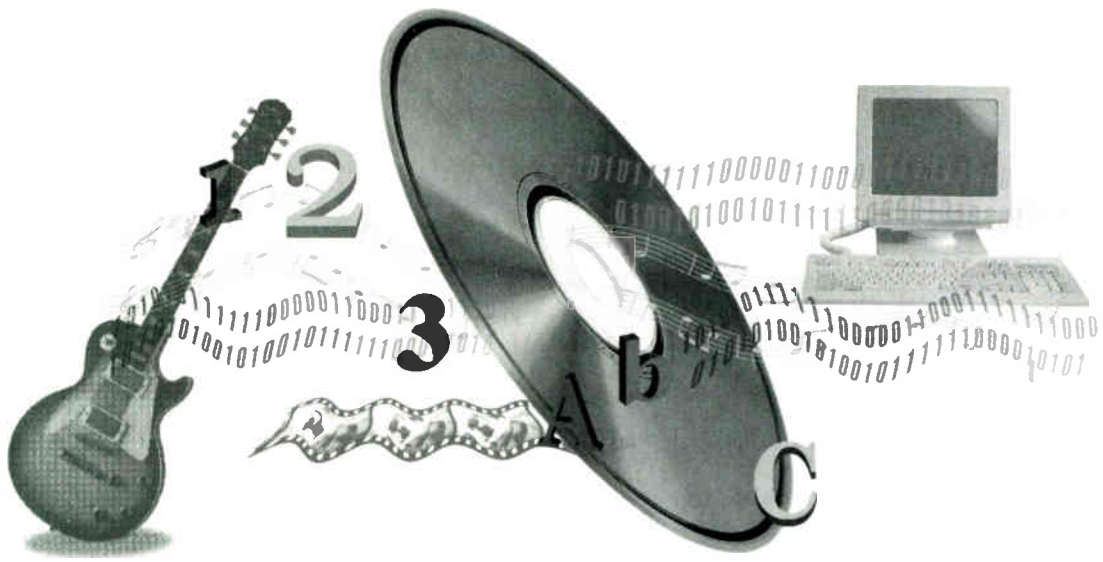

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COAST TO

L.A. GRAPEVINE

by Maureen Droney

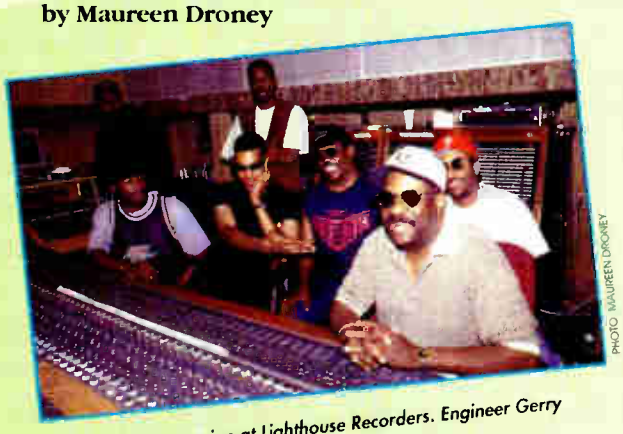


PHOTO: MAUREEN DRONEY

The Gap Band in session at Lighthouse Recorders. Engineer Gerry Brown is in the center in a plain black T-shirt.

Stopped at Lighthouse Recorders Inc. on Magnolia Blvd. in NoHo for a visit with Platinum engineer/producer Gerry Brown who was in recording with those archetypes of funk, the Gap Band. The hook? Well, besides the ones in the tunes, Brown (whose credits include production for Vanessa Williams, Brian McKnight and Brownstone and engineering for Tony Toni Toné, Kenny G and Selena) began his career twenty years ago working with the Gap Band. "It's a fortuitous accident that we hooked up again," says Brown, "but sometimes things just happen magically. I was 17 when I started with them; they are one of the first bands I recorded, and it was almost 19 years ago to the day that I had my first hit with them, 'Oops, Upside Your Head.' Being in the studio with them now brings back the feeling of those days: the hunger of recording and the hunger of the music. The Gap Band is really one of the originators of funk, along with Kool & the Gang and George Clinton and Parliament/Funkadelic; I learned a lot from them. And it's great to be back with [lead singer] Charlie Wilson. He's the identity, just an amazing vocalist; there are a lot of singers then and now who have tried to copy his style. His brother Robert is, of course, very known for his bass work. The legend goes that the five-string bass had to be invented to copy Robert's sound, because on 'Shake,' one of their earliest records, he had detuned his E string down almost a whole step and people couldn't figure out how he got that super-low bass note! The third member of the group is brother Ronnie, on trumpet and keys, who acts as the main producer. Also helping with production on this record are Ronnie's sons Brian and Andre

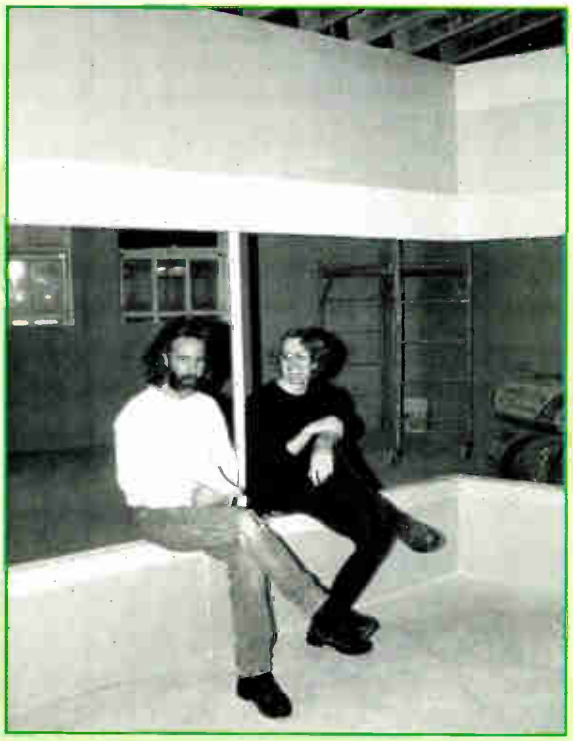
—CONTINUED ON PAGE 210

NY METRO REPORT

by Dan Daley

Only in New York—We're not the finance and rock 'n' roll capital of the world for nothing, ya know. Back in February, investors snapped up $55 million in bonds issued by a Manhattan brokerage firm backed by David Bowie's future royalty payments, the first of their kind in either industry. The interest rate isn't so hot—7.9 percent—but then, neither is Bowie's career lately. Risky, maybe, but asset-backed bonds are one of the hottest new instruments—financial, not musical—out there in the omnivorous capital markets. And not to be outdone, the Rolling Stones, who apparently like money more than each other these days, are reportedly mulling a similar move. (Bowie and the Stones share the same U.S. business manager, Bill Zysblat.) Others thinking about going public on the Street instead of the tabloid racks: Pink Floyd and the estate of Elvis Presley. We've already seen half the pro audio industry go public in the last 24 months, and Walter Yetnikof fishing in the public capital waters to fund independent record distribu-

—CONTINUED ON PAGE 206



John Storyk designed Dubway-CHBO Studios, shown here under construction, for Chris Bowman (left) and Al Houghton in New York City.

World Radio History

COAST

FACILITY SPOTLIGHT

by Evan Ambinder

GROUND ZERO LAUNCHES NEW MASTERING AND RECORDING SPACE

PHOTO: ROBERT WOLSCH DESIGNS

In the mastering suite at Ground Zero's new facility (L to R): mastering engineer Joe Lambert, studio manager Shawn Quinn and studio consultant Jimmy Biondolillo

Tucked away from the art galleries, cafes and boutiques of West Broadway lies Ground Zero Studio's new mastering and recording facility. Housed in a 5,200-sq.-ft., loft-like atmosphere, the new space is neighborhoods away from Ground Zero's former midtown-Manhattan location, and its acoustical and technological upgrades now enable the studio to provide high-end audio production services.

The original Ground Zero opened in May 1993 to augment studio owner Ray McKenzie's independent label, Zero Hour Records. Although used initially as a project studio for overdubbing and mixing Zero Hour and outside recording artists, Ground Zero added mastering services and soon outgrew its space. "We needed a separate mastering room in order to be a first-class mastering facility," explains Joe Lambert, Ground Zero's mastering engineer and former chief engineer of the original studio.

So last year, McKenzie hired studio consultant Jimmy Biondolillo to locate a larger space in Manhattan and assemble a design team that included acoustician Tony Bongiovi and architect Michael Abate. Their first task was to build a mastering suite for Lambert, who Biondolillo refers to as Ground Zero's "artist-in-residence." "We wanted a room that felt like a living room because that's where most people listen to their music," Lambert explains. "I wanted the desk to feel like a car so I could sit at the chair and do what I have to do without moving around too much from

—CONTINUED ON PAGE 204

NASHVILLE SKYLINE

by Dan Daley

Steve Schott, general manager of the studio now known as The Manor at Cool Springs (it was formerly Cool Springs Recording, then Renaissance Recording), says the large, one-room facility should be open on June 1. Owned and financed by John Helvering, former husband, executive producer and manager of gospel great Sandi Patty, the studio will have a modified 64-stereo-input custom API console, previously located in Pinebrook Studios in Alexandria, Ind., which was also owned by Helvering. The mods include retrofit with GML automation and surround mixing and monitoring capabilities. The studio design by Steve Durr includes an 850-square-foot control room and a 3,500-square-foot recording room with three iso booths.

The opening will come nearly a year later than the original estimate, a delay that Schott attributes to a combination of construction holdups (the studio is in an office complex), materials delays and some financial setbacks. However, during that year Nashville saw the arrival of two major new facilities—Starstruck and Ocean Way/Nashville—and the announcement of plans by Sound Kitchen owner Dino Elefante to expand that studio, which is much closer to The Manor's Cool Springs location, with several possible new tracking rooms. Schott counters that The Manor's size is intended to attract video shoot projects and live music broadcasts, and direct video truck hookups and T-1 lines are part of the installation, as is a Sonic Solutions system for posting and editing. In addition, Helvering is co-owner of a record label and production company located in the front part of the office complex; that and other alliances will provide the new facility with built-in clients, initially, Schott maintains.

Speer Communications, which opened on Dickerson Road two years ago, also aimed at the broadcast and shooting stage market in Nashville, one that has not

At Nashville's Recording Arts, new artist Kami Lyle mixed her debut release with producer/engineer Hugh Padgham. At right is studio owner Carl Tatz.

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evolved as far as many had hoped by now, and Speer announced significant layoffs and cutbacks late last year. Schott says he is unaware of the source of Speer's problems, but that the Nashville market, in his view, has considerable untapped potential in those areas, and that the $2-million-plus studio's premise is based as much on those markets as on music recording. "We have to take it one day at a time," he says. "It's definitely been behind schedule, but it's on track now, and I'm very optimistic about what it can mean to Nashville's studio community."

NAPRS celebrated its first anniversary in late February, bringing in a partially new slate of officers, including Robert De La Garza of Starstruck Studios for a two-year term, and Fred Bogert (Studio C), Grant Fowler (Love Shack), Cathy Marshall (Bennett House), Heather Johnson (Woodland Digital) and Lisa Roy (Studio A) for one-year terms. The other eight two-year term board members remained for one more year of their founding terms, with Josef Nuyens of The Castle continuing as president of the organization.

Speaking of organizations, the newly formed SPARS chapter in Nashville had its first gathering in February and named its own executive board. It includes Masterfonics owner Glenn Meadows as president; Lisa Roy of Studio A as executive director; Starstruck's Robert De La Garza as vice president of studios; Studer's Joe Bean as vice president of manufacturers; Masterfonics' Frank Wells as vice president of technology; MCA Records' Jessie Noble as VP for record companies; Middle Tennessee State University associate professor of recording Chris Haseleu as VP of education; and Susan Henson of Henson Crafton Entertainment as VP of artist relations. Coming on as board members were David Preston of BMI, guitarist Brent Rowan, Sun Trust's Brian Williams, Sizmic Sound's Tom Davis, engineer Steve Marcantonio, Emerald's Andrew Kautz and Josef Nuyens of The Castle, among others.

Rob Dennis, formerly with rental company Ears Audio, has opened his own rental company, Rack & Roll is located on the Row, on Division Street, and Dennis says the company will be a comprehensive supplier of equipment, but specializing in digital multitrack decks and, he says, a level of service that reflects the way Nashville's studio market is changing. "Speed has become really important—getting the equipment there as quickly as possible," says Dennis. "The other really critical thing is a new level of service in which you don't just drop off a piece of gear; you stay with it until the people who are renting it know how it operates and they're comfortable with it."

Nashville's rental operations have expanded with the town's success in recent years, and Dennis believes that there is more than enough business to go around for rental companies, based on the same trend that's fueling them nationally. "Studios are finding it harder and harder to justify laying out a lot of capital to make big-ticket item purchases," he explains. "A 3348 costs over $150,000, and rates simply aren't going up. So the need for rentals of things like that is going up."

Dennis has minimized his own capital outlays by essentially acting as a broker for some of the increasing number of digital and other types of multitracks that now populate Nashville, owned by studios and engineers. And, in keeping with the hospitality network that has long characterized the town, Dennis says he has already established good working relationships with the two largest rental companies in Nashville, Dreamhire and Underground Sound. "It's at the point in Nashville where there's enough business for all the rental companies," he says. "There's competition, but it's a very friendly sort of competition." ■

—FROM PAGE 203, GROUND ZERO

the room's 'sweet spot.'"

To that end, they created a floating studio that blends pristine acoustics and an assortment of high-end digital and classic analog gear with a modern industrial, yet casual, look of blond wood and brushed steel. Based around a 4-channel Sonic Solutions mastering system with NoNoise and a Power Macintosh 7100, the suite features a Muth Audio CM2040 mastering console, B&W 801 reference monitors, which are powered by two McCormick DNA-1 mono block amplifiers, and a pair of self-powered Genelec 1031A near-field monitors. Lambert also has at his disposal Apogee DA 1000E and AD 1000 digital-to-analog and analog-to-digital converters, a Z Systems ZQ1M Mastering EQ with Apogee's UV 22 Dithering Processor built-in, a Mytek 603 Digital Meter, a TC Electronic M5000, a Focusrite 315 Isomorphic EQ and 330 stereo compressor and limiter, and two tube EQs from the original Motown Studios. "I love the Focusrite EQs and the Z Systems digital EQ, which is one of the first digital EQs that I really love the sound of," Lambert says.

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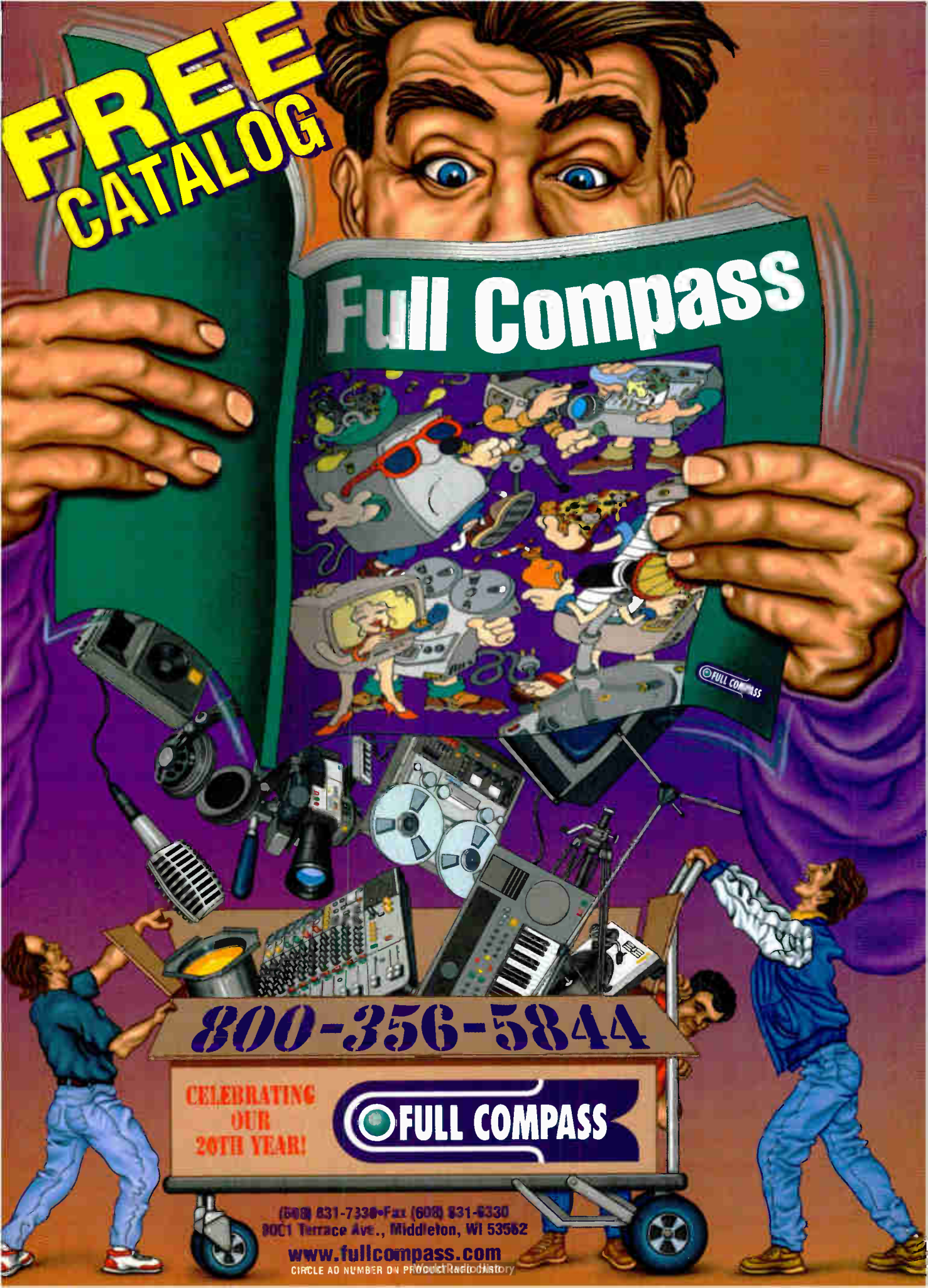
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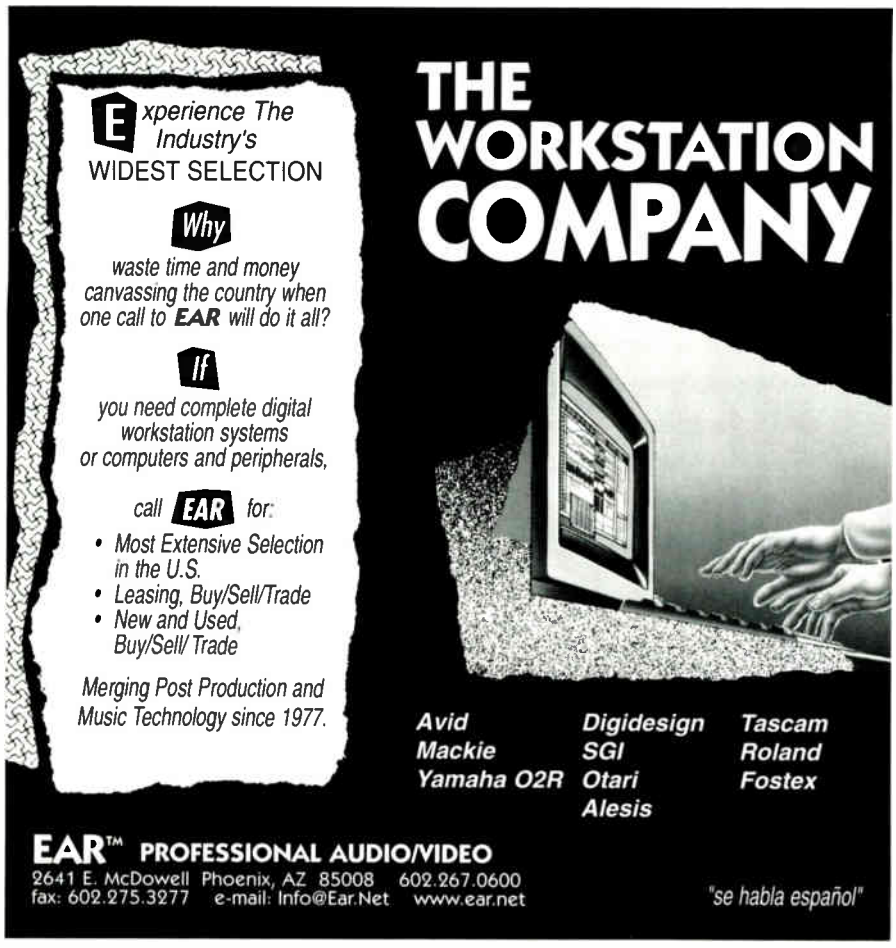

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A Z Systems Z88 digital patchbay connects the entire digital signal path.

Since the room opened in January, Lambert has mastered new releases from Zero Hour recording artists Shallow, Space Needle and Varnaline, as well as Arista Records' "Walk of Fame" compilation and new albums by Most Sordid Pies and Bethenia Rouse. However, mastering services are just the first step in the creation of a full-service, multimedia facility, according to studio manager Shawn Quinn. Ground Zero is in the process of building recording and multitrack mixing rooms, and plans to add video editing, audio-for-video and tape duplication suites over the next year.

"The place looks very SoHo, very industrial," Lambert muses, "and the vibe is much more relaxed than in midtown." ■

—FROM PAGE 202, NY METRO

tion. Now if only we could convince former junk bond king Michael Milken to open a recording studio...

Dubway Studio owner Al Houghton is one of the original tenants of what's been known for years as the Music Building on 8th Avenue, where he produces and mixes records and demos in his small studio for acts including They Might Be Giants. Houghton enlisted fellow tenant Chris Bowman to help construct a new studio at a site on W. 26th Street. The two eventually decided to join forces in the facility, where Bowman will run his studio construction company, CHBO Inc., as well as his own studio.

Design will be by John Storyk, with whom Bowman has built over 20 studios over the years, including JSM, Aural Fixation, Superdupe and QSI. The new facility will be known as Dubway-CHBO, and to defray capital costs, part of the 5,000-square-foot space will be leased out to smaller pro audio operations, including a Storyk-designed MIDI room for composer Philip Goetz, and a commercial production space for an independent jingle composer and producer. The main studio will have video links to other rooms, and it will be a combination private and for-hire facility.

Sound On Sound celebrates its tenth anniversary in 1997. It's official on August 15, but owner Dave Amlen's success story is worth an early peek. One of the last of the breed that got into the business based on a love of music, Amlen recalls that when building in 1986 and opening a year later, he discovered that "It's true what they say: The

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first room takes forever; the second room goes in a couple of months." Sound On Sound started as a one-room facility catering to low-budget overdub work, Amlen recalls. What's remarkable is that Amlen was able to build the business to a two-room, SSL-and-Neve facility catering to upscale tracking and mixing clients during a decade that saw the overall studio business come under fire economically and conceptually, as the economy and project studios took their toll. Looking back, Amlen believes that the studio business was always subject to larger forces beyond this industry and even beyond the record industry itself.

"We survived the stock market crash of 1987, and many people don't realize it but that event reshaped the way all businesses in the U.S. operate," he observes. "It certainly affected the studio business, nowhere more so than right here in New York. I'm heartened to see people like Ed Germano at Hit Factory and Simon at Right Track build their businesses so well during the same period, and I'm especially happy that I was able to build this studio to the point where it entered the upper level of studios in New York. One of the reasons for that, though, is that I got into this a bit later than most other major studios. So as a result, I never knew what kinds of numbers studios had been seeing in the earlier days, and I came into it with far lower financial expectations. That enabled me to ride out the worst of what's happened in the last ten years."

Amlen says the next decade is not likely to be much less tumultuous. Even as the New York studio community stabilizes itself and builds, the next ten years will bring a lot of uncertainty regarding technology. "Ten years ago, people were saying that analog was dead," says Amlen. "Now you look and you see that analog is still the format of choice among upper-level studios. Ironically, it was the smaller studios, the home studios, where digital made the biggest inroads. So in the future, the big questions are going to be, what will be the storage medium of choice? And when should you get into it? How long do you wait? Should you be an early adopter or should you wait for prices to fall and the market to make decisions? That's really what's going on here to a large extent—this has become a business based more on marketing than ever before. The studios, the manufacturers, the equipment. It's largely marketing that helps differentiate one thing from another. That's certainly a big change from ten years ago."

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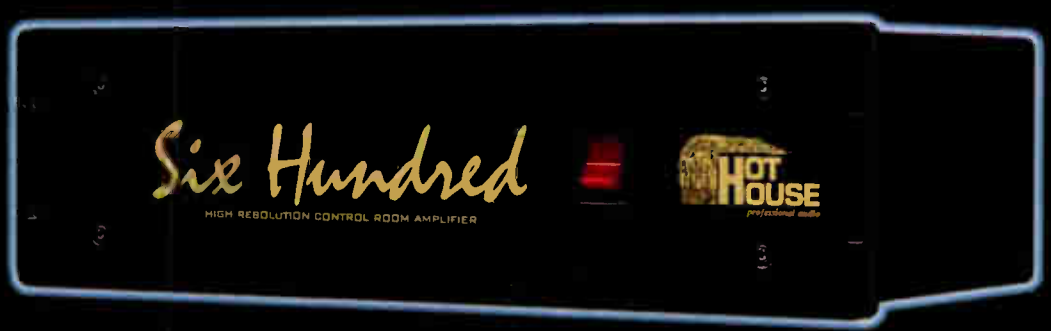

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Euphonix has taken its new CS3000 console on the road, and the caravan stopped in Manhattan on March 5 at the Harley Davidson Cafe. The console, which debuted at AES in November, was put through its paces, including a demo of what Euphonix calls "hyper-surround" mixing. The event was co-sponsored by Euphonix users in New York, including Sony Studios, National Film & Video, Photomag, Buzz and tomandandy. According to Rick Plushner, Euphonix's VP of sales, attendance was 160-plus people. Euphonix did a similar unveiling of the CS3000 in London recently, and Plushner says that other city roll-out events were planned for the future. ■

—FROM PAGE 202, L.A. GRAPEVINE

Wilson, who are both accomplished songwriters."

The Gap Band's hits of the late '70s and early '80s, like "You Dropped a Bomb on Me" have struck a chord with a lot of today's featured artists and up-and-comers, keeping the band contemporary. Lead singer Charlie is featured on several cuts on Snoop Doggy Dogg's latest album, *Tha Doggfather*, including the one called "Snoop's Upside Your Head."

"The way I went about recording them," comments Brown, "is the way we used to record back then, using API and Neve 80 Series consoles for the tracking. We recorded basics on the Neve at The Hook, a cool room with a very nice microphone selection, and at House of Blues, which has an API console very reminiscent of the one we had at Total Experience Studios, where we cut our early hits. Now, here at the Lighthouse, we're working on the Studer console. I'm really happy about that, because I've missed working here. I couldn't get in for the past four years because John Fogerty had it locked out!"

Brown had a cool B3 sound going when I visited. Turns out he used a TLM 170 on the top, and a Sennheiser 421 on the bottom, recording the tracks separately. "I do record for stereo," he says, "top on one side, bottom on the other; it gives a depth to the track more than straight mono, but I don't pan it hard left and right. I've been doing all the rest of my keyboards in mono, because that way you can play with delays and make it more interesting. When you record a lot of sounds in stereo and then put everything far left and right, to me, you just don't have stereo anymore."

One of Brown's favorite tools lately is his new Soundelux mic ("sounds like a hipper U47") that he's using on vocals. He's also got a mysterious piece of gear

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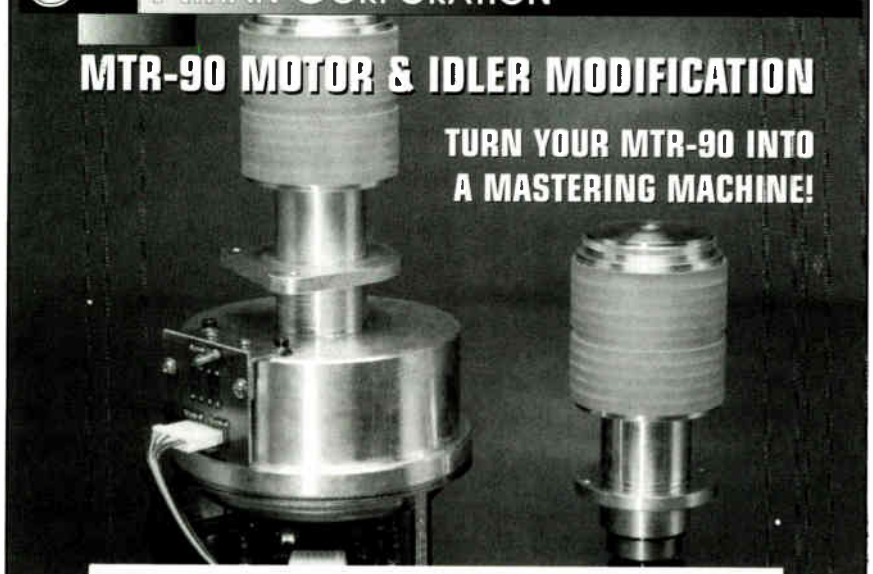
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that he calls "The Array." In the tradition of famed jazz recordist Rudy Van Gelder, it's an unlabeled box. Inside Brown's is a bunch of '60s and '70s effects pedals and gadgets. I couldn't get him to divulge much of The Array's contents, but he did let on that it includes WEM tape delays (predecessors to the Echoplex—who would have thought there was one!), the Electroharmonix Octave Multiplexer, and The Electric Mistress, a guitar gadget reissued by Electroharmonix that Jimi Hendrix reportedly used for deep flange settings.

By the way, that Studer console in Lighthouse's Studio East? It's the only one in the United States, custom-made to the specifications of owner Eduardo Fayad. It's 62-in, and automated with GML moving faders. Studio East also features ten API 550A EQs, UREI LA2As, and the custom Lighthouse stereo mic preamp favored by David Foster and Humberto Gatica, which are also individually made by Lighthouse for sale. And yes, John Fogerty was really locked out in East for four years! Luckily there are two 48-track rooms at Lighthouse; Studio West's console is an SSL 4000 E with G computer. Studio manager Mickie Scott tells us that recent projects in at West have been Mint Condition, the Bee Gees, Rick Springfield, and a mix of an a capella track for Boyz II Men, with Joe Primeau engineering.

Some interesting goings on at Hollywood's Sunset Sound and sister facility Sunset Sound Factory, which have become hubs for L.A.'s progressive rock music scene. Sheryl Crow's eponymous album was recorded and mixed there, including the Grammy-winning (for Female Rock Vocal Performance) "If It Makes You Happy," as were some of Beck's *Odelay* album tracks. Regular clients T-Bone Burnett, Tom Rothrock and Rob Schnapf, Mitchell Froom and Tchad Blake keep the places hopping with their eclectic projects, and on the day I stopped in k.d. lang was working with producer Craig Street and engineer Dan Kopelson in Studio 3 on the API Sunset Sound/DeMedio console, while Alanis Morissette was remixing live concert material with Biff Dawes on Studio 2's Neve 8088.

Other news: Sunset manager Craig Hubler informs us that they are now the exclusive North American distributor for the Alan Smart line of equipment, including the popular "SSL clone" stereo compressor called the C-2, an improved model of the earlier C-1. "We got involved when Alan decided to ramp up production and distribute on a larger

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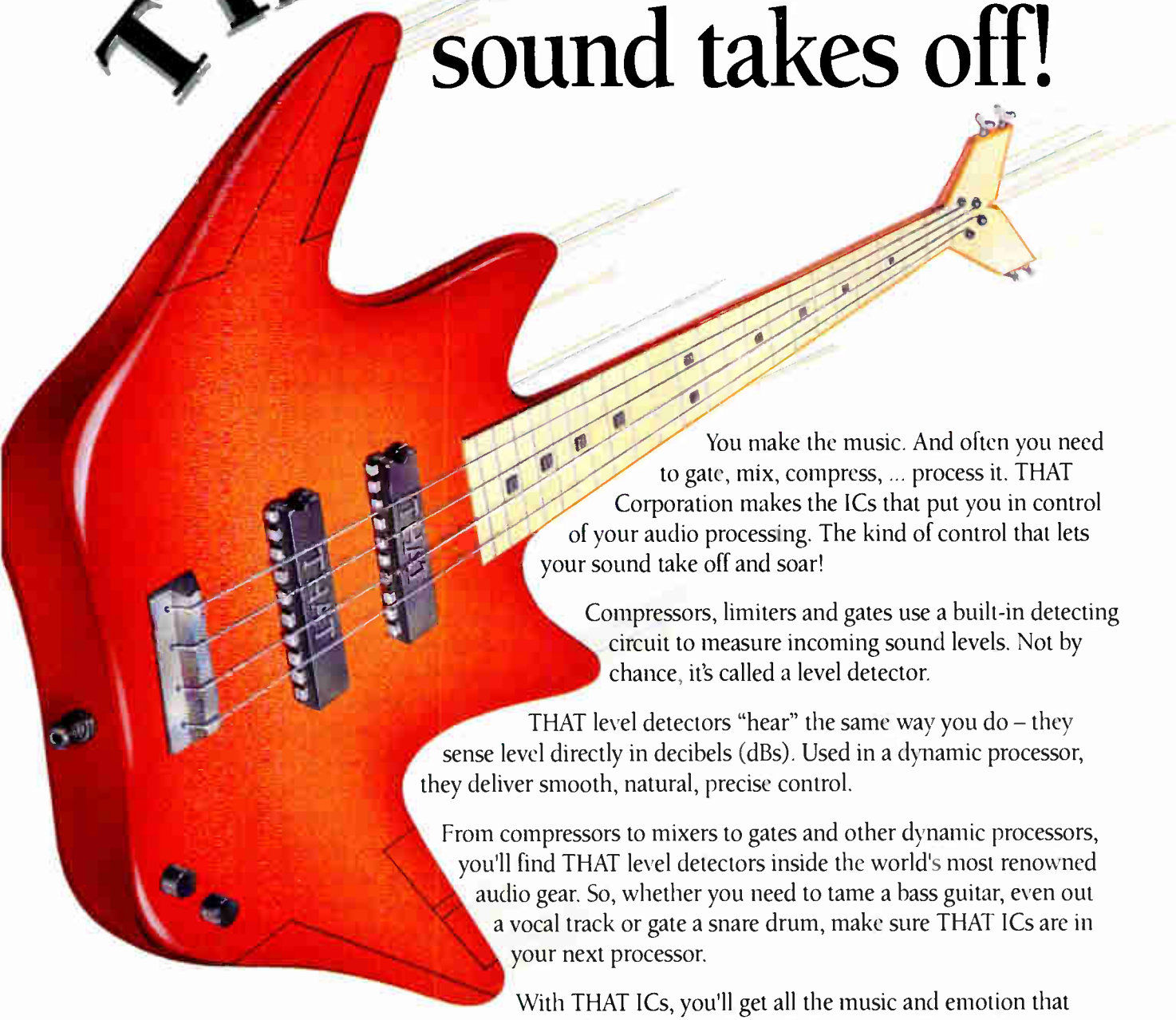

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scale," says Hubler. "Having been the API distributor for many years, we had some experience in marketing audio components to the recording industry. We've been filling orders as fast as Alan can supply product; they're out the door the day they come in!" A Smart direct box is also available with a single rack-space mic preamp in the works.

Also, Sunset Sound is in the process of linking with Sunset Sound Factory, (located a half-mile away) over ISDN phone lines that are part of PacBel's Centrex system. Initially to be used for linking computers between the two locations, the 2-channel, 64-kilobit-per-second system will be able to transmit high-quality audio as well as data, opening the door to recording and monitoring applications.

Meanwhile, Record Plant may have set a new record: Twenty seven of the nominations for the 39th Annual Grammy Awards went to projects that had been worked on at RP; the winning tab ended up at 12, including Record of the Year, Album of the Year, Song of the Year, Male and Female Pop Vocal Performances, and Pop and R&B Albums. With all that success you'd think they could rest on their laurels for a while, but instead president Rose Mann-Cherney tells us that the facility has purchased an SSL 9000, with a second 9000 purchase a very likely possibility. The first board will be installed in SSL 3, the large tracking and mix room, replacing the 72-in G Plus which will move to SSL 2. The new board should be online by the time you read this. ■

Maureen Droney is Mix*'s L.A. editor. Fax your L.A. news to 818/346-3062 or e-mail to MsMDK@aol.com.*

SESSIONS & STUDIO NEWS

NORTHEAST

Jonatha Brooke mixed an upcoming MCA CD at **Beartracks Recording** in Suffern, NY, with producer **Alain Mallet**, engineer **Kevin Killen** and assistant **Steve Regina**...Producer **Daniel Lanois** demo'd songs with **Milla Jovovich** for EMI in Studio B at **Harold Dessau Recording** in New York City. The sessions were engineered by **Scott Anthony**...**Boy Wonder** tracked new material with producer **Tim O'Heir** at Boston studio **Fort Apache**'s Edmunds Street location. The band moved to Fort Apache's Camp Street facility to mix...**Marilyn Manson** rolled into Boston's **Sound Techniques** in between live gigs, for a graveyard shift remixing session with engineer **Sean Beavan**...Tracking and overdubbing at New York City vintage gear emporium **Sear Sound** was folk wise guy **Loudon Wainwright III**. The sessions, for a Virgin Records release, were produced by **John Leventhal** and engineered by **Joe Blaney**. **Tom Schick** assisted...**Sheffield Audio-Video Productions** news: At the company's studio in Phoenix, MD, CBS/Sony artist **Kimberly Scott** worked on a new single with producer **Ernesto Phillips**. The remote truck was recently in Atlanta recording **The Wallflowers** and **Sheryl Crow** for the Global Satellite Network. Also, after two years in development, the company's education branch, The Sheffield Institute for the Recording Arts, is now in full swing...

SOUTHERN CALIFORNIA

David Navarro and **Chad Smith** of the Red Hot Chili Peppers worked on a new project in Studio A at North Hollywood studio **NRG Recording**. The two co-produced with **Dave Schiffman**, and **John Ewing Jr.** assisted...**David Kahne** produced and mixed for Atlantic artists **Sugar Ray** at **Scream Studios** in Studio City. Producer **Don Gehman** was also in mixing the group **Uma** for Refuge/MCA. **Doug Trantow** assisted on both sessions...**Michael Jackson** continued tracking and mixing at L.A.'s **Record Plant** in the SSL 1 and SSL 3 rooms with producers **Brad Buxer** and **Bill Botrell**, engineers **Mick Guzauski**, **Matt Forger** and **Matt Carpenter**. **Jon Mooney** and **Paul DiCato** assisted...Australian artist **Tina Arena** tracked for Sony with producer **Mick Jones** and engineer **Steve Gallagher** at **Brooklyn Recording** in L.A...At **Ocean Studios** in Burbank, Virgin/Canada artists **Blue Meanies** tracked with producer **Howard Benson** and engineer **Mark Dearnley**...**The Foo Fighters** tracked for their new release at **Grandmaster Recorders** in Hollywood with producer **Gil Norton** and engineer **Bradley Cook**...L.A.'s **Skip Saylor Recording** had ex-Bangle **Suzanna Hoffs** in mixing a single for London/Polygram with producer **Peter Koepke**, engineer **Femi Jiya** and assistant **Jason Mauza**...**Dalvin Degrate** mixed at **Larrabee Studios** in West Hollywood for MCA with engineer **Rob Chiarelli** and assistant **Jeff Griffen**...

NORTHWEST

Recent sessions at **Kerr/Macy Studios** (Denver, CO) included **Richie Furay** (founding member of Buffalo Springfield and Poco) mixing his new record for Calvary Chapel Music with producers **Randy Rigby** and **John Macy**. The **Nitty Gritty Dirt Band** recorded their new self-produced release for Rising Tide Records with **John Macy** engineering...At **Michael Cooper Recording** in Eugene, OR, Black Cricket Press artist **Barb Stevens-Newcomb** recorded and mixed her debut, *The Daughters of Ishishini*, with engineer **Michael Souther**. The album won the American Library Association Notable Award, which recognizes the top national recordings for young people...**Sleep** mixed a self-produced Polygram/London release with engineer **Billy Anderson** and assistant **Adam Munoz** at **Different Fur Recording** in San Francisco...The **Dance Hall Crashers** tracked their sophmore album for MCA in the A and B rooms at **Fantasy Studios** in Berkeley, CA, with producer **Stoker** and engineer **Frank Rinella**...

NORTH CENTRAL

Producer/enginer **Trina Shoemaker** recorded Milwaukee's **Citizen King** at **Smart Studios** in Madison, WI. Producer **Mark Haines** was also in, twisting the knobs for cool jazzers the **Ed Anders Quartet**...**The Smashing Pumpkins** demo'd new songs at the **Chicago Recording Co.** with engineers **Chris Shepard** and **Jeff Lane**. The **Smithereens** were in recording a track with engineer **Chris Steinmetz** for a forthcoming Bruce Springsteen tribute album...

SOUTHEAST

At Nashville facility **The Castle**, **John Anderson** tracked for Mercury Nashville with producer **Keith Stegall** and engineer **John Kelton**, assisted by **Paula Montondo**...**Antenna Studios** in Brentwood, TN, is completing renovations to its entire three-studio facility. ForeFront/EMI artist **Geoff Moore** was recently in tracking a self-produced release with co-producer and studio owner **Tedd T.** and co-producer **Brent Milligan**. **Julian Kindred** engineered...**Claudia Church** overdubbed and mixed for a Warner Bros. release at **The Sound Kitchen** in Franklin, TN, with producer **Rodney Crowell** and engineer **David Thoener**...Nashville's **Sound Emporium** had **Waylon Jennings** in tracking with the **Old 97's** for an Elektra release. **John Croslin** produced, and **Rodney Good** and **Matt Andrews** engineered...**Ziggy Marley & the Melody Makers** recorded their next Elektra release in Studio A at **Criteria Recording** in Miami with the production/engineering team of **Steve Thompson** and **Mike Barbiero**. Engineer **Errol Brown** mixed in a second room.

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Chris Carroll and Scott Kieklak assisted on the sessions...At Doppler Studios in Atlanta, Columbia artist Xscape cut new tracks with So So Def's Jermaine Dupri, engineer Phil Tann and assistant Mike Wilson...Cinderella tracked and mixed a new single for their Mecury "Best of" collection at Project One Recording in Hendersonville, TN, with producer/engineers Fred Coury and Martin Horenburg...Dr. Funkenstein George Clinton began working on a new self-produced album at Atlanta's Darp Studios with engineer Vaughn Wilson and assistant Rico Lumpkins...At the House of Blues Studios in Memphis, TN, the production team of Tom Tucker, Ricky Peterson and Paul Peterson were in tracking and mixing new artist Dan Bergman...QED/Sire artists Muscadine mixed four songs at Reflection Sound Studios (Charlotte, NC) with engineer Mark Williams. Reflection is the newest member of booking/service organization the World Studio Group...Shania Twain tracked for Mercury with producer Mutt Lang, engineer Jeff Balding and assistant Mark Hagen at Masterfonics in Nashville...The Freddy Jones Band tracked at Ardent Studios in Memphis, TN, with producer David Z and engineer Greg Archilla...

SOUTHWEST

Hawaiian recording artist Bruddah Walta cut a new self-produced CD at Sea-West Recording on the Big Island with co-producers Rick Asher Keefer and Joe Miller. The studio added a new Roland VS-880 especially for the project...Over at Audio Resource in Honolulu, Japanese pop group Shang Shang Typhoon were in recording for Epic/Sony with engineer Kevin Moloney...Arlyn Studios in Austin, TX, had Soak in working on a self-produced release for Interscope with engineer Larry Greenhill...

STUDIO NEWS

Battery Studio in Nashville finished some acoustic remodeling and also now boasts a newly expanded vintage console. The studio's Neve 8068 was joined to its "twin," acquired from A&M Studios. Both boards were originally built for Media Sound Studios in New York City to the same specification. Now back together after 15 years, the consoles were married by "Rev." Fred Hill in a small private ceremony, and the new board features 64 channels of GML Moving Fader automation with Macintosh front end...New York Studio designer Francis Manzella reorganized his firm and changed its name to Francis Manzella Design Ltd. Recent projects for the firm include a new film mix control room for Manhattan Center Studios and new rooms for Mirror Image Studios and Plotkin Music Associates...New studio The Midway recently opened in Montrose, CA. Geared to music production for albums, television and film, the facility is equipped with 32 tracks of ADAT and Mackie 32 and 24E consoles...Austin, TX, has a new studio—Blue World Music, situated on two acres of hill country. The facility features the first installation of the SSL G+ Special Edition console...Another new SSL went to L.A.'s Conway Recording. The studio installed a 72-input 9000 J in Studio C...Soundworks in Watertown, MA, added a Studer A827 recorder with 24 channels of Dolby SR...Clinton Recording in New York City recently refurbished its illustrious Steinway D concert grand piano. Final adjustments to the piano (which has been played by legends such as Bill Evans, Glen Gould and Thelonius Monk) were made in Clinton's Studio A, to ensure a tonal match between studio and instrument. ■

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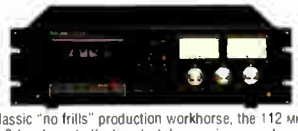

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AKG

K240M

The first headphone of choice in the recording industry. A highly accurate dynamic transducer and an acoustically tuned venting structure produce a naturally open sound.

- Integrated semi-open air design.
- Circumaural pads for long sessions.
- Steel cable, self-adjusting headband
- 15Hz–20kHz, 60Ω

JUST IN

SENNHEISER

HD 265/HD580

The **HD-265** is a closed dynamic stereo HiFi/professional headphone offering high level background noise attenuation for domestic listening and professional monitoring applications.

The **HD 580** is a top class open dynamic stereo HiFi/professional headphone that can be connected directly to DAT, DCC, CD and other pro players. The advanced design of the diaphragm avoids resonant frequenciesmaking it an ideal choice for the professional recording engineer.

marantz

CDR615 / CDR620 Compact Disc Recorder

Both next-generation stand-alone write-once CD recorders they offer built-in sample rate conversion, CD/DAT/MD/DCC subcode conversion, and adjustable dB level sensing. Additional features include adjustable fade in/fade out, record mute time, and analog level automatic track incrementing. A 9-pin parallel (GPI) port and headphone output with level control are also included.

CDR620 *Additional Features*–

- SCSI-II Port • XLR (AES/EBU) Digital In/Out and Digital cascading
- 2x speed recording • Index Recording and playing*
- Defeatable copy prohibit and emphasis*
- 34 key, 2-way wired remote (RC620)

*Available on CDR615 w/optional Wired Remote (RC620)

PMD Series

Portable Professional Cassette Recorders

The world standard for field recording, the PMD line is also the value leader. They all feature RCA Line input/outputs, 1/4-inch headphone jack, built-in speaker, pause control, audible cue and review, tape counter, full auto shut-off and low battery indicator.

- All models except the PMD-430 have 1/2 speed playback/record capability. With 1/2 speed playback, musicians can slow down complicated passages for analysis. At 1/2 speed the pitch is lowered by exactly one octave so the notes are still musically correct.
- By recording at 1/2 speed, a three hour meeting can be recorded on a single tape. A built-in mic and automatic level control make operation simple, and built-in speaker makes transcription convenient.
- Three standard 'D' cell batteries provide up to 7-1/2 hours of operation and the optional RB430 rechargeable battery delivers up to 5-1/2 hours.

	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
General					
Stereo/Mono	Mono	Mono	Mono	Mono	Stereo
Heads	2	2	3	3	3
Inputs/Outputs					
Mic Input	1/4-inch	Miniplug	Miniplug	Mini/XLR	1/4-inch
Condenser Mic	Built-In	Built-In	Built-In	Built-In	—
Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR/dbx NR	—	—	—	—	Yes
Mic Attenuation	—	0,-10dB, -20dB	0,-10dB, -20dB	0,-10dB, -20dB	0,-15dB, -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	—
MPX Filter	—	—	—	—	Yes
Manual Level Control	—	Yes	Yes	Yes	—
Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	±20%	±20%	±20%	±20%	±6%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

Telex

ACC2000/4000 Cassette Duplicators

Designed for high performance and high production, Telex duplicators offer easy maintenance and operation. The ACC2000 is a 2-channel monaural duplicator, the ACC4000 is a 4-channel stereo duplicator. Each produces 3 copies from a cassette master at 16X normal speed and with additional copy modules you can duplicate up to 27 copies of a C-60 original in ***under two minutes.*** And they copy both sides at once!

ACC2000XL / ACC4000XL

The XL Series feature "Extended Life" cassette heads for increased performance and wear characteristics.They also offer improvements in wow and flutter, frequency response, S/N ratio and bias.

Easy Maintenance:

- Slanted work surface and "heads-up" cassette platform prevent oxide build up on the heads and makes cassette loading and unloading easier.
- 3 point tape guidance system eliminates skew problems and prevent unnecessary wear and tear on the tape head mechanism.
- Audio and bias along with head adjustments are made easily from the top of the unit. A switch on the back engages the head and pinch roller for convenient cleaning.

Fingertip Operation

- Individual rotary audio level controls, "Peak" LED Indicators
- Side A or A/B select button
- Stop all tapes instantly, at any point during the copy or rewind cycle.
- Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short.
- Automatic or manual selection of rewind and copy operation: –Rewinds tapes to the beginning or end automatically (AUTO mode) or manually. –In AUTO mode the copy button activates the entire rewind/copy/rewind sequence. In manual mode, it starts copying immediately.

Telex Copyette EH Series Duplicators

The Copyette series produce high quality, low cost cassettes in large quantities at approximately 16X normal speed. The 2 versions are capable of duplicating either 1 or 3 cassettes at a time. Available in both mono and stereo.

Stereo Copyette 1•2•1

Weighing only 8 lbs. (3.6 kg), this unit has a durable, impact resistant housing and includes a removable power cord, carrying handle and protective cover. Optical, non-reflective end-of -tape sensing system provides gentle tape handling.

Stereo Copyette 1•2•3

This duplicator copies both sides of three cassettes at once, yet it's as small as the 1•2•1. It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability.

MICROPHONES

AKG

C414B/ULS

A reputation for flawless performance and uncommon flexibility in the most demanding studio and concert sound applications.

- Dual 1" Gold-sputtered diaphrams.
- Flat on-axis response.
- 126dB dynamic range.
- Switchable 10dB and 20dB pad.
- 20Hz–20kHz.

JUST IN

CAD

Studio Condenser Mics

The "bench mark" for cost and performance, the Equi series of microphones incorporate a unique servo design and exceptional flexibility to provide extraordinary ballistic capability and exceptional transient response.

E-300

A multi-patterned side address mic that combines vintage capsule design with advanced head-amp electronics, the E-300 has an unusually wide frequency response of 10 Hz to 20 kHz and an exceptional dynamic range of 137 dB. Also extremely low self noise of 11dB. Ideal for the most critical applicatio

Shown w optional ZM-1 Shockm

Unique powering of all mics is accomplished with a pair of rechargeable nicad 9-volt batteries in combin tion with 48-volt phantom power. This overcomes inherent current limiting associated with most phantom power supplies and can supply 10X the current.

E-200/E-100

The first member of the Equitek family, the **E-200** is a a dual capsule side address multi-pattern condenser but with lower specifications than the E-300. The **E-1** uses the same electronics as the E-200, but with only one of the same capsules in a supercardioid pattern.

- Frequency response of 10 Hz to 18 kHz.
- Dynamic range of 137 dB • Low self noise of 16 dE

audio-technica.

AT4033

Cardioid Capacitor Microphon

The AT4033 is a transformerless, studio microphone designed for use in the most demanding applications

- Gold-plated, "aged-diaphragm" condenser element w internal baffle plate to increase S/N ratio which, cou with low-noise transformerless electronics, makes t AT4033 ideal for critical digital recordings
- Dynamic range is 123 dB without built-in attenuator
- Accepts up to 140 dB SPL without distortion above T.H.D. A built-in switchable 10 dB (nominal) pad increases it to 150 dB
- Internal open-cell foam windscreen.
- Integral 80 Hz hi-pass filter for easy switching from a flat frequency response to a low-end roll-off.

AT4050/CM5

The AT4050 multi-pattern condenser expands upon the AT4033 to set the standard for studio performance mics.

- 2 capacitor elements.
- Cardioid, Omnidirectional, and Figure 8 polar pattern settings.
- Vapor-deposits of pure gold on specially-contour large diaphragms are aged through 5 steps to ens optimum characteristics over years of use. Transformerless circuitry results in exceptional tr sient response and clean output even under extre ly high SPL conditions.

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PROCESSING

BEHRINGER

MDX 1200 Autocom

Attack/Release times, with Intelligent Program Detection.
Noise gate, switchable Soft Knee/Hard Knee characteristics for varied sound pressure levels.
Bright, illuminated LEDs show gain reduction.

MDX 2100 Composer

Integrated auto/manual compressor, expander & peak limiter.
Compresses "musically" in dynamic range without any audible "pumping" or "breathing".
Attack & release times are controlled automatically or manually.
Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
Servo-balanced inputs and outputs are switchable between +4dB and -10dB.

APHEX

107 Tubessence
2 Channel Mic Preamp

The 107 delivers outstanding sonic performance, as well as a great degree of presence, detail, openness and image.
2 independent channels with front panel XLR inputs
Up to 64dB of gain available
20dB pad with red LED indicator, 2 LED input meter
Full 48V phantom power with red LED indicator
Low cut filter with red LED indicator: 80Hz, 12dB/octave
Polarity inversion switch with LED indicator
Individual channel remote mute capability
Switchable +4dB/-10dB output with 1/4" TRS phone jacks

AIBESSENCE combines the best attributes of both tube and solid state circuitry to provide performance unmatched by conventional designs. The solid state front end is transformerless and only high end capacitors are used in the signal path. The tube circuit imparts the sonic characteristics of tubes without the extremely high voltages, heat, fragility, and short life span of conventional tube circuitry.

109 Tubessence
Parametric EQ

The Aphex 109 is an extremely versatile and high performance parametric vacuum tube EQ with unique features, flexibility and sound.
Great for "warming up" digital signals.
True tube circuitry in the output stage.
Dual (stereo) 2 band or mono 4 band EQ configuration offers flexibility from general sweetening to critical problem solving.
Operates in the EQ flat mode yet still passes signal through the Tubessence vacuum tube stage.
.5 octave to 2 octave bandwidth adjustment.
Switchable -10dBV/+4dBu operating level.

t.c.electronics

Wizard M2000
Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and 6 different routing modes. There are 250 factory programs including reverb, pitch delay, chorus, flange, phase, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit A/D conversion, S/EBU and S/PDIF digital inputs/outputs, "Wizard" pop menus, 16-bit dithering tools, Tap and MIDI tempo modes and single page parameter editing.

HIGH-END MIC PRE-AMPS

Focusrite

Red 1 / Red 8 Mic Pre-amps

The Focusrite Red Series is instantly recognized by leading engineers worldwide for its fidelity, musicality, precision and control. The Red1 is a 4 channel mic pre while the Red 8 has 2 channels. Both are ultra-high quality for use in digital recordings, and with high-quality ribbon, valve, and condenser microphones.
Each channel offers–
- Phantom power & Phase reverse.
- Warm, and crystal-clear.
- Easy-to-read, accurate illuminated VU meters.
- Low noise floor with high gain bandwidth.
- Mic gain has 66dB range.

ISA 215 Dual Mono Mic-Pre & EQ

HOT!

Engineers, producers and musicians worldwide are familiar with the legendary ISA 110 mic pre/EQ that forms the heart of the Focusrite Studio Console. Frequent requests for a 19" rack unit with the same circuitry have led to the development of this high-quality studio device
- 2-independant mic pre-amp & EQ.
- Microphone inputs feature variable gain and switchable phantom power.
- Independant HF and LF shelving sections.
- Overlapping Upper and Lower Mid EQ w/variable bandwidth.
- Independant High and Low pass filters.
- Integrated PSU
- Large, easy to use control knobs and switches.

Focusrite Green Range
NOW AVAILABLE!

ALESIS

3630 Compressor RMS/Peak 2Ch.Comp/Limiter/Gate

The 3630 is a dual-channel compressor that offers Ratio, Threshold, Attack and Decay controls to handle the toughest signals. It also offers a choice between RMS and Peak compression styles, plus Hard and Soft Knee dynamic curves for every application from subtle gain control to in-your-face punch. Ideal for use in applications from studio recording and mixing to live sound reinforcement and broadcast.

M-EQ 230 Dual 1/3 Octave/Precision Equalizer

Used extensively in recording studios since 1989, the M-EQ 230 provides 2 independent 30-band 1/3 octave graphic EQ's in a single rack space. Covering every band from 25 Hz to 20 kHz in 1/3 octave increments the M-EQ 230 is ideal for tuning the monitors in your project studio or even getting the most out of a home stereo setup.

MidiVerb 4 2 Ch. Parallel Processor w/Auto Level Sensing

The MidiVerb 4 extends Alesis' line of affordable professional multi-effects processing. It provides the sonic quality and programming power required for studio recording and live sound reinforcement at an affordable price.
- Wide variety of dense, natural-sounding reverbs, rich chorus and flange, versatile delay, rotating speaker simulation, pitch shift, panning and more.
- Auto Level Sensing feature automatically sets your input signal to the optimum level to take advantage of the MidiVerb 4's wide dynamic range.
- 18-bit oversampling digital converters add to the excellent audio fidelity, with a resulting 20 kHz frequency response and a dynamic range over 90dB.
- 128 preset and 128 user-editable programs.
- Mono or Stereo single effects, dual-mono effects, and multi-chain configurations for 2 or 3 effects at once.

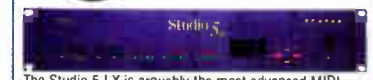
QuadraVerb 2 2 Ch. Master Effects w/Digital I/O

Alesis' most powerful signal processor, the QuadraVerb 2 offers the amazing audio fidelity of a high-end dedicated vocal reverb while providing powerful multi-effects capabilities.
- 300 programs (100 preset and 200 user-editable).
- Octal Processing allows use of up to 8 effects simultaneously in any order. Choose between over 50 different effects types for each block, including reverb, delay, chorus, flange, rotary speaker, pitch shift, graphic and parametric EQ, overdriver and more.
- 5 seconds sampling, triggerd pan, and surround sound encoding are also built in.
- Selectable -10 dB and +4dB levels, servo-balanced TRS inputs and outputs.
- ADAT Digital Interface allows you to work entirely in the digital between the Q2 and an ADAT XT.

MIDI

OPCODE

Studio 5 LX
Macintosh MIDI Interface



The Studio 5 LX is arguably the most advanced MIDI interface on the market today. It incorporates a MIDI patchbay, MIDI processor, and SMPTE synchronizer with it's interface functions, all in a 2 rack space unit.
- 15 Independant MIDI ins and outs.
- SMPTE reads and writes all formats– 24, 25/29.97/29.97DF/and 30.
- Network multiple units, 240 MIDI channels each.
- 128 patches, unlimited virtual instrument controls.
- 2 assignable footswitch inputs, 1 controller input.
- 8X speed when used with OMS.
- Internal power supply.

Studio 3 & 4 MIDI interfaces, and Vision sequncing software also available.

JUST IN

Mark of the Unicorn products now available.

PROCESSING

HOT!

White instruments

4200A, 4400 & 4700
L-C Series 1/3 Octave Active Equalizers

- The 4200A (active, cut only graphic EQ) and 4400 (active graphic EQ) provide 28 1/3-octave filters on I.S.O. centers from 31.5 Hz to 16kHz. Hand-tuned inductor/capacitor (L-C) resonant circuits provide the ultimate in performance and reliability.
- Better than 108 dB signal-to-noise ratio with no degradation even when filters are used.
- Continuously adjustable high and low-pass filters band-limit unwanted subsonic and ultrasonic noise.
- 3 outputs and powered accessory crossover socket facilitate distribution and level control to three subsystems. (Bi-amp or tri-amp operation with optional 2-way and 3-way plug-in crossover networks.
- The 4200A has a -15 dB control range, the 4400 has a ±10 control range.

The **4700** is similar in specifications to the 4200A/4400 EQs, the difference is that all functions of the 4700 are digitally controlled.

DSP 5024
Digital Signal Processor

- 2 input, 4 output signal processor with 107 dB of dynamic range.
- Crossover can be configured as 2-way, 3-way, 4-way or dual 2-way.
- Adjustments can be performed in frequency 1Hz steps, slope (6, 12, 18, 24 dB/oct.), shape (Butterworth, Bessel, Linkwitz-Riley).
- Parametric filters include boost, cut, high pass, low pass, rising shelf and falling shelf, adjustable in 1 Hz steps, 1/10 dB steps and bandwidth from 1/70th octave to 4.8 octaves.
- Delay up to 680 ms on each output.
- Ten non-volatile memories and presets with password security.
- Remote preset select interface includes PA422.

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STUDIO MONITORS

JBL Control 5
Compact Control Monitor Loudspeaker

The Control 5 is a high performance, wide range control monitor for use as the primary sound source in a variety of applications. It's smooth, extended frequency response combines with wide dynamic capability to provide acoustic performance that's ideal for recording studios, A/V control rooms & remote trucks.
- 6-1/2" low frequency driver provides solid, powerful bass response to 50 Hz and a pure titanium 1" dome handles high frequency response to 20 kHz.
- Magnetically shielded for use near video monitors.
- Choice of black, gray or white finish.
- A host of mounting systems including ceiling, rack and tripod allow positioning in exactly the right spot.

4200 Series
Near-Field Monitors

The 4200 Series near field monitors come in 6.5"(4206) and the 8" (4208). Both offer exceptional sonic performance, setting the standard for today's multi-purpose studio environment.
- Multi-Radial baffle directs the axial output for optimum summing at approximately 3 to 5 ft.
- Curved surface of the ABS baffle virtually eliminates baffle diffraction distortion.
- Superb imaging and greatly reduced phase distortion.
- Vertical alignment of the transducers across the baffle center produces natural mirror-imaging.
- Pure titanium diaphragm high frequency transducer provides smooth, extended response.
- Magnetically shielded for use near video monitors.

6208
Near-Field Monitors

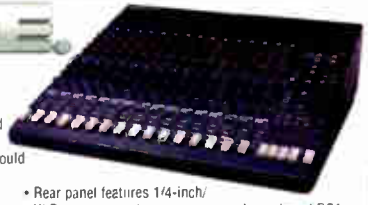
An internally bi-amplified near field studio monitor, the 6208 provides excellent reference in a small, portable package. It combines optimized electronics with an 8" two-way speaker system on a Multi-Radial baffle that aligns acoustic centers of high and low frequency transducers. The transducers are magnetically shielded to allow safe placement near sensitive equipment such as tape recorders and video monitors.
- XLR or 1/4" inputs are compatible with both -10 dbV and +4 dBu nominal operating levels.
- 2.6 kHz electronic crossover with discrete circuitry.
- Low feedback design, with no slew rate limiting and extremely low distortion.
- 8", low frequency transducer delivers a long, linear excursion resulting in a smooth extended bass output with low power compression. It is coupled to a one inch titanium diaphragm, high frequency transducer with patented "diamond pattern" surround exhibiting flat response, +/-2 db from crossover point to 20 kHz.

MIXING BOARDS

BEHRINGER EURODESK MX 8000
24 Channel 8-bus Console

- 48 input channels with dedicated EQ, Mute, Pan, & Level.
- Channel, Subgroup, and Mix insert points.
- Direct Outputs, 24 balanced tape ins/outs.
- 4 band EQ with sweeps.
- 6 Aux sends, 6 stereo Aux returns w/extensive routing.
- Optional **M8-8000** Meter-bridge.
- Optional Cybermix automation software for Windows.

MACKIE CR-1604 VLZ
16-Channel Mic/Line Mixer



A hands-down choice for many major touring groups and studio session players as well as broadcast and sound contracting. The CR-1604 VLZ features everything you would expect from a larger console, and then some!
- 24 line, 7 AUX, 3-band EQ w/ mid sweep, 10-segment LED output meter.
- 90 dB S/N and 108 dB dynamic range.
- 16 studio-grade, phantom powered mic preamps.
- AFL/PFL solo & mute w/ overload and signal indicators.
- Rear panel features 1/4-inch/XLR connectors, inserts on every channel, and RCA tape inputs/outputs.
- Rotary I/O "pod" allows3 different positions for set-up.

MS1202VLZ and MS1402VLZ *IN STOCK!*

The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 8•Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

TASCAM M-1600
16/24 Channel 8-bus Console

NEW!

Great for modular Digital Multitrack setups and hard disk recording, the M-1600 is part of Tascam's next generation series of recording consoles. It features multiple option for inputs and outputs and uses the same, easy to install D-sub connectors as Tascam's more expensive console, all in a compact design.
- XLR Mic inputs w/phantom power on 8 channels.
- Signal present/overload indicators on each channel.
- Balanced/Unbalanced tape returns and Balanced Group/Direct outputs using D-sub connectors.
- TRS Balanced Line Inputs on all channels.
- 3-band EQ with sweepable mids.
- 5 Aux sends (1 stereo)
- 4 assignable aux returns.
- Perfect for use with DA-88 and ADAT setups.

Digital Multi-Track Recorders

TASCAM DA-88

- Hi-8mm tape format.
- ATF system ensures no tracking errors or synchronization loss on up to 16 cascaded decks.
- 16-bit D/A, selectable 44.1 or 48KHz.
- Flat 20Hz to 20KHz, 92dB dynamic range
- Seamless Punch-in and out, for programmable digital crossfade and insert.
- Individual track delay for special effects and timing correction.

SONY PCM-800 Digital 8-Track In Stock!

ALESIS adat xt
S-VHS DIGITAL

The ADAT-XT sets the standard in modular digital multitrack recording. The ADAT-XT operates up to four times faster than the original ADAT and offers an intelligent software-controlled tape transport as well as provides onboard digital editing and flexible autolocation.
- IncludesLRC remote control with transport and locate functions
- Advanced transport software continuously monitors autolocation performance.
- 56-pin ELCO connector operates at +4dB and -10dB
- Built-in electronic patchbay
- Flawless copy/paste digital edits between machines or within a single unit.

STUDIO MONITORS

ALESIS Monitor 1
Near Field Reference Monitors
- 6.5" low frequency driver provides excellent image ar transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology elim nates the "choking" effect of port turbulence for solic high-power bass transients and extended low frequer cy response.

Monitor Two
Mid Field Studio Reference Monitor

Today's popular music demands more bass at louder volumes than a small near field monitor can possibly produce, the Monitor 2 delivers.
- 10" three way speaker design with a unique asymmetrical crossover maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound fiel
- 5" mid frequency driver offers exceptional mid frequency detail
- 1" silk dome high frequency driver delivers a broad b natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.

Point Seven

NEW PRODUCT

- Shielded reference monitor.
- Front ported venting system for great bass response.
- 50 watts RMS– 100 watts peak @ 4Ω.
- 85Hz–27kHz, ±3dB.
- 2kHz crossover for accurate phase and a wide "sweet spot" for mixing.
- Accurate flat sound reproduction.
- Great for studio and multimedia applications.

TANNOY PBM Series II
Near-field Reference Monitor

The PBM II Series is the industry standard for referen monitors providing true dynamic capability and real world accuracy.

PBM 5 II
- Custom 5" injection-molded bass driver
- Woofer blends seamlessly with the 3/4" polymide so dome ferro-fluid cooled tweeter providing extended bandwidth

PBM 6.5 II
- 6.5" lowfrequency driver and 3/4" tweeter
- Fully radiused and ported cabinet design reduces re nance and diffraction while providing deep linear extended bass.

PBM 8 II
- High tech 1" soft dome tweeter and 8" driver capabl of powerful bass extension under high SPL demand
- Hard wired crossover features true bi-wire capability
- Full cross-braced matrix medite structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporati a large diameter port featuring laminar air flow at hi er port velocities

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PORTABLE DAT RECORDERS

TASCAM

DA-P1

- Rotary 2 head design and 2 direct drive motors.
- XLR mic/ line inputs (w/phantom power)
- Analog and S/PDIF (RCA)digital I/O
- 32/44.1/48kHz sample rates & SCMS-free recording.
- Built in MIC limiter and 20dB pad
- TRS jack w/ level control for monitoring
- Includes shoulder belt, AC adapter, & battery.

PDR1000/PDR1000TC

- 4 head Direct Drive transport
- Balanced XLR mic and line analog inputs and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU XLR
- Left/Right channel mic input attenuation selector(0dB/-30dB)
- 48v phantom power, limiter & internal speaker.
- Illuminated LCD display shows clock and counter, peak level metering, margin display, battery status. ID number, tape source status and machine status.
- Nickel Metal Hydride battery powers the PDR1000 for two hours. AC Adapter/charger included.

PDR1000TC Additional Features:

- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External sync to video, field sync and word sync.

STUDIO DAT RECORDERS

FOSTEX

D-25/D-30

- Pro DAT master recorder featuring confidence monitoring and insert editing with a 4-head transport.
- Sync functions include the ability to chase sync to a master timecode. Resolves to WORD/VIDEO/DAT frame signal + WORD.
- Independent left/right recording.
- Scrub from tape or buffer, Jog/ Shuttle 1/2X to 16X.
- SMPTE/EBU TC generator/reader
- On board chase/lock sync, RS-422 slot.
- 4-head 4-motor transport.
- 16 MBit RAM buffer for instant Start & Edits.

D-30 Additional Features:

- Large, high resolution backlit LCD display which shows all parameters at a glance
- Intuitive menus from 10 dedicated soft keys
- 2/ RS-422 ports for added flexibility.

FOSTEX D-15 TimeCode DAT NOW AVAILABLE!

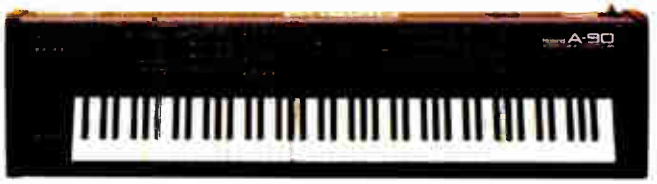
Panasonic.

SV-3800/SV-4100

The SV-3800/SV-4100 feature highly accurate and reliable transport mechanisms with search speeds up to 400X normal. Both use 20-bit D/A converters to satisfy the highest professional expectations. The **SV-4100** features instant start, program and cue assignment, enhanced system diagnostics, multiple digital interfaces and more.

Roland

A-90EX Master Controller for the Next Century



The A-90EX is an 88-note weighted master controller with the best keyboard action currently on the market—bar none. It offers incredibly realistic piano sounds, powerful controller capabilities and 'virtual' programmable buttons which can be configured to operate your software and other devices. The A-90EX combines the majestic sound of a concert grand, the expressive action of a fine acoustic keyboard and the comprehensive MIDI functions of a master controller—all in a portable stage unit.

Keyboard Controls

- Master Volume Slider and Global Transpose features allow you to send control commands to your entire MIDI setup without changing the balance between connected units.
- Sequencer Control Section lets you control song selection, tempo and other parameters quickly.
- The keyboard can be split into eight zones and features 20 different controls and connectors.

Superb Sound

- 2 types of stereo-sampled grand pianos various acoustic and electric pianos (including a great classic Rhodes).
- 128 patches selected from Rolands extensive "JV" and "JD" series library.
- 64-voice polyphony. Built in effects

Extensive Performance Configurations

- Stores up to 64 Performances.(128 w/optional M-512E card) which may consist of up to 4 preset Patches along with various user-configurable parameters such as zone, effects, and MIDI channel.

88 Key Keyboard

- Proprietary 88-note hammer-action, velocity sensitive keyboard w/aftertouch offers the natural resistance and rebound of an acoustic piano and control of a synth.

JV-2080 64-Voice Synthesizer Module

JUST IN

Roland resets the standard with the incredibly expandable JV-2080 64-Voice Synthesizer Module. This amazingly powerful package offers unprecedented expandability, digital signal processing, and remarkable operational ease, all housed in a 2-unit rack-mount design

Features

- 64-Voice polyphony / 16-part multitimbral capability.
- 8 slots for SR-JV80 series expansion boards.
- 3 independant effects sets plus independant reverb/delay and chorus.
- 64-Voice polyphony/16-part multitimbral capability.
- NEW patch finder and Phrase Preview functions for easy access to the huge selection of patches.
- Large backlit graphic display
- Compatable with the JV-1080, XP-50, and XP-80.

NEW SR-JV80-10 "BASS & DRUMS" EXPANSION BOARD NOW AVAILABLE!

DM-800 Digital Audio Workstation

A compact, stand-alone multi-track hard-disk recorder that provides an amazing array of features at an unbelievably low price. Used music production, post production and broadcast, it performs all digital mixing operations from audio recording and editing to rotation track-bouncing and final mixdown. It supports SMPTE and MTC and features a built-in Sample Rate Resolver for sync with any time code.

NEW PRODUCT

VS-880 V-Xpanded Digital Studio Workstation

The VS-880 V-Studio Digital Workstation, is now even more versatile with the release of the VS-880 V-Xpanded. This new version incorporates powerful additional functions that allow you to get the most out of the VS-880's incredible creative potential.

NEW FEATURES

Mixer Section

- Auto Mixing Fuction records and plays back song data in realtime including fader movements and panning positions. No external sequencer is required.
- Easy recording with an inserted effect in "INPUT-TRACK" mode.*
- Process the master output with a specific inserted effect such as total compression.*
- Scene change by MIDI program change message.

Recorder Section

- Simultaneous playback of 6 tracks in MASTER MODE recording.
- Digital output with copy protection.

Effects Section*

- 10 additional effect algorithms (30 total) including Voice Transformer, Mic Simulator, 19-band Vocoder, Hum Canceler, Lo-Fi Sound Processor, Space Chorus, Reverb 2, 4-band Parametric EQ, 10-band Graphic EQ, and Vocal Cancellor.
- 100 additional preset effects patches.
- Effect change by MIDI program change message.
- Effect edit by MIDI control change message.

And More...

- Additionally, over 20 powerful and convenient features in editing/sync sections have been added.

The functions marked * require the optional VS8F-1 Effect Expansion Board

VS-880-S1 SYSTEM EXPANSION KIT

Current owners of the VS-880 now enjoy unprecedented support from Roland with the release of this System Expansion Kit. Supplied on a ZIP diskand including a new owner's manual, the VS-880-S1 will provide current version users with all of the benefits of the VS-880 V-Xpanded at a fraction of the cost.

HARD DISK RECORDING

ATTENTION MAC USERS-

digidesign

PROTOOLS PROJECT, AUDIOMEDIA III, MASTERLIST CD, & POWERMIX DAE NOW AVAILABLE!

SOUNDSCAPE DIGITAL TECHNOLOGY LTD.

SSHRD-1 Hard Disk Recorder/ Editor

A professional Multitrack Digital Audio Workstation for the PC, the SSHDR1 combines the highest quality processing hardware with easy-to-use Windows-based software for the most complete and affordable solution for high quality digital audio recording and editing on the PC. The SSHDR1 has over 50 powerful editing tools and is expandable from 8 to 128 tracks, with up to 32 inputs and 64 outputs. Ideal for a wide range of applications ranging from, recording music in project studios with an 8 track system, to multiple unit 32, 48 and 64 track systems used by major TV and film studios for audio post productionlinked to video.

- All audio processing, disk handling and sync. is carried out by the powerful DSP in the hardware, so any PC can be used. Even a 386!!!
- Up to 64 virtual tracks all with Move, Copy, Trim, Slip Solo, Repeat, Delete, Cut, Glue edit functions.
- Solo/Multi-track audio scrubbing 999 named markers
- Realtime fade In/Out (8 selectable curves).
- Automated Punch In/Out. Volume contouring.
- All SMPTE formats, including 29.97 and 29.97 DF.
- AV file support w/full sync. (Req Video forWin,V1.1).
- Optional EDL File support w/full auto conform via RS422
- Volume and Pan controls, assignable fader grouping.
- Reverse/Phase Invert/Compute tempo.
- Optional Time Module features Time stretch/Time compression Pitch shift and Sample rate conversion.
- 8 physical output channels, selectable for each PART
- Non-destructive sample-resolution editing.
- Cycle record mode with stacked TAKES and pre-roll (like analog multi-track tape recorders)
- **AND MUCH MORE...**

FOSTEX

DMT-8 VL

JUST IN

The latest in the Fostex HD recording family, the DMT-8 VL truely brings the familiarity of the personal multi-track to the digital domain.

- 18 bit A/D, 20 bit D/A conversion
- 8 channel mixer, CH. 1&2 feature both mic & line level
- 2 band EQ and 2 AUX sends per channel
- Cut/Copy/Move/Paste within single or multiple tracks
- Scrub from tape or buffer, Jog/ Shuttle 1/2X to 16X.
- Built-in MIDI Sync., 6 memory locations.
- Dual function Jog/Shuttle wheel provides digital "scrub" without pitch change.
- Divide the drive into 5 seperate virtual reels" each with it's own timing information.
- **NO COMPRESSION!**

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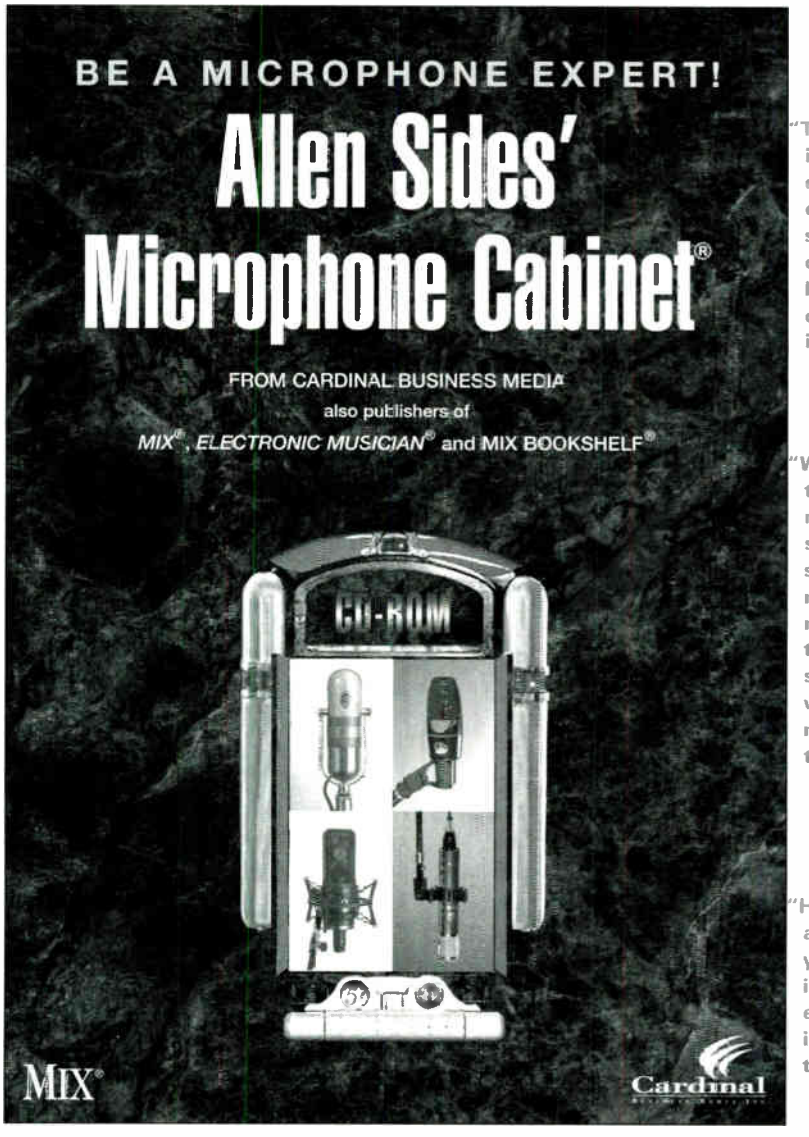
A revolutionary new microphone auditioning tool on CD-ROM!



Allen Sides has recorded and mixed sessions for dozens of world-class artists such as Ry Cooder, Count Basie, Ray Charles, Sinead O'Connor and Brian Setzer.

David Schwartz, producer of this CD-ROM project, is the founder and former editor-in-chief of *Mix*.

"The Microphone Cabinet is now a required reference tool for all of our classes. It really shows students the importance of subtle differences between mics, but best of all, I can secretly use it too!"

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Founder and Chief Administrator
California Recording Institute

"What a great educational tool! My students can now learn the technical specifications and the sonic characteristics of microphones which normally aren't available to them. With studio time in such demand, it's a great way to get to know the mics before going into the studio."

Wesley Bulla
Coordinator of Recording Studio Curriculum
Belmont University

"Hey, I got the CD-ROM and it's great! Finally, you get a chance to look in a top engineer/producer's toolbox without having to buy all of the tools."

David Miles Huber
Author and musician

This unique, fully interactive CD-ROM lines up the top classic and contemporary professional microphones for a series of audio comparison tests on dozens of instruments.The disc features:

- A "Selector Cabinet" of both popular and classic mics for recording each instrument.
- 16-bit Red Book audio samples of the selected mics and instruments.
- Allen Sides' "Tips" for getting the best sound from each microphone.
- A high-resolution color photograph of each microphone and the mic placement setup for each instrument.
- Complete specifications for each microphone.
- A color photograph and description of each musical instrument.
- A "Microphone Basics" section by noted author John Woram.
- A directory of the microphone manufacturers.

This amazing disc features tests of 66 mics and 33 different instruments. The microphones were chosen from the world-renowned collection at Sides' Ocean Way/Record One studios in Los Angeles. Sort by microphone to check out the best instruments for each, or sort by instrument to see which mics you should use. **Item MC) $69.95** plus $9.95 shipping and handling.

Call Toll-Free!
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—FROM PAGE 16, WIRE WE ALL HERE?

quasi-mono (twisted and deformed) audio on a carrier that mocked me by turning on my stereo light and crashing my (now) AC3 decoder. It was Comcast, my beloved cable provider! Now this brings up an interesting question. Since Comcast is (thankfully) constrained to operating only within my local area, why didn't *any* of you readers ever bother to drop a line telling me that your stereo TV was, in fact, stereo and that I was unfairly attacking the poor friendly folks who bring you my MTV? And I admit that I actually watch MTV, whenever a friend has a new release in rotation.

And then there's the issue of video quality. With DSS, you trade in that old dusty, distorted, noisy, clipped-yet-overmodulated, unstable analog RF cable-fed image for a rock-solid, noiseless, ghostless image with a crap-shoot of compression artifacts. I say this because the actual image quality changes as a function of such variables as how creative the tech was when he made optimization decisions while doing the multipass conditioning and compression for the feature films, how noisy the image was before conversion and how many bits per second are actually allocated to *your* image at any given time. You see, the resolution of your movie might suddenly drop when lots of data-intensive action is going on on the *other* channels! Yes, folks, DSS robs Peter to pay Paul, and at some point or other, each of us has to be Peter. There is a finite amount of data that the birds can pipeline, and the allocation for each channel is dynamic! Lots o' sports on the other channels; sparkly green squares on your movie. No sports, no live events (they use massive data, as there is no time to precondition them to lower their data demands), and your movie is actually stunning.

All in all, though, I feel it's usually a great trade. You can actually read the credits at the end of a film, red stays inside the lines, and you can tell a Strat from a Les Paul. The MPEG artifacts do come and bite you in the easy chair from time to time (the system can't deal with fade-ins or flash bulbs), but all in all it is great fun. *If* you can get the decoded converted analog image safely from the DSS receiver over to your NTSC TV. And *this* "If," friends, is how I return from the second "How DSS Works" side trip to the topic at hand: how to properly discipline your wire.

I chose the Sony DSS system, and the owner's manual says there are three ways to get video to your TV: RF (no lo contesto), composite video (twisted), and S-video (literally untwisted). It says that RF is the worst, composite is pretty good and S-video is the best. No surprises here. I chose S-video. It bit. Although it was certainly delivering higher detail than composite, it had its own problems. In fact, I would go so far as to say that in some ways the composite feed looked nicer. What a disappointment. Then I remembered that years ago when I set up the video monitor system in my studio, I was again disappointed by the same mediocre S-video performance. And I guess most people feel the same, because every year it gets harder and harder to buy gear with comprehensive S-video I/O.

DSS robs Peter to pay Paul, and at some point or other, each of us has to be Peter.

I have an audio rule that simply states: "Wire Superimposes Unacceptable Constraints, Killing Sound." Now for those of you who have either never been secret agents trained to extract hidden messages from bodies of text, or who have not yet figured out that I often bury such messages in my columns, take another look at my rule. Okay, still didn't get it? Wire...now take the first letter of each word.

Basically, all shielded wire is a lowpass filter. The schematic for the most common type of lowpass filter is a series resistor with a capacitor to ground. Is this not in fact the true nature of wire? It has a running series resistance, and because the conductor is inside of and very close to the grounded shield, it is also one nice long capacitor. So without even getting into exotic factors such as termination reflections, garbage induction, crosstalk, ground loop currents, nonlinear transmission properties (distortion) as a function of oxygen present while the copper was being formed, and time/frequency disruption from skin effect, wire sucks up high frequencies. It just ain't flat.

I have come to believe that the skin effect as it applies to audio basically seems to be not only real, but a major area of hope for long-distance signal integrity. And since my studio is equipped with high-quality wire, incorporating every skin effect trick there is, I thought I would try real good S-video wire, hoping for video improvement similar to what I have experienced from top-end audio wire. After all, the higher the frequencies involved, the more skin effect matters.

I found that for short runs of a meter or less, super-good wire does a nice job of minimizing transmission loss to an acceptable level. And for long runs, say seven meters or so, the difference in good and cheap S-video wire is even more pronounced. The good super S-video wire yields fair results, while the cheap S-video stuff delivers an unusably bad image. In fact, most consumer-grade S-video wire produces a *worse* overall subjective image than *regular composite video wire* on runs of seven meters or more. Too true. Too bad.

Why? Because even though S-video's separation of luminance and chroma allows for a superior image by avoiding the separation filter (among other things), it is *less* tolerant of longer runs than good ol' composite. In fact, S-video feeds clearly degenerate after as little as one meter, while composite happily muddles along in the placid bliss of mediocrity for ten meters or more (personification of modulated voltage notwithstanding). So what's a poor boy to do?

Well, for me the answer revealed itself as I was trying to find an S-video distribution amp for my living room projection system. A local tweezy AV boutique turned me on to TRIBUTARIES/Gordon J. Gow Technologies Inc. in Florida. It turns out that they make super-tweezy S-video cable (along with most other types of audio wire) and an active S-video distribution amp that had some "special features that I might like."

I got TRIBUTARIES' Very Best Silver wire for my short feeds, and I put one of their line amps on the sending end of every S-video feed more than three feet long. I also got seven meters of their Very Best Silver wire and their Pretty Good Wire to experiment with the long run. I will tell you right now that the real good wire clearly outperformed the pretty good wire (which dramatically outperformed the wire I could buy at my local Radio Shack). No comparison. But since seven meters of

World Radio History

the real good wire costs about the same as a small Harley, and the guy at TRIBUTARIES told me to try their line amp feeding the less expensive wire, I did.

The line amp, called the S-video Compensator, is 1 in, 3 out, with two of the outs having very interesting controls and one just actively buffered so that you can feed another amp for even more fan-out. So now wire goes beyond wire—it has it's own adjustable line driver. Each of the two main outputs has Narrow Band Cable Compensation (HF EQ), Broad Band Cable Compensation (midrange EQ), Luminance, and Chroma levels. Mmmm. This might actually be enough to fix the problems with line transmission of S-video, I thought to myself. And it seems that it is.

I have an audio rule that simply states: "Wire Superimposes Unacceptable Constraints, Killing Sound."

By following the rather sparse instructions that tell you how to set this thing up, you can get pretty flashy video. But by *not* following the sheet, I was able to get very impressive long-cable performance and the type of image that I like: crisp, with a bit less edginess than most people seem to prefer. The single most important factor for me, and the reason that I now use this gear, is that I have control over the *ratio* of luminance and chroma levels. I don't have anything else that lets me do this. No more faded colors when using S-video!

I also put one on my videodisc player and set it up just for that 5-meter feed. This is what has been missing in my studio and living room for many years now. Now it looks like I'm ready to sit back and catch a few of the 80 movies offered by DSS tonight, so this column is done. Don't call me for ten hours or so. Thanks. ■

SSC wishes to thank the many who cared enough to send their concern and support after the bike crash. A couple more surgeries are in the future, but he still thinks life is fun and even funny.

UPDATED EDITION

The Studio Business Book

Revised Ed. by Jim Mandell

This updated edition of the informative, wide-ranging guide presents all you need to know about:

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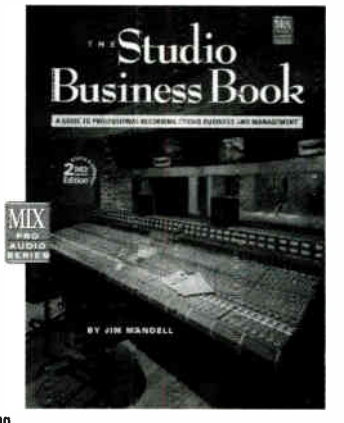
- ❑ Scheduling
- ❑ Managing, hiring, and firing personnel
- ❑ And more



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—FROM PAGE 24, SUMMER READING

called me and asked, 'How do I turn this damn thing off?'" And closer to home, I learned from the book that Vladimir Ussachevsky and Otto Luening's concert of tape music at New York's Museum of Modern Art, which was the first American electronic-music concert aimed at the general public and is regarded by many as the birthday of electronic music in this country, took place the same night I was born.

Second on my between-the-covers hit parade is a must-read for anyone who thinks that the current technology wars between AT&T and MCI, AOL and CompuServe, Alesis and TEAC, or Microsoft and just about everybody, are anything new. Corporate bullying, impossible R&D crash programs, lying to the press, using the courts to drive the competition out of business, turning government regulation on its head, and all of the other favorite corporate strategies we think are unique to the ruthless '80s and '90s were every bit as popular 70 years ago, if not more so. That's one of the major lessons of *Tube: The Invention of Television*, written by father-and-son team David E. and Marshall Jon Fisher, and published by Counterpoint, a small but very impressive Washington, D.C. house.

You may have seen the recent PBS documentary on this subject (David Fisher was one of the talking heads in the program), in which case you know about Idaho farm boy Philo T. Farnsworth, the engineer who was as responsible as anyone for the development of the medium, but who 20 years later was so totally obscure he could stump the panel on "I've Got a Secret." Like Edison and Bell, Farnsworth was the epitome of the lone inventor as the spirit of American technological genius. He got the inspiration for the scanning electron gun at age 14 while mowing a hayfield, and he told his high school chemistry teacher in 1922 that someday everyone in America would own a television tube.

Edison and Bell, however, didn't have RCA and David Sarnoff, a figure who makes Bill Gates look like Beaver Cleaver, to contend with. Unwilling to let his company use any technology owned by others, Sarnoff first tried to buy Farnsworth off, then spent the next decade systematically screwing him, stealing his patents, keeping his achievements out of the press and tying him up in lawsuits—which RCA ultimately lost, though they had the desired effect. By 1940, Farnsworth had lost control of his company and was (ironically for a Mormon) an alcoholic. Within a few years he developed a drug habit, his house had burned down, and his company was absorbed by ITT and vanished. He lived until 1971 but never again did anything that brought any success.

"General" Sarnoff (the title was essentially honorary, but he insisted that everyone address him by it) wouldn't let anything stand in his way. In 1935 he pulled the plug on his company's development of FM radio, partly because he didn't want to obsolete all of RCA's AM radios and partly so he could use the spectrum (and the transmitting towers atop the Empire State Building) for television. Major Edwin Armstrong, the inventor of FM, tried to sue his own employer for not supporting his baby, and eventually committed suicide.

The stories of the Theremin, the Electronic Sackbut, the Mixturtrautonium and the RCA Mark II synthesizer are fascinating and instructive.

Sarnoff struck again 15 years later in the battle over color, which started when a sequential-image system using a spinning disk designed by CBS's Peter Goldmark (whose other major invention was the long-playing record) was approved by the FCC. Because the system was incompatible with RCA's existing black-and-white sets, Sarnoff fought it tooth and nail and developed his own system, far inferior in quality to CBS's but compatible with older sets. CBS had trouble getting its manufacturing off the ground because of the Korean War, while RCA made sure their monochrome sets flooded the marketplace. After a couple of years, the FCC, not wanting to obsolete the millions of sets now in use, caved in and reversed its decision. The problems with RCA's color system would still give viewers headaches for 20 years—I have fond memories of playing hooky and going to a friend's house to watch *Do You Trust Your Wife*, starring a green Johnny Carson.

The Fishers paint sympathetic pictures of Farnsworth and other figures like eccentric Scotsman John Logie Baird, who in fact built the world's first working television (his previous, unsuccessful inventions included pneumatic boots and a glass razor), but they don't take sides; they let us know that RCA, mostly in the person of engineer Vladimir Zworykin, really *did* contribute a tremendous amount to television's development. And they tell us that there's a lot more to the saga than just Farnsworth and Sarnoff. Besides Baird's work, there was research going on in Germany, France, Japan and Russia, most of which ground to a halt when World War II broke out. The Germans, for example, had invented videoconferencing in 1940 but never went into production, while the Japanese had a home-grown television system that they hoped to use to broadcast the 1940 Olympics in Tokyo, but they were too busy fighting in China to make it happen. (They would win a different television war, but that was much later.)

If you follow any of today's format and platform wars, in any medium, the stories the Fishers tell will seem painfully familiar. They even offer a preview of the next TV war, in an even-handed chapter on the death of HDTV and the birth of digital television. Digital technology, they warn us, may not make television any better—it just may make more channels available to today's broadcasters. "Radio and television contributed nothing to world harmony," they warn, "and neither will digital TV. Only human beings can do that."

By humanizing the people behind the technology, and showing us the excitement and the heartbreak that accompanied nearly every step in the development of the new medium, the Fishers have brought to life a crucial part of our history—recent enough that there are still many alive who were around when it all started, but already largely forgotten in this age of constant media churn. There are lessons here for all of us, and we'd better start learning them.

Next month: Gravikords, Wurlies, Pyrophones and Tom Waits. ■

Paul D. Lehrman, composer, writer, educator and iconoclast, only watches television when he's working.

World Radio History

—FROM PAGE 80, RING AROUND MANHATTAN
created an instant control room, complete with an API 2432 console. The raucously decorated space has become a favorite of producers such as Jack Douglas and jazz and regional rock acts. The recently revivified Patti Smith cut her most recent record there. "The business is definitely coming here from New York," says Cicala, who came back to the New York area several years ago after stints in California, South America and Nashville. "This is not a producer's or engineer's room," he says of the cavernous, frat house-like space. "We didn't spend the money on aesthetics; we spent it on things like microphones." The studio goes for $1,000 per day. Cicala, whose engineering and producing talents assisted performers like Alice Cooper, Paul Simon and John Lennon, also acts as a draw for the facility (his services are extra). "The New York studio scene has become so expensive, it's scaring a lot of people," he says. "Not the major labels, but the indies, who are providing a lot of the recording business these days. This is being operated just like Record Plant was, but not with a $150,000 monthly overhead."

Showplace Studios, in Dover, offers an Amek Mozart with Supertrue automation and analog Studer and Otari decks. Forty-five minutes from Manhattan, the studio, which charges $750 per day, has attracted post-alternative acts like Henry Rollins Band, a clientele based to a large degree on the relationships built by owner/chief engineer Ben Elliott, says studio manager Jess Mulvaney, who also sings the praises of engineer Michael Wooding. "Everything is word of mouth when it comes to New Jersey," he says.

"With the recent addition of a Studer A800 MkII, we have become a 48-track studio," he continues. "We also have one of the largest collections of vintage gear anywhere in the world. This, plus our large, versatile tracking room, attracts clients from all over who seek any sound, such as producer/engineers Jason Corsaro, Andy Wallace and Joe Barresi."

The regional scene around New York is diverse, as healthy as can be expected given the times, and—most importantly—incredibly hardy. It could be that they draw their strength from the fact that, at any minute, they can leave the bucolic studio environments for the city and grab a slice of any kind of life they want. Or, as is the case most days, just a slice of pizza. You have to have your priorities in order. ■

FIELD TEST

—FROM PAGE 139, WESTLAKE AUDIO Lc 6.75
of test CDs: old jazz releases, in-your-face rock and funk tunes, solo piano, percussion and full orchestral works. The quality of the recordings varied from cruddy to marvelous, and the 6.75s hid nothing. Another bonus was that after extended mixing sessions, I experienced no ear fatigue and felt that I could actually monitor successfully at moderate volumes for several hours.

In addition to optional heavy-duty multistrand hookup cables, Westlake offers other choices: A magnetically shielded version of the speakers is available for those working near computer and video displays. Also, Westlake recommends its Super Duper Speaker Muffs ($85/pair), removable 3-inch sculpted foam "frames" that essentially extend the area of the front speaker baffle. In console-top applications, the foam edge extending from the bottom of the monitor may partially block sightlines to your meter bridge. However, I found the SDSMs make an audible difference and are worth the extra bucks, improving the stereo image and apparent bass response. Speaking of bass, subwoofers for the Lc series are being developed and should be available in the coming months.

Studio monitors rarely include much in the way of documentation, but Westlake should be commended for the 6.75's thorough manual. This includes a survey of characteristics in an optimum set-up as well as acoustical considerations to ponder. The booklet winds up with an unusual word of caution on monitoring at high SPLs. This message can't be said enough and it's laudable that Westlake mentions it here.

With the Lc 6.75 speaker system, Westlake Audio provides a truly handcrafted monitor to the professional studio community at a reasonable price. Accurate and smooth, with a transparency found in monitors costing much more, the Lc 6.75s represent an exciting direction for the company. The Lc 6.75s also have a big brother, the Lc 8.1, which is said to improve on the Lc 6.75. If my experience is any indication, seek them both out. They're worth a serious listen.

Westlake Audio, 2696 Lavery Court, Unit 18, Newbury Park, CA 91320; 805/499-3686; fax 805/498-2571. ■

Alex Artaud is editor-in-chief of Mix—Edición en Español.

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World Radio History

—FROM PAGE 176, METALLICA

ble; it will terrify you, leave you speechless. If you start putting microphones with the wrong pattern into that environment, you're done. Pick the right one with the right pattern and you'll help yourself get around some of that noise.

Care to reveal any trade secrets on miking the drum kit? I noticed you're using underhead cymbal mics. Was that a choice driven by aesthetics or performance?

Hughes: I did that for two reasons. One, there was so much guitar across the overheads, they simply weren't usable, and two, the drummer just wouldn't have it any other way. We picked eight Shure SM98As for the underheads and used two more for the hi-hats. Toms are Beta 56s, snare bottom is an SM81. Snare tops one and two each received an SM57, and we use SM91As in the kick drums.

Please explain the logic behind the six loudspeaker hangs.

Hughes: It goes like this: There's one hang over each corner of the stage and two in the center. The two in the center are pulled back to mechanically provide time offset correction. Because our stage is five feet high, it's almost pointless to put anything on the ground. You can't put a horn in someone's face, after all. If the stage were seven feet tall it would be over their heads, but at five feet, it's literally in-your-face.

With six hangs and a stereo console, how do you split between right and left?

Hughes: There's eight matrixes on the Midas XL4, so I have left and right at my end of the stage, center, then left and right again at the other end. It counts off left, right, left, right all the way around, so you actually have stereo. I'm in the worst place to listen, because I can't hear the other side. I'd need a platform constructed out in the seating area if I wanted to even try to hear everything, and that would just kill too many seats. So I stay on the floor. To keep tabs on the areas I can't hear; my sound crew serves as my ears. They constantly walk the venue and report back on how it sounds. Sometimes I even walk the floor myself during the show if its a problem venue.

We mentioned effects earlier with regard to vocals. Perhaps that topic warrants further investigation...

Hughes: I excite the tom-toms to give them the attack they need with BBE862 Sonic Maximizers across the subgroup. Then there's the usual complement of reverbs and whatnot: a Klark-Teknik 780, Eventide H3000se multi-effects unit, Yamaha SPX990, Korg SRV3000 and an ancient Yamaha REV1.

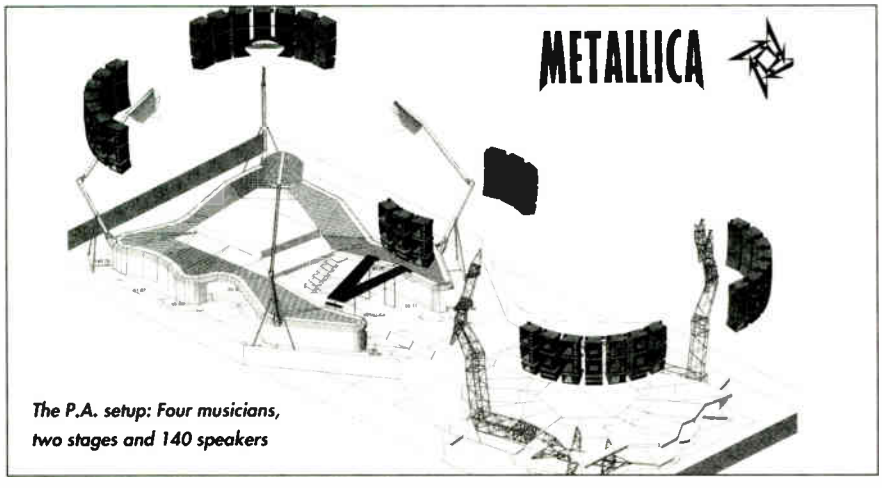
Isn't the REV1 about the size of a dishwasher?

Hughes: It is a bit large. I use it quite a bit in the studio, but I don't know if it's going to survive out here. I'll give it as much of a go as I can and see if it'll last.

What is your basic philosophy on the use of effects?

Hughes: I don't go for mega-effects. I think it's more important to work on the source sound. The tributes come later. In a lot of these rooms, if you can actually use them effectively, well good luck...Effects tend to go off the wall in places where acoustics are bad. You aren't going to discern that extra 0.2 milliseconds on the snare drum in a room that has nine seconds of reverb anyway. This music doesn't ask for effects. It asks for energy, EQ and power. And we have power. Three hundred fifty kilowatts worth to be exact. When you hear it, it's like staring into the mouth of a lion... ■

Greg DeTogne is a freelance writer based in the Chicago area.



The P.A. setup: Four musicians, two stages and 140 speakers

—FROM PAGE 158, MERLE HAGGARD

SM98As for snare and toms, a foam-mounted SM91 for kick, SM81s for overheads and hi-hat, and SM58s on lead and backing vocals. "I've tried all kinds of microphones on Merle's vocal," McGill explains, "and the way he likes to use the microphone, using the entire spectrum of the mic during his show, we found the SM58 is best to get all the different pitches and tones that he uses."

The one really new piece of gear being used on this tour is Haggard's guitar: the Fender Merle Haggard Tough Dog issue, which will make its official debut at this summer's NAMM show in Nashville. But, of course, in order to sound like Merle Haggard, you have to be able to play and sing like Merle Haggard, and he's one-of-a-kind.

"I just try to keep Merle's vocal above everything," McGill says, "because that's what people are here for. A lot of times that's hard in a boomy room, because the stage volume alone will wash out a lot of the front of house, so I'll just bring everything else down as much as I can, and bring Merle's vocal up. Also, sometimes he'll back off of the microphone, and it'll thin out, so I have to fight that once in a while—to keep his vocal in front without bringing up the volume too much. There's a mixture of people at these shows, but we normally have an older crowd out there, so we have to keep the volume down to where it's comfortable for people."

At the Maritime Hall show, Haggard and The Strangers played mainly Haggard classics, such as "Mama Tried," "Swinging Doors," "Silver Wings" and "I Think I'll Just Stay Here and Drink," a song the crowd took pretty seriously. Haggard generously surrendered lead vocals a few times, though, for the Manuel brothers to shine on a couple of Cajun tunes, and for Bonnie Owens to sing "Have I Told You Lately That I Love You." It was a treat for country music fans—not many hard core country acts come to urban San Francisco—and it was a gift in more ways than one: All proceeds were going to pay medical bills for the great Rose Maddox, who is currently hospitalized with cancer. Haggard kept the mood light, though, by joking that it was much better than giving money to him, because he'd just end up passing it on to the IRS and "the law."

After that gig, the tour was headed north and then back east. The Maritime Hall, meanwhile, would prepare for March visits from Willie Nelson and Waylon Jennings—further hope for country music fans with the "Nashville Rash." ■

World Radio History

—FROM PAGE 196, BEN VAUGHN

Brothers. This way of working is not as radical as it used to be."

By proving an artistic point—that you can record a CD in the back seat of your car—Vaughn managed to produce some pretty soulful, catchy tunes in his *Rambler '65*. "It works, and it makes great music, and that's really what it's all about. 'By any means necessary,'" Vaughn stresses. "I know Malcolm X wasn't talking about recording in a car when he said that. But, my feeling is if you're slowing me down, get out of my way, because I want to finish this record, by any means necessary. If a trash can lid sounds right, then that's the right instrument. Get the job done. Make sure the spirit of what you intended is intact. It doesn't work for everyone. It's not gonna work for Kenny G." ■

—FROM PAGE 183, A HIP HOP SAMPLE

all the parts put together, that's when it works."

Grama says the studio's break came when DJ Premiere started using the rooms about five years ago and then mentioning it when he played his remixes on the radio. It attracted other DJs, including Evil D, Tony Touch and Red Alert, bringing in the hip hop crews just as dance was getting old.

While D&D remains home to established acts and producers, it also functions as a starting point for many new artists. Typical sessions are short and go for between $85 and $100 per hour, including an engineer, for five-hour minimums. "With three rooms, we often do as many as eight sessions a day in here," says Grama. "They're not spending three weeks getting a hi-hat sound."

Grama has a crew of freelance engineers, many of whom trained at the studio. Both Grama and leading New York hip hop engineer Tony Maserati—whose credits include Mary J. Blige, Notorious B.I.G. and Heavy D—note that many black hip hop engineers come in and want to be producers or artists, not engineers. "They choose a different path through the music," says Maserati.

Maserati says one way that hip hop differentiates itself from dance is the slower tempos, with 94 beats per minute being a fast hip hop track, while 125 has been the dance standard for years. "Hip hop comes from the early sampling days of New Jack back in the '80s; there's not really many parallels to dance in it," he says. "But the samples can come from all over time. Right now, a lot of samples from '70s-era records are hot. Those are all over Mary J. Blige's last record. [Producers] Trackmasters and [Sean] Puffy [Combs, who recently opened his own SSL-equipped facility, Daddy's House] are heavily into Barry White and Isaac Hayes samples. The way to look at it is that samples are an allusion to what the artist is trying to depict in the lyric of the song. But certain samples are cool and others are not, and that can change from month to month."

At D&D, a typical hip hop session starts with an MPC 60 or the MPC 3000 as the source for sequencing samples and drum loops. How much is sampled depends on a combination of creativity and economics—i.e., how much of the record the artist is willing to give up for the sample (see sidebar). Maserati says the trend recently has been going away from samples, for either creative or economic reasons. Sometimes the sequencing is done offline at a producer's or artist's home studio, usually on the Akai, sometimes on a DA-88, a favorite *modus operandi* of Trackmaster's Poke. Stevie J from Puff's Bad Boy camp will come in with just a few loops and build from there. Puff himself will often start more organically, playing acoustic guitar and piano and sampling it to the MPC, Maserati says. Linear tape formats are used, but generally after the sequencing has been done.

"One of the differences is that in hip hop, the programmer is part of the group; in dance, they use live horns a lot and bring in outside programmers," says Maserati, citing Devante Swing, member of and producer for Jodeci—he also writes and programs their records.

The MPC 1200 and other low-resolution boxes are still favorites. Maserati says that he never looks for distortion, but does try to achieve grittiness, using more conventional outboard gear. "I'll put an occasional telephone EQ on a vocal, or else push the vocal real hard through an LA-2A to get the tubes to hum," he explains. "But you never go for a real rock-style, Nine Inch Nails distorted vocal. Like any genre, there are parameters you have to stay within. Hip hop wants the heavy bottom and the steady groove, but you also have the rap, so you have to be able to sculpt frequency holes in the bottom and the groove to let the vocal and other key instruments through." ■

CLEARING THE SAMPLE

In the wake of dozens of lawsuits over the past several years—most notably *Grand Upright Music vs. Warner Bros. Records*, which helped establish clearer definitions—several companies have sprung up to deal with the legalities of sampling. Sample Clearance Ltd., formed in 1992, is owned by two New York attorneys, Eric Weissman and Danny Rubin, and provides sample-clearance services to both individual artists and producers, as well as to major music corporations, including EMI Music and Capitol Records.

"Once someone submits a request, we find the publishers [of the song being sampled]," explains Weissman, who previously worked on legal licensing at SBK Records and EMI Music Publishing in New York. "Requests do get turned down occasionally, but usually they're approved. There's no set fee or schedule; it's more like negotiating a sync license—what is the demand for the sample and how much of it is being used and who and how popular is the artist all goes into it."

Clearances can cost the artist anywhere from 10% on up of a song's publishing and mechanical royalties. If the sample is continuously looped over a rap track, it can run to 50% or more, and sometimes a royalty advance is requested.

What length of sample constitutes infringement? Weissman says there is no set law and that all such alleged infringements have to be tested according to the doctrine of "substantial similarity," a concept that dates back to the 1976 flap over George Harrison's use of the tune to The Chiffons' "He's So Fine" on his record "My Sweet Lord." "The smartest thing is to do your clearances in advance of the record's release," advises Weissman. "If you wait, you could be hit with much higher costs for a sample."

—Dan Daley

World Radio History

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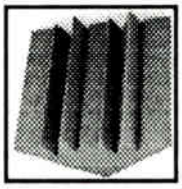

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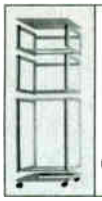

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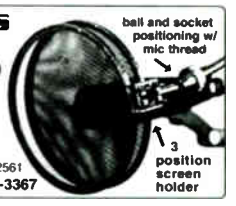

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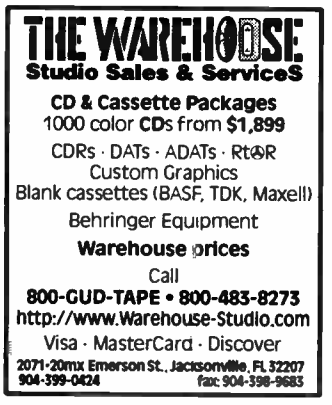

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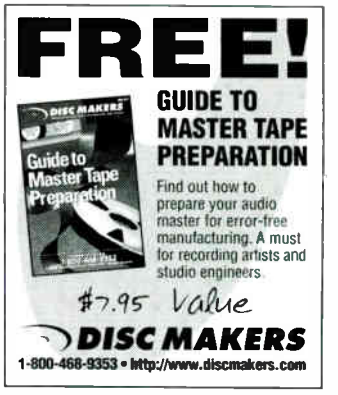

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—FROM PAGE 154, 20-BIT ADATs

or within a system, and internal trim pots for precisely matching operating levels (±5 dB) to your console. System status, locator information and metering are on two large fluorescent displays, with double the space of that provided on the Alesis XT.

An LRC mini-remote is included with the machines. For those requiring more, an optional Controller Autolocator Desktop Interface (CADI) can control up to eight ADATs (64 tracks) with access to all controls, track arming and sync functions. Unlike the BRC control, CADI does not house all the system synchronization circuitry. Communicating to any Type II deck via a single RJ-45 Ethernet-style cable (up to 300 meters), CADI merely acts as the interface telling the system what to do. The real power is in the ADAT itself. Also on the RJ-45 bus is display information for the redesigned 32-track optional meter bridge, which like the new ADATs, also provides a choice of metering modes (including a high-res 0.2dB/division setting) as well as error/interpolation indicators.

THE NEW FORMAT INCLUDES A DEDICATED TIMECODE TRACK AS WELL AS AN ANALOG AUXILIARY TRACK FOR CUEING OR OTHER PURPOSES.

Behind its silver-colored faceplate, the Studer V-Eight is substantially different from the Alesis Meridian. The V-Eight employs 24-bit A/D converters from Studer's D827 MCH and a parallel port for 9-pin control via the Sony P2 standard. For field listening or machine room applications, the deck also has a front panel 8x2 monitor mixer, with headphone out and a cascade function for monitoring multiple machines. The V-Eight will retail at about 10% more than the Meridian.

Priced at less than $7,000 (about double the cost of an Alesis XT), Meridian brings the cost of a 24-track, 20-bit digital recorder below that of a new analog 24-track. Combined with some of the new 20-bit workstations on the market, a variety of useful options (CADI, meter bridge, AES interfacing, rack slider kit, etc.) and an existing base of 100,000 machines, the ADAT Type II format should provide new choices for large and small studios alike.

Alesis Corp., 3630 Holdrege Avenue, Los Angeles, CA 90016; 310/841-2272; fax 310/836-9192; Web site: www.alesis.com.

Studer Professional Audio, 1449 Donelson Pike, Nashville, TN 37210; 615/391-3399; fax 615/259-4452. ■

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FEEDBACK

FOR THE RECORD

I would like to thank *Mix* and Dan Daley for the "Producer's Desk" article in the February 1997 issue. I am extremely pleased to be chosen for this recognition, especially in such a renowned publication as *Mix*. However, in the interest of clarity I wish to amend one portion of the interview. During the making of Mariah Carey's first record, I was in no way responsible for the hiring of musicians. That aspect was handled by Rhett Lawrence and the people at Sony (then CBS). My opinion was solicited on the subject of certain musicians, and often players I supported were used. My comments were only intended to convey an appreciation for being included in that process, not to imply that it was an area under my control. Thank you for the opportunity to clarify this point.

Patrick Dillett

20/20 HINDSIGHT

As a 20/20 reference monitor user, it is my pleasure to say that I love them to death and that I could not have asked for a better-sounding powered system in that price range. So the one and only question I ask is: "Why in the hell were the on/off buttons put on the back?!" after each session in the studio, I literally have to climb on top of the mixing board to turn them off (and on for that matter) because of limited space. In my book, I would have given Event Electronics a perfect "10" instead of a 9½ if they had put the on/off buttons on the front.

Alfonso.Sanchez@ncal.kaiperm.org

NOTHING BUT STAR WARS

Larry Blake's article in the February issue on Ben Burtt and the remastering of the *Star Wars* Trilogy was informative, exciting and, above all, proved to me that I wasn't crazy after all. When Burtt described the different mixes that the first film went through, it answered years of questions that I had but never knew where to direct. I distinctly remember differences in dialog and sound effects from the original theatrical release to the subsequent home video versions, including the Threepio line Burtt mentions.

Along with that line (which wasn't even in the THX remaster) was another line of dialog that I don't remember being in any video release—a line a stormtrooper yells out while chasing Han Solo and Chewbacca: "Close the blast doors!" which sets up the humor in the scene when Han and Chewie narrowly escape and another trooper calls out "Open the blast doors, open the blast doors!" I wonder if Burtt ever received calls from pay phones in Manhattan about that one. As strange as it may sound, I wanted to cheer out loud when I heard that line—missing for years—and the audience laughed heartily, which was the intent in the scene. The only other differences I noticed were certain creature sounds in the cantina scene and various bits of Chewbacca growls that were in or out, depending on the home video version. As a matter of fact, one of my sources that backs up the discrepancies is the original album called *The Story of Star Wars*, narrated by Roscoe Lee Browne (and yes, the "Close the blast door" line is on that release).

Now the Special Editions are finished (as I write this, *The Empire Strikes Back* hits theaters in a matter of days), and once again the team at Lucasfilm has redefined the movie-going experience both visually and aurally. I'm very pleased that they didn't decide to start from scratch on the sound elements in the films—something that Burtt can do as he prepares for the new Trilogy.

Dane Eric Petersen
dep0008@jove.acs.unt.edu

WHATEVER TURNS YOU ON

I wait patiently with bated breath for every issue of *Mix* magazine to show up at my P.O. Box. In my younger days, it would be a copy of *Playboy* or *Penthouse* (or the occasional *Hustler*), but now that I'm older I swear I get the same type of arousal when that copy of *Mix* arrives. Don't change a damn thing. I'm sick and tired of everybody slamming Stephen St.Croix, and I'm not even a Mac user; if you get rid of him, I'm canceling my subscription. Plus, the article "Level Practices" by Bob (God) Katz in your March 1997 issue was worth its weight in gold.

Also, I sometimes wonder who your magazine is geared toward. I mean, I drool over serious words such as "SSL w/VU + Ultimatopeo" and "Neve w/flying Whatchamacallits" (usually I'm saying to myself, "What the hell is that? It sure sounds expensive"), but much of your advertising seems to be geared toward us poor guys (with Mackie 8-buses and ADATs, etc.), although I realize that technically that line is getting smaller. Anyway, excuse my rambling (I'm getting drunk on homebrew and pizza) and don't change a damn thing or I'm canceling my subscription. Seriously, keep up the good work.

Todd from Seattle

MEET YOUR MAKER

I really enjoy your magazine. It's taken me light years along my audio and recording path. I'd like to see more articles on some of the interesting people behind the high-end equipment, such as a bio of Rupert Neve, the workshop of James Demeter, what's behind the scenes at D.W. Fearn, Anthony DeMaria Labs and Manley, to name a few. Those of us who got into this business only a few years ago see the pictures of the products and we read the reviews, but I think the really neat part of the better, more hand-made equipment is the people behind them and the workshop environment the equipment comes from, as opposed to the mass-produced, robotic circuit board-assembled pieces. I have my share of those, too, and many of them are good, but it's the people behind the technology, just as it's the people behind the music, the microphone and the mixing desk that make our business mean something. I'd like to meet more of them through your magazine! Keep up the great work.

Elliot James, Wateree Studio, Atlanta
ejames@concentric.net

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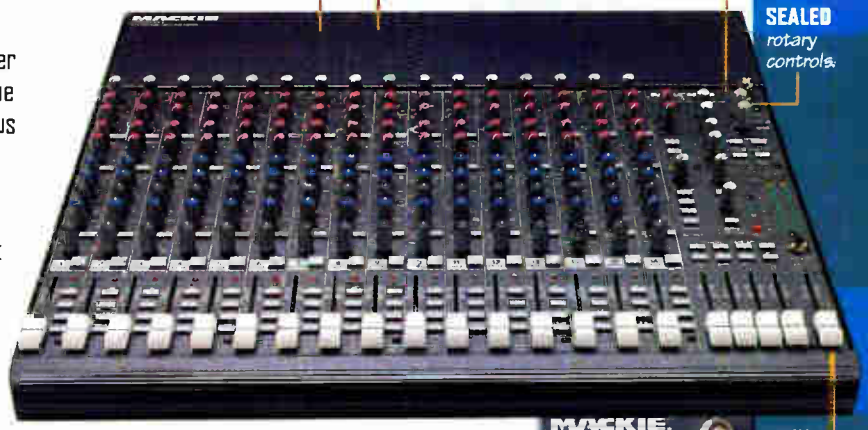

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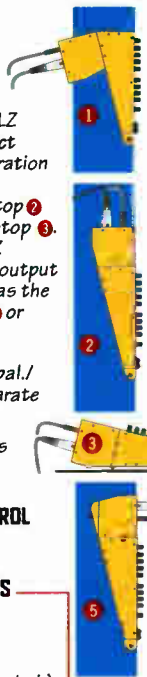

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Studio-quality **DISCRETE MIC PREAMP** on every channel.

Pre-fader **INSERT** on every ch.

*Suggested U.S. retail; higher in Canada.

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MACKIE™

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CIRCLE AD NUMBER ON PRODUCT INFO CARD

Most Tour Sound Systems Take Years to Become Classics. Some Are Just Born That Way.

Introducing the Revolutionary New HLA Series Loudspeakers.

4895 Three-Way

Once in a great while, an idea comes along that can be considered truly revolutionary. Well, it's once-in-a-great-while-time again. Introducing the HLA Series and its centerpiece, the 4895 Three-Way -- a metamorphosis in tour sound technology from JBL Professional.

At the heart of the series are two DCD drivers, a 10" and a 14", which offer the ultimate in performance at as little as 7 lbs. per driver. This is accomplished with a new Neodymium magnet design and new voice coil topology which vastly reduce the need for steel. Dual Coil Drive was chosen because it has two magnetic gaps and two voice coils in each driver. This doubles their power-handling capabilities.

To provide each listener with better quality sound, JBL engineers designed a new, three-way MultiBand Waveguide™, powered by the two DCD drivers in a composite magazine with a large format compression driver. The composite magazine gives the drivers the rear compression load required to balance the acoustic resistance furnished by the waveguide. To minimize distortion, Optimized Aperture™ technology is used to supply the longer path length required for precise pattern control. To make the most of this increased efficiency, we then placed the entire system in our patented SpaceFrame™ enclosure, which allows it to be easily tilted and aimed to give the audience even coverage with minimal overlap.

To keep pace with this extended performance, the HLA Series also features our powerful 4897 Subwoofer, which has an innovative composite enclosure made of carbon fiber and aluminum and new port technology. The net result is 3dB more output than any other 18" system in existence and dimensions conveniently equal to the 4895.

Put all its remarkable components together and the HLA Series represents a radical departure from any professional sound reinforcement system currently in use -- one that offers unparalleled flexibility, ease of setup and the most seamlessly uniform coverage ever. With this revolutionary, not just evolutionary, new tour sound system, JBL has given a whole new meaning to the already universally respected "JBL Loaded". If professional sound matters to you, write to JBL Professional or visit our website at jblpro.com. A change for the better never sounded so good.

HLA Series

JBL PROFESSIONAL

Tilting the Balance

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